Revised YouTube link 3/25/20

KY COUNCIL ON POSTSECONDARY EDUCATION
ACADEMIC & STRATEGIC INITIATIVES COMMITTEE

March 25, 2020 - 10:00 AM
ZOOM teleconferencing for Committee members
Livestream video for public: https://youtu.be/Ysh3vVBtJKU

I. Welcome & Roll Call

II. Approval of the Minutes
- *January 9, 2020*

III. Update from the President

IV. Proposed New Academic Programs for Review & Recommendation (Action Item)

A. Eastern Kentucky University
   1. Master of Social Work, CIP Code 44.0701

B. Northern Kentucky University
   1. Cybersecurity (B.S.) CIP Code 11.1003

C. University of Kentucky
   1. Biomedical Engineering (BS) CIP Code 14.0501
   2. Computer Engineering (MS) CIP Code 14.0901
   3. Computer Engineering (PhD) CIP Code 14.0901
   4. Orientation and Mobility (MA) CIP Code 13.1009
   5. Product Design (BS) CIP Code 50.0404
   6. Supply Chain Engineering (MS) CIP Code 14.3501
   7. Supply Chain Management (MS) – CIP Code 52.1399
   8. Teacher Preparation Program in Visual Impairments (MS) CIP Code 13.1009

V. Engineering in Kentucky: A Sector Analysis of Labor Market Information and Program Demand

VI. Other Business and Adjournment

Next meeting: May 20, 2020 @ 2:00 p.m. ET

DRAFT MINUTES
Council on Postsecondary Education

Type: Academic & Strategic Initiatives Committee Meeting
Date: January 9, 2020
Time: 1:00 p.m. ET
Location: Council on Postsecondary Education, 2nd Floor Training Room

CALL TO ORDER

The Academic & Strategic Initiatives Committee met Thursday, January 9, 2020, at 1:00 p.m., ET, at the CPE offices in Frankfort, Kentucky. Committee Chair Lori Harper presided.

ATTENDENCE

- Attendance in person: Lori Harper and Grant Minix
- Attendance by teleconference: Lucas Mentzer, Donna Moore, Vidya Ravichandran, Robert Staat (joined at 1:20 p.m.), and Sherrill Zimmerman.
- Did not attend: Ben Brandstetter, OJ Oleka and Brandon Wilson.
- Heather Faesy, CPE's senior associate for Board Relations, served as recorder of the meeting minutes.

APPROVAL OF THE MINUTES

The minutes of the October 8, 2019 meeting were approved as distributed.

PROPOSED NEW ACADEMIC PROGRAMS FOR REVIEW & RECOMMENDATION

KRS 164.020 (15) empowers the Council on Postsecondary Education to define and approve the offering of all postsecondary education technical, associate, baccalaureate, graduate, and professional degree, certificate, or diploma programs in the public postsecondary education institutions. Council staff reviewed the following proposed programs and recommended approval by the board.

1) Morehead State University - Bachelor of Science in Systems Integration Engineering (CIP Code 14.2701)

The proposed Systems Integration Engineering (SIE) program aims to produce graduates who are interdisciplinary professionals capable of designing, manufacturing and constructing mechatronic devices and systems, as well as automating industrial processes.

MOTION: Mr. Minix moved the Committee approve the Bachelor of Science in Systems Integration Engineering at Morehead State University, and recommend approval by the Council at its January 24, 2020 meeting. Ms. Zimmerman seconded the motion.

VOTE: The motion passed.

2) University of Louisville - Bachelor of Science in Business Administration (CIP Code 52.0201)

This program is a 120-credit hour undergraduate degree that prepares versatile, broadly educated graduates to accelerate their professional success as managers. In additional to the core business courses required of all BSBA students, the management major curriculum covers a range of management functions: project management, human resources management, team management, and operations management.

MOTION: Ms. Moore moved the Committee approve the Bachelor of Science in Business Administration at the University of Louisville, and recommend approval by the Council at its January 24, 2020 meeting. Mr. Minix seconded the motion.

VOTE: The motion passed.

3) University of Louisville - Bachelor of Science in Urban Studies (CIP Code 45.1201)

The BS in Urban Studies is designed to prepare students for future careers in municipal and metropolitan-related occupations, such as planning technicians, public administrators, public policy analysts, or community development specialists and for future graduate training in affiliated disciplines. Graduates of the program will be versed in urban policy, sociology, geography, governance, and analytical and research methods.

MOTION: Ms. Zimmerman moved the Committee approve the Bachelor of Science in Urban Studies at the University of Louisville, and recommend approval by the Council at its January 24, 2020 meeting. Mr. Minix seconded the motion.

VOTE: The motion passed.

4) University of Kentucky – Doctor of Social Work (CIP Code 44.0701)

The DSW is designed to move social workers from the broader foundation of generalist social work practice to an advanced level of application of theory, knowledge and skills in a variety of practice settings. This Doctorate of Social Work will provide an educational foundation to prepare practitioners who seek social work positions that require an advanced practice doctorate.

MOTION: Ms. Zimmerman moved the Committee approve the Doctor of Social Work at the University of Kentucky, and recommend approval by the Council at its January 24, 2020 meeting. Dr. Staat seconded the motion.

VOTE: The motion passed.

5) University of Kentucky – Master of Arts in Applied Environmental and Sustainability Studies (CIP Code 03.0103)

Applied Environmental and Sustainability Studies (ENS) is an interdisciplinary field that prepares students to analyze complex environmental problems from a variety of perspectives and apply their findings to facilitate change. The Master's in Applied Environmental and Sustainability Studies encourages a liberal arts approach by drawing from the humanities, social sciences, and mathematics and natural science disciplines. By taking coursework across disciplines, students develop skills required for success in the field. Those skills may include critical thinking, independent learning, oral and written communication, problem solving, academic knowledge in environmental issues; an understanding of sustainability as it pertains to healthy, productive, and equitable quality of life for future generations.

MOTION: Mr. Minix moved the Committee approve the Master of Arts in Applied Environmental and Sustainability Studies at the University of Kentucky, and

recommend approval by the Council at its January 24, 2020 meeting. Dr. Staat seconded the motion.

VOTE: The motion passed.

6) University of Kentucky – Doctor of Philosophy in Arts Administration (CIP Code 50.1001)

The MA program provides students with an innovative and individualized course of study as they work closely with graduate faculty in arts administration and the arts. This program will enhance the stature and strength of the Department, and the addition of the PhD will enhance the reputation and make the University of Kentucky the only university in the country offering a BA, MA and PhD in Arts Administration.

MOTION: Mr. Minix moved the Committee approve the Doctor of Philosophy in Arts Administration at the University of Kentucky, and recommend approval by the Council at its January 24, 2020 meeting. Ms. Moore seconded the motion.

VOTE: The motion passed.

REVIEW OF EXPIRING ADMINISTRATIVE REGULATION

Presenter: Travis Powell, CPE's Vice President and General Counsel

House Bill (HB) 50, signed into law in the 2017 Regular Session, amends the statutes governing administrative regulations, KRS Chapter 13A, and requires that action be taken on an administrative regulation at least every seven (7) years or the regulation will be repealed. Action can be in the form of certification that the agency either intends to keep the regulation in effect "as is," or amend the regulation within 18 months. Agencies can also choose not to take action and allow regulations to be repealed after the expiration date.

The first date of expiration outlined in HB 50 was July 1, 2019 for regulations last adopted or amended on or before July 1, 2012, but due to the passage of HB 4 in the 2019 Regular Session, the first date of expiration was extended to March 1, 2020. The issue of regulation expiration was generally discussed with the full Council at the February 22, 2019 and April 25, 2019 meetings.

Mr. Powell discussed 13 KAR 2:025 – *College Preparatory Education* – and the staff's recommendation for action. The regulation was adopted in November 2002 and will expire on March 1, 2020 without Council action.

MOTION: Dr. Staat moved the Committee recommend to the Council at its January 24, 2020 meeting that the regulation, 13 KAR 2:025 – *College Preparatory Education,* remain in its current form. Mr. Minix seconded the motion.

VOTE: The motion passed.

HIGHER EDUCATION'S RETURN ON INVESTMENT REPORT

Presenters: David Mahan, CPE's Associate Vice President for Data and Analytics
Melissa Young, CPE's Director of Grants and Special Projects

Dr. Mahan presented the findings from the Higher Education's Return on Investment Report, which focuses on Kentucky postsecondary education's return on investment from both a student and state perspective. It is the story of one cohort of students - the Kentucky high school class of 2010. This report tracks 42,856 students who graduated from a Kentucky high school in 2010 through 2018, the most recent year of data available. A more thorough review of the report will be given at the January 24, 2020 meeting.

2020 CAMPUS DATA BRIEFINGS

Presenters: David Mahan, CPE's Associate Vice President for Data and Analytics
Lee Nimocks, CPE's Vice President & Chief of Staff

Ms. Nimocks provided the schedule and format of the annual campus presentations to take place on January 23 and 24, 2020. Committee members did not provide any suggested revisions.

PROGRAM UPDATES & PROPOSALS

Presenters: Melissa Bell, CPE's Vice President of Academic Affairs

Dr. Bell provided updates on several projects in the Academic Affairs and Student Success Unit:

- Essential Skills Profile Proposal: The purpose of the Kentucky Essential Skills Profile is to communicate some of the most common and highly valued postsecondary learning outcomes. The Profile will help students articulate what they learned in college, employers better understand what students learned in college, and the public to better understand what postsecondary learning is and what graduates can do. Dr. Bell provided a draft of the developing document update on this work and how it may be embedded in the general education curriculum in the future.

- Program Review System Update: Dr. Bell provided an update on the project work at each of the campuses. It is planned that a campus will speak at the next ASI meeting in order give the Committee members a more thorough understanding.

- Upcoming Dual Credit Policy Changes: Dr. Bell briefed the Committee on the changes that may be coming to the Committee at its March 25, 2019 meeting for review and recommendation.

UPCOMING EVENTS

1) The Comebacker Convening: Improving Adult Access and Success will occur on February 6-7, 2020 at the Louisville Marriott East. This convening, co-sponsored by CPE and The Graduate! Network, focuses on ways campuses can effectively recruit and serve the adult market.

2) The 2020 Student Success Summit will occur on April 6-7, 2020 at the Louisville Marriott East. The theme of the Summit centers on the collaboration of faculty, administrators and staff working together toward the common goal of educating students.

ADJOURNMENT

The Academic & Strategic Initiatives Committee adjourned at 2:30 p.m., ET.

MINUTES REVIEWED AND APPROVED BY THE COMMITTEE: _____

TITLE: Proposed New Academic Programs for Review & Recommendation

RECOMMENDATION: Staff recommends the Committee accept the proposed New Academic Programs from Eastern Kentucky University, Northern Kentucky University and the University of Kentucky and recommend approval of each to the full Council at its April 24, 2020 meeting.

PRESENTER: Melissa Bell, CPE's Vice President of Academic Affairs and Student Success

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SUPPORTING INFORMATION

KRS 164.020 (15) empowers the Council on Postsecondary Education to define and approve the offering of all postsecondary education technical, associate, baccalaureate, graduate, and professional degree, certificate, or diploma programs in the public postsecondary education institutions. Council staff has reviewed the proposed programs and recommends approval by the board.

PROGRAMS PROPOSED FOR APPROVAL

Eastern Kentucky University

- Master of Social Work, CIP Code 44.0701

Northern Kentucky University

- Cybersecurity (B.S.) CIP Code 11.1003

University of Kentucky

- Biomedical Engineering (BS) CIP Code 14.0501
- Computer Engineering (MS) CIP Code 14.0901
- Computer Engineering (PhD) CIP Code 14.0901
- Orientation and Mobility (MA) CIP Code 13.1009
- Product Design (BS) CIP Code 50.0404
- Supply Chain Engineering (MS) CIP Code 14.3501
- Supply Chain Management (MS) – CIP Code 52.1399

- Teacher Preparation Program in Visual Impairments (MS) CIP Code 13.1009

Proposed summaries for each program are attached and provide detailed information on the following elements:

- Overview - Program description, CIP code, credit hours, institutional governing board approval date, and expected implementation date
- Market Demand – Justification of need and employer demand
- Unnecessary duplication justification
- Expected revenues and expenditures associated with implementation

PROPOSED PROGRAM SUMMARY

Instituion: Eastern Kentucky University
Program Name: Social Work
Degree Designation: MASTER OF SOCIAL WORK (MSW)
Degree Level : Master's

Program Description

The Master of Social Work (MSW) Program builds on a generalist foundation to prepare students to be advanced generalist social workers. The advanced generalist social work concentration teaches students to integrate social work theory, practice, and research as well as draw from interdisciplinary perspectives to support the well-being of individuals, groups, families, organizations, and communities.
The Eastern Kentucky University (EKU) Master of Social Work (MSW) Program will consist of 30 credit hours in the Advanced Standing Program and 60 credit hours in the Regular Program.

Will this program replace or enhance any existing programs(s) or tracks, concentrations, or specializations within an existing program? If yes, please specify

no

CIP Code: 44.0701
Credit Hours: 60
Institutional Board Approval Date: 4/20/2020
Implementation Date: 8/15/2020

Student Demand

Year 1 - 16
Year 2 - 24
Year 3 - 32
Year 4 - 32
Year 5 - 32

Market Demand

According to a market research report by Anderson and Diaz (2015), the demand for social workers has been historic with a 23 percent increase in the south since the second half of 2013. The Bureau of Labor Statistics (BLS) (2019) estimates that all social work jobs will grow much faster than average, 11 percent between 2018 and 2028, due to an increased demand for healthcare and social services specific to areas of specialty.

Employment Demand

	Regional	State	National
Type Of Job	**Child, Family, and School Social Workers**		
Avg. Wage	$38,830	$40,950	$49,760
# Jobs (Postings)	920	920	38300
Expected Growth	6%	6%	14%
Type Of Job	**Healthcare Social Workers**		
Avg. Wage	$43,850	$50,340	$58,470
# Jobs (Postings)	220	220	22900
Expected Growth	17%	17%	20%
Type Of Job	**Mental Health and Substance Abuse Social Worker**		
Avg. Wage	$29,450	$35,600	$49,630
# Jobs (Postings)	110	110	15900
Expected Growth	15%	15%	19%
Type Of Job	**Social Workers, all other**		
Avg. Wage	$43,130	$58,050	$62,660
# Jobs (Postings)	70	70	7200
Expected Growth	3%	3%	8%

Indicate source of market demand information

Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Social Workers,
on the Internet at https://www.bls.gov/ooh/community-and-social-service/social-workers.htm (visited October 18, 2019).

Projections Central, State Occupational Projections, Long Term Occupational Projections, on the Internet at https://projectionscentral.com/Projections/LongTerm (visited October 18, 2019).

2012-2016

Academic Demand

The Council on Social Work Education (CSWE) uses the Educational Policy and Accreditation Standards
(EPAS) when evaluating a social work program for accreditation. EPAS supports academic excellence by establishing thresholds for professional competence. EPAS recognizes a holistic view of competence; that is, social work competence is the ability

to integrate and apply social work knowledge, values, and skills to practice situations. Competent social work practitioners seek to promote human and community well-being in a manner that is purposeful, intentional, and professional. This includes the social worker's ability to engage in critical thinking, affective reactions, and exercise judgment that is congruent with unique situations. Therefore, student learning outcomes are the following Social Work Competencies:

Competency 1: Demonstrate Ethical and Professional Behavior
Competency 2: Engage Diversity and Difference in Practice
Competency 3: Advance Human Rights and Social, Economic, and Environmental Justice
Competency 4: Engage in Practice-informed Research and Research-informed Practice
Competency 5: Engage in Policy Practice
Competency 6: Engage with Individuals, Families, Groups, Organizations, and Communities
Competency 7: Assess Individuals, Families, Groups, Organizations, and Communities
Competency 8: Intervene with Individuals, Families, Groups, Organizations, and Communities
Competency 9: Evaluate Practice with Individuals, Families, Groups, Organizations, and Communities

The George Washington University Health Workforce Institute (2019a,c) also found that most MSWs (89% to 92%) were satisfied with their degree. They often became social workers due to flexibility in job opportunities, good knowledge base, social justice orientation, and opportunity for self-growth. Most graduates who searched for social work-related positions were offered a job (ranging from 76% to 79%) with 75% planning to seek licensure and nearly 50% planning to continue their education. MSW graduates assumed a wide variety of positions some of which did not include social worker in their title, but required social work skills like the following:

Caseworker/Care Coordinator/Manager
• Case Worker
• Care Coordinator
• Care/Case Manager
• Clinical Care Coordinator
• Mental Health Specialist/Counselor

Program Coordination/Project Management
• Program Coordinator/Manager
• Director of Program Events
• Intergenerational Program Coordinator
• Program Analyst

Academic/Education
• Researcher/Research Assistant
• Student Support
• School Coordinator
• Teacher/Assistant, including Special Ed
• School Counselor

Other job titles

• Adoption and Foster Recruitment Supervisor
• Advocate
• Chemical Dependency Counselor
• Family Liaison
• Forensic Interviewer

Unneccessary Duplication

Similar Program(s):

Program Id	Inst code	Inst Description	Degree Designation	Program Title	Report year
6618	00927500	Northern Kentucky University	MSW	Social Work	2015
3248	00198900	University of Kentucky	MSW	Social Work	2015
4450	00199900	University of Louisville	MSW	Social Work	2015
5049	00200200	Western Kentucky University	MSW	Social Work	2015

Comparison of Objectives/Focus/Curriculum to Similar Programs:
The majority of online MSW programs are not accessible for students who are already employed, especially those living and working in Kentucky. There are various requirements such as campus residency, synchronous courses, and sporadic on-site campus visits and/or in-person class attendance. Twenty-five online MSW programs disallow Kentucky residents from enrolling. Currently, there are only nineteen programs that offer an advanced-standing MSW degree program that is 1) completely online with no residential requirements and 2) allow Kentucky resident admissions.

• Brescia University: This university is located in Owensboro, Kentucky. It has a 60-hour MSW program as well as a 30-hour Advanced Standing program in advanced generalist practice. However, they require students to attend weekly, evening, synchronous “class chats” for all courses. This could prove to be a barrier for some students with small children or have evening employment.

• Campbellsville University: This university is located in Campbellsville, Kentucky. It has a 60-hour MSW program as well as a 30-hour Advanced Standing program in advanced generalist practice and clinical practice. This program has enrolled numerous EKU BSW graduates and exemplifies the concept of an online asynchronistic program that requires no residential component.

• University of Kentucky: This program is located in Lexington, Kentucky. It offers a part-time 60-hour as well as 30-hour Advanced Standing program in advanced generalist practice. Hybrid and fully online program with synchronous and asynchronous classes which could be a barrier.

• University of Louisville: This program is located in Louisville, Kentucky. It offers the 60-hour and 30-hour program. Within the MSSW online program, students have the option of choosing an online specialization in Psychosocial Oncology, Mental Health, Alcohol and Drug Counseling, Military Social Work or Gerontology. Fully online

program with synchronous and asynchronous classes which could be a barrier. This program also charges the most per credit hour ($764, see Table 2).

• Western Kentucky University: This university is located in Bowling Green, Kentucky. It offers the 60-hour and 33-hour program Advanced Standing program in advanced generalist rural practice. WKU requires online students to attend an on-campus orientation and some classes are synchronous which could be a barrier.

Only one (1) (Campbellsville) out of five online MSW Programs in Kentucky are comparable to EKU's proposed program when considering residency requirements, proximity to Richmond, and asynchronous sessions. It is also important to note that students who have already paid for one degree may be especially sensitive to cost per credit hour in seeking a second degree. In Table 2, there is a review of costs in the five MSW programs available. This does not include costs associated with being an out-of-state student or additional credit hours to complete a certificate program.

Comparison of Student Populations:
see above

Access to Existing Programs:
see above

Feedback from Other Institutions:
The development of the MSW program has been an ongoing process dating back to 2017. During this time, faculty had informal conversations with faculty in other social work programs in Kentucky with more recent conversations with EKU BSW students and alumni. These conversations have been positive, but more formal conversations are necessary now that plans for the MSW Program are solidifying.

Cost

Projected Revenue over Next Five Years ($) : 6765640
Projected Expenses over Next Five Years ($) : 4127629

Will Additional faculty be needed? Yes
A full-time faculty member has been hired to be the MSW Program Director once this program has achieved Candidacy status through CSWE. A search is underway for a full-time MSW Field Director to start Fall 2020. CSWE Accreditation Standards require a total of 6 faculty with primary assignment to the MSW program. This requirement can be reached using the two new hires, existing faculty and part time faculty as needed.

Provide a budgetary rationale for creating this new program
E-Campus programs are self-funded, reliant only on their own revenues to pay for program expenses. This requires educational innovation that builds on past and current success in online education. One of the signature features of the EKU MSW Online Program is student access to Interdisciplinary University Certificate Programs. Interdisciplinary University Certificate Programs have been created as an extension of the MSW Online Program based on popular national MSW certificate offerings, employment trends, and certificates in other Kentucky programs. The curriculum for each certificate includes online graduate courses being offered by partners across the University and are specific to the certificate being offered, and so this collaboration helps offset the cost of developing new social wor

Eastern Kentucky University
MSW - MASTER OF SOCIAL WORK
44.0701-Social Work.
Submission Date: 03/03/2020 06:50

Full Proposal - Basic Info

Institution :	Eastern Kentucky University
Program Type :	Single Institution
Program Name :	Social Work
Degree Level :	Master's
Degree Designation :	MASTER OF SOCIAL WORK
CIP Code (2-Digit) :	44-PUBLIC ADMINISTRATION AND SOCIAL SERVICE PROFESSIONS.
CIP Code :	44.0701-Social Work.

Academic Unit (e.g. Department, Division, School) :	Department
Name of Academic Unit :	Department of Anthropology, Sociology, and Social
Name of Program Director :	Ann Callahan

Intended Date of Implementation :	8/15/2020
Anticipated Date for Granting First Degrees :	8/15/2021
Date of Governing Board Approval :	2/28/2020

Institutional Contact Information

First Name :	Sherry
Last Name :	Robinson
Title :	Vice Provost
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Eastern Kentucky University
MSW - MASTER OF SOCIAL WORK
44.0701-Social Work.
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Full Proposal - Mission: Centrality to the Institution's Mission and Consistency with State's Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

Building on a strong generalist foundation, EKU's integrative advanced generalist program develops ethical leaders with the vision, values, and capacity to promote human and community well-being. Graduates draw from social work theory and employ research to inform and evaluate the delivery of integrative advanced generalist practice. This includes being agents of change who cultivate interdisciplinary partnerships and transformative relationships with individuals, groups, families, organizations, and communities. The MSW Program curriculum is defined by experiential learning in a safe and nurturing environment. In the process, students learn to balance breadth with depth of knowledge, convey respect for diverse perspectives, engage in interdisciplinary teamwork, and apply the scientific method to advance social work practice. This curriculum gives students the opportunity to integrate advanced generalist practice with an area of interest and set a standard for lifelong learning.

The EKU MSW Program objectives are to

1) provide advanced generalist education grounded in professional values that reflect a commitment to promote human and community well-being;

2) facilitate holistic competence in the application of appropriate knowledge, values, skills, and cognitive and affective processes for generalist and advanced generalist social work practice;

3) promote the ethical integration of social work theory, practice, and research for the delivery of advanced generalist social work in a practice setting and context congruent with expertise;

4) create opportunities to draw from interdisciplinary knowledge and develop collaborations that support the well-being of individuals, groups, families, organizations, and communities; and

5) advocate for an educational environment that supports human diversity, student development, faculty leadership, shared governance, and adequate instructional resources.

These EKU MSW Program objectives address Kentucky's need for qualified social workers. Integrative advanced generalist social workers can address problems in living associated with poverty, drug abuse, un- and underemployment, and low educational attainment. A majority of EKU students are at-risk for these social problems as they are often first-generation college students from the poorest counties in our state. Success in ameliorating these social problems starts with providing access to quality education. EKU's MSW Program also reflects our professional mandate and shared institutional commitment (EKU, 2019a) to encourage graduate students to critically assess assumptions and seek diverse perspectives as informed thinkers; communicate professional values and responsibilities including the value of human rights and dignity and worth of all people; and mobilize human potential and social capital in local communities, the Commonwealth, and beyond.

Eastern Kentucky University
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2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

Objective 8: Promote academic excellence through improvements in teaching and learning.
• EKU has been recognized across the nation by, for example, U.S. News & World Report and EDsmart, as a leader in affordable, quality online education. The EKU MSW will has been developed with the same quality-matters standards.
• The EKU MSW Online Program will strive to maintain academic excellence by drawing from the expertise of social work faculty and instructional designers across the University, including the Faculty Center for Teaching & Learning and the Instructional Design Center, to develop universal access to evidence-based award-winning online social work courses.
• The EKU MSW Online Program will uphold the accreditation standards of the Council on Social Work Education (CSWE) and Southern Association of Schools and Colleges (SACS). Direct and indirect methods of assessment will be used to measure student mastery of student learning outcomes as outlined by the CSWE Educational Policy and Accreditation Standards (EPAS).

3. Explain how the proposed program addresses the state's postsecondary education strategic agenda.

Policy Area 1: Opportunity
Kentucky will be stronger by ensuring postsecondary education is broadly accessible to all residents, students have the support and resources they need to pursue postsecondary opportunities, and all students enter postsecondary education prepared for credit-bearing work.
Objective 3: Increase participation in postsecondary education, particularly among traditionally underserved populations.
The EKU MSW Online Program is designed to be flexible. All courses are asynchronous, 8-weeks long outside of field practicum. There are three start dates for the Advanced Standing Program (an expedited program for students with an undergraduate social work degree) and two start dates for the Regular Program with full- and part-time options.

Policy Area 2: Success
Kentucky will be stronger by ensuring that many more individuals complete a postsecondary degree or credential, and that they graduate with the skills and abilities to be productive, engaged citizens.
Objective 6: Increase persistence and timely completion for all students at all levels, particularly for low-income and underrepresented minority students.
MSW students have their own advisor and numerous opportunities to engage with instructors and peers. Course facilitators also support the delivery of online courses and students in helping them stay on track. Free online tutoring and career services are available.

4. Explain how the proposed program furthers the statewide implementation plan.

It will provide accountability measures that will feed into the state and campus strategic plans.

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Full Proposal - Quality: Program Quality and Student Success

1. List all student learning outcomes of the program.

The Council on Social Work Education (CSWE) uses the Educational Policy and Accreditation Standards (EPAS) when evaluating a social work program for accreditation. EPAS supports academic excellence by establishing thresholds for professional competence. EPAS recognizes a holistic view of competence; that is, social work competence is the ability to integrate and apply social work knowledge, values, and skills to practice situations. Competent social work practitioners seek to promote human and community well-being in a manner that is purposeful, intentional, and professional. This includes the social worker's ability to engage in critical thinking, affective reactions, and exercise judgment that is congruent with unique situations. Therefore, student learning outcomes are the following Social Work Competencies:

Competency 1: Demonstrate Ethical and Professional Behavior
Competency 2: Engage Diversity and Difference in Practice
Competency 3: Advance Human Rights and Social, Economic, and Environmental Justice
Competency 4: Engage in Practice-informed Research and Research-informed Practice
Competency 5: Engage in Policy Practice
Competency 6: Engage with Individuals, Families, Groups, Organizations, and Communities
Competency 7: Assess Individuals, Families, Groups, Organizations, and Communities
Competency 8: Intervene with Individuals, Families, Groups, Organizations, and Communities
Competency 9: Evaluate Practice with Individuals, Families, Groups, Organizations, and Communities

The CSWE (2015) further describes the knowledge, values, skills, and cognitive and affective processes that comprise each competency for generalist social work practice, followed by a set of behaviors that integrate these components. These behaviors represent observable components of the competencies that follow an explanation of the underlying content and processes that inform these behaviors. In addition to assisting graduate students in the mastery of the nine Social Work Competencies, the EKU MSW Program will further prepare students for integrative advanced generalist practice. This requires the extension of the nine Social Work Competencies with the knowledge, values, skills, cognitive and affective processes, and behaviors that are associated with integrative advanced generalist practice.

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

The MSW program offers a part- and full-time course of study, employer-based field placements, and advanced standing for students with an undergraduate degree in social work. The regular program consists of 60 graduate credit hours and 30 graduate credit hours for the advanced-standing program. Students admitted into the regular program start with foundation courses to help them master generalist social work practice. The foundation course sequence is completed with a Foundation Practicum and Foundation Capstone project. After foundation courses, these students and advanced standing students take courses to concentrate on the integration of advanced generalist social work theory, practice, and research. In coordination with social work faculty and staff, MSW students practice the integration of advanced generalist social work theory, practice, and research while taking elective courses with students across disciplines. MSW students select an Interdisciplinary University Certificate Program to gain access to diverse perspectives on a shared area of concern. MSW students apply integrative advanced generalist skills for collaborative action in a related practice setting. Therefore, in addition to taking integrative micro, mezzo, and macro practice courses, the concentration course sequence requires three elective courses, an Integrative Practicum, and Integrative Capstone project congruent with a student's chosen Certificate program.

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3. Highlight any distinctive qualities of this proposed program.

MSW students will complete an interdisciplinary certificate program as part of the advanced generalist degree pathway, without any additional coursework or barriers to accessibility (i.e., synchronistic evening or weekend courses) (Table 2). Certificates require the completion of asynchronous, online electives that are specific to workforce needs. Current options for interdisciplinary certificate programs include addictions intervention, mental health, child and family services, social advocacy and justice, and management and leadership. MSW students are required to complete three electives from the certificate curriculum, a practicum in a related setting, and a capstone project that demonstrates learning. Other required advanced practice courses will support student synthesis of learning and provide the scaffolding for independent integration of interdisciplinary knowledge and application as an advanced generalist social worker.

4. Will this program replace any existing program(s) or specializations within an existing program?

NO

5. Include the projected faculty/student in major ratio.

According to the Council on Social Work Education (2015), the EKU MSW Program is required to have a 1:12 full-time faculty to-student ratio. This includes six full-time faculty with master's degrees in social work from a CSWE-accredited program and whose principal assignment is to the master's program. Adjunct and part-time faculty can help satisfy this full-time faculty to-student ratio (Accreditation Standard AS3.2.2)

6. Is there a specialized accrediting agency related to this program?

YES

Please identify the agency.

The specialized accrediting agency for the EKU MSW Program is the Council on Social Work Education (CSWE). The CSWE represents over 800 accredited baccalaureate and master's degree social work programs as well as educators, practitioners, and agencies dedicated to advancing quality social work education. Within the CSWE, the Commission on Accreditation (COA) is recognized by the Council for Higher Education Accreditation (CHEA) as the sole accrediting agency for social work education in the United States and its territories (CSWE, 2020a). Therefore, the EKU MSW Program will seek accreditation through the CSWE's COA.

Do you plan to seek accreditation?

YES

Please explain your plans for accreditation.

Yes. CSWE's COA establishes and evaluates social work program compliance with CSWE Educational Policies and Academic Standards (EPAS) and accreditation standards (AS). For example, the CSWE EPAS describes four features of an integrated curriculum design: (1) program mission and goals; (2) explicit curriculum; (3) implicit curriculum; and (4) assessment. This provides a foundation for student mastery of nine competencies which is required by all CSWE accredited programs (CSWE, 2015; 2020 b,c). Evaluation starts with seeking CSWE accreditation. The accreditation process entails program self-studies, site visits, and COA reviews over a three-year period (CSWE, 2020d,e). The EKU Online MSW Program will apply for candidacy status in March 2020 then complete the benchmarks required to gain initial accreditation in June 2023 (CSWE, 2017, 2018a, 2018b). Initial accreditation is retroactive, therefore, students who graduate while the program is in candidacy, will be recognized as having graduated from a CSWE-accredited program (CSWE, 2020f).

7. Attach SACS Faculty Roster Form.

MSW Faculty Roster.docx

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8. A. Describe the library resources available to support this program. You may attach any documentation provided to SACS.

The EKU BSW Program was last re-accredited by the Council on Social Work Education in June 2016. At this time, library resources and online journals were considered appropriate for BSW students. It is reasonable to assume that these same resources will be appropriate for MSW students. For example, EKU subscribes to Social Work Abstracts which provides digital access to 900 social work and human services journals from 1965-present. This database along with other social science databases are standard resources for MSW students.

MSW students will have access to a social work librarian. This includes librarian announcements, a live chat link for library help, and library links in every Blackboard course shell. More specifically,
a. MSW students will have the ability to schedule one-on-one appointments with the social work librarian, either in-person or via a number of virtual meeting applications such as Skype, Zoom, or the EKU learning management system (Blackboard).
b. MSW students have extended borrowing privileges and access to a dedicated interlibrary loan and document delivery service any materials requested by students will either be delivered electronically or in the case of tangible items, by UPS free of charge.
c. MSW students have 24/7 access to an in-depth online research guide focused on social work research.

The social work librarian also has the dual role of Distance Education Program Officer. Therefore, MSW students will have ready access to a social work librarian with expertise in online education.

As the MSW Program grows, the needs of MSW students will be monitored by the social work librarian and MSW faculty to ensure existing library resources remain sufficient. If needed, changes will likely involve an increase in student access to digital resources rather than an expansion of library facilities.

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B. Describe the physical facilities and instructional equipment available to support this program. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.

The EKU BSW Face-to-Face and Online Programs operate under the auspices of the Department of Anthropology, Sociology, and Social Work which will expand to include the EKU MSW Program. This Department is located in the Keith building on the main campus in Richmond, KY. All social work faculty have private offices on the second floor of the Keith Building. Part-time faculty share an office also located on the second floor of the Keith Building. Additional office space may be required as new faculty are hired. The need for office space will be offset by MSW faculty who work remotely from a home office.

The program will be online and the Blackboard system will be used as the learning management system, congruent with existing EKU online courses. This means no additional classroom space will be required. All faculty are typically issued a new University computer every three years.

In order to participate in MSW courses, students will need the following:
a. A working computer system with the latest version of Firefox. Blackboard will work with other browsers, but EKU's IT only recommends (and supports) Firefox.
b. Access to a reliable moderate-to-high speed Internet connection for viewing the videos and films.
c. Access to Microsoft Word. EKU provides Microsoft 360 Plus for students. Instructions on how to install the applications free are provided through this link: Microsoft 360 Plus for EKU Students
d. Access to EKU Google Drive. Students often use Google Docs to collaborate in courses, and will need access to their EKU Google Account.
e. A PDF viewer. The Adobe Reader is a free recommended application.
f. Basic computer skills, including word processing, emailing, navigating Blackboard and the EKU library website, and viewing videos.

If a student’s computer/internet connection does not meet these requirements, they will need to make alternate arrangements to access the course through the EKU labs at the main or satellite campuses, a public library, or a friend or family member's house. Students have access to EKU Instructional Technology to address any technical problems or assistance improving computer skills.

9. Clearly state the admission, and retention, and completion standards designed to encourage high quality.

A prospective student will apply for admission as outlined through EKU Online website at https://ekuonline.eku.edu/how-apply-graduate. An enrollment advisor is available to assist throughout this process. A student completes the EKU Graduate School’s online application which requires the submission of official undergraduate transcripts, GRE test scores (if applicable), three recommendations, resume/curriculum vitae, and professional statement. The Graduate School will manage incoming documents for applications prior to admission review.

Students applying for admission to the 60-hour program must have a baccalaureate degree from a college or university accredited by the appropriate regional accrediting agency or foreign equivalent with a grade point average of 2.7 out of a possible 4.0 on all undergraduate work and a minimum GPA of 3.0 out of a possible 4.0 on all previous graduate work*. All applicants applying for advanced standing status must have a cumulative undergraduate GPA of 3.0 or higher, must have an undergraduate major in social work from a CSWE accredited program (BSW or BSSW) and must have graduated within five years of entry to the MSW program. Some work experience is preferred. Although GRE scores are not required for program admission, applicants may submit current scores from the GRE General Exam to support their application materials. GRE scores are valid for five years from the date of the exam. Students may be conditionally admitted with probationary status. This means students on probation must successfully complete the first semester with a minimum GPA of 3.0 and maintain this performance through the completion of at least six graduate credit hours until this status is removed. *Preference is given to applicants with a 3.0 cumulative GPA or above in their undergraduate work with coursework or other experience related to social work. If a student does not have a 3.0 cumulative GPA, they will need to explain 1) what prevented them from achieving a 3.0 GPA and 2) what steps will they take to ensure they are successful in the MSW program as part of their application materials.

Students from other CSWE-accredited graduate MSW programs will be allowed to transfer credits into the EKU MSW

Program. Course work equivalent to generalist social work and elective course requirements may be accepted. Transfer courses must be approved as equivalent to required courses taken for graduate credit and passed with a grade of “B” or better. An S (earned on an S/U system) for the field practicum is also accepted. Transfer credits for coursework taken in another field may be considered as a substitution for elective requirements. Transfer applicants must complete the entire application process and must also submit a course syllabus for each course they are seeking to transfer. Transfer courses must be part of an otherwise satisfactory graduate program (B average), the majority of the total hours required for a master’s degree must be taken at EKU, and all courses must have been completed within the six-year period prior to receiving the degree. Transfer credit is not guaranteed for all courses. Students cannot receive academic credit for life experiences or previous work experiences.

There are numerous University resources provided to support the success of Online MSW students. Some of these resources include the following:
a. The Student Success Center, located on the ground floor of Crabbe library on the Richmond campus, provides free online tutoring and mentoring through an EKU Guru. Students can drop-in for assistance with no appointment necessary, email the successcenter@eku.edu, or visit www.successcenter.eku.edu.
b. The Noel Studio for Academic Creativity provides a face-to-face and online trained consultant to work with students on any piece of written, oral or multi-modal communication, at any stage in the process from brainstorming to finished product. Consultants can also help students develop effective research strategies. For more information, visit https://studio.eku.edu.
c. Smarthinking is a third-party tutoring service specifically contracted to support all e-Campus students. Students can access Smarthinking tutors directly by selecting “Smarthinking” on the main menu of a course site.
d. The EKU Counseling Center (EKUCC) provides confidential psychological services for currently enrolled EKU students. EKUCC also provides psychoeducational events and programs to increase mental health awareness within the EKU community through prevention, awareness, education, and stigma reduction. Provision of these services in a welcoming, comfortable, and multi-culturally sensitive environment for all in the EKU community is of utmost importance. Visit https://counselingcenter.eku.edu/ for more information or https://counselingcenter.eku.edu/appointments for appointments and walk-in hours.
e. Students registered with the Center for Student Accessibility (CSA), are asked to request accommodation letters from the CSA office. The Center for Student Accessibility will email the student’s academic adjustment letter to the student. Students are encouraged to discuss the accommodations needed with their course instructor(s). Students, who need an accommodation for a documented medical, mental health, or learning difference, may register online at accessibility.eku.edu/applying-services, or if you have questions, you may email the CSA office at accessibility@eku.edu or telephone at (859) 622-2933.
f. E-Campus also ensures that every online MSW student has their own academic advisor and numerous opportunities to engage with peers and instructors for support. Depending on the size of the course, course facilitators are contracted to assist social work faculty in course delivery and help students stay on track.

Students must maintain an overall GPA of 3.0 or better on all graded courses and maintain a satisfactory performance in field practicum courses. Departmental approval is required for student progression in the program if they do not earn at least a “B” in required courses. Required courses cannot be repeated. Students must also maintain conduct that is congruent with the Code of Ethics of the National Association of Social Workers.

Students must earn at least a “B” in SWK 855 Foundation Capstone and SWK 895 Integrative Capstone. For example, a capstone project is required in SWK 895 that demonstrates competency in the ability to integrate social work theory and practice with interdisciplinary knowledge for ethical, culturally inclusive evidence-based advanced generalist practice.

In consultation with a student’s MSW academic advisor, each student is required to complete at least three elective courses, SWK 890 Integrative Social Work Practicum, and SWK 895 Integrative Capstone for a total of 19 credit hours as part of an approved certificate program. The student’s field practice setting and capstone project must relate to the student’s certificate program and demonstrate competency in integrative advanced generalist social work practice.

10. Clearly state the degree completion requirements for the program.

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Foundation Courses.....24 hours
SWK 800, 810, 815, 820, 825, 830, 840, and 845.
Advanced Courses.....9 hours
SWK 860, 870, and 880.
Elective* Courses.....9 hours
*Students choose from an approved Interdisciplinary University Certificate Program. Electives are based on each certificate program's curriculum. Students may seek an elective course substitution or transfer credit by applying with the MSW Program Director.
Addictions Intervention Certificate Program
JPL 828, MPH 810, NFA 826, PSY 818, SWK 761, SWK 762, SWK 863, SWK 866, SWK 867
Mental Health Certificate Program
JPL 828, MPH 810, NFA 826, OTS 863, PSY 777, PSY 817, PSY 837, PSY 850, PSY 859, SWK 863, SWK 865, SWK 866, SWK 867
Child and Family Services Certificate Program
CDF 701, CDF 741, CDF 744, EAD 853, EAD 856, EDF 855, EMS 777, EPY 839, OTS 715, OTS 863, OTS 865, PSY 777, PSY 817, SED 800, SED 817, SED 819, SED 827, SWK 863, SWK 864
Social Advocacy and Justice Certificate Program
CRJ 802, CRJ 814, CRJ 862, CRJ 875, JPL 812, JPL 830, JPL 840, MPH 810, SWK 845, SWK 863
Leadership and Management Certificate Program
EPY 869, HLS 830, HLS 835, JPL 812, JPL 835, OTS 853, POL 765, POL 845, POL 846, POL 847, PSY 873, PSY 874, PSY 875, SSE 826, SSE 830, SWK 863
Experiential Courses.....14 hours
SWK 850 (6 hours) and SWK 890 (8 hours).
Exit Requirements
Capstone Courses….....4 hours
SWK 855 and SWK 895.
Total Requirements.....60 hours

Name	Total number of hours required for degree	Number of hours in degree program core	Number of hours in guided electives	Number of hours in free electives
Program	60	51	9	0

12. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.

Students from other CSWE-accredited graduate MSW programs are allowed to transfer credits into the EKU MSW Online Program. Course work equivalent to generalist social work course requirements may be accepted. Currently, EKU policy allows up to 12 graduate credit hours in transfer.

13. List courses under the appropriate curricular headings.

KPPPSCourseTemplate for EKUMSW.xlsx

14. Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)?

YES

YES	Distance learning
NO	Courses that combine various modes of interaction, such as face-to-face, videoconferencing, audio-conferencing, mail, telephone, fax, e-mail, interactive television, or World Wide Web
NO	Technology-enhanced instruction

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NO	Evening/weekend/early morning classes
NO	Accelerated courses
NO	Instruction at nontraditional locations, such as employer worksite
NO	Courses with multiple entry, exit, and reentry points
NO	Courses with "rolling" entrance and completion times, based on self-pacing
NO	Modularized courses

Please describe planned alternative methods of program delivery involving greater use of technology, distance education, and/or accelerated degree designs, to increase efficiency, better address student educational and workforce needs, and maximize student success, for both traditional and non-traditional students.

The EKU MSW Program is designed to be flexible. The EKU MSW Program is the only public option for Kentucky residents who wish to enroll in an asynchronous online MSW program. In addition to being asynchronous, all courses are 8-weeks long outside of field practicum. There are three start dates for the Advanced Standing Program (an expedited program for students with an undergraduate social work degree) and two start dates for the Regular Program with full- and part-time options.

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Full Proposal - Demand: Program Demand/Unnecessary Duplication

1. Student Demand:

a. Provide evidence of student demand at the regional, state and national levels.

EKU Baccalaureate Social Work (BSW) students provide evidence of student demand for an Online MSW Program. The Online BSW Program started Fall 2017 and has grown at an unprecedented rate (Fall 2017 enrollment = 34; Fall 2019 enrollment = 330). Semesters are divided into eight-week sessions resulting in a Fall A and Fall B session, Spring A and Spring B session, and a Summer session. This allows for students to concentrate on completing one or two eight-week courses at a time. Between Fall A 2017 and Fall B 2019, enrollment has grown 10 times and the number of active students has doubled. There are currently 119 active students with approximately 30 more students expected to start in Spring 2020. One student has graduated and approximately 16 more students will graduate in Spring 2020. In addition, the Face-to-Face BSW Program is well-established having started in Spring 1977. Student enrollment and retention has largely been consistent with periods of outperforming other social science programs at EKU. This program has an average enrollment of 250 students and annual graduation rate of 50 students.

Current and past Baccalaureate Social Work (BSW) students have expressed a desire to obtain a master's degree from EKU. A survey conducted in January 2019 with EKU BSW students (n=43), further substantiated this support. The majority of students were in the face-to-face BSW program (76.7%). When combining the number of students in the face-to-face and online BSW programs (100%), slightly less than half (49%) had taken online classes. The number of online classes taken was relatively small (median = 6, range 1-44). Nevertheless, every student (100%) said they were planning to (90.7%) or would consider going to (9.3%) graduate school and nearly every student (83.7%) said they were planning to (44.2%) or would consider going to (39.5%) an online MSW program. Given that the majority of respondents were seniors (41.9%) or juniors (39.5%) and half (50%) identified as non-traditional, it is reasonable to assume that these students would consider an online MSW program at EKU given a positive experience with EKU faculty and classmates with whom they can draw immediate support.

b. Identify the applicant pool and how they will be reached.

Eighty-four percent of EKU students are Kentucky residents; however, EKU has many students from all walks of life, hailing from all 50 states and 43 countries. Online students tend to be nontraditional, i.e., employed with families, and have a limited time to seek career advancement. The EKU MSW Program is likely to attract the same types of students and more due to being the most flexible, low-cost public option. Research on online MSW graduates suggest that students who are female, significantly older, African-American, and employed full-time are most likely to apply (GWUHWI, 2019a,b,c; 2018a,b; 2017a).

The Office of e-Campus Learning has a Director of Marketing, Director of Enrollment Management, Marketing Specialists, Employer Recruiting & Engagement Analyst, Digital Strategy Optimization Manager, Program Recruiter/Enrollment Advisor, and other staff that are focused on reaching prospective online students. E-Campus staff will also coordinate with other University and College of Letters, Arts, and Social Sciences recruitment staff as needed to help our program grow. The EKU Office of Military and Veteran Affairs will also help recruit for the MSW Program.

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c. Describe the student recruitment and selection process.

Student recruitment is the responsibility of all EKU employees, but recruitment for the MSW Program depends the most on those affiliated with EKU's Office of e-Campus Learning and the BSW/MSW Programs. Recruitment for the EKU Online MSW Program is already underway informally through social networking among current students, alumni, and friends. To manage the number of inquiries about the new MSW program, e-Campus created an interest form for prospective students to sign-up for more information. Since the end of October 2019, we have had 13 direct inquires and 33 people sign-up. Below is an overview of other steps being taking:

a. Information about the EKU Online MSW Program is being disseminated by EKU Social Work Faculty through local and professional organizations such as the Kentucky Association of Social Work Educators and the National Association of Social Workers - Kentucky Chapter.

b. Student recruitment will also occur through formal and informal recruitment at community workshops and national professional conferences. For example, the EKU BSW Program hosts an annual Social Work Day to provide free continuing education credits as a service to Kentucky social workers. As soon as the EKU MSW Program is approved to launch, we will be able to join other social work graduate schools in a tabling event to recruit students at Social Work Day.

c. The EKU MSW Program will support the BSW Program in student recruitment at University-sponsored events such as EKU Spotlight. This includes orienting prospective undergraduate students to the social work profession and, later, BSW students to the advantages of a MSW degree.

d. Inquiring students who complete an interest form for the program are be placed in to a program specific communication plan that includes detailed emails and phone calls to keep the informed and engaged.

e. Most importantly, the EKU BSW Face-to-Face and Online Programs have a number of community agencies where BSW students and graduates work as living examples of the quality of EKU social work education.

The MSW Admissions Committee will review applications for student admission including official undergraduate transcripts, GRE test scores (if applicable), three recommendations, resume/curriculum vitae, and a professional statement. Applicants will be provided directions on how to complete the required components of their application, including questions to be addressed in the candidate's professional statement. Student selection may require an interview with an applicant and the use of rubrics to evaluate the overall strength of an application. Only complete applications will be considered.

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d. Identify the primary feeders for the program.

The EKU Online MSW Program will rely on existing programs within the University for prospective students. The EKU BSW Face-to-Face and Online Programs will be primary feeders for the program. The Face-to-Face BSW Program is well-established having started in Spring 1977. Student enrollment and retention has largely been consistent with periods of outperforming other social science programs at EKU. This program has an average enrollment of 250 students and annual graduation rate of 50 students. The Online BSW Program started Fall 2017 and has grown at an unprecedented rate. Between Fall A 2017 and Fall B 2019, enrollment has grown 10 times and the number of active students has doubled. There are currently 120 active students with 35 more students who started in Spring 2020.

The EKU Online MSW Program can negotiate contracts with area agencies to provide employee training. For example, the Credit for Learning program is one example of an existing arrangement where educational institutions are contracted through Training Resource Centers across the state to provide graduate-level training for state employees in child protection. These students may seek related courses as well as transfer credit in pursuit of a Child and Family Services certificate and MSW degree at EKU.

EKU's e-Campus offers numerous online courses, programs, certificates, and non-degree programs that provide an alternative access point for student transfers (EKU, 2019). In addition, a number of new Interdisciplinary Certificate Programs will provide other graduate and non-degree seeking students an alternative pathway to earn an affordable, academic credential and experience the benefits of collaborative work with social work students. This could inspire non-social work Interdisciplinary Certificate Program students to seek admission into the EKU Online MSW Program.

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

The MSW Program is expected to add 70 Advanced Standing and 20 Regular Full-Time students to the total student enrollments to the campus.

f. Project estimated student demand for the first five years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) - Fall Semester
2020-2021	15	70
2021-2022	70	90
2022-2023	70	90
2023-2024	70	90
2024-2025	70	90

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2. Employer Demand:

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

Mental Health and Substance Abuse
- marriage and family therapists (USA 23.4%; 5,700/KY 25%; 40) – Higher than national average.
- mental health counselors (USA 23.1%; 21,600/KY 24.7%; 330) – Higher than national average.
- substance abuse and behavioral disorder counselors (USA 23.2%; 14,100/KY 21.9%; 190)
- mental health and substance abuse social workers (USA 19.4%; 15,900/KY 14.9%; 110)
- therapists all other (USA 19.9%; 1,900/KY 14.5%; 50)
- psychiatric technicians (USA 5.9%, 5,600/KY 2.9%; 30)*
- psychiatric aides (USA 5.6%; 8,800/KY 0; 90)*

Human Services and Social Welfare
- social and human service assistants (USA 16.4%; 55,400/KY 19.2%; 660) – Higher than national average.
- protective service workers all other (USA 8.4%; 35,2000/KY 15%; 280) – Higher than national average.
- probation officers and correctional treatment specialists (USA 5.7%; 8,300 [KY correctional officers and jailers -6.4%; 480])
- child, family, and school social workers (USA 14.2%; 38,300/KY 6.2%; 920)

Health Care and Rehabilitation
- medical and health services managers (USA 20.5%; 36,700/KY 17.9%; 470)
- healthcare social workers (USA 20.1%; 22,900/KY 16.6%; 220)
- rehabilitation counselors (USA 12.7%; 14,500/KY 12.4%; 120)
- personal care aides (USA 38.6%; 414,300/KY 40.6%; 3,420) – Higher than national average.*
- personal care and service workers all other (USA 7.9%; 14,100/KY-1.8%; 80)*

Management and Community Development
- social and community service managers (USA 18%; 16,300/KY 18.3%; 280) – Higher than national average.
- training and development specialists (USA 11.5%; 31,700/KY 12.3%; 370) – Higher than national average.
- training and development managers (USA 10.4%; 3,500/KY 9.3%; 40)

Education and Research
- social work teachers postsecondary (USA 9.4%; 1,300/KY 11.1%; 20) – Higher then national average.
- social scientists and related workers all other (USA 6.7%; 4,200/KY 4.8%; 40)
- social science research assistants (USA 4.4%; 4,100/KY 0, 10)

Note: Some jobs may accept a BSW and jobs with an asterisk (*) are likely to accept less education.

Source: Projections Central, State Occupational Projections, Long Term Occupational Projections, on the Internet at https://projectionscentral.com/Projections/LongTerm (visited October 18, 2019).
Type of Job: Mental Health and Substance Abuse Social Workers

The chart for average wages and job openings at the state, regional, and national levels was submitted with the NOI.

3. Academic Disciplinary Needs:

This program is not in response to changes in academic disciplinary need.

a. If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.

(Should not be blank)

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4. Similar programs:

a. Are there similar programs in other Southern Regional Education Board (SREB) states and in the nation?

YES

Please identify similar programs in other SREB states and in the nation.

Other online MSW programs include, but are not limited to, programs at: University of Tennessee, Florida State University, Louisiana State University, University of Alabama, University of Houston, Tulane University, and University of Arkansas.

b. Our records indicate the following similar programs exist at public institutions in Kentucky.

#Enr = Fall Enrollments , #Grd = Academic Year Graduates

		2019 - 20		2018 - 19		2017 - 18		2016 - 17		2015 - 16		2014 - 15	
Institution	Program	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd
Northern Kentucky University	Social Work	117		117	70	104	56	105	62	110	60	113	68
University of Kentucky	Social Work	290		202	108	198	90	216	96	223	83	219	124
University of Louisville	Social Work	447		480	239	468	193	430	201	440	208	435	180
Western Kentucky University	Social Work	99		101	49	99	58	109	63	112	61	113	59

c. Does the proposed program differ from existing programs?

YES

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Please explain.

A defining feature of the EKU MSW Online Program is student access to Interdisciplinary University Certificate Programs. Interdisciplinary University Certificate Programs have been created as an extension of the MSW Online Program based on popular national MSW certificate offerings, employment trends, and certificates in other Kentucky programs. The curriculum for each certificate includes online graduate courses that are already being offered by partners across the University through EKU's Office of e-Campus Learning, and so this collaboration helps offset the cost of developing new social work electives. Interdisciplinary partners include Political Science, Occupational Science and Occupational Therapy, Health Promotion & Administration, Safety, Security and Emergency Management, Homeland Security, Justice, Policy & Leadership, Early Elementary/Middle Grade/Secondary, Special Education, Educational Foundations, Counseling, Educational Psychology, and Educational Administration. New certificate offerings can be added to the MSW program at any time. This approach is responsive to changing workforce needs as well as practice interests and needs of social work students.
Integrating courses from other disciplines in the MSW curriculum is also unique. Other programs typically require students to take social work electives in addition to core MSW courses for degree completion. Additional courses and, sometimes, a separate application process, are required to complete a certificate program at other schools. This usually adds more credits hours required for graduation. The EKU MSW Online Program draws from interdisciplinary partners to provide instructional support for elective courses. Certificate elective courses are embedded in the required MSW curriculum. This allows students to simultaneously earn a certificate within the number of credit hours required by the Council on Social Work Education, the national accrediting body, for MSW degree completion. This approach is congruent with the program's emphasis on integrative, advanced generalist practice. This prepares MSW students to integrate breadth and depth of knowledge to collaborate with professionals across disciplines and settings. Students are further assisted in applying their skills in a community placement associated with a certificate program.
Interdisciplinary Certificate Program offerings also provide other graduate and non-degree seeking students an alternative pathway to earn an affordable, academic credential and experience the benefits of collaborative work with social work students. For example, non-degree seeking students may seek an Interdisciplinary Certificate for continuing education credits required for state licensure. Non-degree seeking students may need additional training that is satisfied by a Certificate Program. A non-degree seeking student may enroll in a Certificate Program to learn how various disciplines approach a shared issue of concern to help them further determine which graduate degree to pursue. In addition, Certificate Programs can easily be adapted to better support employer-specific needs for employee training and workforce demand. Therefore, the EKU Online MSW Program provides many growth opportunities as it provides needed access to social workers and related professionals to serve local communities, the Commonwealth, and beyond.

d. Does the proposed program serve a different student population (i.e., students in a different geographic area) from existing programs?

YES

Please explain.

This program will attract students from Eastern Kentucky (EKU's service region) whose reticence of online education may be mitigated by familiarity with EKU.

e. Is access to existing programs limited?

YES

Please explain.

While online programs are typically accessible to a broad range of students, EKU's online MSW will provide a different accessibility in two ways. First, MSW programs are available to Kentucky residents at the University of Louisville, the University of Kentucky, and Western Kentucky University. It is important to note that every state MSW program requires synchronous participation at some point in the program. This requirement may create barriers for some students.

Second, students who have already paid for one degree may be sensitive to cost per credit hour of $662, which is below WKU ($707), UK ($726), and UoL ($764)

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f. Is there excess demand for existing similar programs?

NO

g. Will there be collaboration between the proposed program and existing programs?

NO

Please explain why there is no proposed collaboration with existing programs.

EKU's priority is to launch the MSW program. However, the Social Work Program at EKU has a history of collaboration with other social work programs in the state through our involvement and leadership in the Kentucky Association of Social Work Educators. We also have worked together in the Public Child Welfare Certificate Program and in field education throughout the state. We fully anticipate using our strong relationships with our state partners to develop additional collaborations as the MSW program is launched.

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Full Proposal - Cost: Cost and Funding of the Proposed Program

1. Will this program require additional resources?

YES

Please provide a brief summary of additional resources that will be needed to implement this program over the next five years.

9. Will this program require additional resources? If yes, provide a brief summary of additional resources that will be needed to implement the program over the next five years.
a. Faculty expenses cover faculty salaries and benefits including: Program Director, Field Director, Coordination, Instruction, Course Development, and Facilitation. The only variance is an increase in instruction or facilitation each year due to increasing course offerings and enrollments.
b. Academic and/or Student Services cover Recruiter/Advisor for the program salaries and benefits.
c. Other Support Services cover e-Campus expenses for operational support, 10 percent of revenues. This covers all administrative support by e-Campus including marketing, instructional design, finance, and program management.
d. Other covers advertising and other operating expenses

2. Will this program impact existing programs and/or organizational units within your institution?

YES

Please describe the impact.

EKU will have to absorb the demands of serving more undergraduate and graduate students. The availability of an online graduate program will likely attract more undergraduate social work students due to increased access to a clear pathway to a graduate degree without the need to transfer to another school. Graduate courses affiliated with new Interdisciplinary University Certificate (IUC) Programs will likely experience an increased class size as well planning demands on the instructional resources i.e., course facilitators, on affiliated organizational units. Nevertheless, increased revenues generated from the MSW Program and new IUC Programs are expected to offset these expenses.

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

E-Campus programs are self-funded, reliant only on their own revenues to pay for program expenses. One of the signature features of the EKU MSW Program is student access to Interdisciplinary University Certificate (IUC) Programs. IUC Programs have been created as an extension of the MSW Program based on popular national MSW certificate offerings, employment trends, and certificates in other Kentucky programs. The curriculum for each certificate includes online graduate courses being offered by partners across the University and are specific to the certificate being offered, and so this collaboration helps offset the cost of developing new social work electives. Interdisciplinary partners include Political Science, Occupational Science and Occupational Therapy, Health Promotion & Administration, Safety, Security and Emergency Management, Homeland Security, Justice, Policy & Leadership, Early Elementary/Middle Grade/Secondary, Special Education, Educational Foundations, Counseling, Educational Psychology, and Educational Administration.

This efficient approach is unusual for other social work graduate programs, which typically require students to take additional social work electives beyond requirements for a MSW degree to earn a certificate. Interdisciplinary partners will provide instruction that supports MSW student specialization in integrative, advanced generalist social work. This concentration prepares MSW students to work collaboratively across disciplines and settings. MSW students are also required to take foundation and/or advanced standing social work courses for certificate and graduate degree completion. These courses assist students in the application of integrative advanced generalist skills which includes service learning through practicum placement in the community. IUC Programs will also provide other graduate-level students an alternative pathway to earn an affordable, academic credential and experience the benefits of collaboration with social work students in related courses and settings. Therefore, the Online MSW Program is a growth opportunity as it provides needed access to social workers for local communities, the Commonwealth, and beyond.

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A. Funding Sources, by year of program	1st year	2nd year	3rd year	4th year	5th year
	0	0	0	0	0
Total Resources Available from Federal Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Total Resources Available from Other Non-State Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
State Resources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Internal					
Allocation :	0	0	0	0	0
Reallocation :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Student Tuition					
New :	642140	1416680	1568940	1568940	1568940
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	e-campus (fully online) programs are funded entirely by tuition dollars and are not supplemented by other sources.				
Total					
New :	$642,140	$1,416,680	$1,568,940	$1,568,940	$1,568,940
Existing :	$0	$0	$0	$0	$0
Total Funding Sources :	$642,140	$1,416,680	$1,568,940	$1,568,940	$1,568,940

B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Staff: Executive, administrative, and managerial					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Other Professional					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Faculty					
New :	397442	532350	589680	589680	589680
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Graduate Assistants (if master's or doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Student Employees					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Faculty expenses cover faculty salaries and benefits including: Program Director, Field Director, Coordination, Instruction, Course Development, and Facilitation. The only variance is an increase in instruction or facilitation each year due to increasing course offerings and enrollments.				
Equipment and Instructional Materials					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Library					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	The library currently has all necessary journals.				
Contractual Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Academic and/or Student Services					
New :	68250	68250	68250	68250	68250
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Academic and/or Student Services cover Recruiter/Advisor for the program salaries and benefits.				
Other Support Services					
New :	64214	141668	156894	156894	156894
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Other Support Services cover e-Campus expenses for operational support, 10 percent of revenues. This covers all administrative support by e-Campus including marketing, instructional design, finance, and program management.				
Faculty Development					
New :	0	0	0	0	0
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Narrative Explanation/Justification :	The University provides faculty development to faculty regardless of program.				
Assessment					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional assessment resources will be needed.				
Student Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Faculty Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Other					
New :	86000	86000	86000	86000	86000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Other covers advertising and other operating expenses.				
Total					
New :	$615,906	$828,268	$900,824	$900,824	$900,824
Existing :	$0	$0	$0	$0	$0
Total Budget Expenses/Requirements :	$615,906	$828,268	$900,824	$900,824	$900,824
Grand Total					
Total Net Cost :	$26,234	$588,412	$668,116	$668,116	$668,116

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Full-Proposal - Assess: Program Review and Assessment

1. For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:

a. Which components will be evaluated?

The CSWE requires an extensive period of self-study to prepare for initial accreditation and every eight years to maintain accreditation. This process involves an evaluation of MSW Program curriculum, including (1) program mission and goals; (2) explicit curriculum; (3) implicit curriculum; and (4) assessment process, to determine if the curriculum supports student learning outcomes.

According to the CSWE (2015), the explicit curriculum constitutes the program's formal educational structure and includes the courses and field education used for each of its program options. Social work education is grounded in the liberal arts, which provide the intellectual basis for the professional curriculum and inform its design. Using a competency-based education framework, the explicit curriculum prepares students for professional practice at the baccalaureate and master's levels. Baccalaureate programs prepare students for generalist practice. Master's programs prepare students for generalist practice and specialized practice.

The EKU MSW Program supports academic excellence by aligning program curriculum with the CSWE 2015 EPAS competencies for generalist practice, which are extended and enhanced to prepare students for integrative advanced generalist practice. EKU MSW Program graduates will be prepared to promote individual and collective well-being through purposeful, intentional, and professional generalist practice. EKU MSW graduates will further demonstrate holistic capacity to evaluate relevant theory and research, critically process cognitive and affective reactions with compassion, and apply social work values and ethics for culturally inclusive integrative advanced generalist practice.

The EKU MSW Program starts with the foundation course sequence, which prepares students to engage in generalist practice. According to the CSWE (2017b), generalist practice is defined as social work practice with diverse individuals, families, groups, organizations and communities that is:
• grounded in liberal arts and person-in-environment framework;
• uses scientific inquiry, ethical principles and critical thinking in practice at the micro, mezzo and macro levels;
• engages diversity in practice and advocates for human rights and social and economic justice; and
• recognizes and builds upon the strengths and resiliency of all human beings.

The concentration course sequence prepares students for integrative advanced generalist practice. The EKU MSW Program defines integrative advanced generalist practice as the application of relevant theory and research as informed by social work values and ethics to engage in practice that is culturally inclusive, compassionate, and evidence-based. This includes mobilizing the benefits of interdisciplinary partnerships that seek to promote individual and collective well-being. Therefore, the EKU MSW Program defines integrative advanced general practice as social work practice with diverse individuals, families, groups, organizations and communities that:
• reflects the breadth and depth of social work values, ethics, and practice principles;
• demonstrates personal insight with a commitment to compassionate action;
• strengthens the application of social work theory as informed by the scientific method;
• draws from diverse perspectives to inform culturally inclusive practices; and
• strives to mobilize and contribute to the strength of interdisciplinary teamwork.

The CSWE 2015 EPAS suggests behaviors and their associated dimensions for each social work competency that is specific to the practice of generalist social work. These competencies are extended and enhanced to support integrated advanced generalist practice (see draft below). EKU MSW students are, therefore, expected to demonstrate holistic competence in generalist and integrative advanced generalist practice. Holistic competence is measured by the appropriate application or "integration" of social work knowledge, values, skills, and cognitive and affective processes (called "dimensions") that inform behaviors associated with each competency. This includes the ability to demonstrate each

competency in a real and simulated practice setting.

Each competency and associated behaviors are aligned with course objectives and assignments that enable the inculcation and evaluation of the implicit curriculum. More specifically, practice behaviors (that incorporate the dimensions of appropriate knowledge, values, skills and cognitive and affective processes) will be evaluated in real (field practice) and simulated practice (classroom) settings. At least two dimensions per competency will be assessed to determine mastery. Field education, where students gain supervised experience in the practice of social work, is considered the signature pedagogy of social work.

CSWE also requires the evaluation of implicit curriculum. According to the CSWE (2015), indicators of the implicit curriculum need to be evaluated to ensure the educational context supports a programmatic culture and climate that is congruent with the values of the profession and the mission, goals, and context of the MSW Program. Information about the program's commitment to diversity; admissions policies and procedures; advisement, retention, and termination policies; student participation in governance; faculty; administrative structure; and resources will be collected.

b. When will the components be evaluated?

The implicit and explicit curriculum will be evaluated at the beginning, during, and end of our program and then up to two years after graduation. Instruments from the Social Work Education Project (SWEAP) and student coursework, including field practicum and capstone projects completed as part of the foundation and concentration course sequences, will be used to evaluate student mastery of core competencies that drive the explicit curriculum. Additional SWEAP instruments will be used to evaluate how program functioning shapes the conditions for student learning as part of the implicit curriculum (i.e., commitment to diversity, student role in governance). SWEAP is a national non-profit organization that was organized by social work educators to provide a variety of instruments validated for multi-dimensional assessment of social work programs. SWEAP instruments are accepted by CSWE for program evaluation.
An internal measure of the implicit curriculum are course evaluations. Course evaluations are administered every semester for every course through EKU's Office of Institutional Research. In addition, a faculty designee observes an instructor's performance annually and completes an assessment instrument. These results are reviewed annually by the administration.

c. When will the data be collected?

A variety of methods will be used to evaluate student learning outcomes at the beginning, during, and end of our program and then up to two years after graduation for CSWE program evaluation purposes. SWEAP instruments will be used to increase consistency in the data collection process, the quantification of program outcomes, and evaluation of trends deemed significant relative to expected norms. The following SWEAP instruments will be used:

1. The Foundation Curriculum Assessment Instrument (FCAI) measures how well a program's curriculum prepares students with the knowledge necessary for competent professional social work practice. The FCAI is an exam, designed to be taken by students as they enter a social work program and again at the time of exit, with the explicit purpose of testing for knowledge gained throughout the program's curriculum.

2. The Field Placement/Practicum Assessment Instrument (FPPAI) was developed to assess student practice of the EPAS Core Competencies in Field Placement/Practicum. The FPPAI consists of a series of items, related to each EPAS Core Competency, and related behaviors, to be scored on a 5-point Likert-type scale by the field instructor. In addition to the quantitative portion of the FPPAI, an optional qualitative questionnaire/text field option is available in online version only.

3. The MSW Exit Instrument measure the Program's implicit curriculum as it relates to student perception of program commitment to diversity, admission policy and procedure, advisement, retention and termination, student participation in governance, faculty, administrative structure, resources, and field education.

d. How will the data be collected?

SWEAP will provide an internet link for students to complete a designated instrument. This link will be shared with students by their instructor. Each student has an assigned code that the student must enter to complete the instrument. After completion, SWEAP generates a report that includes aggregate, data analysis with tests of significance, and national norms. The following are the instruments that will be administered to students entering the program and completing the foundation course sequence: Foundation Curriculum Assessment Instrument (FCAI) and Field Placement/Practicum Assessment Instrument (FPPAI)

SWEAP will be contracted to develop customized instruments to evaluate student mastery of competencies for the integrative advanced generalist practice concentration. The data collection, analysis, and reporting process will be similar to the approach used with foundation students. The following will be the instruments administered to students entering the program and completing the concentration course sequence: Integrative Curriculum Assessment Instrument (ICAI) and Integrative Field Placement/Practicum Assessment Instrument (IFPPAI)

e. What will be the benchmarks and/or targets to be achieved?

All CSWE programs are required to measure and report student learning outcomes. A measurement benchmark is set by the social work program for each competency. As assessment score at or above that benchmark is considered by the program to represent mastery of that particular competency, which is accepted by CSWE as evidence of competency.

Overall, in response to questions related to each competency, 80% of students must answer 50% or more of questions correctly. Percentages across the FCAI and FPPAI will be averaged for students completing the foundation course sequence. Percentages across the ICAI and IFPPAI will be averaged for students completing the concentration course sequence.

These benchmarks are established based on the reporting practices of other CSWE-accredited MSW programs. CSWE requires the most recent outcomes data to be posted on EKU's website.

f. What individuals or groups will be responsible for data collection?

The MSW Program Director will obtain an online link for students to complete SWEAP instruments. Instructors will share this link with students. Instructors will also record their evaluation of student performance on assignments as part of course completion. Student assignments also provide a means for student self- and peer-evaluation. Students and a faculty designee will also provide feedback on the quality of instruction. The MSW Program Director will consult with the Office of e-Campus Learning's Directors, Marketing Specialist, Program Recruiter/Enrollment Advisor, and other staff supporting the MSW Program to review program recruitment and retention data which lends insight into program outcomes

g. How will the data and findings be shared with faculty?

Program outcome data will be shared with faculty individually and as part of faculty meetings. Being a new program, faculty are likely to be very interested in program outcomes. Extra effort will be made to include all full-time and part-time faculty (i.e., adjuncts and course facilitators). This discussion will extend to EKU's Assurance of Learning (AOL) Day. AOL day is set aside at the beginning of each academic year for programs to discuss changes needed in the program to strengthen the curriculum.

h. How will the data be used for making programmatic improvements?

These data will be essential for determining programmatic strengths and weaknesses. Data collected in the first year will provide unique insights into the success of initial program planning efforts by the MSW Program Director and MSW Field Director. Since the program is new, it will be important to move relatively quickly to address necessary changes. The MSW Program will start by building on successful practices used by EKU's Office of e-Campus Learning, the BSW Face-to-Face and Online Programs, and other social work programs in comparable institutions.

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2. What are the measures of teaching effectiveness?

The EKU MSW Program will strive to maintain academic excellence by drawing from the expertise of social work faculty and instructional designers across the University, including the Faculty Center for Teaching & Learning and the Instructional Design Center, to develop universal access to evidence-based award-winning online social work courses. For example, EKU's Instructional Design Center will assist faculty members in designing quality MSW courses. All online courses will go through rigorous review based on Quality Matters (2019) standards. Quality Matters provides an evidence-based rubric that is used by a trained reviewer to evaluate each online course before approval for delivery.

The EKU MSW Program will uphold the accreditation standards of the Council on Social Work Education (CSWE) and Southern Association of Schools and Colleges (SACS). Direct and indirect methods of assessment will be used to evaluate the implicit and explicit curriculum congruent with the CSWE Educational Policy and Accreditation Standards (EPAS). Course evaluations are administered every semester for every course through EKU's Office of Institutional Research. In addition, a faculty designee observes an instructor's performance annually and completes an assessment instrument. These results are reviewed annually by the administration.

3. What efforts to improve teaching effectiveness will be pursued based on these measures?

There are many ways these data can help improve teaching effectiveness. These data may point to the need for additional resources or the redirection of resources for faculty development. For example, faculty may require support for targeted readings, workshops, or mentorship that build on their strengths. These data may help clarify effective teaching strategies. Some of these teaching strategies may vary across courses and instructors. There will be new technological resources adopted and need further evaluation. Finally, these data could point to the need to hire new faculty with particular areas of expertise.

4. What are the plans to evaluate students' post-graduate success?

The SWEAP MSW Graduate Survey will be administered two years after graduation to provide a formal measure of student success; however, there are a number of informal ways to evaluate the success of our students. EKU's Social Work Day is an annual community event that entails free continuing education and professional networking to celebrate the social work profession. Many EKU BSW graduates attend and it is likely that MSW graduates will attend as well. In addition, our MSW graduates are likely to be working in the community and some will be serving as field instructors for our current social work students.

Course Title (CIP)						
Degree Program Core Courses (i.e., Courses required by ALL students in the Major--includes Premajor or Preprofessional courses)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Type of Course: program core (C) or pre-major/ pre-professional (P)**	**Credit Hours**	**Existing (E) or New (N) Course**
SWK	**800**	**The Social Work Relationship**	Introduction to generalist social work practice including the importance of self-care, professional ethics, and respect for diversity with the opportunity to build skills in facilitating therapeutic relationships.	C	**3**	**N**
SWK	**810**	**Human Behavior/Social Environment I**	Applies current research and various paradigms to explain how biopsychosocial-spiritual development across the lifespan and in relation to the social environment shape individual functioning and family interactions.	C	**3**	**N**
SWK	**815**	**Human Behavior/Social Environment II**	Prerequisite: SWK 800 with a minimum grade of "B" or departmental approval. Prerequisite or corequisite: SWK 810. Applies current research and various paradigms to explain how social, cultural forces, and institutions shape group, organization, and community interactions.	C	**3**	**N**
SWK	**820**	**Social Work Practice I**	Prerequisite: SWK 800 and SWK 810 with a minimum grade of "B" or departmental approval. Corequisite: SWK 825. Foundation for social work practice with individuals. Draws from current research and various paradigms with the opportunity to practice facilitating the generalist intervention method to develop skills in ethical, culturally inclusive micro practice.	C	**3**	**N**
SWK	**825**	**Social Work Research Methods**	Prerequisite: SWK 800 and SWK 810 with a minimum grade of "B" or departmental approval. Prerequisite or Corequisite: SWK 820. Foundation for qualitative and quantitative research with the opportunity to critically evaluate research methodology and plan a research study for ethical, culturally inclusive social work practice across client systems.	C	**3**	**N**
SWK	**830**	**Social Work Practice II**	Prerequisites: SWK 815 and SWK 820 with a minimum grade of "B" or departmental approval. Foundation for social work practice with families and groups. Draws from current research and various paradigms with the opportunity to practice facilitating a group to develop skills in ethical, culturally inclusive mezzo practice.	C	**3**	**N**
SWK	**840**	**Social Work Practice III**	Prerequisite: SWK 815, SWK 820, and SWK 830 with a minimum grade of "B" or departmental approval. Prerequisite or corequisite: SWK 845. Foundation for generalist social work practice with organizations and communities. Draws from current research and various paradigms with the opportunity to practice facilitating a community intervention to develop skills in ethical, culturally inclusive macro practice.	C	**3**	**N**
SWK	**845**	**Social Policy Analysis and Advocacy**	Prerequisite: SWK 800 with a minimum grade of "B," admission to EKU Graduate School or departmental approval. Engages students as change agents starting with policy analysis, formulation, modification, and evaluation at administrative, judicial, and legislative levels. Emphasis on personal and social empowerment to foster policies and practices that support a just society.	C	**3**	**N**
SWK	**850**	**Foundation Practicum**	Prerequisite: Admission to the MSW Social Work Program, Practicum Placement Approved by Field Director, SWK 800 and SWK 810 completed with at least a "B" or departmental approval. Supervised practice in a social agency and foundation seminar to discuss the application of social work knowledge, skills, competencies, behaviors, ethics and values necessary for evidence-based generalist practice. May be repeated up to 6 hours.	C	**6**	**N**
SWK	**855**	**Foundation Capstone**	Prerequisite: Admission to Advanced Standing or all foundation courses completed with a minimum grade of "B" or departmental approval. Opportunity to review, integrate, and apply learning in order to demonstrate mastery in the application of social work knowledge, skills, competencies, behaviors, ethics, and values necessary for evidence-based generalist practice.	C	**2**	**N**
SWK	**860**	**Integrative Micro Practice**	Prerequisite: Admission to Advanced Standing or all foundation courses completed with a minimum grade of "B" or departmental approval. Opportunity to observe and engage in the delivery of ethical, culturally inclusive advanced generalist micro practice that is informed by social work theory and applied research.	C	**3**	**N**
SWK	**870**	**Integrative Mezzo Practice**	Prerequisite: Admission to Advanced Standing or all foundation courses completed with a minimum grade of "B" or departmental approval. Opportunity to observe and engage in the delivery of ethical, culturally inclusive advanced generalist mezzo practice that is informed by social work theory and applied research.	C	**3**	**N**
SWK	**880**	**Integrative Macro Practice**	Prerequisite: Admission to Advanced Standing or all foundation courses completed with a minimum grade of "B" or departmental approval. Opportunity to observe and engage in the delivery of ethical, culturally inclusive advanced generalist macro practice that is informed by social work theory and applied research.	C	**3**	**N**
SWK	**890**	**Integrative Practicum**	Prerequisite: Admission to Advanced Standing or all foundation courses completed with a minimum grade of "B," Field Director approval of placement. Corequisite: SWK 860, SWK 870, and SWK 880. Supervised practice in a social agency and foundation seminar to integrate social work theory and practice with interdisciplinary knowledge for ethical, culturally inclusive evidence-based advanced generalist practice. May be retaken to a maximum of eight hours.	C	**8**	**N**
SWK	**895**	**Integrative Capstone**	Prerequisite: All foundation and advanced courses completed with a minimum grade of "B" or Departmental approval. Opportunity to review, integrate, and apply learning in order to demonstrate mastery in the capacity to integrate social work theory and practice with interdisciplinary knowledge for ethical, culturally inclusive evidence-based advanced generalist practice.	C	**2**	**N**
			Total Credit hours Required for Program Core (i.e., # of hours in degree program core) **Note: number recorded will automatically populate Core Hours in "Summary of Total Program Hours" table**		**51**	**NA**
Core Courses Required for Track(s), Concentration(s), or Speciality(s) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			Total Credit hours Required for Program Options (Track(s), Concentration(s), or Speciality) (if applicable) **Note: number recorded will automatically populate Program Option hours in "Summary of Total Program Hours" table**		**0**	**NA**

GUIDED Elective Courses (i.e., Specified list of Program Electives AND/OR Electives focused on a specific track/concentration/or speciality) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
SWK	**561**	**Alcohol and Drug Assessment**	Prerequisite: Junior or senior standing. Provides clinical and scientific knowledge about the history and range of consequences associated with alcohol and drug addiction. Credit will not be awarded for both SWK 561 and SWK 761.	**P**	**3**	**N**
SWK	**761**	**Alcohol and Drug Assessment**	Prerequisite: Admission to EKU Graduate School or departmental approval. Provides clinical and scientific knowledge about the history and range of consequences associated with alcohol and drug addiction. Students having received credit for SWK 561 may take this course for a maximum of six hours, including the undergraduate credit.	**P**	**3**	**N**
SWK	**562**	**Alcohol and Drug Treatment**	Prerequisite: Junior or senior standing. Open to all majors. Provides clinical and scientific knowledge about the treatment of alcohol and drug addiction. Credit will not be awarded for both SWK 562 and SWK 762.	**P**	**3**	**N**
SWK	**762**	**Alcohol and Drug Treatment**	Prerequisite: Admission to EKU Graduate School or departmental approval. Provides clinical and scientific knowledge about the treatment of alcohol and drug addiction. Students having received credit for SWK 562 may take this course for a maximum of six hours, including the undergraduate credit	**P**	**3**	**N**
SWK	**863**	**Stress Management and Self-Care**	Prerequisite: Admission to EKU Graduate School or departmental approval. Addresses what supports a healthy lifestyle that includes stress management and perceived quality of life. Emphasis is on evidence-based approaches and experiential learning to inform the development and maintenance of a plan for self-care.	**P**	**3**	**N**
SWK	**864**	**Child and Family Services**	Prerequisite: Admission to EKU Graduate School or departmental approval. Critical appraisal of societal values underlying services to children. Examines a range of social and child welfare services, impact of public policies, and interventions to support children and families.	**P**	**3**	**N**
SWK	**865**	**Social Gerontology**	Prerequisite: Admission to EKU Graduate School or departmental approval. Applies current research and various paradigms to describe factors that shape the aging process. Class activities inspire new insights that can be used to better support older adults and their families.	**P**	**3**	**N**
SWK	**866**	**Crisis Intervention**	Prerequisite: Admission to EKU Graduate School or departmental approval. Examination of current theories pertaining to the fundamentals of trauma and traumatic stress that can lead to crisis. The implications of crisis intervention to modify, manage, and cope with trauma will be addressed.	**P**	**3**	**N**
SWK	**867**	**Spiritual Sensitivity for Helping Professionals**	Prerequisite: Admission to EKU Graduate School or departmental approval. Describes how professionals can address spiritual issues that emerge in health and mental care settings. Students will also explore how their own beliefs influence daily life and work.	**P**	**3**	**N**
SWK	**899**	**Independent Study in Social Work**	Student must consult with the faculty project advisor and have the independent study proposal form approved by their faculty project advisor, program director, and department chair prior to enrollment. Course may include intensive reading in a specialized area, synthesizing literature on a topic, completing a research project, or other assignment arranged with faculty advisor. May be retaken to a maximum of nine hours.	**P**	**9**	**N**
JPL	**828**	**Mental Health/Substance Abuse Issues in the Correctional Setting**	Formerly COR 828. Explores prevalence, diagnosis, best practices for treatment of mental illness/substance abuse disorders; pressing issues facing the criminal justice system in the correctional population. Credit will not be awarded to students who have credit for COR 828.	**P**	**3**	**E**
MPH	**810**	**Human Behavior Change**	Formerly HEA 810. This course examines selected theories and models of health behavior relevant to health promotion in individuals and communities. Students will analyze biological, psychological, sociological, and environmental influences on behavior, and evaluate strategies for health promotion.	**P**	**3**	**E**
NFA	**826**	**Nutrition for Chronic Disease**	Pre-requisite: Departmental approval. Critical review of chronic disease incidence and risk factors with an emphasis on the role of nutrition for the management of chronic disease through community based programming.	**P**	**3**	**E**
PSY	**818**	**Psychology of Addictions**	Prerequisite: admission to the Psy.D. program. This course is designed to provide an overview of the assessment, diagnosis, theory, and treatment of substance-related and addictive disorders.	**P**	**3**	**E**
CDF	**701**	**Prenatal and Infant Development**	Growth and development from conception to three years. In-depth study of theories and issues related to development during the first three years and before birth. Impact on family, education, and community will be explored.	**P**	**3**	**E**
CDF	**741**	**Infant-Toddler Development and Group Care**	Growth and development from conception to three years. Emphasis on family intervention, appropriate policies and practices for group care, assessment, disabilities, multicultural and gender issues, and caregiver professional growth. Minimum of 27 field/clinical experiences required.	**P**	**3**	**E**
CDF	**744**	**Child Development and Program Planning**	Theory pertinent to early childhood development and learning including constructiveness, socially mediated intelligence, multiple intelligence and creativity. Emphasis on emergent curriculum and teaching strategies reflecting social collaboration such as webbing, project work, and multimedia documentation.	**P**	**3**	**E**
EAD	**853**	**Conditions for Learning**	Candidates will use data from surveys and interviews to evaluate a school's learning environment. Candidates will develop recommendations for improvement.	**P**	**3**	**E**
EAD	**856**	**Learning for At-Risk Students**	The course will provide knowledge and strategies for aspiring school leaders to support staff, programs, and initiatives to reduce the impact of risk factors on student learning.	**P**	**3**	**E**
EDF	**855**	**Foundation of Multicultural Education**	Examination of the education implications of cultural pluralism in America and selected societies of the world.	**P**	**3**	**E**
EMS	**777**	**Cultural Competency with ELLs**	The purpose of this course is to help educators develop awareness of the implications of cultural and linguistic diversity for school success as well as effective techniques for collaborating with immigrant students and families. Credit will not be awarded to students who have credit for EMS 577.	**P**	**3**	**E**
EPY	**839**	**Human Growth & Development**	A theoretical examination of human development across the lifespan. Emphasis is placed on developmental norms, etiology, diagnosis and interventions over the lifespan found in the population.	**P**	**3**	**E**
OTS	**715**	**Early Childhood Sensorimotor Development**	Prerequisite: education major or degree or instructor's approval. Provides an overview of normal sensorimotor development in infants and young children. Includes contrasting normal/abnormal development and application of appropriate developmental tasks. Laboratory experiences will be provided.	**P**	**3**	**E**
OTS	**863**	**Occupation and Sensory Processing**	Understanding the impact of sensory processing disorders on occupational natures will enable students to provide appropriate intervention. Occupational adaptation and sensory integrative theories will be applied as conceptual frameworks for occupational therapy intervention.	**P**	**3**	**E**
OTS	**865**	**School-Based Practice**	Prerequisite: Departmental approval. In-depth study of school-based therapy. Theories, principles, models of practice, and methods of therapy service delivery for students with learning and behavioral difficulties, within the context of state and federal laws.	**P**	**3**	**E**
PSY	**777**	**The Autism Spectrum**	Prerequisite: departmental approval. Assessment, diagnosis, and intervention in autism spectrum disorders across the lifespan. Conduct autism spectrum assessment and design interventions.	**P**	**3**	**E**
PSY	**817**	**Introductory Foundation, Concepts, and Principles in Behavior Analysis**	Prerequisite: Departmental Approval. Foundation, concepts, and principles of behavioral science applied to the field of behavior analysis.	**P**	**3**	**E**
SED	**800**	**Exceptional Learners in the General Education Classroom**	Open only to non LBD, MSD, and DHH majors. Characteristics of students with disabilities, identification procedures, and instructional strategies. Salient features of PL94-142, IEP, roles and responsibilities of general education educators.	**P**	**3**	**E**
SED	**817**	**Behavior Disorders Strategies**	Formerly SED 778. This course examines behavior disorders and emotional disturbances as educational, psychological, and sociological phenomenon. Definitions, characteristics, theoretical foundations, and programmatic approaches are discussed. Credit will not be awarded for both SED 817 and 778.	**P**	**3**	**E**

SED	819	**Mod/Sev Disabilities Intro**	No prerequisite. Introduction to teaching students with Moderate and Severe Disabilities (MSD). Educational needs, issues, legal mandates, family concerns, and best practices for student-focused inclusive school and community programs. Credit will not be awarded for both SED 819 and 700.	P	3	E
SED	827	**Early Child Special Education Partnerships**	Review of needs of and methods for effective collaboration with families of children with disabilities, focusing on family-school interactions, impact of family variability on collaboration. Credit will not be awarded for both SED 827 and 711.	P	3	E
EPY	869	**Research & Program Evaluation**	This course is designed to provide an understanding of research methods, statistical analysis, needs assessment, and program evaluation principles, models, and applications.	P	3	E
HLS	830	**Long-Term Disaster Resilience**	Explores disaster trends and problems, as well as community wide mitigation and preparedness strategies aimed at reducing the impacts of natural hazards and achieving long-term disaster resilience.	P	3	E
HLS	835	**Intergovernmental Relations in Disaster Management**	Analysis of intergovernmental relations and disaster policies across all phases of emergency management with a focus on disaster response and recovery. Systems are investigated through critical thinking, case studies, and comparative analysis methodologies.	P	3	E
JPL	812	**Leading with Political, Ethical and Emotional Intelligence**	Formerly COR 812. This course examines leadership within the justice field, focusing on three competencies essential for effective, just leadership: political, ethical, and emotional intelligence. Understanding mindset/tactics associated with administrators that do/don't lead with these competencies. Credit will not be awarded to students who have credit for COR 812.	P	3	E
JPL	835	**Advanced Justice Administration and Leadership**	Formerly COR 835. An examination of theoretical bases and contemporary approaches to justice organizations, administration and leadership. Emphasis placed on the social, cultural, and political setting of justice administration and management. Credit will not be awarded to students who have credit for COR 835.	P	3	E
OTS	853	**Leadership in Human Services**	Focus on the development and application of leadership skills, including transformational and transactional leadership. Students will demonstrate development of their own leadership skills through a major project.	P	3	E
POL	765	**Administrative Law**	Nature of the powers vested in administrative agencies; the problems of administration procedure; the methods and extent of judicial control over administrative action.	P	3	E
POL	845	**Community Development**	Examines developmental efforts on community level in the United States; relates community development to community organization and examines current efforts, especially those based on the concept of self-help, to generate and implement community development programs.	P	3	E
POL	846	**Non-Profit Organizations**	Study of non-profit organizations, including an examination of types, leadership styles, management tools, board organization, budgeting and fund-raising.	P	3	E
POL	847	**Grant Writing**	The study of grant writing processes involving federal and foundation grants as they apply to the public and non-profit sector. Credit will not be awarded for both POL 847 and POL 847S.	P	3	E
PSY	873	**Organizational Psychology**	Prerequisite: departmental approval. Examination of research, theory, and applications in organizational psychology. Topics include commitment, involvement, satisfaction, power, conflict, motivation, leadership, quality of work life, group/team processes, and organizational structure.	P	3	E
PSY	874	**Organizational Change and Development**	Prerequisite: departmental approval. Analysis of psychological theory, research and practice pertaining to organization change and development including the change process, culture, interventions, evaluation, consulting, and legal/ethical concerns.	P	3	E
PSY	875	**Training and Development**	Prerequisite: departmental approval. Graduate level survey of psychological theory, research, and practice utilized in the training and development of human resources in the workplace.	P	3	E
SSE	826	**Emergency Prep/ Response**	In-depth study of the planning process, program development, training methods, etc., for response to man-made and natural emergencies/disasters for both private and public entities.	P	3	E
SSE	830	**Organizational Continuity**	Organizational continuity will be discussed using the phases of emergency response, crisis management, and recovery. This course addresses value added activity of planning for catastrophic events and critical factors in restoring operational activity.	P	3	E
PSY	837	**Social Psychology & Cultural Diversity**	Prerequisite: departmental approval. Graduate level survey of topics in social psychology including social influence, persuasion, social cognition, self-justification, aggression and prejudice. Emphasis on multi-cultural diversity and tolerance of other groups.	P	3	E
PSY	850	**Psychotherapy and Behavior Change I: Basic Techniques**	Prerequisite: departmental approval. A didactic and experiential introduction to the theories and techniques facilitative of personal growth and behavior change.	P	3	E
PSY	859	**Cog/Affect Bases of Behavior**	Prerequisite: departmental approval. Broad survey of findings regarding cognitive and affective influences on behavior, including learning and conditioning, memory, and cognitive and affective processes. Credit will not be awarded to students who have credit for PSY 840.	P	3	E
PSY	860	**Psychotherapy and Behavior Change II: Advanced Techniques and Theories**	Prerequisite: PSY 850 or departmental approval. The in-depth study of techniques selected from those presented in PSY 850. Emphasis will be placed on developing proficiency in such skills and techniques.	P	3	E
PSY	817	**Introductory Foundations, Concepts, & Principles in Applied Behavior Analysis**	Prerequisite: Departmental Approval. Foundation, concepts, and principles of behavioral science applied to the field of behavior analysis.	P	3	E
CRJ	802	**Violence Against Women**	This course provides students with a human right framework and cross-cultural understanding of violence against women, and efforts across societies to translate international knowledge into local justice for gender-based violence and female victims.	P	3	E
CRJ	814	**Policing and Society**	Theoretical, historical and comparative perspectives on policing. Critical analysis of the function of police in modern society	P	3	E
CRJ	862	**Race, Identity, & Policing**	Examines why racial injustices exist in criminal justice and policing, using historical and contemporary studies of connections between race, poverty, and the criminal justice system/policing.	P	3	E
CRJ	875	**Crime and Public Policy**	Provides an overview of factors shaping crime policy. The concept of crime, the use of law to promote social control policies, policy responses related to crime control and the efficacy of those policies will be examined. Addresses conceptualizations of the modern state and the use of state power.	P	3	E
JPL	812	**Leading with Political, Ethical and Emotional Intelligence**	Formerly COR 812. This course examines leadership within the justice field, focusing on three competencies essential for effective, just leadership: political, ethical, and emotional intelligence. Understanding mindset/tactics associated with administrators that do/don't lead with these competencies. Credit will not be awarded to students who have credit for COR 812	P	3	E
JPL	830	**Understanding Corrections and Juvenile Justice**	Formerly COR 830. Situates issues facing correctional organizations in historical, political, economic, cultural contexts. Emphasizes applying theory and critical thinking to address problems/issues/trends facing leaders in corrections and juvenile justice. Credit will not be awarded to students who have credit for COR 830.	P	3	E
JPL	840	**Trends/Issues in Adult/Institutional/Community Corrections**	Formerly COR 840. This course analyzes current and emerging trends/issues in adult community and institutional corrections. The future of corrections is examined based on current and projected trends. Credit will not be awarded to students who have credit for COR 840	P	3	E
			# of REQUIRED Credit hours in Guided Electives (i.e., electives for a focused or track/concentration/speciality are). If 9 hours is required and there are 15 hours to choose from, then only 9 hours are required) **Note: number recorded will automatically populate Guided Elective hours in "Summary of Total Program Hours" table**		**9**	**NA**

FREE Elective Courses (i.e, general program electives, open to the students to choose) (if applicable)

Course Prefix	Course #	Course Title	Course Description	Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
			Total # of Credit Hours in Free Electives (i.e., general program electives) (if applicable) **Note: number recorded will automatically populate Free Elective Hours in "Summary of Total Program Hours" table**		**0**	**NA**

		Summary of Total Program Hours	**Required Core Hours (i.e., # of hours in degree program core)**	**51**	NA
			Required Program Options - Track/Concentration/Specialty Hours (if applicable)	**0**	NA
			Guided Elective Hours (e.g., focused or track/concentration/speciality area specific electives) (if applicable)	**9**	NA
			Free Elective Hours (i.e., general program electives) (if applicable)	**0**	NA
			Total # of credit hours required for Program	**60**	**NA**
		Information to be completed by PIE Office			
			# of new courses		NA
			Total # of Courses (includes new and existing)		NA
			Precentage of new courses (more than 25% may require SACS Substantive Change)	#VALUE!	NA

PROPOSED PROGRAM SUMMARY

Institution: **Northern Kentucky University**
Program Name: BS in Cybersecurity

Program Description: According to the Cybersecurity Curricular Guidelines 2017 (CSEC2017), "Cybersecurity is a computing-based discipline involving technology, people, information, and processes to enable assured operations in the context of adversaries."

The proposed Bachelor of Science in Cybersecurity degree program would expand on NKU's existing curricular strengths as a DHS/NSA Center of Academic Excellence (CAE) in Cyber Defense Education by creating a new degree program that would meet both the CSEC2017 and the updated 2018 DHS/NSA requirements for the university's recertification as a CAE in 2019. The new program would build upon existing cybersecurity courses in Business Information Systems, Computer Information Technology, and Computer Science, while creating a small number of new courses.

CIP Code: 11.1003
Credit Hours: 120
(Tentative) Institutional Board Approval Date: November 2019
Implementation Date: January 13, 2020

Student Demand

We have seen strong interest in the Cybersecurity track of the Computer Information Technology degree in 2016. As of spring 2019, the Cybersecurity track is the highest enrolled track in the BS/CIT degree.

Students interested in other cybersecurity career paths, such as security engineer or architect roles, do not have a program that serves their needs. High participation in NKU's cyber defense team, with many students attending the weekly Friday night practices that cover material beyond the BS/CIT curriculum, demonstrates interest in cybersecurity knowledge beyond what is currently offered in our curriculum.

5 Year Projected Enrollment

	Year 1	Year 2	Year 3	Year 4	Year 5
New Students	30	60	90	120	120
Current/Existing Students	20	40	60	80	80
Total Student Enrollment	50	100	150	200	200

Market Demand

Cybersecurity is a rapidly growing field with many unfilled job positions in the region. According to the National Institute of Standards and Technology, there are 1,608 open cybersecurity positions in the state of Kentucky and 1,290 open positions in the Greater Cincinnati metropolitan area.

CSEC2017 was recently published by the Joint Task Force (JTF) on Cybersecurity Education, defining standards for university degrees in cybersecurity. The document begins by citing studies showing a global shortfall of 1.8 million cybersecurity professionals by 2022 without the creation of new degree programs in cybersecurity.

The publication of CSEC2017 provides an opportunity for NKU to get ahead of the curve by creating a Bachelor of Cybersecurity program that can meet the rapidly growing demand for cybersecurity professionals. No such degree program exists in Kentucky or the Greater Cincinnati region. However, as a member of the JTF, the author heard many other participants describe plans for creating cybersecurity degree programs after publication of the standard.

There are a variety of certificate programs, concentrations, and tracks, like the cybersecurity track in NKU's own Computer Information Technology B.S. degree program, there are no B.S. in Cybersecurity. The closest in name is EKU 's Bachelor of Network Security and Electronics degree program. However, this program does not meet CSEC2017 requirements and includes only 2 security courses, which is less than the number of security courses required by NKU's CIT cybersecurity track or even NKU's Information Security minor.

The B.S. Cybersecurity program would differ from NKU's Cybersecurity Track in Computer Information Technology by offering a broader focus, including several courses from Business Information Systems and Computer Science.

Employer Demand:

	Regional	State	National	Growth Projections
Type of Job	**Cybersecurity Specialists**	**Cybersecurity Specialists**	**Cybersecurity Specialists**	**Cybersecurity Specialists**
Average Wage	$95,060	$83.890	$98,350	28% from 2016-2026 (much faster than average)
# of Openings	1410	1644	313,735	up to 1.8 million by 2022 (worldwide)
Type of Job				
Average Wage				
# of Openings				
Type of Job				

Average Wage				
# of Openings				
Type of Job				
Average Wage				
# of Openings				
Type of Job				
Average Wage				
# of Openings				

Academic Demand

N/A - degree's role is to produce graduates immediately ready for the workforce.

Unnecessary Duplication

Similar Programs	**Comparison of Objectives/Focus/ Curriculum to Similar Programs**	**Comparison of Student Populations**	**Access to/Demand for Existing Programs**	**Feedback from Other Institutions**
Program 1 EKU-BS in Digital Forensics and Cybersecurity	EKU's program focuses on digital forensics and cybercrime investigation. It does not educate professionals for roles like security architect and security engineer in the corporate or non-profit sector as NKU's proposed cybersecurity program does. There is much higher demand for cybersecurity talent in the private sector than in law enforcement.	EKU's student population largely comes from the central KY region while NKU's comes mostly from northern KY and Cincinnati.	Access should be equal.	There is some expressed interest in collaborating across the two programs. Otherwise, the two programs are separate and have somewhat differing goals and curricula.
Program 2				
Program 3				

Comparison of Objectives/Focus/Curriculum to Similar Programs: *Explain the differences in curriculum, focus, and/or objectives. If the proposed program curriculum does not differ substantially from existing programs, then describe potential collaborations with other institutions.*

Comparison of Student Populations*:*

Access to Existing Programs:

Feedback from Other Institutions:

Cost

Projected Revenue over Next Five Years	$1,206,000
Projected Expenses over Next Five Years	$727,174.07
Net Cost over Next Five Years	483,825.93

Will additional faculty be needed? The department has just hired two new faculty to support this and existing computer security programs. 1 additional faculty member is anticipated in year 4. As noted above, projected revenue greatly exceeds projected expenses, so the cost for the new faculty is covered by the program's revenue.

Provide a budgetary rationale for creating this new program: Cybersecurity is one of the largest in-demand job areas in the tech industry and growth projection indicates a growing need. As the cybersecurity program builds upon curricula of two existing programs (BS CIT and BS in computer science), expenses are minimal. Aside from 1 new faculty (to go along with two new hires and 3 additional existing faculty), the other expenses are for hardware upgrades in year 3, student workers, marketing, and professional development.

Northern Kentucky University
BS - BACHELOR OF SCIENCE
11.1003-Computer and Information Systems Security/Information Assurance.
Submission Date: 01/13/2020 15:25

Full Proposal - Basic Info

Institution :	Northern Kentucky University
Program Type :	Single Institution
Program Name :	Cybersecurity
Degree Level :	Baccalaureate
Degree Designation :	BACHELOR OF SCIENCE
CIP Code (2-Digit) :	11-COMPUTER AND INFORMATION SCIENCES AND SUPPORT SERVICES.
CIP Code :	11.1003-Computer and Information Systems Security/Information Assurance.

Academic Unit (e.g. Department, Division, School) :	Department
Name of Academic Unit :	Department of Computer Science
Name of Program Director :	Dr. James Walden

Intended Date of Implementation :	5/8/2020
Anticipated Date for Granting First Degrees :	12/9/2021
Date of Governing Board Approval :	1/15/2020

Institutional Contact Information

First Name :	James
Last Name :	Walden
Title :	Dr.
Email :	waldenj@nku.edu
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Northern Kentucky University
BS - BACHELOR OF SCIENCE
11.1003-Computer and Information Systems Security/Information Assurance.
Submission Date: 01/13/2020 15:25

Full Proposal - Mission: Centrality to the Institution's Mission and Consistency with State's Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

The primary objective of the program is to produce cybersecurity professionals, who understand the processes and technologies needed to secure the information infrastructure of a modern organization.

2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

This program will improve career readiness and employability of university graduates by educating them as professionals who will address the critical need for cybersecurity skills in the state, region, and nation.

3. Explain how the proposed program addresses the state’s postsecondary education strategic agenda.

This program will encourage more students taking advantage of this postsecondary cybersecurity education opportunity in order to fill computer and information security workforce shortages. It will also guide students to a successful cybersecurity oriented career path to help secure critical information infrastructure of Kentucky and other regions of the nation.

4. Explain how the proposed program furthers the statewide implementation plan.

This program will encourage more students to take advantage of this postsecondary cybersecurity education opportunity in order to fill computer and information security workforce shortages. It will also guide students to a successful cybersecurity oriented career path to help secure critical information infrastructure of Kentucky and other regions of the nation.

Northern Kentucky University
BS - BACHELOR OF SCIENCE
11.1003-Computer and Information Systems Security/Information Assurance.
Submission Date: 01/13/2020 15:25

Full Proposal - Quality: Program Quality and Student Success

1. List all student learning outcomes of the program.

a. Assess risks to an organization's information infrastructure using appropriate standards and effectively communicate those risks to decision makers.
b. Identify and deploy appropriate security controls to mitigate risks.
c. Design, implement, and evaluate secure software systems.
d. Understand the principles and best practices of responding to a cybersecurity incident.
e. Explain ethical and legal issues involved in security and privacy.

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

Outcome 1: achieved primarily through CIT 285 Cybersecurity Fundamentals, CYS 310 Cybersecurity Risk Management, and CIT 430 Computer Forensics. These 3 courses at 3 different levels give students different opportunities and angles on learning risk assessment and communicating risks to decision makers.
Outcome 2: achieved primarily through CIT 285 Cybersecurity Fundamentals, CYS 444 Software Security, and CIT 485 Advanced Cybersecurity. These 3 courses at 3 different levels give students knowledge on security controls and applying these security controls to mitigate risks.
Outcome 3: achieved primarily through CIT 285 Cybersecurity Fundamentals, CSC 482 Computer Security, CYS 444 Software Security and MAT 483 Cryptography. Students learn and practice on secure software design, secure coding, crypotography, code review, and software vulnerability analysis through these courses.
Outcome 4: achieved primarily through CIT 285 Cybersecurity Fundamentals, CYS 330 Intro. to Ethical Hacking, and CIT 430 Computer Forensics. This sequence of courses give students the technical knowdge and process on correctly handling cybersecurity incidents.
Outcome 5: achieved primarily through PHI 310 Information Ethics, CYS 330 Intro. to Ethical Hacking, and CIT 485 Advanced Cybersecurity. This sequence of courses gives students knowledge on ethical and legal issues involved in security and privacy.
See the table below showing the mapping of SLO to course.
SLO 1:
Introductory: CIT 285 Cybersecurity fundamentals
Enhanced: CYS 310 Cybersecurity Risk Management
Mastery: CIT 480 Computer Forensics
SLO 2:
Introductory: CIT 285 Cybersecurity fundamentals
Enhanced: CYS 444 Software Security
Mastery: CIT 485 Adv. Cybersecurity
SLO 3:
Introductory: CIT 285 Cybersecurity fundamentals
Enhanced: CSC 482 Computer Security
Mastery: CYS 444 Software Security
SLO 4:
Introductory: CIT 285 Cybersecurity fundamentals
Enhanced: CYS 350 Intro to Ethical Hacking
Mastery: CIT 430 Computer Forensics
SLO 5:
Introductory: PHI 310 Information Ethics
Enhanced: CYS 350 Intro to Ethical Hacking
Mastery: CIT 485 Adv. Cybersecurity

Northern Kentucky University
BS - BACHELOR OF SCIENCE
11.1003-Computer and Information Systems Security/Information Assurance.
Submission Date: 01/13/2020 15:25

3. Highlight any distinctive qualities of this proposed program.

This program is designed to meet the DHS/NSA curriculum requirements for certification as a Center of Academic Excellence (CAE) in Cyber Defense Education. While NKU is currently designated as a CAE, creating an undergraduate degree program in cybersecurity is important to ensure NKU will keep up with the continual expansion of educational criteria required to maintain CAE status. This program will be the first and only undergraduate cybersecurity degree offered by a CAE in Kentucky.

The content of the degree is also unique. In particular, the combination of business and technical skills in the B.S. cybersecurity degree is a unique combination driven by guidance from the advisory board for NKU's Center for Information Security, which is responsible for coordinating educational and research activities in cybersecurity.

4. Will this program replace any existing program(s) or specializations within an existing program?

YES

Please specify.

The program will not replace any existing programs, but it will include new courses that may be approved as electives in the BS/CIT cybersecurity track or information security minor.

5. Include the projected faculty/student in major ratio.

10 faculty for 200 students (approx)

6. Is there a specialized accrediting agency related to this program?

YES

Please identify the agency.

Department of Homeland Security / National Security Agency

Do you plan to seek accreditation?

YES

Please explain your plans for accreditation.

Department of Homeland Security / National Security Agency will review and determine approval.

7. Attach SACS Faculty Roster Form.

SACSFacultyRoster_BS_Cybersecurity-8-28-2019-updated.pdf

8. A. Describe the library resources available to support this program. You may attach any documentation provided to SACS.

The NKU Steely Library provides adequate resources in the form of online journals, reference texts, and texbooks to support this program. In addition, NKU has interlibrary loan services that will allow students to get additional cybersecurity study resources.

B. Describe the physical facilities and instructional equipment available to support this program. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.

All classes will be offered within the state-of-the-art facilties in Griffin Hall of College of Informatics which includes smart classrooms, Networking Lab, Virtualization Lab, Cyber Threat Intelligence Lab, and high speed WiFi access.

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9. Clearly state the admission, and retention, and completion standards designed to encourage high quality.

Admission: The program follows NKU's admission standards, i.e., successful completion of Kentucky's pre-college curriculum and standard test score meeting CPE college readiness standards. If a propective student standardized test score falls below the CPE college readiness standards, the student will be required to take a College Placement Test to determine proper placement in English, math, and/or reading prior to course registration.

CPE Placement Standards

ACT: English 18, Math 19, Reading 20

SAT: Evidence-Based Reading and Writing 480, Math 500

Retention: College centralized student academic advising & student course success markers.

Completion: Students need to have at least a 2.0 cumulative GPA on all work attempted at NKU. Students must earn a grade of C- or better in each course that counts as part of this program. Students also need to fulfill NKU's Bachelor's degree requirements in order to complete this program.

10. Clearly state the degree completion requirements for the program.

Students need to complete 120 credits hours to complete this major. The 120 hours consist of 80 hours within the major, 37 hours of general education coursework, 45 hours of advanced (3xx/4xx) coursework and a secondary area of study. The secondary area of study is automatically provided as embedded minors in both computer information technology and computer science are contained within the major. The 80 hours comprise 74 hours in the core and 6 hours of elective courses. The major includes 6 hours of general education coursework, two embedded minors, and more than 45 advanced hours. Therefore, the BS in Cybersecurity student will have 80 hours in the major + 31 hours of additional general education coursework. The student will then have 9 hours of free electives to complete the 120 hours for graduation.

General Education: 31 (6 additional hours are core requirements)

Cybersecurity Coursework: 80

Free electives: 9

Name	Total number of hours required for degree	Number of hours in degree program core	Number of hours in guided electives	Number of hours in free electives
Program	120	74	6	0

12. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.

NKU has a basis for transfer in our existing articulation agreement for the KCTCS Associate of Applied Science in Computer and Information Technologies – Information Security Track to Bachelor of Science in Computer Information Technology at NKU. Many of the classes in this new program are included in the existing agreement. NKU Computer Science Department Chair Maureen Doyle initiated an articulation conversation in May 2019 asking our partners at KCTCS for creating a pathway into our new cybersecurity program. We will work on course mappings for the articulation agreement of this cybersecurity program once the cybersecurity program is approved.

13. List courses under the appropriate curricular headings.

bs-cybersecurity-courses- curriculum template.xlsx

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14. Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)?

YES

YES	Distance learning
YES	Courses that combine various modes of interaction, such as face-to-face, videoconferencing, audio-conferencing, mail, telephone, fax, e-mail, interactive television, or World Wide Web
YES	Technology-enhanced instruction
NO	Evening/weekend/early morning classes
NO	Accelerated courses
NO	Instruction at nontraditional locations, such as employer worksite
NO	Courses with multiple entry, exit, and reentry points
NO	Courses with "rolling" entrance and completion times, based on self-pacing
NO	Modularized courses

Please describe planned alternative methods of program delivery involving greater use of technology, distance education, and/or accelerated degree designs, to increase efficiency, better address student educational and workforce needs, and maximize student success, for both traditional and non-traditional students.

This proposed program is a hybrid program utilizing both face-to-face and distance education methods for addressing student educational and workface needs, and maximize student success.

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Full Proposal - Demand: Program Demand/Unnecessary Duplication

1. Student Demand:

a. Provide evidence of student demand at the regional, state and national levels.

We have seen strong interest in the Cybersecurity track of the Computer Information Technology degree, which was initially offered in 2016. As of spring 2019, the Cybersecurity track is the highest enrolled track in the BS/CIT degree.

The BS/CIT Cybersecurity track focuses on teaching students to work as security analysts. Students interested in other cybersecurity career paths, such as security engineer or architect roles, do not have a program that serves their needs.

Participation in NKU's cyberdefense team, with many students attending the weekly Friday night practices that cover material beyond the BS/CIT curriculum, demonstrates interest in cybersecurity knowledge beyond what is currently offered in our curriculum.

b. Identify the applicant pool and how they will be reached.

The applicant pool consists of traditional high school students and US veterans who are seeking to advance their career in cybersecurity. We plan to have high school visits, college fairs, and advertising events to help reach prospective students of this program.

c. Describe the student recruitment and selection process.

We plan to have multiple recruitment events such as Norse Days, Welcome Wednesdays, the College of Informatics Showcase, high school camps at NKU, high school visits, and collaboration with InterAlliance for student recruitment. The student selection process follows NKU admission standards.

d. Identify the primary feeders for the program.

Local high school, community colleges with articulation agreements, and other community colleges.

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

We estimate about 30 new students plus 20 existing students transferring from related programs in year 1, up to a stable population of 200 students by year 4. This is based upon the demand for professionals in this field and the attraction to this major which is not replicated at other colleges of universities. This yields a net of 30 new students per year, or 120 after 4 years.

f. Project estimated student demand for the first five years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) - Fall Semester
2020-2021	0	50
2021-2022	15	100
2022-2023	30	150
2023-2024	75	200
2024-2025	100	200

2. Employer Demand:

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

According to our employer survey results, 94% employers said that they have difficulty in finding/hiring qualified cybersecurity professionals. 98% employers responded that they are interested in hiring future NKU graduates with Bachelor of Science degree in Cybersecurity. 94% employers think that the region needs more cybersecurity specialists

and the proposed program will fulfill those needs. 98% employers think that Kentucky has a critical need for cybersecurity skills and students graduating with this Cybersecurity Degree from NKU address this critical need in the state. 98% employers think that students graduating with this Cybersecurity Degree also address the critical need in US.

The following type of cybersecurity job roles are currently employed at the employers surveyed (The list is ranked based on the percentage of response counts from employers):

1. System Security Analyst (21.59%)

2. Product/Software Security Engineer (19.89%)

3. Penetration Tester (17.61%)

4. Cyber Defense Analyst (15.34%)

5. Cyber Defense Infrastructure Support Analyst(15.34%)

6. Cyber Defense Forensics Analyst (10.23%)

Based on the survey, employers are very concerned about the skill gap in cybersecurity. Cybersecurity will remain one of the greatest growth areas in the future. No matter whether companies are going to the public cloud, private cloud, or using their own data center, cybersecurity graduates will fill an ever growing gap in security. The survey shows that this proposed program will be a huge benefit to the region and the nation. It will also be a key differentiator for the College of Informatics at NKU from the other universities in the area.

Type of jobs available for graduates are:

1. System Security Analyst

2. Product/Software Security Engineer

3. Penetration Tester

4. Cyber Defense Analyst

5. Cyber Defense Infrastructure Support Analyst

6. Cyber Defense Forensics Analyst

Based on the Bureau of Labor Statistics (www.bls.gov), the percentile annual wage estimates for security analyst are $73, 890 (25% percentile), $98,350 (50% percentile, median), and $126, 870 (75% percentile). These figures were taken from the website in September, 2019.

According to the Department of Homeland Security’s Cyberseek project (www.cyberseek.org), the state of Kentucky has 5225 security workers and 1644 unfilled security jobs, while the Greater Cincinnati metropolitan region has 4410 security workers and 1410 unfilled security jobs. These figures were taken from the web site in April 2019.

According the National Institute of Standards and Technology (NIST), U.S. employers posted an estimated 313,735 job openings for cybersecurity workers between September 2017 and August 2018. The total U.S. cybersecurity workforce at the time had approximately 715,000 workers.

Industry reports such as the (ISC)2 2017 Global Information Security Workforce Study also indicate a severe cybersecurity talent shortage. A projected 1.8 million cybersecurity positions will remain unfilled worldwide by year 2022.

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3. Academic Disciplinary Needs:

N/A, this program is being proposed to fulfill employer demand and a lack of this specific curriculum.

a. If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.

(Should not be blank)

4. Similar programs:

a. Are there similar programs in other Southern Regional Education Board (SREB) states and in the nation?

YES

Please identify similar programs in other SREB states and in the nation.

The program that comes closest in content to the proposed program is NKU's own Bachelor of Computer Information Technology Cybersecurity track. While the Cybersecurity track prepares students for work as a cybersecurity analyst, it does not prepare students for other roles like cybersecurity engineer or architect positions that require additional computer science and business knowledge.

The second closest program is Eastern Kentucky University's (EKU) new Digital Forensics and Cybersecurity B.S. degree. EKU's program focuses on digital forensics, cybersecurity and cybercrime investigation. NKU's program will focus on business risk management, ethical hacking and secure software development.

There are no B.S. cybersecurity programs in the Greater Cincinnati metropolitcan area where NKU is located. University of Cincinnati does have a cybersecurity track in their B.S. Information Technology program, which is similar to NKU's BS/CIT cybersecurity track described above.

b. Our records indicate the following similar programs exist at public institutions in Kentucky.

---- No Programs Exist----

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Full Proposal - Cost: Cost and Funding of the Proposed Program

1. Will this program require additional resources?

YES

Please provide a brief summary of additional resources that will be needed to implement this program over the next five years.

One (1) already hired cybersecurity faculty member will start in spring 2020. With increasing enrollments, we anticipate needing one (1) more faculty member in year 4. We will need time from existing administrative staff and will also need one student assistant for 20 hours/week.

2. Will this program impact existing programs and/or organizational units within your institution?

YES

Please describe the impact.

We may see some current CSC and CIT Cybersecurity students as well as future students who might have selected CSC or CIT Cybersecurity enrolling in the BS in Cybersecurity. However, we anticipate a net increase in enrollment within the department as a whole as a result of the BS in Cybersecurity.

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

Please see the following cost/funding explanation for details. The program will generate positive return on investment starting from year 2. The year 3, year 4, and year 5 estimated net positive return on investment is $296,919.38, $503,419.38, and $500,919.38 respectively.

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A. Funding Sources, by year of program	1st year	2nd year	3rd year	4th year	5th year
	0	0	0	0	0
Total Resources Available from Federal Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Total Resources Available from Other Non-State Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
State Resources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Internal					
Allocation :	0	0	0	0	0
Reallocation :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Student Tuition					
New :	361800	723600	1085400	1447200	1447200
Existing :	241200	482400	723600	964800	964800
Narrative Explanation/Justification :	Estimate of 30 new students + 20 existing students transferring from related programs, up to a stable population of 200 students in year 4.				
Total					
New :	$361,800	$723,600	$1,085,400	$1,447,200	$1,447,200
Existing :	$241,200	$482,400	$723,600	$964,800	$964,800
Total Funding Sources :	$603,000	$1,206,000	$1,809,000	$2,412,000	$2,412,000

B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Staff: Executive, administrative, and managerial					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Other Professional					
New :	5813	5813	5813	5813	5813
Existing :	0	0	0	0	0
Faculty					
New :	0	0	0	120000	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Existing :	507000	550000	555000	555000	675000
Graduate Assistants (if master's or doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Student Employees					
New :	8268	0	0	0	0
Existing :	0	8268	8268	8268	8268
Narrative Explanation/Justification :	Other Professional is reassigned time for the director of the BS/cybersecurity program. NKU has 3 cybersecurity faculty and 1 additional faculty member will start in spring 2020. With increasing enrollments, we anticipate needing one more faculty member in year 4. We will need time from existing administrative staff and will also need one student assistant for 20 hours/week.				
Equipment and Instructional Materials					
New :	0	0	0	0	0
Existing :	0	0	25000	0	0
Narrative Explanation/Justification :	Cybersecurity courses will use the donor-funded Cyber Threat Intelligence Lab ((CTIL), which opened for classes in 2018. We estimate $25,000 for new PCs and other technology replacement for that space in year 3 of the BS/Cybersecurity program.				
Library					
New :	2000	1000	1000	1000	1000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Cybersecurity is a rapidly expanding field, with new articles and books published regularly. The initial year investment is larger than future years to address gaps in our current library resources.				
Contractual Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Academic and/or Student Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Other Support Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Faculty Development					
New :	12500	12500	12500	12500	15000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Cybersecurity is a rapidly changing field, so faculty need to keep up to date on technologies and techniques used in industry. We estimate $2500 per faculty member. Discounted academic registration for industry conferences like Black Hat and RSA range around $1000, while $1500 is an estimate of air fare and hotel expenses. Unlike academic conferences, industry cybersecurity conferences focus closely on topics and techniques that students need for the workforce.				
Assessment					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Student Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Faculty Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Other					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Total					
New :	$28,581	$19,313	$19,313	$139,313	$21,813
Existing :	$507,000	$558,268	$588,268	$563,268	$683,268
Total Budget Expenses/Requirements :	$535,581	$577,581	$607,581	$702,581	$705,081
Grand Total					
Total Net Cost :	$67,419	$628,419	$1,201,419	$1,709,419	$1,706,919

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Full-Proposal - Assess: Program Review and Assessment

1. For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:

a. Which components will be evaluated?

The BS Cybersecurity Program Committee and the department dedicated program assessment coordinator will be responsible for assessing the program on the same schedule as other four-year degree programs at NKU are assessed, and for evaluating student learning outcomes. The quality of the program will be tracked by:

Graduation/completion rate data
Employer surveys
Graduate surveys
A review/feedback process managed by the NKU Center for Information Security Advisory Board
Full curriculum review on a standard five-year cycle according to NSA/DHS CAE criteria (as NKU is a national center for Academic Excellence in Cyber Defense Education designated by NSA and Department of Homeland Security)
Full program review on a standard five-year cycle according to Kentucky CPE criteria
End-of-semester evaluations by students
All 5 program SLOs will be evaluated at introductory, enhanced, and mastery levels.

b. When will the components be evaluated?

The five student learning outcomes will be evaluated in a 3-year cycle. We will evaluate one to two learning outcomes during each year of the 3-year assessment cycle. Other aspects of the program (graduation data, etc) will be collected when available and assessed during the 5-year review period.

c. When will the data be collected?

Course-level assessment data will be collected during spring and fall semesters based on the rotation of SLO assessment. Based on data collected, the program will be reviewed annually based on assessment results every fall semester.

d. How will the data be collected?

Each course in the assessment cycle will have instruments (projects, programs, exam questions, homeworks). The instruments will be collected for each course being assessed in that semester. Student results (performance on the instruments) will be collected by the faculty teaching those courses. Other data will be collected through Institutional Research and surveys.

e. What will be the benchmarks and/or targets to be achieved?

Course learning outcomes will be set by the faculty (and confirmed by the BS Cybersecurity program committee). Our initial target will be 75% students in the program can meet the learning outcome expectations.

f. What individuals or groups will be responsible for data collection?

The program assessment coordinator in the department will be responsible for scheduling the assessment rotation and will notify instructors who need to collect assessment data for a specific academic semester. The BS in Cybersecurity program director will be responsible for ensuring all data is collected and submitted.

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g. How will the data and findings be shared with faculty?

The assessment data and findings will be shared with faculty members in the program annually (every fall). During this review, all faculty members teaching in the program will be asked to suggest improvements to the program based on assessment results. The data and findings will also be discussed at departmental meeting to gather feedback for assessment.

h. How will the data be used for making programmatic improvements?

For student learning outcomes, the assessment results show the number of students meeting learning outcomes. The departmental faculty will review these results and suggest course-level changes such as new assignments, changes to curricula and improved course delivery mechanisms.

2. What are the measures of teaching effectiveness?

This is achieved through the combinations of course evaluation and student learning outcome assessment.

3. What efforts to improve teaching effectiveness will be pursued based on these measures?

Program assessment results will be shared with faculty teaching in the program. Students' feedback from course evaluation will be used together with program assessment results for generating approaches for course improvements. Given the assessment results and student feedback, best practices will be applied to determine strategies for improving teaching effectiveness. Further, peer coaching will be used when available and applicable.

4. What are the plans to evaluate students' post-graduate success?

Program alumni survey and employer survey will be utilized for evaluating students' post-graduate success.

Course Title (CIP)						
Degree Program Core Courses (i.e., Courses required by ALL students in the Major--includes Premajor or Preprofessional courses)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Type of Course: program core (C) or pre-major/ pre-professional (P)**	**Credit Hours**	**Existing (E) or New (N) Course**
INF	**120**	**Elementary Programming**	An elementary introduction to programming for those with no previous programming experience. Emphasis on understanding how to read and write basic procedural programs, and on understanding the concepts of algorithm and execution.	C	**3**	**E**
INF	**284**	**Introduction to Networks and Data Communication**	Introduction to computer networking; data communications; data transmission, data encoding, data link control; communications network techniques; network protocols; wireless networking; network server configuration; and planning and deploying a local area network.	C	**3**	**E**
INF	**286**	**Introduction to Web Development**	An introduction to web design and development for majors in the informatics fields. Web page creation and HTML; site organization and best practices; e-business planning, models and strategies; overview of XML and CSS; introduction to client-side and server-side programming.	**C**	**3**	**E**
BIS	**275**	**Introduction to Business Analysis**	Introduces students to the underlying concepts and tools of business operations and data analysis. These concepts and tools are the foundation of an Informatics professional's ability to assess business operations and analyze data for business decisions.	**C**	**3**	**E**
BIS	**300**	**Management Information Systems**	Principles of MIS designed to introduce students to the fundamentals of Management Information Systems and to apply problem-solving skills in Excel, Access, and Web development.	**C**	**3**	**E**
BIS	**330**	**IT Project Management**	This course provides students knowledge and skills pertaining to IT Project Management. It exposes students to the knowledge requirements for managing information technology projects and fosters development of skills pertaining to the use of computer software for project management.	**C**	**3**	**E**
BIS	**382**	**Principles of Information Security**	An introduction to the various technical and administrative aspects of Information Security and Assurance. This course provides the foundation for understanding the key issues associated with protecting information assets, determining the levels of protection and response to security incidents, and designing a consistent, reasonable information security system, with appropriate intrusion detection and reporting features.	**C**	**3**	**E**
CSC	**260**	**Object-Oriented Programming I**	Elementary object-oriented programming concepts and practice: types, decisions, loops, methods, arrays, classes; design and problem-solving. An intensive introduction intended for students with programming experience.	**C**	**3**	**E**
CSC	**350**	**Database Programming**	Database concepts and practice essential for the database programmer: relational databases; Structured Query Language; entity-relationship model; ER to relational; relational algebra; design and implementation of relational database applications.	**C**	**3**	**E**
CSC	**360**	**Object-Oriented Programming II**	Intermediate object-oriented programming concepts and practice: inheritance, basic graphical user interface elements; introduction to recursion; implementation of linked lists; use of basic container types.	**C**	**3**	**E**
CSC	**362**	**Computer Systems**	ANSI C, pointers, pointer arithmetic; dynamic memory allocation; introduction to instruction sets, registers, addressing modes and assembly language; binary representations and bit manipulations; computer organization concepts.	**C**	**3**	**E**
CSC	**364**	**Data Structures and Algorithms**	Analysis and efficient implementation of container types such as stacks, queues, hash tables, search trees, and graphs; sorting algorithms.	**C**	**3**	**E**
CSC	**460**	**Operating Systems**	Internal structures and algorithms for file systems, I/O, memory management and process scheduling; examples drawn from contemporary operating systems such as UNIX and Windows NT.	**C**	**3**	**E**
CSC	**482**	**Computer Security**	Fundamental concepts and principles of computer security. Fundamental concepts and principles of computer security. Topics include authentication, access control, database security, malware, operating systems security, cloud and IoT security, wired and wireless network security, and common vulnerabilities and attacks.	**C**	**3**	**E**
CIT	**130**	**Information Technology Fundamentals**	Introduction to the organization of computers, operating systems, and networks; comparison of common operating systems; hands-on experience in PC construction and configuration; command-line usage of Windows and Unix/Linux systems; data representation; overview of the information technology industry and its societal context.	**C**	**3**	**E**
CIT	**285**	**Cybersecurity Fundamentals**	An introduction to fundamental concepts and technologies in cyber-security, with lab exercises that focus on practical aspects of securing computers. Topics include risk analysis, common attacks and defenses, authentication, access control, network security, application and data security, and cryptography.	**C**	**3**	**E**
CIT	**371**	**Unix Systems**	Advanced usage and basic administration of Unix/Linux systems, including management of files, users and processes, tools for editing and pattern matching, shell scripting, and software installation.	**C**	**3**	**E**
CIT	**430**	**Computer Forensics**	Computer and network forensics principles; incident response process; forensic duplication and analysis; reconstruction of computer activities; network-based evidence for intrusions; forensics tools.	**C**	**3**	**E**
CIT	**485**	**Advanced Cybersecurity**	Advanced cybersecurity topics, including incident response, network security monitoring, and penetration testing. This class also covers ethical, policy, and legal issues related to cybersecurity.	**C**	**3**	**E**
MAT	**185**	**Introductory Discrete Mathematics**	Number systems important in computer applications, logic, set theory, combinatorics and probability, graph theory. Not open to students who have completed MAT 385.	**C**	**3**	**E**
STA	**205**	**Introduction to Statistical Methods**	Graphical descriptive measures; numerical descriptive measures; probability; hypothesis testing, estimation; analysis of variance; chi-square; regression; analysis by means of statistical software. Credit is not given for both STA 205 and STA 212. Not open to students who have completed STA 250 or STA 314.	**C**	**3**	**E**
MAT	**483**	**Cryptology**	Cryptology of classical ciphers, mathematical foundations of cryptology, Hill cipher, DES and AES, cryptography of public key cryptosystems Also listed as CSC 483.	**C**	**3**	**E**
CMST	**370**	**Advanced Public Speaking**	Organization, style and delivery of speeches for social occasions, non-classroom settings, and complex setting; speech writing.	**C**	**3**	**E**
PHI	**310**	**Information Ethics**	Ethical issues faced by computing professionals including those related to computing in the workplace, security, crime, privacy, property rights, risk, liability, and the internet.	**C**	**3**	**E**

CYS	310	Cybersecurity Risk Management	This course examines cybersecurity from a risk management perspective. Enterprises identify cybersecurity risks, asseses those risks, then make risk mitigation decisions based on available resources and business requirements. Students will learn about risk management frameworks and standards, risk assessment processes, appropriate security controls for risk mitigation, and planning for disaster recovery.	C	3	N
CYS	444	Software Security	Student will learn the fundamentals of building secure software by applying appropriate processes, techniques, and tools to the software development lifecycle. Topics include secure design principles, threat modeling, secure programming practices, security testing, and applying cryptography securely.	C	3	N
			Total Credit hours Required for Program Core (i.e., # of hours in degree program core) **Note: number recorded will automatically populate Core Hours in "Summary of Total Program Hours" table**		78	NA
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			Total Credit hours Required for Program Options (Track(s), Concentration(s), or Speciality) (if applicable) **Note: number recorded will automatically populate Program Option hours in "Summary of Total Program Hours" table**		0	NA
GUIDED Elective Courses (i.e., Specified list of Program Electives AND/OR Electives focused on a specific track/concentration/or speciality) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			# of REQUIRED Credit hours in Guided Electives (i.e., electives for a focused or track/concentration/speciality are). If 9 hours is required and there are 15 hours to choose from, then only 9 hours are required) **Note: number recorded will automatically populate Guided Elective hours in "Summary of Total Program Hours" table**			NA
FREE Elective Courses (i.e, general program electives, open to the students to choose) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
CYS	330	Introduction to Ethical Hacking	Discover vulnerabilities in computers, networks, and services. Understand the procedures and tools used for exploiting weaknesses, escalating privilege, and lateral movement. Perform network, operating system, and application penetration testing. Be able to harden the security of computer systems including applications and networks.	p	3	N
XXX	3XX Or 4XX	2nd BIS, CIT, CSC, OR DSC course at 300 or 400 level		P	3	E
			Two 300- or 400-level elective courses from the BIS, CIT, CSC, CYS, or DSC designators, for a total of 6			
			Total # of Credit Hours in Free Electives (i.e., general program electives) (if applicable) **Note: number recorded will automatically populate Free Elective Hours in "Summary of Total Program Hours" table**		6	NA
		Summary of Total Program Hours	**Required Core Hours (i.e., # of hours in degree program core)**		78	NA
			Required Program Options - Track/Concentration/Specialty Hours (if applicable)		0	NA
			Guided Elective Hours (e.g., focused or track/concentration/speciality area specific electives) (if applicable)		0	NA
			Free Elective Hours (i.e., general program electives) (if applicable)		6	NA
			Total # of credit hours required for Program		84	NA
		Information to be completed by PIE Office				
			# of new courses		3	NA
			Total # of Courses (includes new and existing)		28	NA
			Precentage of new courses (more than 25% may require SACS Substantive Change)		11%	NA

PROPOSED PROGRAM SUMMARY

Council on Postsecondary Education

Institution:	***University of Kentucky***
Program Name:	***Biomedical Engineering***
Degree Designation	***Bachelor of Science***
CIP Code:	***14.0501***
Credit Hours:	***128***
(Tentative) Institutional Board Approval Date:	***02/21/2020***
Implementation Date:	***08/19/2020***

Program Description:

Describe the program and its aims

Biomedical engineering (BME) is a multidisciplinary field that applies engineering principles and design methods to improve the interaction and integration of engineering with medicine and biological sciences for improving human health and solving healthcare challenges.

The proposed 4-year Bachelor of Science (BS) in BME undergraduate program is designed for students who aspire to engineer novel treatments, devices, materials, technologies, or processes to improve human healthcare. Students seeking careers in industry, the healthcare professions, government agencies, or graduate studies in BME are candidates for this program.

The proposed curriculum provides students with a unique set of qualitative and quantitative healthcare problem definition, analysis, and solution skills. This program uses the shared freshman-engineering curriculum and offers students the flexibility to select among a variety of foundational engineering courses beginning in the 3rd semester and a variety of upper-level BME courses in the senior year. A novel 2- semester interdisciplinary Capstone Senior Design project focused on creative engineering solution of an actual healthcare issue posed by collaborating industrial and/or healthcare partners completes the curriculum. BME and Product Design courses jointly created by BME and College of Design faculty, are integral

to semesters 4 to 8 of the proposed program and are intended to instill “design-thinking” in students.

The proposed curriculum is distinct from other BS BME programs due to these integral design-thinking courses and experiences integral to the proposed curriculum. These design-thinking experiences balance left-brain oriented technical curriculum with right-brain creative approaches to cultivating crucial abilities needed to: 1) communicate empathetically with all stakeholders in a design cycle; 2) frame healthcare challenges into engineering problems; and 3) design, prototype, build, test, refine. and implement solutions that solve contemporary healthcare challenges problems and meet all user needs.

Will this program replace or enhance any existing programs(s) or tracks, concentrations, or specializations within an existing program? If yes, please specify.

No, however the program will support the Product Design program in the College of Design.

Student Demand:

Please note the expected enrollment over the first five years of the program

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
32	70	110	120	120

Market Demand:

This is an open-ended response that will be used in CPE agenda items. Institutions should explain why this program is needed. Note if it replaces another program on campus. Remember that your audience is the CPE, not higher education administrators, faculty, or staff.

The United States spent 17.1% of Gross National Product on healthcare in 2014. This percentage is expected to increase to 19.9% by 2025. Advanced healthcare technology, while partially responsible for this escalating cost, is also partially the solution. Development of such technology relies upon human workforce development, and in turn, biomedical engineering educational programs that prepare the next generation of engineers.

This may help explain why biomedical engineering programs enjoy robust enrollments in the top 10 (US News & World Report) engineering schools. Recently published undergraduate enrollments are Georgia Tech (1,300), Hopkins (480), MIT (149), Duke (263), Stanford (graduate only), UC San Diego (~2,500), UC Berkeley (400), Rice University (~200), University Michigan (~200), and University Pennsylvania (~ 300).

The proposed program is unlike all other existing BME programs due to its programmatic design and intended mission. The integral juxtaposition of engineering and design courses, together with laboratory, studio and clinical immersive experiences, will equally develop both technical engineering and creative design skills in students. The mission of proposed program graduates is to create a new era of biomedical technology that cost-effectively advances human healthcare and wellbeing, increases access to healthcare, or provides a standard of care equivalent healthcare quality at substantially reduced cost.

Demand for this program is manifested by student enrollment in our BME minor (currently 30 students), oral expression of student interest, and enrollment data at other institutions.

Answer either Employer Demand or Academic Demand below

Employer Demand: [1]

If the program is designed for students to enter the workforce immediately, please complete the following table.

	Regional	State	National
Type of Job	Biomedical Engineer		
Average Wage	$70,766	$61,951	$73,297
# of Openings	29	9	2,049
Growth Projections	12.7%	25%	23.1%
Type of Job			
Average Wage			
# of Openings			
Growth Projections			
Type of Job			
Average Wage			
# of Openings			
Growth Projections			
Type of Job			
Average Wage			
# of Openings			
Growth Projections			
Type of Job			
Average Wage			
# of Openings			
Growth Projections			

Please note the time frame for the projections and source of the market demand information:	Data was provided by Burning Glass and represented data collected from BLS, Actual Job Postings, and Proprietary Data Models. Salary range is for the last 12 months Projections are from 2019-2030.

Academic Demand:

If this is not a program that is designed for students to enter the workforce immediately after graduation, please indicate the skills that graduates will attain, the types of graduate programs the graduates are most likely to attend, and the types of jobs graduates will eventually seek.

NA

Unnecessary Duplication

List any similar programs based on CIP codes or other programs that are similar but may be classified in a different CIP code.

	Program	Institution
Program 1:	**Bioengineering**	**University of Louisville**
Program 2:		
Program 3:		
Program 4:		
Program 5:		

a. **Comparison of Objectives/Focus/Curriculum to Similar Programs:** *Explain the differences in curriculum, focus, and/or objectives. If the proposed program curriculum does not differ substantially from existing programs, then describe potential collaborations with other institutions.*

While using the same CIP code, all other biomedical engineering programs focus heavily, if not exclusively, on science and technical learning. The proposed program is distinguished because in addition to the requisite sciences and engineering coursework, it provides a strong experiential learning component integral to product design coursework and hands-on (shop and studio) experiences incorporating design, prototyping, computational modeling, and immersive learning in nontraditional settings. These experiences are guided by faculty and fellow student inspired design-based thinking. Students completing the proposed program will gain an extraordinarily useful and professionally powerful skill set that can be gainfully employed to create innovative new biomedical technologies in a humanistic and economically relevant manner.

b. **Comparison of Student Populations***: Describe how your target student population is different from those at other institutions and explain how your program reaches this new population (e.g. the proposed program is completely online while other programs are face-to-face or hybrid).*

There would be a similar population of students but currently there is an excess demand that is not being met.

c. **Access to Existing Programs:** *Explain how/why existing programs cannot reach your target population and/or provide evidence that existing programs do not have the capacity to meet current student demand (e.g. the number of students on enrollment waiting list).*

Recent communication with colleagues at the University of Louisville (the only other institution in Kentucky that offers a Bachelor's Degree in Biomedical Engineering) indicates that they reject approximately 50 students per year from their program due to their self-imposed enrollment cap. Activation of the proposed degree program at UK will enable in-state retention of many of these Kentucky residents and draw others to UK who would ordinarily seek education at non-Kentucky institutions.

d. Feedback from Other Institutions: *Summarize the feedback from colleagues at institutions with similar programs.*

Recent communication with colleagues at the University of Louisville (the only other

institution in Kentucky that offers a Bachelor's Degree in Biomedical Engineering) indicates that they reject approximately 50 students per year from their program due to their self-imposed enrollment cap. Activation of the proposed degree program at UK will enable in-state retention of many of these Kentucky residents and draw others to UK who would ordinarily seek education at non-Kentucky institutions.

Cost

Please provide a summary of revenues and expenditures.

Projected Revenue over Next Five Years	$7,237,891
Projected Expenses over Next Five Years	$3,256,983

Will additional faculty be needed?

If yes, please explain how the institution will pay for these additional costs.

Provide a budgetary rationale for creating this new program:

This is an open-ended response that will be used in CPE agenda items. Institutions should explain how the program will be funded, what other programs will be affected, and why this program is considered both an efficient and effective use of funds.

The current program will be net positive

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14.0501-Bioengineering and Biomedical Engineering.
Submission Date: 02/24/2020 09:08

Full Proposal - Basic Info

Institution :	University of Kentucky
Program Type :	Single Institution
Program Name :	Biomedical Engineering
Degree Level :	Baccalaureate
Degree Designation :	BACHELOR OF SCIENCE
CIP Code (2-Digit) :	14-ENGINEERING.
CIP Code :	14.0501-Bioengineering and Biomedical Engineering.

Academic Unit (e.g. Department, Division, School) :	College of Engineering
Name of Academic Unit :	F. Joseph Halcomb III, M.D. Department of Biomedic
Name of Program Director :	David Pienkowski

Intended Date of Implementation :	8/19/2019
Anticipated Date for Granting First Degrees :	5/16/2023
Date of Governing Board Approval :	4/10/2020

Institutional Contact Information

First Name :	Annie
Last Name :	Weber
Title :	Assistant Provost for Strategic Planning and Institutional Effectiveness
Email :	ann.weber@uky.edu
Phone :	859-257-1962

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Full Proposal - Mission: Centrality to the Institution's Mission and Consistency with State's Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

The proposed program will educate the next generation of leaders in creative biomedical technology and provide students with an excellent education enabling sustainable professional success in industry, graduate studies in biomedical engineering, health-professions programs, legal/regulatory affairs, or entrepreneurial activities.

The proposed program will benefit:

Students: biomedical engineering is among the largest undergraduate engineering programs at major universities, but UK has no undergraduate BME program. The proposed program will benefit UK students by providing them: 1) a new choice of major, 2) a unique multidisciplinary curriculum due to cross-fertilization between the Colleges of Engineering, Design, and others, and 3) new career opportunities enabled by design-thinking inherent to this technology-based program.

UK: this program offers a strategic response to forecasted applicant declines because it will attract new students that are otherwise outside of UK's market. UK's graduate BME program will benefit from an increased pool of candidates. Because BME is typically composed of relatively equal numbers of men and women, the proposed program will substantially increase the number of women engineers in the College of Engineering.

Region: healthcare expenditures consume a large and growing portion of the world's economies. While advancing healthcare technology is partially responsible for these costs, it is also partially the solution. The proposed BME program powered by design-thinking offers a unique approach to educating the next generation of professionals who will creatively apply learned technologies to establish a new healthcare landscape. Close collaboration between the Colleges of Engineering, Design, Medicine, etc. embodied in the
proposed program, offers the potential for graduates to create a Lexington-based biomedical design hub. This will put Lexington on the map as the "go-to" place for creative new healthcare design and product ideas. This may in turn bring new manufacturing facilities to the Lexington area.

2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

University Mission: The proposed program supports the mission of the university by educating the next generation of leaders who will use their newly acquired skills to improve human well-being through creative solutions to technical healthcare challenges.

Transformational education is one of the outcomes of the novel curriculum of the proposed program. It offers prospective students a unique opportunity to combine technical and design educational experiences that lead to unique, career-transforming opportunities.
The proposed program also contributes to regional economic development. Coalescence of UK biomedical engineering and design faculty, together with program graduates and industrial representatives, may provide the basis for new biomedical product-design "think-tank" based organizations in the Lexington area. The region may eventually become the hub for industry-leading healthcare product innovation, and in turn, motivate the establishment of industrial manufacturing facilities in the area.

3. Explain how the proposed program addresses the state's postsecondary education strategic agenda.

The proposed program improves educational opportunities for Kentucky residents. It offers a creative new opportunity for obtaining a higher post-secondary education in a healthcare-related field. This will promote the attainment of the goal of 60% of the Kentucky population with a post-secondary degree. The proposed program offers a unique new opportunity for creating new Kentucky based biomedical product design companies. The ensuing economic benefits from such newly established companies will partially satisfy one of the goals of the CPE Strategic Agenda.

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4. Explain how the proposed program furthers the statewide implementation plan.

The proposed program improves educational opportunities for Kentucky residents. It offers a creative new opportunity for obtaining a higher post-secondary education in a healthcare-related field. This will promote the attainment of the goal of 60% of the Kentucky population with a post-secondary degree. The proposed program offers a unique new opportunity for creating new Kentucky based biomedical product design companies. The ensuing economic benefits from such newly established companies will partially satisfy one of the goals of the CPE Strategic Agenda.

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Full Proposal - Quality: Program Quality and Student Success

1. List all student learning outcomes of the program.

Students who successfully complete the proposed program will be able to apply STEM-based knowledge using design-thinking to creatively address human healthcare challenges. They will gain the ability to design new biomedical technologies within system constraints (i.e., anatomic, physiologic, economic, ethical, manufacturing, regulatory, safety, etc.). Graduates will be able to apply newly acquired skills to advance biomedical technology and benefit society by providing increased healthcare technology efficacy, greater accessibility, or equivalent efficacy/accessibility at lower cost.

Student learning outcomes will be those specified by ABET (Table 1). Students will demonstrate program acquired broad integrative knowledge by proving their ability to frame healthcare challenges into engineering problems and analyze qualitative facts using quantitative engineering relationships. Levels of skill acquisition will be assessed by: 1) oral and written examinations, 2) design studio performance, and 3) senior design project quality. Faculty administering these evaluations will require minimum standards of competency that exceed the breadth & depth of standards required of undergraduate engineering students
minoring in biomedical engineering, but less than the standards required of graduate students seeking a master's degree.

Biomedical engineering requires a high level of oral and written communication skills with technical, clinical, and lay personnel. Proposed program graduates must be able to author components of scientific and clinical manuscripts, prepare effective oral presentations using text and visual aids, and make substantive written contributions to patent applications, technical reports, patient consent forms, etc. Communication skills acquired in WRD 110 & 111 will be applied and refined in BME 421 when students prepare oral and written reports of their senior project design. Faculty and senior design project industry sponsors will help students refine WRD 110 & 111 acquired communication skills in BME 421.

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

The objective of the proposed program is to produce graduates with the ability to develop, communicate, and implement creative new solutions to contemporary challenges in human healthcare technology using engineering-based skills.

The proposed curriculum achieves this program-level student learning outcome by developing creative design-thinking abilities simultaneously with competency in STEM (science, technology, engineering, math) courses and the ability to integrate these skills to solve healthcare challenges. The proposed program has three main components: 1) foundational math, science (including biology), design and engineering courses,
2) biomedical engineering courses applying these foundational courses to healthcare, and 3) 2 senior design courses requiring cumulative skill application to real-world human healthcare problems. Student learning outcomes pertaining to creativity, STEM, and learned skills application will be assessed throughout the curriculum in design studios, STEM coursework, and during the senior design project, respectively. Students will demonstrate knowledge of STEM subjects, and will creatively apply theories, concepts and analytical methods to formulate and solve human healthcare problems. Culmination of proposed program acquired skills will be manifested and refined in the outcomes of the senior design project. This 2-semester mandatory course sequence requires students, under BME and CoD faculty supervision, to work with industry representatives to understand and formulate an engineering approach to an actual biomedical product design challenge and to provide a sound, creative, ethically and economically feasible solution to that problem. This solution is to be communicated in a variety of means including one-on-one discussions,group presentations, technical reports, conference proceedings/abstracts, and potentially peer-reviewed (scientific, clinical, or patent) publications.

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3. Highlight any distinctive qualities of this proposed program.

There are three distinctive qualities of the proposed bachelor of science in biomedical engineering program.

This proposed program is unique due to simultaneous educational and experiential emphases on cultivating design-thinking amid a rigorous technical biomedical engineering curriculum. The proposed program will confer graduates with a distinct competitive edge in the employment marketplace.

Students in the proposed program will benefit from unique learning experiences jointly contributed by internationally recognized faculty from the Colleges of Engineering, Design, Medicine, etc. These faculty will collaborate to provide mutually agreed assignments, joint lectures, design-project mentoring, as well as research-project mentoring. Students will receive from these faculty an extraordinarily rich exposure to a wide variety of classroom lectures, laboratory sessions, studio experiences, and immersion in actual industrial related healthcare challenges.

Industry representatives will contribute real-world biomedical product development challenges to senior project design students in this program, and thereby provide access to industrial technologies and learning experiences that rival those of co-ops. Furthermore, this experience will facilitate post-graduate employment of proposed program graduates.

4. Will this program replace any existing program(s) or specializations within an existing program?

NO

5. Include the projected faculty/student in major ratio.

Given the present effective 5.75 BME faculty members and the planned enrollment of 40 students per year (120 students in BME program specific years 2 to 4) in the proposed BS in BME program, the within major faculty-to-student ratio is expected to be 1:21. Hence, additional full-time faculty with a primary appointment in BME will be acquired beginning in year 3 of the proposed program. These faculty will be added approximately one per year resulting in an improvement in this ratio such that the research excellence and productivities of the faculty will not be adversely affected in the beginning years of the program launch. Within-major faculty-to-student ratio is expected to be 1:15.5 after year 4 of the proposed program.

6. Is there a specialized accrediting agency related to this program?

YES

Please identify the agency.

ABET

Do you plan to seek accreditation?

YES

Please explain your plans for accreditation.

The program will fall under the College's accreditation

7. Attach SACS Faculty Roster Form.

BME Faculty Roster 9 October 2019.xlsx

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8. A. Describe the library resources available to support this program. You may attach any documentation provided to SACS.

The University of Kentucky, the flagship public university for the Commonwealth of Kentucky, maintains the premier research library in the state. This library is composed of 11 major facilities: William T. Young Library, Agricultural Information Center, Hunter M. Adams College of Design Library, Education Library, Shaver Engineering Library, John A. Morris Equine Library, Lucille Caudill Little Fine Arts Library, Medical Center Library, Science Library, Special Collections, and the Kentucky Transportation Center Library.

Collections and information resources available from the UK Library website include 4,023,142 volumes, 588,428 electronic books, more than 400 commercial databases, approximately 27,000 linear feet of manuscripts and archives, and a broad collection of computer files, microforms, maps, film/video, audio and graphics. Annual collections expenditures total more than $11.1 million. In FY12, 6.6 million searches were conducted in licensed databases and 2.8 million full-text articles were downloaded.

UK Libraries collections support teaching, learning, and research in agricultural sciences, life sciences, chemistry, geological sciences, mathematics, physics, humanities, history, social sciences, economics, communications, information studies, business, fine arts, medicine, nursing, dentistry, health sciences, engineering, computer science, and veterinary science.

B. Describe the physical facilities and instructional equipment available to support this program. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.

The department of biomedical engineering, in addition to individual faculty laboratories, offers shared-use and collaborative environmental capabilities including: design and development of smart medical devices, electromechanical testing of biomaterials and structures, microcomputed tomography, diffuse optical spectroscopy and tomography, advanced signal processing of cardiovascular and neural phenomena, computational analysis of musculoskeletal systems and evaluation of cellular and tissue mechanics. This department also has full access to all facilities of the College of Engineering.

The College of Design has three major resources: design studio, fabrication lab, and shop facilities. The design studio is the facility where innovative design solutions to a wide range of spatial challenges become reality. Studio offers hands-on experiences requiring students to become a key component in a culture of critical thinking and creativity that challenges, exercises, and expands preconceptions and encourages formulation of new ideas that stimulate the imagination. Studio is a unique environmental experience that stimulates curiosity and propels students to foster their own vision for the future of biomedical technological environment.

Studio requires that students “get their hands dirty” testing new intellectual ideas and evaluating creative solutions through drawings, models, scale mockups and digitally fabricated prototypes. This is a group endeavor where learning also occurs by observing faculty and fellow students all working together collaboratively to solve biomedical technological challenges. Learning occurs by project critique, exchange of techniques, and sharing ideas throughout all stages of the design process.

The Workshop and Digital Fabrication Lab provides a safe, well-maintained environment in which both students and faculty can explore three-dimensional construction in natural (wood, metal, ceramic) and artificial media. Shop facilities provide standard materal shaping tools, e.g. lathe, grinder, milling machine, welding, etc. and hand tools.

9. Clearly state the admission, and retention, and completion standards designed to encourage high quality.

Admissions
The minimum entry requirement for admission into the College of Engineering is an ACT math score of 23 or higher, or the SAT equivalent of 570 or higher. Additionally, students must meet the minimum Kentucky statewide academic readiness requirements for Reading and Writing to be admitted to the College of Engineering:
• Reading: Students must have an ACT Reading subscore of 20 or above (or SAT subscore of 26 or above in Critical Reading);
• English/Writing: Students must have an ACT English subscore of 18 or above (or SAT of 25 or above in Writing).

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Alternative admission routes include:
1. 3 or above on the Calculus AB portion of the Advanced Placement Exam.
2. Eligibility to enter MA 110 based on the UK Math Department Placement Exam (61 percent or higher).
3. Completion of or the equivalent of MA 110 with a grade of C or higher.
4. Completion of or the equivalent of MA 109 and MA 112 with a grade of C or higher.
5. Students who do not meet the reading/ writing requirements will be required to take the ACCUPLACER exam and receive a score of 244 or better.
6. Students who do not meet the minimum score on the ACCUPLACER will be required to take APP courses (UK 120 for Reading and UK 130 for Writing) and can be considered for admission to the College of Engineering after successful completion of these courses.

As noted in the UK College of Engineering Bulletin “all newly admitted students will participate in the First-Year Engineering Program for their first two semesters. During this first year, they will have the opportunity to participate in hands-on engineering activities, explore all the engineering and computer science disciplines and learn about the Engineering Grand Challenges. Based on this experience, students will have the option to change their major or declare their major based on their interests. Upon declaring their major, students will be designated as pre-major until they meet engineering standing requirements.

Every student must be admitted to engineering standing in a specific program prior to taking engineering upper level courses that require engineering standing as a prerequisite.

Admission to engineering standing in a degree program is necessary to continue in upper level courses and to be granted a baccalaureate degree in engineering or computer science. Specific departmental requirements for admission to engineering standing in the department of Biomedical Engineering are as noted below and engineering standing applies to a specific program. Students can request admission to engineering standing in Biomedical engineering after completing the required set of pre-major courses in the first three semesters of the published curriculum in this proposed program.”

Students admitted to engineering standing in biomedical engineering must:
a) attain a cumulative UK GPA of at least 2.5
b) successfully complete (grade C or better)* each of the following pre-major courses BIO 148, BIO 152, BME 201, CHE 105, CHE 107, WRD 110, WRD 111, MA 113, MA 114, MA 213, PHY 231 PHY 241, PHY 232, and PHY 242, and
c) earn a grade point average in BIO 148, BIO 152, BME 201, CHE 105, CHE 107, WRD 110, WRD 111, MA 113, MA 114, MA 213, PHY 231 PHY 241, PHY 232, and PHY 242 of at least 2.5.*
* If a course is repeated, then the best grade will be considered for these criteria.

Retention Student retention begins with individual faculty having an active role in the education of the individual student. All BME faculty will actively engage in teaching, and as needed, research activities with students in the proposed program to maximize retention and graduate rates. An annual (at the conclusion of the spring semester) evaluation of each student’s progress will be conducted by the BME faculty, assisted by College of Design (CoD) faculty as appropriate. The faculty will evaluate student progress and if needed, recommend individualized remedial counseling for performance enhancement or maximization. Target retention rates are at least 70% at 4 years and 90% at 6 years from date of freshman enrollment.

Probation
Probation, suspension, and reinstatement follow standard University of Kentucky regulations as stated in Senate Rule 5.3.2.2 Graduation

In addition to the University graduation requirements listed in the Graduation Requirements section of this Bulletin, to be awarded a Bachelor of Science degree in any field of engineering or Computer Science, a student must:
1. complete the University and College requirements related to writing and the UK Core,
2. complete the required number of credit hours (128) exclusive of those earned in freshman college algebra and freshman college trigonometry, with cumulative standing of at least 2.0 on a 4.0 scale,
3. be admitted to engineering standing in an engineering program for at least the final semester and complete the requirements of that program,
4. complete a minimum of 24 credit hours of biomedical engineering departmental courses at or above the 300 level,
5. complete all biomedical engineering departmental courses and related technical electives with a cumulative standing of 2.5 out of a possible 4.0 or greater and attain a grade of C or greater in each of these courses,
6. successfully defend an oral presentations of the senior design project to both engineering and clinical audiences.

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10. Clearly state the degree completion requirements for the program.

Requirements for successful program completion include: completion of University & College requirements regarding writing & UK Core, completion of 128 credit hours, exclusive of those earned in freshman college algebra and freshman college trigonometry, with cumulative standing of at least 2.0 on a 4.0 scale, be admitted to engineering standing in an engineering program for at least the final semester & complete the requirements of that program, complete at least 24 credit hours of departmental courses at or above the 300 level, complete all departmental courses and technical electives with a cumulative standing of at least 2.0 on a 4.0 scale, successful team performance on the senior design project and successful completion of both oral and written defense of this project.

Name	Total number of hours required for degree	Number of hours in degree program core	Number of hours in guided electives	Number of hours in free electives
Program	128	37	9	0

12. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.

There is no planned articulation of the proposed BS in Biomedical Engineering with other programs in the state. There are; however, considerable plans for future articulation of this program with planned Bachelors Degree in Product Design from the UK College of Design.

13. List courses under the appropriate curricular headings.

KPPPSCourseTemplate_Biomedical Engineering BS.xlsx

14. Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)?

NO

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Full Proposal - Demand: Program Demand/Unnecessary Duplication

1. Student Demand:

a. Provide evidence of student demand at the regional, state and national levels.

The United States spent 17.1% of Gross National Product on healthcare in 2014. This percentage is expected to increase to 19.9% by 2025. Advanced healthcare technology, while partially responsible for this escalating cost, is also partially the solution. Development of such technology relies upon human workforce development, and in turn, biomedical engineering educational programs that prepare the next generation of engineers.

This may help explain why biomedical engineering programs enjoy robust enrollments in the top 10 (US News & World Report) engineering schools. Recently published undergraduate enrollments are Georgia Tech (1,300), Hopkins (480), MIT (149), Duke (263), Stanford (graduate only), UC San Diego (~2,500), UC Berkeley (400), Rice University (~200), University Michigan (~200), and University Pennsylvania (~ 300).

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or provides a standard of care equivalent healthcare quality at substantially reduced cost.

Demand for this program is manifested by student enrollment in our BME minor (currently 30 students), oral expression of student interest, and enrollment data at other institutions.

b. Identify the applicant pool and how they will be reached.

The applicant pool for the proposed Design Thinking BS in BME degree includes all students seeking a career using technology to improve human healthcare.

Specifically identified potential applicants include:
1) high school graduates considering careers in medicine, dentistry, or law (the general emphasis area of the proposed BME curriculum provides pre-med, pre-dental students with a quantitative understanding of the biological processes attending disease, congenital defects, and trauma. It also provides pre-law students with the ability to understand the healthcare relevant STEM basis of intellectual property), or
2) high-school students contemplating a career in engineering, but who have not yet been exposed to the field of biomedical engineering, or
3) first year UK College of Engineering students who are uncommitted to a particular field of engineering.

Potential applicants will be reached by telephone calls to high school guidance counselors, visits to selected high school programs potentially coupled with exhibits or presentations, program advertisements at e-Day engineering events, presentations to University freshman guidance counselors, and program promotion during engineering orientation week.

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c. Describe the student recruitment and selection process.

tudents will be recruited by a variety of means. University of Kentucky representatives will visit area high schools, particularly those with STEM programs, to inform guidance counselors and select student groups regarding the proposed new Bachelor of Science in Biomedical Engineering degree program. Promotional materials will be developed for and distributed to these high school students. The new program will also be featured in ongoing University activities, particularly e-Day (engineering) open house events held annually and which attract motivated high school students.

Program promotion will also occur through UK website advertising and news releases. All incoming engineering freshman will, on orientation day, receive an information briefing regarding the proposed new program. In addition, the field of biomedical engineering will be showcased during the required freshman engineering courses EGR 101 (Engineering Exploration).

Applicants to the proposed program will be selected based upon high school GPA scores, ACT scores, and demonstrated extracurricular activities (including design experiences). Initial class enrollment is expected to be a maximum of 40 students per class.

d. Identify the primary feeders for the program.

Primary feeders for the proposed program include all students seeking a career in the healthcare technology field. Specific program feeders include, but are not limited to:
1) high school STEM (science, technology, engineering, math) majors considering careers in medicine, dentistry, or law (the general emphasis area of the proposed BME curriculum provides pre-med, pre-dental students with a quantitative understanding of the biological processes attending disease, congenital defects, and trauma. It also provides pre-law students with the ability to understand the healthcare relevant STEM basis of intellectual property),
2) high-school students contemplating a career in engineering, but who have not yet been exposed to the field of biomedical engineering,
3) first-year UK College of Engineering students interested in healthcare related engineering, and
4) first year UK College of Design students who seek greater depth of understanding of scientific and technological foundations of design..

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

Healthcare and biotechnology are the gold rush of the 21st Century. Kentucky residents who seek a bachelor's degree in biomedical engineering have the University of Louisville as their only current choice for an undergraduate degree in this major. Recent communication with colleagues at the U of L indicates that they reject approximately 50 students per year from their program due to their self-imposed enrollment cap. Activation of the proposed degree program at UK will enable in-state retention of many of these Kentucky residents and draw others to UK who would ordinarily seek education at non-Kentucky institutions.

f. Project estimated student demand for the first five years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) - Fall Semester
2019-2020	0	32
2020-2021	0	70
2021-2022	0	110
2022-2023	28	120
2023-2024	35	120

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2. Employer Demand:

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

According to the U.S. Bureau of Labor Statistics, most biomedical engineers work in manufacturing, universities, hospitals, and research facilities of companies and educational and medical institutions. They usually work full time. Median pay (2017) for biomedical engineers (degree level unspecified) was $88,040/year or $42.33/hour. The number of job opportunities for biomedical engineers in 2016, according to this source, was 21,300. No information is available for state or regional job opportunities for biomedical
engineers, but it is important to note that the proposed program offers the potential to create a biomedical product design think tank in the Lexington area, and thereby greatly expand the number of biomedical engineering related jobs in this area.

3. Academic Disciplinary Needs:

NA

a. If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.

(Should not be blank)

4. Similar programs:

a. Are there similar programs in other Southern Regional Education Board (SREB) states and in the nation?

NO

Would your institution like to make this program available through the Academic Common Market?

YES

b. Our records indicate the following similar programs exist at public institutions in Kentucky.

#Enr = Fall Enrollments , #Grd = Academic Year Graduates

		2018 - 19		2017 - 18		2016 - 17		2015 - 16		2014 - 15		2013 - 14	
Institution	Program	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd
University of Louisville	*Bioengineering	184	30	198	42	215	42	214	32	214	33	191	23

c. Does the proposed program differ from existing programs?

YES

Please explain.

While using the same CIP code, all other biomedical engineering programs focus heavily, if not exclusively, on science and technical learning. The proposed program is distinguished because in addition to the requisite sciences and engineering coursework, it provides a strong experiential learning component integral to product design coursework and hands-on (shop and studio) experiences incorporating design, prototyping, computational modeling, and immersive learning in nontraditional settings. These experiences are guided by faculty and fellow student inspired design-based thinking. Students completing the proposed program will gain an extraordinarily useful and professionally powerful skill set that can be gainfully employed to create innovative new biomedical technologies in a humanistic and economically relevant manner.

d. Does the proposed program serve a different student population (i.e., students in a different geographic area) from existing programs?

NO

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e. Is access to existing programs limited?

NO

f. Is there excess demand for existing similar programs?

YES

Please explain.

Recent communication with colleagues at the University of Louisville (the only other institution in Kentucky that offers a Bachelor's Degree in Biomedical Engineering) indicates that they reject approximately 50 students per year from their program due to their self-imposed enrollment cap. Activation of the proposed degree program at UK will enable in-state retention of many of these Kentucky residents and draw others to UK who would ordinarily seek education at non-Kentucky institutions.

g. Will there be collaboration between the proposed program and existing programs?

YES

Please explain the collaborative arrangements with existing programs.

It has been said that one learns much from their teachers, but more from their peers. To enhance student learning through collaborative exchanges with the University of Louisville, the UK department of biomedical engineering with collaborate with the U of L regarding efforts such as: a) joint seminars featuring invited speakers from industry, b) senior project design competitions judged by students and faculty from the opposite institution, c) KY student chapter of the Biomedical Engineering Society that melds UK and U of L BME students, and d) establishment of a KY Healthcare Challenge Forum that pools the imaginative talents of students and faculty from both institutions to identify cost-effective technological solutions to healthcare challenges particular to Kentuckians.

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Full Proposal - Cost: Cost and Funding of the Proposed Program

1. Will this program require additional resources?

YES

Please provide a brief summary of additional resources that will be needed to implement this program over the next five years.

Implementation of the proposed program will require additional staff support beginning in year 1 and additional faculty beginning in year 3. These faculty will be needed to teach the existing and proposed new courses required by the proposed program. Resources for these faculty will be obtained from revenues derived from undergraduate tuition.

The required new faculty will be full-time regular tenure track faculty who will be recruited one per year starting the third year of the program. Implementation of the proposed new program will require modest new classroom, laboratory, and studio space.

2. Will this program impact existing programs and/or organizational units within your institution?

YES

Please describe the impact.

The proposed bachelor's program in biomedical engineering (BME) in the College of Engineering (CoE) will have a symbiotic relationship with concurrently proposed bachelor of science in product design from the UK College of Design (CoD).

Specifically, faculty from the CoD will work collaboratively with faculty from BME to teach students product design basics and supervise their work in studio exercises. Faculty from BME will work with faculty from the CoD to teach students regarding the technical constraints of engineering which are futher compounded by the unique aspects of human healthcare. Faculty from BME and the CoD will co-mentor students in their senior design projects. Classroom, laboratory, and studio spaces and equipment will be shared between the CoE and CoD to provide students pursuing the proposed BS in BME program a broad educational and experiential learning environment. Faculty from both colleges will pool their collective industrial contacts to create relevant and impactful senior design projects for students.

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

Amounts included under GRAND TOTAL, Total Net Cost are negative cost values for each of the 5 years of the proposed program. This denotes a net surplus of revenues minus expenses for each of these 5 years. Present design of the form will not permit editing of the "cost" designation, thus the "negative" sign prefix for "cost" denotes positive cash flow from the proposed BS in BME program.

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A. Funding Sources, by year of program	1st year	2nd year	3rd year	4th year	5th year
	0	0	0	0	0
Total Resources Available from Federal Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	None				
Total Resources Available from Other Non-State Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	None				
State Resources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	None				
Internal					
Allocation :	0	0	0	0	0
Reallocation :	0	0	0	0	0
Narrative Explanation/Justification :	None				
Student Tuition					
New :	386240	830468	1367505	1996886	2656792
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Tuition calculated for 32, 38, 40, 40 students from years 1 through 4 with 10% increase in out-of-state students annually. Assumes retention rates of 85%, 85%, 90%, and 90% for years 1 through 4, less scholarships awarded to 12% of students. This form will not permit inclusion of proper $ denotations for amounts noted above and below..				
Total					
New :	$386,240	$830,468	$1,367,505	$1,996,886	$2,656,792
Existing :	$0	$0	$0	$0	$0
Total Funding Sources :	$386,240	$830,468	$1,367,505	$1,996,886	$2,656,792

B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Staff: Executive, administrative, and managerial					
New :	128000	266240	346112	359956	374355
Existing :	0	0	0	0	0
Other Professional					
New :	0	0	0	0	0
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Faculty					
New :	0	121600	250496	387016	531503
Existing :	30580	31803	33075	34398	35774
Graduate Assistants (if master's or doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Student Employees					
New :	0	75000	75000	100000	100000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Two administrative staff in year 1 to assist with marketing, operations, and student affairs. Increasing to a total of 4 staff in year 2 and 5 in year 3. One new additional faculty per year from years 2 to 5. Two teaching assistants per year ($37,500/TA) starting year 2, increasing to 2.75 years 4 & 5.				
Equipment and Instructional Materials					
New :	50000	50000	50000	50000	50000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Marketing of programs				
Library					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Contractual Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Academic and/or Student Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Other Support Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Faculty Development					
New :	0	50000	50000	50000	50000
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Narrative Explanation/Justification :	faculty instructional materials attending development of on-line courses and conference attendance for undergraduate engineering education for all faculty				
Assessment					
New :	50000	50000	50000	50000	50000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Survey (alumni & industrial sponsors) instrument development, beta testing, administration, and analyses to assess programmatic effectiveness.				
Student Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Faculty Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Other					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Total					
New :	$228,000	$612,840	$821,608	$996,972	$1,155,858
Existing :	$30,580	$31,803	$33,075	$34,398	$35,774
Total Budget Expenses/Requirements :	$258,580	$644,643	$854,683	$1,031,370	$1,191,632
Grand Total					
Total Net Cost :	$127,660	$185,825	$512,822	$965,516	$1,465,160

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Full-Proposal - Assess: Program Review and Assessment

1. For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:

a. Which components will be evaluated?

Students who successfully complete the proposed program will be able to apply STEM-based knowledge using design-thinking to creatively address human healthcare challenges. They will gain the ability to design new biomedical technologies within system constraints (i.e., anatomic, physiologic, economic, ethical, manufacturing, regulatory, safety, etc.). Graduates will be able to apply newly acquired skills to advance biomedical technology and benefit society by providing increased healthcare technology efficacy, greater accessibility, or equivalent efficacy/accessibility at lower cost.

Student learning outcomes will be those specified by ABET (Table 1). Students will demonstrate the program acquired broad integrative knowledge by proving their ability to frame healthcare challenges into engineering problems and analyze qualitative facts using quantitative engineering relationships. Levels of skill acquisition will be assessed by: 1) oral and written examinations, 2) design studio performance, and 3) senior design project quality. Faculty administering these evaluations will require minimum standards of competency that exceed the breadth & depth of standards required of undergraduate engineering students minoring in biomedical engineering, but less than the standards required of graduate students seeking a master's degree.

Biomedical engineering requires a high level of oral and written communication skills with technical, clinical, and lay personnel. Proposed program graduates must be able to author components of scientific and clinical manuscripts, prepare effective oral presentations using text and visual aids, and make substantive written contributions to patent applications, technical reports, patient consent forms, etc.
Communication skills acquired in WRD 110 & 111 will be applied and refined in BME 421 when students prepare oral and written reports of their senior project design. Faculty and senior design project industry sponsors will help students refine WRD 110 & 111 acquired communication skills in BME 421.

b. When will the components be evaluated?

Biomedical engineering faculty will evaluate program components at the end of program year 2, 3 and 4, and triennially thereafter. BME faculty will evaluate attainment of program effectiveness determined by prescribed student learning outcomes manifested by homework assignments, exam scores, course project quality, oral questioning, and participation in optional research coursework. The process to be followed will be analogous to that employed to evaluate current master’s and PhD students in biomedical engineering. The undergraduate student population will be divided by the number of faculty and each faculty member will report on the past academic year’s progress of each assigned student.

c. When will the data be collected?

Data will be collected continually and BME faculty will evaluate program components at the end of program year 2, 3 and 4 and triennially thereafter. Annual program evaluation will be performed by the biomedical engineering faculty in mid-May each year. These evaluations will also be reviewed by the biomedical engineering external advisory board (12 members) when this group convenes late each September. The first comprehensive program review will be conducted after the first full cycle of the program (mid-May of 2023 when the first group of students receives the proposed new degree). Subsequent comprehensive program reviews will be conducted after each 6th year of the program preparatory to ABET review.

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d. How will the data be collected?

Administrative assistants from the department of biomedical engineering will collect emails, Excel grade files, graded assignment sheets, and progress evaluation forms provided by BME faculty regarding student learning outcomes manifested by homework assignments, exam scores, course project quality, oral questioning, and participation in optional research coursework. Assistants will prepare summaries of these learning outcomes categorized as unsatisfactory, fair, good, or excellent based upon established grading standards. This information will be presented to the proposed director of undergraduate studies and then assimilated into formal reports for the BME faculty.

e. What will be the benchmarks and/or targets to be achieved?

Benchmarks for student success will be: a) within-year Grade Point Averages of at least 3.2, b) a rating of "good" or better on 70% of homework, exams, course project quality, oral questions, class project or optional research performance.

f. What individuals or groups will be responsible for data collection?

Course instructors of record will collect and de-identify course data, then share data with the director of undergraduate studies who will prepare summaries for the BME faculty, and when necessary, College of Design faculty.

g. How will the data and findings be shared with faculty?

Summaries of student learning outcomes will be placed on password-protected share drives and made available to UK biomedical engineering faculty, and as appropriate, College of Design faculty. Printed copies of this information, de-identified for student anonymity, will be prepared and presented during the program review meeting held each mid-May. BME faculty, and when appropriate, College of Design faculty, will review this information.

h. How will the data be used for making programmatic improvements?

Systematics deficiencies in student learning outcomes will be noted and the BME faculty provide suggestions for improvements. Courses associated with lower than expected grades or student learning outcomes will be evaluated by the faculty and remediation efforts will be implemented.

2. What are the measures of teaching effectiveness?

Measures of teaching effectiveness include a demonstration of student abilities to achieve ABET specified educational outcomes (Table 1).

3. What efforts to improve teaching effectiveness will be pursued based on these measures?

The department chair or the director of undergraduate studies will attend classes taught by the Instructor of Record in which sub-standard student learning outcome metrics are discovered. The BME and as necessary, other faculty, will provide recommendations for curriculum modification or teaching improvement as necessary.

4. What are the plans to evaluate students' post-graduate success?

Post graduate student success will be evaluated by measuring: a) students achieving professional positions in biomedical engineering, b) number of job offers received by each student, c) duration of employment at each position, d) promotions received, e) patents issued with graduate as named inventor, e) publications listing graduate as co-author, and f) products created by graduate.

Course Title (CIP)						
Degree Program Core Courses (i.e., Courses required by ALL students in the Major--includes Premajor or Preprofessional courses)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Type of Course: program core (C) or pre-major/ pre-professional (P)**	**Credit Hours**	**Existing (E) or New (N) Course**
BME	**201**	**Introduction to Biomedical Engineering**	Survey of the principles, practices, sub-specialty areas, and careers in biomedical engineering.	P	**3**	**N**
BME	**302**	**Strategic Biomedical Engineering**	Survey of the constraints imposed on biomedical engineering materials, devices or methods by financial and regulatory agencies as well as statistical, regulatory, and economic strategies for successful biomedical engineering practices.	C	**3**	**N**
BME	**330**	**Experimental Methods in Biomed Engineering**	Introduction to the major biomedical instruments. Basic concepts of medical instrumentation, biopotentials, physiological pressure and flow, respiratory measurements, optical sensing, and clinical applications. Quantitative foundations of the hardware and software of each instrument.	C	**3**	**N**
BME	**435**	**Computer Modeling of Coplex Systems**	A holistic approach to engineering problems using computer modeling. Lectures exemplified by real-world problems governed by combined mechanical, electrical, thermal, electrochemical and mass-transport phenomena addressed in an integrated and multidisciplinary manner.	**C**	**4**	**N**
EDR	**102**	**Engineering Computing**	Fundamentals of Engineering Computing introduces students to the practice and principles of computer programming and computational problem solving. Students will engage in hands-on project-based problem solving using modern computer software and hardware, with a particular emphasis on problems and techniques commonly appearing in various domains of engineering. Open to students enrolled in the College of Engineering. Prereq: Enrolled in the College of Engineering or MA ACT of at least 23 or equivalent.	**P**	**2**	**E**
STA	**381**	**Statistics for Engineers**	Data collection, description, and factor "association" versus causal relationship; "Confidence" – statistical versus practical; and Hypothesis testing – All of these covered in a conceptual approach while relying heavily on the mathematical language of probability (e.g., population and sample distributions; sampling; regression on one variable) and use of simulated and real data. Prereq: MA 213.	**C**	**3**	**E**
PGY	**412g**	**Physiology**	Intermediate level human physiology course emphasizing applied concepts. Prereq: One year biology or PGY 206.	**C**	**4**	**E**
PRD/BME	**372**	**User experience & interface for product design**	This course is supplemental to PRD 221 Product Design Studio II, serving as an introduction to basic concepts of user experience (UX) design. Students will learn how to create engaging interactions between users and products/services through a holistic user-centered approach to design. Students will examine the history and evolution of user experience design and define key terms associated with the field. Students will explore a range of design research methods and discuss how these practices, along with theories regarding human behavior and perception, inform the user experience design process. Projects from PRD 221 and other studio courses within the College of Design will serve as case studies for analysis and application of course content.	**C**	**1**	**N**
PRD/BMS	**371**	**Ergonomics**	This course is supplemental to PRD 320 Product Design Studio III and discusses advanced concepts of ergonomics with respect to product design. Students will create 2D and 3D studies of situations requiring a diagrammatic understanding of human factors and ergonomic issues. Students will learn how to conduct a range of usability tests to evaluate and improve ergonomic conditions. Projects from PRD 321 and other studio courses within the College of Design will serve as case studies for analysis and application of course content.	**C**	**2**	**N**
BME/PDE	**420**	**Senior Design Project I**	irst semester of a two-semester degree-program capstone biomedical engineering design project. This project involves team-based application of basic science, foundational engineering, biomedical engineering, personal management and communication skills to actual industrial product, process, or material developments aimed at solving a real contemporary human healthcare challenge	**C**	**3**	**N**
BME/PDE	**421**	**Senior Design Project II**	This course is the continuation of BME 420 and requires students to engage with industry representatives to provide substantive new engineering solutions to practical current healthcare challenges.	**C**	**3**	**N**
PRD/BME	**272**	**introduction to user experience for product design**	This course is supplemental to PRD 221 Product Design Studio II, serving as an introduction to basic concepts of user experience (UX) design. Students will learn how to create engaging interactions between users and products/services through a holistic user-centered approach to design. Students will examine the history and evolution of user experience design and define key terms associated with the field. Students will explore a range of design research methods and discuss how these practices, along with theories regarding human behavior and perception, inform the user experience design process. Projects from PRD 221 and other studio courses within the College of Design will serve as case studies for analysis and application of course content.	**C**	**2**	**N**
PRD/BME	**350**	**Materials and Processes**	A survey of current materials, processes, techniques and equipment used in the design of products for mass production. A significant portion of the design process is devoted to manufacturing questions - how materials are selected, shaped, and then assembled. This course will include field visits to manufacturing facilities.	**C**	**3**	**N**
EGR	**101**	**Engineering Exploration**	Engineering Exploration I introduces students to the engineering and computer science professions, College of Engineering degree programs, and opportunities for career path exploration. Topics and assignments include study skills, team development, ethics, problem solving and basic engineering tools for modeling, analysis and visualization. Open to students enrolled in the College of Engineering. Students who received credit for EGR 112 are not eligible for EGR 101. Prereq: Enrolled in the College of Engineering or MA ACT of at least 23 or equivalent. Students who received credit for EGR 112 are not eligible for EGR 101.	**P**	**1**	**E**
MA	**113**	**Calculus I**	Calculus I: a course in one-variable calculus, including topics from analytic geometry. Derivatives and integrals of elementary functions (including the trigonometric functions) with applications. Lecture, three hours; recitation, two hours per week. Students may not receive credit for MA 113 and MA 137. Prereq: Math ACT of 27 or above, or Math SAT of 620 or above, or a grade of C or better in MA 109 and in MA 112, or or a grade of C or better in MA 110, or appropriate score on math placement test, or consent of the department. Students who enroll in MA 113 based on their test scores should have completed a year of precalculus study in high school that includes the study of the trigonometric function. Note: Math placement test recommended.	**P**	**4**	**E**
MA	**114**	**Calculus II**	Calculus II: a second course in Calculus. Applications of the integral, techniques of integration, convergence of sequence and series, Taylor series, polar coordinates. Lecture, three hours; recitation, two hours per week. Prereq: A grade of C or better in MA 113, MA 137 or MA 132.	**P**	**4**	**E**
MA	**213**	**Calculus III**	Calculus III: a course in multi-variable calculus. Topics include vectors and geometry of space, threedimensional vector calculus, partial derivatives, double and triple integrals, integration on surfaces, Green's theorem. Optional topics include the Stokes theorem and the Gauss divergence theorem. Lecture, three hours; recitation, two hours per week. Prereq: A grade of C or better in MA 114 or in MA 138 or equivalent.	**P**	**4**	**E**

MA	**214**	**Calculus IV**	A course in ordinary differential equations. Emphasis is on first and second order equations and applications. The course includes series solutions of second order equations and Laplace transform methods. Prereq: MA 213 or equivalent.	**P**	**3**	**E**
PRD/BME	**250**	**Solidwork**	This course focuses on the fundamental tools of Solidworks (the industry standard CAD software for product design). Students will learn and practice using all methods of rapid representation available in the College of Design (fused deposition modeling (FDM), Objet, starch and CNC) and methods of prototype creation with vendors outside the College. Exercises and projects focus on workflow, basic rendering and drawings to make simple multi-part objects. Prereq: PRD 150-151.	**C**	**2**	**N**
PRD/BME	**210**	**Medical Product Design**	A basic understanding of the history of product design, significant design movements, designers, manufacturers, innovations in technology and material use, and intellectual property (IP) development. This is the second half of a two-part history sequence in the program. The lectures present a chronological overview of the profession of Product Design and its antecedents. Coursework includes extensive reading, in-class presentations based on independent research and writing.	**C**	**1**	**N**
CHE	**105**	**General College Chemistry I**	A study of chemical principles and their application to pure and mixed substances. Not open to students who have already completed both CHE 109 and CHE 110.	**P**	**4**	**E**
CHE	**107**	**General College Chemistry II**	A continuation of CHE 105. A study of the principles of chemistry and their application to elements and compounds.	**P**	**4**	**E**
CHE	**236**	**Survey of Organic Chemistry**	A one-semester course in organic chemistry. Not open to students who have already completed both CHE 230 and 232. Prereq: CHE 115.	**C**	**3**	**E**
EGR	**103**	**Engineering exploration II**	Engineering Exploration II focuses on a semester long engineering design project with students working in teams to apply the skills and tools introduced in EGR 101 or EGR 112 for transfer students and EGR 102. Topics and assignments include more in depth exploration of engineering tools for modeling, analysis, visualization, programming, hardware interfacing, team development, documentation and communication. Students gain experience in project management, identifying constraints, iteration and technical report writing. Prereq: EGR 102 or equivalent; prereq or concur: MA 113.	**P**	**2**	**E**
PHY	**231**	**General University Physics**	General University Physics: first part of a two-semester survey of classical physics. Consequences of the principles of mechanics are developed conceptually, analytically and quantitatively. Lecture, three hours; recitation, one hour per week. Prereq or concur: MA 113.	**P**	**4**	**E**
PHY	**241**	**General University Physics Laboratory**	A laboratory course offering experiments in mechanics and heat, framed in a small group environment that requires coordination and team work in the development of a well-written lab report. Prereq or concur: PHY 231.	**P**	**1**	**E**
PHY	**232**	**General University Physics**	A general course covering electricity, magnetism, electromagnetic waves and physical optics. Lecture, three hours; recitation, one hour per week. Prereq: PHY 231; concur: MA 213.	**P**	**4**	**E**
PHY	**242**	**General University Physics Laboratory**	A laboratory course offering experiments in electricity, magnetism, and light, framed in a small group environment that requires coordination and team work in the development of a well written lab report. Prereq: PHY 241; concur: PHY 232.	**P**	**1**	**E**
WRD	**110**	**Composition and Communication I**	Composition and Communication I is the introductory course in a two-course sequence designed to engage students in composing and communicating ideas using speech, writing, and visuals. Students will develop interpersonal communication, critical thinking, and information literacy skills by exploring what it means to be engaged, twenty-first century citizens. Students will practice composing, critiquing, and revising ideas based on personal experience, observation, and fieldwork in the community, culminating in several discrete projects using oral, written, and visual modalities.	**P**	**3**	**E**
WRD	**111**	**Composition and Communication II**	Composition and Communication II is the second of two general education courses focused on integrated oral, written, and visual communication skill development emphasizing critical inquiry and research. In this course, students will explore issues of public concern using rhetorical analysis, engage in deliberation over those issues, and ultimately propose solutions based on well-developed arguments. Students will sharpen their ability to conduct research; compose and communicate in written, oral, and visual modalities; and work effectively in groups (dyads and small groups). A significant component of the class will consist of learning to use visual and digital resources, first to enhance written and oral presentations and later to communicate mass mediated messages to various public audiences. Over the course of the semester, class members can expect to work independently, with a partner, and in a small group (team) to investigate, share findings, and compose and deliver presentations, as well as to practice and evaluate interpersonal and team dynamics in action. Prereq: CIS 110 or WRD 110.	**P**	**3**	**E**
BIO	**148**	**Introductory Biology I**	BIO 148 introduces the student to the biological mechanisms operating at the molecular, cellular, and population level that contribute to the origin, maintenance, and evolution of biodiversity including the origins and history of the evolutionary process. Course material is presented within a phylogenetic context, emphasizing the shared history of all living organisms on earth through common ancestry. The first semester of an integrated one-year sequence (BIO 148 and BIO 152). Prereq: Math ACT of 23 or above or MA 109, past or concurrent enrollment in CHE 105.	**P**	**3**	**E**
BIO	**152**	**Principals of Biology II**	The second semester of an integrated one-year sequence (BIO 150 and 152) that is designed to develop understanding and appreciation for the diverse forms of plant and animal life, and their relationships to each other and to their environment. Structure and function relationships will be explored at many levels of organization: cell, tissue, organ, organism, population and community. Prereq: CHE 105, or Math ACT of 26 or above plus concurrent enrollment in CHE 105, or chemistry placement test passed plus concurrent enrollment in CHE 105.	**P**	**3**	**E**
			Total Credit hours Required for Program Core (i.e., # of hours in degree program core) **Note: number recorded will automatically populate Core Hours in "Summary of Total Program Hours" table**		**90**	**NA**

Core Courses Required for Track(s), Concentration(s), or Speciality(s) (if applicable)

Course Prefix	Course #	Course Title	Course Description	Course Required for Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
			Total Credit hours Required for Program Options (Track(s), Concentration(s), or Speciality) (if applicable) **Note: number recorded will automatically populate Program Option hours in "Summary of Total Program Hours" table**		**0**	**NA**

90

GUIDED Elective Courses (i.e., Specified list of Program Electives AND/OR Electives focused on a specific track/concentration/or speciality) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
CME	**320**	**Engineering Therodynamics**	Fundamentals of thermodynamics, review of first law, second and third laws, VL, LL and SL equilibria, homogeneous and heterogeneous chemical reaction equilibria. Prereq: MA 213, PHY 231, and "C" or better in CME 200	**P**	**3**	**E**
CME	**200**	**Process Principles**	A course in material and energy balances, units, conversions, tie elements, recycle, bypass, equations of state, heat effects, phase transitions, and the first and second laws of thermodynamics applications in separation processes involving equilibrium reactions and energy exchange. Prereq: "C" or better in MA 113; "C" average in CHE 105 and 107; prereq or concur: MA 114, PHY 231.	**P**	**3**	**E**
EM	**221**		Study of forces on bodies at rest. Vector algebra; study of force systems; equivalent force systems; distributed forces; internal forces; principles of equilibrium; application to trusses, frames and beams; friction. Prereq or concur: MA 21. Note: EM 302 is also included in this list, but the form does not allow the space for EM 302 or its description.	**P**	**3**	**E**
EM	**302**	**Mechanics of Deformable Bodies**	A study of stress and strain in deformable solids with application primarily to linear elastic materials: stress and strain transformations; simple tension and compression of axial members; torsion of shafts; bending of beams; combined loading of members; buckling of columns. Prereq: Registration in the College of Engineering or consent of chairperson, and EM 221; prereq or concur: MA 214.	**P**	**3**	**E**
EM	**211**	**Statics**	Fundamental laws, principles and analysis techniques for DC and AC linear circuits whose elements consist of passive and active components used in modern engineering practice including the determination of steady state and transient responses. In addition to the required text book, additional materials including a portable oscillator & signal generator, a digital multimeter, an electronics-part kit, and a simulation software are required for at-home laboratory assignments. Prereq: MA 114, prereq or concurrent; PHY 232, 242.	**P**	**3**	**E**
EM	**313**	**Dynamics**	Study of the motion of bodies. Kinematics: cartesian and polar coordinate systems; normal and tangential components; translating and rotating reference frames. Kinetics of particles and rigid bodies: laws of motion; work and energy; impulse and momentum. Prereq: Registration in College of Engineering, EM 221; prereq or concur: MA 214.	**P**	**3**	**E**
ME	**340**	**Introduction to Mechanical Systems**	Modeling of mechanical, thermal, hydraulic and electrical systems, and other phenomena from a systems viewpoint. Analysis of continuous-time models for free and forced response. Laplace transforms and transfer functions. Introduction to numerical simulation. Analysis of higher-order systems. Prereq: MA 214, and engineering standing. Coreq: EM 313.	**P**	**3**	**E**
MSE	**351**	**Materials Thermodynamics**	Solution thermodynamics; partial molal quantities; ideal and non-ideal solutions; application of thermodynamics to phase equilibria; heterogeneous equilibria; free energy-composition relationships; temperature-pressure relationships. Prereq: MSE 201, MA 213 or concurrent.	**P**	**3**	**E**
MSE	**201**	**Materials Science**	Microscopic and macroscopic structure as related to the properties of materials with engineering applications. Prereq or concur: MA 114 and freshman chemistry	**P**	**3**	**E**
EE	**211**	**Circuits I**	Fundamental laws, principles and analysis techniques for DC and AC linear circuits whose elements consist of passive and active components used in modern engineering practice including the determination of steady state and transient responses. Prereq: MA 114; prereq or concur: PHY 232, 242.	**P**	**3**	**E**
EE	**305**	**Electronic Circuits and Electronics**	A service course covering electrical engineering principles for engineering or science students with majors outside of electrical engineering. Topics include: AC and DC circuits analysis. Prereq: MA 114, PHY 232.	**P**	**3**	**E**
BME	**405**	**Introduction to Biomedical Signal Processing**	Study of continuous and discrete signal concepts, sampling of analog signals, domain transformation (Fourier, LaPlace, Z- Transforms), and introduction to correlation and power spectrum. Characteristics and design of analog and digital filters. Features of biological signals and systems and biomedical applications. Introduction to non-linear systems. Prereq: EE 305 or equivalent and MA 214; or consent of instructor.	**P**	**3**	**E**
BME	**470**	**Biosolid Mechanics**		**P**	**3**	**E**
BME	**472**	**Human Biomechanics**	This course presents an engineering-based approach to the quantitative study of the human musculoskeletal system. Principles involving static and dynamic mechanical analyses will be applied to quantify the forces and moments in human posture and movement. Study of the material and biological properties of the musculoskeletal system is included because they are intimately coupled to the formulation and interpretation of problems in static and dynamic biomechanics. Prereq: EM 221, EM 313; or consent of instructor.	**P**	**3**	**E**
BME	**481g**	**special topics in Biomedical Engineering**		**P**	**3**	**E**
BME	**488**	**Biomaterials**	Study of biological and man-made materials that perform, improve, or restore natural functions. Structure and properties of connective tissue and commonly implanted metals, ceramics, and polymers; biocompatibility of materials used in orthopedic, soft tissue, and cardiovascular applications. Prereq: Engineering standing and MSE 201; or consent of instructor.	**P**	**3**	**E**
BME	**508**	**Cell Mechanics and Mechanobiology**		**P**	**3**	**E**
BME	**515**	**Modeling of Physiological Systems**	This introductory course in mathematical modeling will teach students how to construct simple and elegant models of biological and physiological processes – for instance the absorption and elimination of drugs in the human body or the kinetics of tumour growth in tissue – and to analyze or predict the dynamics of these events by solving the models. Prereq: MA 113, 114, 213, 214, or consent of instructor; familiarity with computer programming	**P**	**3**	**E**
BME	**530**	**Biomedical Instructmentation**	A comprehensive introduction to major aspects of biomedical instrumentation. Topics include basic concept of medical instrumentation, biopotentials, physiological pressure/flow/respiratory measurement, optical sensing, and clinical applications of all the above. The fundamental mathematics underlying each instrument will be reviewed and an engineering picture of the hardware and software needed to implement each system will be examined. Prereq: Consent of instructor.	**P**	**3**	**E**
BME	**540**	**Mechanical Modeling of Human Motion**	An introduction to mechanical modeling of human motion (lectures) along with application of computational software to model and estimates internal tissues responses to physical demands of several different activities/tasks (lab activities). Prereq: EM 221, EM 313; or consent of instructor.	**P**	**3**	**E**
BME	**395**	**Independent Research in Biomedical Engineering**		**P**	**3**	**E**
			# of REQUIRED Credit hours in Guided Electives (i.e., electives for a focused or track/concentration/speciality are). If 9 hours is required and there are 15 hours to choose from, then only 9 hours are required) Note: number recorded will automatically populate Guided Elective hours in "Summary of Total Program Hours" table		**9**	**NA**

FREE Elective Courses (i.e, general program electives, open to the students to choose) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			Total # of Credit Hours in Free Electives (i.e., general program electives) (if applicable) **Note: number recorded will automatically populate Free Elective Hours in "Summary of Total Program Hours" table**		**0**	**NA**
		Summary of Total Program Hours	**Required Core Hours (i.e., # of hours in degree program core)**		**90**	NA
			Required Program Options - Track/Concentration/Specialty Hours (if applicable)		**0**	NA
			Guided Elective Hours (e.g., focused or track/concentration/speciality area specific electives) (if applicable)		**9**	NA
			Free Elective Hours (i.e., general program electives) (if applicable)		**0**	NA
			Total # of credit hours required for Program		**99**	**NA**
		Information to be completed by PIE Office				
			# of new courses			NA
			Total # of Courses (includes new and existing)			NA
			Precentage of new courses (more than 25% may require SACS Substantive Change)		#VALUE!	NA

PROPOSED PROGRAM SUMMARY

Instituion: University of Kentucky
Program Name: Computer Engineering
Degree Designation: MASTER OF SCIENCE (MS)
Degree Level : Master's

Program Description

The proposed Master's program in Computer Engineering (MSCompE) will offer both a Plan A Thesis Option (24 hours of coursework plus a 6-credit thesis) and a Plan B Non-Thesis (30 hours of coursework which may include a 3-credit project) option. The proposed program will provide an advanced degree in the area of Computer Engineering, an area in which we already have a successful undergraduate program and successful faculty research.

The field of computer engineering integrates expertise from both electrical engineering and computer science, emphasizing an understanding of computer architecture, hardware/software interface, and the integration of computers into products and systems at a larger scale. It involves developing technical skills in traditional areas of electrical engineering, such as analog and digital circuit design and communications systems, as well as in areas related to computer science, such as software development and operating systems. Sub-disciplines within Computer Engineering include Computer Software Engineering and Computer Hardware Engineering, which emphasize the software and hardware sides of computer systems, respectively. As might be expected in such a broad field, there are a great many specialty areas as well, which change regularly to match the needs of the job market.

The proposed program will support the College of Engineering's mission "to provide education, research, and service in a scholarly environment in a way that prepares our students for successful professional careers, addresses the changing needs of our other constituents, and responds to the technological challenges facing the Commonwealth and the Nation." The development of graduate programs in Computer Engineering will further enhance the College's ability to pursue its "Top 50" vision of being internationally recognized and ranked as one of the top 50 colleges of engineering in the United States.

Will this program replace or enhance any existing programs(s) or tracks, concentrations, or specializations within an existing program? If yes, please specify
NA

CIP Code: 14.0901
Credit Hours: 30
Institutional Board Approval Date: 2/20/2020
Implementation Date: 8/12/2020

Student Demand

Year 1 - 10
Year 2 - 15
Year 3 - 20
Year 4 - 20
Year 5 - 20

Market Demand

Strong motivating factors support the need to implement graduate programs in the area of Computer Engineering. This program will enable us to:

• Provide advanced training in the areas of computer hardware and software engineering needed to support continued regional and national workforce demands.

• Improve our ability to recruit and retain faculty in this area, in support of not only the CompE undergraduate program but the CS and EE undergraduate and graduate programs as well.

• Improve our ability to recruit qualified graduate Teaching Assistants with backgrounds in Computer Engineering, in support of CompE, CS, and EE programs.

•Create an appropriate curriculum and program infrastructure for those faculty and graduate students who are already doing research in the area of Computer Engineering. (Currently graduate students doing work in this area must identify as either CS or EE and fulfill those program requirements.)

• Strengthen our research infrastructure by providing much-needed research and technical support for the many other disciplines and projects throughout UK who rely on expertise in Computer Engineering to support and carry out their scholarly work. The need for advanced knowledge in high-performance computing systems is growing across nearly all branches of scholarship. Demand and salaries in computer engineering continue to be strong. According to Bureau of Labor Statistics estimates, employment in computer occupations is projected to increase by 12.5 percent from 2014 to 2024; this growth is expected to result in nearly half a million new jobs, far more than in any other STEM field. Currently, the median annual wage for Computer Engineers ranges from $107K to $150K depending on factors such as employment sector (industry, academia, government) and geographical location.(Bureau of Labor Statistics, 2015)

STEM fields continue their upward growth in undergraduate and graduate degrees awarded. Of

those degrees, the largest percentage increases in recent years have been in fields related to computer engineering. For example, from the most recent ASEE data, growth in Bachelor's degrees in Computer Engineering from 2014 to 2015 was 16.2% while combined Electrical and Computer Engineering Bachelor's grew 21.3%. At the graduate level as well, computer engineering-related programs had some of the largest percentage increases among all engineering fields. Nationally, MS degrees in Computer Engineering have grown more than 40% in the past 15 years (Yoder, 2016).

Salary growth in computer engineering continues to be strong. According to Bureau of Labor Statistics estimates, employment in computer occupations is projected to increase by 12.5 percent from 2014 to 2024; this growth is expected to result in nearly half a million new jobs, far more than in any other STEM field. Currently, the median annual wage for Computer Engineers ranges from $107K to $150K depending on factors like the employment sector (industry, academia, government) and geographical location.(Bureau of Labor Statistics, 2015) In fact, nearly all of the 10 fastest growing STEM occupations that require a bachelor's or higher degree are in the computer and mathematics groups. Some of the fastest-growing of these are in computer systems design and related services. The rapid growth projected is due in large part to the projected growth for the industry of 23 percent. (Fayer, 2017)

Employment Demand

	Regional	State	National
Type Of Job	**Computer Programmer**		
Avg. Wage	$72,864	$71,654	$84,346
# Jobs (Postings)	188	114	20116
Expected Growth	13%	9%	7%
Type Of Job	**Data Engineer**		
Avg. Wage	$114,874	$133,081	$113,630
# Jobs (Postings)	49	16	12368
Expected Growth	11%	15%	12%
Type Of Job	**Network Engineer Architect**		
Avg. Wage	$104,195	$1,021,094	$105,115
# Jobs (Postings)	608	139	36892
Expected Growth	7%	12%	10%
Type Of Job	**Software Developer/Engineer**		
Avg. Wage	$89,219	$84,934	$84,346
# Jobs (Postings)	2810	1131	291783
Expected Growth	24%	33%	31%
Type Of Job	**Software QA Engineer/Tester**		
Avg. Wage	$104,197	$96,082	$105,457
# Jobs (Postings)	340	192	85153
Expected Growth	9%	11%	9%

Indicate source of market demand information

Data was collected from Burning Glass and uses realtime job market data and bls data. # of openings are for the last 12 months and projected are from is 2019-2028.

Academic Demand

NA

Unneccessary Duplication

Similar Program(s):

Program Id	Inst code	Inst Description	Degree Designation	Program Title	Report year
4399	00199900	University of Louisville	MENG	Computer Science and Engineering	2015
11133	00199900	University of Louisville	MS	Computer Science	2015

Comparison of Objectives/Focus/Curriculum to Similar Programs:

The University of Louisville has an MS program in "Computer Science" . Its curriculum is strictly Computer Science, however, requiring some subjects that our proposed program omits (in the area of foundational (theory) and analytic (modeling) courses. It omits subjects that our proposed program requires, including embedded systems, digital computer structure, and compiler construction (offered as electives). The focus of the Louisville program is, therefore “classical” computer science. The focus of the proposed program is the intersection of computer science and electrical engineering.

Comparison of Student Populations:

The proposed program will, in particular, better serve the UK undergraduate population. It will also better distinguish the CS, ECE, and Computer Engineering disciplines.

Access to Existing Programs:

Geographically, students from the central and eastern parts of the state have better access to UK. There is a tremendous need and growth in this discipline, more than enough to justify multiple programs within one state. There are currently at least 86 U.S. universities with MS programs in Computer Engineering (per ASEE data 2016), and more than 200 undergraduate programs in the field.

Feedback from Other Institutions:

The proposal was submitted to the Chair of the Department of Computer Science and Engineering at the Speed School of Engineering for review and the response was positive and we have full support for the program

Cost

Projected Revenue over Next Five Years ($) : 863100
Projected Expenses over Next Five Years ($) : 188750

Will Additional faculty be needed? No

Provide a budgetary rationale for creating this new program

The number of undergraduate and graduate programs in the area of Computer Engineering is growing rapidly nationally. The fastest growth in STEM fields in recent years has been in fields related to computer engineering. For example, from the most recent ASEE data, growth in Bachelor's degrees in Computer Engineering from 2014 to 2015 was 16.2% while combined Electrical and Computer Engineering Bachelor's grew 21.3%. At the graduate level, computer engineering-related programs had some of the largest percentage increases among all engineering fields. The number of MS degrees granted in Computer Engineering has grown more than 30% over the past 15 years to more than 2,000 nationally (Yoder, 2016).

Existing faculty will teach in the program so no new faculty will be necessary, so the program

University of Kentucky
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14.0901-Computer Engineering, General.
Submission Date: 03/09/2020 09:53

Full Proposal - Basic Info

Institution :	University of Kentucky
Program Type :	Single Institution
Program Name :	Computer Engineering
Degree Level :	Master's
Degree Designation :	MASTER OF SCIENCE
CIP Code (2-Digit) :	14-ENGINEERING.
CIP Code :	14.0901-Computer Engineering, General.

Academic Unit (e.g. Department, Division, School) :	College of Engineering
Name of Academic Unit :	Computer Science
Name of Program Director :	Raphael Finkel

Intended Date of Implementation :	8/21/2020
Anticipated Date for Granting First Degrees :	8/5/2021
Date of Governing Board Approval :	2/10/2020

Institutional Contact Information

First Name :	Annie
Last Name :	Weber
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Full Proposal - Mission: Centrality to the Institution's Mission and Consistency with State's Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

The goal of this program is to provide students advanced training in the areas of computer hardware and software engineering needed to support continued regional and national workforce demands.
Specific program objectives include that graduates of our program will:

1. Obtain employment and advance in careers appropriate to an advanced technical degree
2. Use their technical and professional skills to make a positive impact on society and the world.
3. Engage in continued professional development and life-long learnin

Strong motivating factors support the need to implement graduate programs in the area of Computer Engineering. This program will enable us to:
• Provide advanced training in the areas of computer hardware and software engineering needed to support continued regional and national workforce demands.
• Improve our ability to recruit and retain faculty in this area, in support of not only the CompE undergraduate program but the CS and EE undergraduate and graduate programs as well.
• Improve our ability to recruit qualified graduate Teaching Assistants with backgrounds in Computer Engineering, in support of CompE, CS, and EE programs.
• Create an appropriate curriculum and program infrastructure for those faculty and graduate students who are already doing research work in the area of Computer Engineering. (Currently graduate students doing work in this area must identify as either CS or EE and fulfill those program requirements.)
• Strengthen our research infrastructure by providing much-needed research and technical support for the many other disciplines and projects throughout UK who rely on expertise in Computer Engineering to support and carry out their scholarly work.
Demand and salaries in computer engineering continue to be strong. According to Bureau of Labor Statistics estimates, employment in computer occupations is projected to increase by 12.5 percent from 2014 to 2024; this growth is expected to result in nearly half a million new jobs, far more than in any other STEM field.

2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

As a key area of national growth and prominence with great cross-disciplinary impact, Computer Engineering supports UK's dedication to "improving people's lives through excellence in education, research and creative work, service, and health care" through facilitating learning, expanding knowledge, and serving as a global community for dissemination of knowledge.
Similarly, the proposed program will support the College of Engineering's mission "to provide education, research, and service in a scholarly environment in a way that prepares our students for successful professional careers, addresses the changing needs of our other of our other constituents, and responds to the technological challenges facing the Commonwealth and the Nation."

3. Explain how the proposed program addresses the state's postsecondary education strategic agenda.

This program will support the CPE priority to "Increase degree and certificate completion, fill workforce shortages, and guide more graduates to a career path" as well as to "Create economic growth and development and make our state more prosperous". As noted above, demand and salaries in the area of computer engineering are a strong long-term growth area.

4. Explain how the proposed program furthers the statewide implementation plan.

This program will support the CPE priority to "Increase degree and certificate completion, fill workforce shortages, and guide more graduates to a career path" as well as to "Create economic growth and development and make our state more prosperous". As noted above, demand and salaries in the area of computer engineering are a strong long-term growth area.

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Full Proposal - Quality: Program Quality and Student Success

1. List all student learning outcomes of the program.

Student Learning Outcomes (SLOs) for the proposed program, reflecting skills and abilities that students are expected to possess by the time they graduate, include the ability to:
1. Identify, analyze and solve technical problems related to computer engineering.
2. Design and conduct experiments and detailed data analysis.
3. Participate and make contributions to scholarly research activities.
4. Communicate technical concepts effectively, both orally and in writing.

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

The program has four student learning outcomes:

1. Identify, analyze and solve technical problems related to computer engineering.
2. Design and conduct experiments and detailed data analysis.
3. Participate and make contributions to scholarly research activities.
4. Communicate technical concepts effectively, both orally and in writing

These outcomes are introduced, reinforced, and mastered in the following curricular program elements:
? 3 of the following 4 core courses; CS570 Operating Systems, EE685 Digital Computer Structure, CS541 Compiler Design, EE580 Embedded Systems
? A Masters Thesis (thesis option) or project (non-thesis option) that involves a mentored scholarly project, written report, and oral defense

Problem Solving: Introduced/Reinforced in CS 570, EE685, CS 541, EE 580, and Mastered in the Thesis/Project

Experimental Design: Introduce/Reinforced in EE 585 and EE580, Masters in the Thesis/Project

Contribution to Scholarly Work: Introduced in EE 585, EE 580, CS570, CS 541 and Reinforced/Masters in Thesis/Project

Effective Communication: Reinforced in EE 585, EE 580, CS 541, CS 570, and masters in Thesis/Project

3. Highlight any distinctive qualities of this proposed program.

This program is a logical continuation of the undergraduate program in Computer Engineering, which started in 2006. The original proposal for that program, approved at the department and college levels, included both MS and PhD programs. The undergraduate program has grown from zero to over 200 students in the past 10 years., and CS and ECE departments have multiple faculty who do research in areas related to Computer Engineering.
These faculty regularly bring in funding and carry out research in this area, but it is challenging to recruit graduate students (as well as TAs to support the undergraduate program) given the lack of a graduate program in this area.

4. Will this program replace any existing program(s) or specializations within an existing program?

NO

5. Include the projected faculty/student in major ratio.

We expect a steady state of approximately 20 students in this program. A proximately 10 faculty members will be involved in presenting classes and supervising projects and theses at any time pertaining to this program. So the faculty-to-student ratio will be 1:2. However, this program is administered by the faculty of two departmental units,who already support multiple undergraduate programs and graduate programs, so this measure is misleading.

6. Is there a specialized accrediting agency related to this program?

NO

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7. Attach SACS Faculty Roster Form.

CE_MS_Faculty Roster.pdf

8. A. Describe the library resources available to support this program. You may attach any documentation provided to SACS.

UK library resources are already sufficient to support this program

B. Describe the physical facilities and instructional equipment available to support this program. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.

Physical facilities and instructional resources are already available to support this program. The addition of this MS program is not likely to place undue pressure on those resources.

9. Clearly state the admission, and retention, and completion standards designed to encourage high quality.

Applicants to the MS program in Computer Engineering should have an ABET or CSAB accredited undergraduate degree in Computer Engineering, Computer Science, or Electrical Engineering. In addition to the graduate school admissions criteria, specific MS prerequisites include a programming background (equivalent to CS215 or higher) and at least 3 of the following 5 undergraduate courses: Algorithm Design (CS315 or equivalent), Discrete Mathematics (CS275 or equivalent), Digital Logic (EE280 or equivalent), Embedded
Systems (CPE287 or equivalent), and Computer Architecture (CPE380 or equivalent).
Students may also be admitted to the program through the University Scholars Program, including the BSCPEMSCPE, BSCS-MSCPE, and BSEE-MSCPE scholars programs. Students must meet the published GPA and status requirements to apply for this program. Students must maintain a 3.0 or better GPA across all CS and ECE courses, and they must have an overall GPA of 3.0 or better to complete the degree

10. Clearly state the degree completion requirements for the program.

Thesis option:24 credit hours of courses plus a Master's thesis. Students take 9 credits of core coursework, 3 of 4 listed core courses. Of the 24 course credits, 2/3 (minimum 18 credits) must in CS, EE, or CPE. Half of the total coursework (minimum 12 credits) and half of the CS/EE/CPE coursework (minimum 9 credits) must be at the 600 or 700 level. Thesis defense and document are completed per graduate school requirements.
Non-thesis option: 30 credit hours of courses. Students take 9 credits of core coursework. Of the 30 course credits, 21 credits must be courses in CS, EE, or CPE. Half of the total coursework (minimum 15 credits) and 12 credits of the CS/EE/CPE coursework must be at the 600 or 700 level. Students must complete a mentored project with defense and report .

Name	Total number of hours required for degree	Number of hours in degree program core	Number of hours in guided electives	Number of hours in free electives
Program	36	9	0	0

12. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.

The University of Louisville is currently the only university in Kentucky with graduate programs that include the area of Computer Engineering, offering both MS and PhD degrees in "Computer Engineering and Computer Science". (However, they do not have standalone Computer Engineering degrees.) In addition, U of L, UK, and Western Kentucky have accredited undergrad EE programs, and U of L, UK, and Eastern Kentucky have accredited undergrad CS programs, and students from any of those programs would be eligible to apply to the proposed MS program.

13. List courses under the appropriate curricular headings.

Copy of Curriculum_Computer Engineering_Masters.xlsx

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14. Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)?

NO

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Full Proposal - Demand: Program Demand/Unnecessary Duplication

1. Student Demand:

a. Provide evidence of student demand at the regional, state and national levels.

STEM fields continue their upward growth in undergraduate and graduate degrees awarded. Of those degrees, the largest percentage increases in recent years have been in fields related to computer engineering. For example, from the most recent ASEE data, growth in Bachelor's degrees in Computer Engineering from 2014 to 2015 was 16.2% while combined Electrical and Computer Engineering Bachelor's grew 21.3%. At the graduate level as well, computer engineering-related programs had some of the largest percentage increases among all engineering fields. Nationally, MS degrees in Computer Engineering have grown more than 40% in the past 15 years (Yoder, 2016).
Salary growth in computer engineering continues to be strong. According to Bureau of Labor Statistics estimates, employment in computer occupations is projected to increase by 12.5 percent from 2014 to 2024; this growth is expected to result in nearly half a million new jobs, far more than in any other STEM field. Currently, the median annual wage for Computer Engineers ranges from $107K to $150K depending on factors like employment sector (industry, academia, government) and geographical location.(Bureau of Labor Statistics, 2015)
In fact, nearly all of the 10 fastest growing STEM occupations that require a bachelor's or higher degree are in the computer and mathematics groups. Some of the fastest growing of these are in computer systems design and related services. The rapid growth projected is due in large part to the projected growth for the industry of 23 percent. (Fayer, 2017)

b. Identify the applicant pool and how they will be reached.

Students will be actively recruited by faculty within our ECE and CS departments to their existing and new funded research programs, through contact on campus, at conferences and workshops and through online advertisements. We also plan to actively recruit our own UK CS, EE, and CompE undergraduate students, including through the University Scholars program as well as undergraduate research programs.
Computer Engineering is a high-demand field and there is a large pool of eligible applicants

c. Describe the student recruitment and selection process.

The graduate committee, led by the DGS for the program, will be in charge of the recruitment and selection process for the program. Faculty in the program will also personally recruit students in their area of interest to apply to the program.

d. Identify the primary feeders for the program.

All state and national undergraduate programs in EE, CS, or Computer Engineering. Primary feeders are UK undergraduate programs, and faculty-recruited graduate students in specific research areas. There are now hundreds of programs in each of these areas.

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

We estimate 20-25 MS students in this program (10-12 new students per academic year) based on the current size of the undergraduate population and of enrollments in the CS and EE graduate programs. (A few of these may be students who are already doing work in this area but are forced to choose either CS or EE graduate programs because there is not one yet in Computer Engineering.)

f. Project estimated student demand for the first five years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) - Fall Semester
2020-2021	0	10
2021-2022	5	15
2022-2023	10	20

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2023-2024	10	20
2024-2025	10	20

2. Employer Demand:

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

Job category	Regional	State	National
Network and Computer Systems administrator	85 ($61K)	395 ($53K-$77K)	1,956,500 ($81K)
Computer Systems Analyst	193 ($76K)	973 ($66K-$80k)	3,002,500 ($88K)
Software Developers, Systems Software	107 ($84K)	341 ($72K-$91K)	6,281,000 ($104K)

Computer Engineering graduates work in a wide variety of jobs and disciplines since the computer field now significantly affects almost every sector of the industry. Areas include technology-driven companies but also finance, health care, transportation, energy, and other fields.

3. Academic Disciplinary Needs:

NA

a. If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.

(Should not be blank)

4. Similar programs:

a. Are there similar programs in other Southern Regional Education Board (SREB) states and in the nation?

YES

Please identify similar programs in other SREB states and in the nation.

There are currently at least 86 U.S. universities with MS programs in Computer Engineering (per ASEE data 2016).

b. Our records indicate the following similar programs exist at public institutions in Kentucky.

#Enr = Fall Enrollments , #Grd = Academic Year Graduates

		2019 - 20		2018 - 19		2017 - 18		2016 - 17		2015 - 16		2014 - 15	
Institution	Program	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd
University of Louisville	*Computer Science	106		94	47	98	38	93	33	80	39	89	26
University of Louisville	*Computer Science and Engineering	106		94	47	98	38	93	33	80	39	89	26

c. Does the proposed program differ from existing programs?

YES

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Please explain.

Our program is at the intersection of two fields. Its focus, therefore, is on the “systems” side of computer science and the “computer” side of Electrical Engineering.

d. Does the proposed program serve a different student population (i.e., students in a different geographic area) from existing programs?

YES

Please explain.

There are many diverse student populations served, particularly students from Central Kentucky.

e. Is access to existing programs limited?

YES

Please explain.

There are many regional and access differences across programs.

f. Is there excess demand for existing similar programs?

YES

Please explain.

The number of total degrees being granted and the number of job opportunities in the field continues to grow both regionally and nationally.

g. Will there be collaboration between the proposed program and existing programs?

YES

Please explain the collaborative arrangements with existing programs.

Many faculty collaborate across universities and share curricular and other teaching resources to avoid duplication of effort in developing such materials.

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Full Proposal - Cost: Cost and Funding of the Proposed Program

1. Will this program require additional resources?

NO

2. Will this program impact existing programs and/or organizational units within your institution?

YES

Please describe the impact.

The ECE and CS departments will administer this program jointly, as they do the undergraduate Computer Engineering program. The DGS and graduate committee will come from the faculty of those departments. All faculty with research related to this area will be positively affected by the addition of graduate students and programs that better align to their field.

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

There is minimal new investment required for implementing either the MS or PhD programs in this area (although as noted previously there is significant need for new faculty in this area due to the large increase in undergraduate enrollment that has already been seen, with no accompanying increase in resources).
The benefit is significant ? implementing these graduate programs is a top priority of the CS and ECE faculty, because lack of the programs has impeded our ability to recruit both faculty and graduate students and restricts our ability to perform cutting edge research in this important growth area. Computer Engineering is an area of national need, rapid workforce development, and one in which we already have an undergraduate program but not the graduate programs that are necessary to recruit faculty, support
research work, or recruit TAs for those undergraduate programs. Since the undergraduate program and departmental support structure is already in place, the cost of adding the proposed program is minimal.

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A. Funding Sources, by year of program	1st year	2nd year	3rd year	4th year	5th year
	0	0	0	0	0
Total Resources Available from Federal Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No known federal resources for creation of new program in this area				
Total Resources Available from Other Non-State Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No established donors identified for this effort. Initial creation of Computer Engineering program was aided by $650k grant from Lexmark, which at that time was intended to fund undergraduate and graduate programs in this area.				
State Resources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No specific state allocations have been made.				
Internal					
Allocation :	0	0	0	0	0
Reallocation :	0	0	0	0	0
Narrative Explanation/Justification :	There is already an undergraduate program in this area operated by CS and ECE together, and an existing departmental structure with allocated faculty lines in CS and ECE. Because budgeting is at the unit level and there is no budgeting differentiation between resources at the programmatic level (i.e. specific allocations to individual undergraduate and graduate programs), there is no need for any rebudgeting to support the proposed graduate program.				
Student Tuition					
New :	40600	91400	142200	142200	142200
Existing :	60900	60900	60900	60900	60900
Narrative Explanation/Justification :	Estimated enrollments in program of 10, 15, 20, 20, 20, with about 1/3 of those students who would otherwise be in either CS or ECE. (New = 4, 9, 14, 14, 14, Existing = 6, 6, 6, 6, 6) Approximately 50% of our current student base are in-state, so a 50/50 balance has been assumed for tuition rates				

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Total					
New :	$40,600	$91,400	$142,200	$142,200	$142,200
Existing :	$60,900	$60,900	$60,900	$60,900	$60,900
Total Funding Sources :	$101,500	$152,300	$203,100	$203,100	$203,100

B. Breakdown of Budget Expenses/Requirements	**1st year**	**2nd year**	**3rd year**	**4th year**	**5th year**
Staff: Executive, administrative, and managerial					
New :	7500	7500	7500	7500	7500
Existing :	3250	3250	3250	3250	3250
Other Professional					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Faculty					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Graduate Assistants (if master's or doctorate)					
New :	27000	27000	27000	27000	27000
Existing :	0	0	0	0	0
Student Employees					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Staff: Primary administrative and logistical support is already in place in CS and ECE departments. New cost is reflective of the need for a new DGS position, including 1 month of summer salary, which would support both proposed MS and PhD programs (so 1/2 of position included in this proposal). Existing cost is reflective of administrative support within departments for additional students. Currently grad student logistics represents less than 1/4 time of a staff member, estimate is that additional students causes increase in workload by less than 50%, so equivalent to 1/8 of a staff person. As with DGS, 1/2 of this included in this proposal, 1/2 in the PhD program proposal. Student: Budgeting 1 additional TA position in both CS and ECE to support courses, approximately 54k per year including 30k stipends and 24k tuition. As with other costs, 1/2 of this included in this proposal and 1/2 in the PhD proposal.				
Equipment and Instructional Materials					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable.				

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Library					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Contractual Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Academic and/or Student Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Other Support Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Faculty Development					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Assessment					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Both departments already have assessment plans and processes in place, negligible new cost to implement this process.				
Student Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Faculty Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Other					
New :	0	0	0	0	0
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Narrative Explanation/Justification :	Not applicable				
Total					
New :	$34,500	$34,500	$34,500	$34,500	$34,500
Existing :	$3,250	$3,250	$3,250	$3,250	$3,250
Total Budget Expenses/Requirements :	$37,750	$37,750	$37,750	$37,750	$37,750
Grand Total					
Total Net Cost :	$63,750	$114,550	$165,350	$165,350	$165,350

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Full-Proposal - Assess: Program Review and Assessment

1. For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:

a. Which components will be evaluated?

Instructors will select specific assignment components and test questions to assess the desired SLO for the course. Specifically, CS570 And CS541 will include assessment of SLO 1 And 3; EE685 and EE580. will include assessment of SSLO 2 And 4.
A standard rubric will cover all 4 SLOs for the thesis or project defense and report document.

b. When will the components be evaluated?

Instructors will be contacted by the DGS and Computer Engineering graduate committee regarding the needed assessment, and the committee will review the selected components on a semi-annual basis.

c. When will the data be collected?

Course-based assessments will be assessed by instructors during the course. All 4 SLOs will be assessed at the time of the thesis/project defense.

d. How will the data be collected?

For course assessment as well as for thesis/project assessment, instructors will assess the applicable SLO via a standardized rubric.

e. What will be the benchmarks and/or targets to be achieved?

The rubrics will include sub-elements with categories of "below expectations"=1, "meets expectations"=2, and "exceeds expectations"=3. The mean of these sub-elements will be computed, with a benchmark of a mean value of at least 2 for each SLO.

f. What individuals or groups will be responsible for data collection?

Course instructors and faculty committee members will collect the data and give it to the DGS for aggregation and review by the graduate committee.

g. How will the data and findings be shared with faculty?

The graduate committee will review and make recommendations for action items, which will be distributed to faculty in ECE and CS departments for approval at faculty assessment meetings held each fall semester.

h. How will the data be used for making programmatic improvements?

The graduate committee will make recommendations for programmatic improvements based on the assessment results.

2. What are the measures of teaching effectiveness?

Evaluation of teaching effectiveness is separate from program evaluation or evaluation of SLOs.
Instructors in the program will be individually assessed for teaching effectiveness using TCE as well as peer review and other measures in accordance with the performance evaluation standards used in each instructors home department.
If SLO assessment indicates problems with teaching effectiveness within specific core courses, that information will be shared with the department chair for discussion and follow up with instructors as a part of the regular performance evaluation process.

3. What efforts to improve teaching effectiveness will be pursued based on these measures?

Efforts to improve teaching effectiveness will be pursued on a case-by-case basis with individual faculty involved with the program.

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4. What are the plans to evaluate students' post-graduate success?

We plan to conduct an alumni survey approximately every 3-5 years (more frequently in the first few years after the program has started operating).

Course Title (CIP)						
Degree Program Core Courses (i.e., Courses required by ALL students in the Major--includes Premajor or Preprofessional courses)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Type of Course: program core (C) or pre-major/ pre-professional (P)**	**Credit Hours**	**Existing (E) or New (N) Course**
CS	570	**Modern Operating Systems**	Brief review of classical operating system concepts (process and memory management, process coordination, device drivers, file systems, starvation/deadlock). Modern topics of files systems (logstructured file systems, distributed file systems, memory-based file systems), operating system design (monolithic, communication-kernel, extensible/adaptable, distributed shared memory), multiprocessor issues (scheduling, synchronization, IPC), security (Internet attacks, encryption, defenses). Inspection and modification of actual operating system code (Linux).	C	**3**	**E**
EE	685	**Digital Computer Structure**	Study of fundamental concepts in digital computer system structure and design. Topics include: computer system modeling based on instruction set processor (ISP) and processor-memory-switch (PMS) models, design and algorithms for ALU, processor, control unit and memory system. Special topics include floatingpoint arithmetic, cache design, pipeline design technologies, and parallel computer architectures. Prereq: EE 380 and EE 581 or consent of instructor.	C	**3**	**E**
CS	541	**Compiler Design**	Intermediate aspects of a compilation process with an emphasis on front-end issues. Practical issues in using compiler writing tools. Code generation for expressions, control statements and procedures (including parameter passing). Symbol tables, runtime organization for simple and structured variables. Using compilers and translators for automation (filters, programs writing programs).	C	**3**	**E**
EE	580	**Embedded Systems**	Embedded System Design covers the design and implementation of hardware and software for embedded computer systems. Topics include architectural support for embedded systems, power management, analog and digital I/O, real-time processing design constraints and the design of embedded systems using a realtime operating systems. Prereq: EE/CPE 287, EE/CPE 380, and engineering standing or consent of instructor.	**C**	**3**	**N**
			Total Credit hours Required for Program Core (i.e., # of hours in degree program core) Note: number recorded will automatically populate Core Hours in "Summary of Total Program Hours" table		**12**	**NA**
Core Courses Required for Track(s), Concentration(s), or Speciality(s) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			Total Credit hours Required for Program Options (Track(s), Concentration(s), or Speciality) (if applicable) Note: number recorded will automatically populate Program Option hours in "Summary of Total Program Hours" table		**0**	**NA**
GUIDED Elective Courses (i.e., Specified list of Program Electives AND/OR Electives focused on a specific track/concentration/or speciality) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			# of REQUIRED Credit hours in Guided Electives (i.e., electives for a focused or track/concentration/speciality are). If 9 hours is required and there are 15 hours to choose from, then only 9 hours are required) Note: number recorded will automatically populate Guided Elective hours in "Summary of Total Program Hours" table			**NA**

FREE Elective Courses (i.e, general program electives, open to the students to choose) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			Total # of Credit Hours in Free Electives (i.e., general program electives) (if applicable) **Note: number recorded will automatically populate Free Elective Hours in "Summary of Total Program Hours" table**		**12.00**	**NA**
		Summary of Total Program Hours	**Required Core Hours (i.e., # of hours in degree program core)**		**12**	NA
			Required Program Options - Track/Concentration/Specialty Hours (if applicable)		**0**	NA
			Guided Elective Hours (e.g., focused or track/concentration/speciality area specific electives) (if applicable)		**0**	NA
			Free Elective Hours (i.e., general program electives) (if applicable)		**12**	NA
			Total # of credit hours required for Program		**24**	**NA**
		Information to be completed by PIE Office				
			# of new courses			NA
			Total # of Courses (includes new and existing)			NA
			Precentage of new courses (more than 25% may require SACS Substantive Change)		#VALUE!	NA

PROPOSED PROGRAM SUMMARY

Instituion: University of Kentucky
Program Name: Computer Engineering
Degree Designation: DOCTOR OF PHILOSOPHY (PHD)
Degree Level : Doctor's Degree Research/Scholarship

Program Description

The proposed doctoral program in Computer Engineering (PhD Computer Engineering) will provide an advanced degree in the area of Computer Engineering, an area in which we already have a successful undergraduate program and successful faculty research.

The field of computer engineering integrates expertise from both electrical engineering and computer science, emphasizing an understanding of computer architecture, hardware/software interface, and the integration of computers into products and systems at a larger scale. It involves developing technical skills in traditional areas of electrical engineering, such as analog and digital circuit design and communications systems, as well as in areas related to computer science, such as software development and operating systems. Sub-disciplines within Computer Engineering include Computer Software Engineering and Computer Hardware Engineering, which emphasize the software and hardware sides of computer systems, respectively. As might be expected in such a broad field, there are many specialty areas as well, which change regularly to match the needs of the job market.

The proposed program will support the College of Engineering's mission "to provide education, research, and service in a scholarly environment in a way that prepares our students for successful professional careers addresses the changing needs of our other constituents, and responds to the technological challenges facing the Commonwealth and the Nation." The development of graduate programs in Computer Engineering will further enhance the College's ability to pursue its "Top 50" vision of being internationally recognized and ranked as one of the top 50 colleges of engineering in the United States.

Will this program replace or enhance any existing programs(s) or tracks, concentrations, or specializations within an existing program? If yes, please specify

The proposed PhD program in Computer Engineering will support the existing undergraduate program in Computer Engineering, as well as the existing grad programs in EE and CS.

CIP Code: 14.0901
Credit Hours: 36
Institutional Board Approval Date: 2/20/2020
Implementation Date: 8/12/2020

Student Demand

Year 1 - 4
Year 2 - 7
Year 3 - 10
Year 4 - 10
Year 5 - 10

Market Demand

Strong motivating factors support the need to implement graduate programs in the area of Computer Engineering. This program will enable us to:

• Provide advanced training in the areas of computer hardware and software engineering needed to support continued regional and national workforce demands

. • Improve our ability to recruit and retain faculty in this area, in support of not only the CompE undergraduate program but the CS and EE undergraduate and graduate programs as well. • Improve our ability to recruit qualified graduate Teaching Assistants with backgrounds in Computer Engineering, in support of CompE, CS, and EE programs.

• Create an appropriate curriculum and program infrastructure for those faculty and graduate students who are already conducting research in the area of Computer Engineering. (Currently graduate students doing work in this area must identify as either CS or EE and fulfill those program requirements.)

• Strengthen our research infrastructure by providing much-needed research and technical support for the many other disciplines and projects throughout UK who rely on expertise in Computer Engineering to support and carry out their scholarly work. The need for advanced knowledge in high-performance computing systems is growing across nearly all branches of scholarship.

Demand and salaries in computer engineering continue to be strong. According to Bureau of Labor Statistics estimates, employment in computer occupations is projected to increase by 12.5 percent from 2014 to 2024; this growth is expected to result in nearly half a million new jobs, far more than in any other STEM field. Currently, the median annual wage for Computer Engineers ranges from $107K to $150K depending on factors like employment sector (industry, academia, government) and geographical location.(Bureau of Labor Statistics, 2015)

Employment Demand

	Regional	State	National
Type Of Job	**Computer Programmer**		
Avg. Wage	$72,864	$71,654	$84,346
# Jobs (Postings)	188	114	20116
Expected Growth	13%	9%	7%
Type Of Job	**COmputer Science, Postsecondary Teacher**		
Avg. Wage	$83,411	$91,973	$87,048
# Jobs (Postings)	56	66	2846
Expected Growth	5%	6%	8%
Type Of Job	**Data Engineer**		
Avg. Wage	$114,876	$133,081	$113,630
# Jobs (Postings)	49	16	12368
Expected Growth	11%	15%	12%
Type Of Job	**Network Engineer Architect**		
Avg. Wage	$104,159	$102,104	$105,115
# Jobs (Postings)	608	139	36892
Expected Growth	7%	12%	10%
Type Of Job	**Software Developer/Engineer**		
Avg. Wage	$89,219	$84,934	$84,346
# Jobs (Postings)	2810	1131	29783
Expected Growth	24%	33%	31%
Type Of Job	**Software QA Engineer/Tester**		
Avg. Wage	$104,197	$96,082	$105,457
# Jobs (Postings)	340	192	85153
Expected Growth	9%	11%	9%

Indicate source of market demand information

Data was collected from Burning Glass and uses realtime job market data and bls data. # of openings are for the last 12 months and projected are from is 2019-2028.

Academic Demand

NA

Unneccessary Duplication

Similar Program(s):

Program Id	Inst code	Inst Description	Degree Designation	Program Title	Report year
4359	00199900	University of Louisville	PHD	Computer Science and Engineering	2015

Comparison of Objectives/Focus/Curriculum to Similar Programs:

Our program is at the intersection of two fields. Its focus, therefore, is on the “systems” side of computer science and the “computer” side of Electrical Engineering.

Comparison of Student Populations:

The programs have similar targeted student populations but the demand for the program is high enough to support an additional program.

Access to Existing Programs:

Only the University of Louisville offers a similar program which limits the number of students who can enroll in such a program.

The number of jobs in the field continues to grow and the demand exceeds the number of graduates of any single university in the state.

Feedback from Other Institutions:

The proposal was submitted to the Chair of the Department of Computer Science and Engineering at the Speed School of Engineering for review and the response was positive and we have full support for the program.

Cost

Projected Revenue over Next Five Years ($) : 416500
Projected Expenses over Next Five Years ($) : 188750

Will Additional faculty be needed? No

Provide a budgetary rationale for creating this new program

The number of undergraduate and graduate programs in the area of Computer Engineering is growing rapidly nationally. The fastest growth within STEM fields in recent years has been in fields related to computer engineering. At the graduate level, computer engineering-related programs have had some of the largest percentage increases among all engineering fields. The number of PhD degrees granted in Computer Engineering has grown more than 200% over the past 15 years. (Yoder, 2016). According to ASEE 2016 data, 46 universities now offer doctoral programs in Computer Engineering. The only program in Kentucky that covers this area is the University of Louisville, which has a doctoral program in "Computer Science and Computer Engineering" that crosses both disciplines. There is a clear need for

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Full Proposal - Basic Info

Institution :	University of Kentucky
Program Type :	Single Institution
Program Name :	Computer Engineering
Degree Level :	Doctor's Degree Research/Scholarship
Degree Designation :	DOCTOR OF PHILOSOPHY
CIP Code (2-Digit) :	14-ENGINEERING.
CIP Code :	14.0901-Computer Engineering, General.

Academic Unit (e.g. Department, Division, School) :	Department
Name of Academic Unit :	Computer Science
Name of Program Director :	Raphael Finkel

Intended Date of Implementation :	8/16/2020
Anticipated Date for Granting First Degrees :	5/15/2022
Date of Governing Board Approval :	2/21/2020

Institutional Contact Information

First Name :	Annie
Last Name :	Weber
Title :	Assistant Provost for Strategic Planning and Institutional Effectiveness
Email :	ann.weber@uky.edu
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Full Proposal - Mission: Centrality to the Institution's Mission and Consistency with State's Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

The goal of this program is to provide strong research and development expertise in the areas of computer hardware and software engineering needed to support continued regional and national workforce demands.
Specific program objectives, reflecting expectations for accomplishments of our students in the years following graduation, are that graduates of our program will:
1. Obtain employment and advance in careers appropriate to a doctoral degree, through leadership roles in industry, entrepreneurship and business development, or positions in academia.
2. Use their technical and professional skills to make a positive impact on society and the world.
3. Engage in continued professional development and life-long learning.

2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

As a key area of national growth and prominence with great cross-disciplinary impact, Computer Engineering supports UK's dedication to "improving people's lives through excellence in education, research and creative work, service, and health care" through facilitating learning, expanding knowledge, and serving as a global community for dissemination of knowledge.

Similarly, the proposed program will support the College of Engineering's mission "to provide education, research, and service in a scholarly environment in a way that prepares our students for successful professional careers, addresses the changing needs of our other of our other constituents, and responds to the technological challenges facing the Commonwealth and the Nation."

3. Explain how the proposed program addresses the state's postsecondary education strategic agenda.

This program will support the CPE priority to "Increase degree and certificate completion, fill workforce shortages, and guide more graduates to a career path" as well as to "Create economic growth and development and make our state more prosperous". As noted, demand and salaries in the area of computer engineering are a strong long-term growth area.

4. Explain how the proposed program furthers the statewide implementation plan.

This program will support the CPE priority to "Increase degree and certificate completion, fill workforce shortages, and guide more graduates to a career path" as well as to "Create economic growth and development and make our state more prosperous". As noted, demand and salaries in the area of computer engineering are a strong long-term growth area.

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Full Proposal - Quality: Program Quality and Student Success

1. List all student learning outcomes of the program.

Student Learning Outcomes (SLOs) for the proposed program, reflecting skills and abilities that students are expected to possess by the time they graduate, include the ability to:
1. Identify, analyze and solve complex technical problems in the field of computer engineering.
2. Independently identify open questions in their areas of expertise and conduct scholarly research to address these questions.
3. Communicate technical concepts effectively, both orally and in writing.

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

The program core courses support the technical foundations (Developing SLOs 1 and 3, and introducing SLO 2) necessary to perform advanced research and scholarship in this area. The path of the scholarly work involved with the doctoral dissertation advances mastery of all three SLOs.

3. Highlight any distinctive qualities of this proposed program.

This program is a logical continuation of the undergraduate program in Computer Engineering, which began in 2006. The original proposal for that program, approved at the department and college levels, included both MS and PhD programs. The undergraduate program has grown from zero to over 200 students in the past 10 years, and CS and ECE departments already both have multiple faculty who do research in areas related to Computer Engineering. These faculty regularly bring in funding and carry out research in this area, but it is challenging to recruit graduate students (as well as TAs to support the undergraduate program) given the lack of a graduate program in this area. Addition of MS and PhD programs in Computer Engineering is an important strategic priority for the ECE and CS departments, and lack of these graduate programs inhibits our ability to recruit faculty and graduate students and carry out research work.

4. Will this program replace any existing program(s) or specializations within an existing program?

NO

5. Include the projected faculty/student in major ratio.

We expect a steady state of approximately 10 students in this program. A proximately 10 faculty members will be involved in presenting classes and supervising dissertations at any time pertaining to this program. So the faculty-to-student ratio will be 1:1. However, this program is administered by the faculty of two departmental units who already support multiple undergraduate programs and graduate programs, so this figure is misleading.

6. Is there a specialized accrediting agency related to this program?

NO

7. Attach SACS Faculty Roster Form.

Faculty Roster_ PhD in Computer Engineering.pdf

8. A. Describe the library resources available to support this program. You may attach any documentation provided to SACS.

No additional library resources are required beyond the library resources currently available at UK

B. Describe the physical facilities and instructional equipment available to support this program. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.

Physical facilities and instructional resources are already available to support this program. The addition of this PhD program is not likely to place undue pressure on those resources.

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9. Clearly state the admission, and retention, and completion standards designed to encourage high quality.

The Computer Engineering graduate committee of ECE and CS faculty, led by the DGS for the program, will be in charge of the recruitment and selection process for the program. Admission guidelines are based on completion of appropriate ABET-accredited undergraduate degrees plus a set of prerequisite technical coursework. Annual reviews monitoring student progress toward degree completion will be completed to monitor and encourage student success.
Many students will come through our own UK CS, EE, or Computer Engineering undergraduate programs.
Eligible students will be considered for TAs in the CS or ECE departments to support Computer Engineering courses, and faculty in both CS and EE will recruit applicants for RA positions as well.

10. Clearly state the degree completion requirements for the program.

36 hours. successful completion of 9 core classes and 27 electives including the successful completion the doctoral qualifying exam and a doctoral dissertation

Name	Total number of hours required for degree	Number of hours in degree program core	Number of hours in guided electives	Number of hours in free electives
Program	36	9	0	27

12. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.

The University of Louisville is the only university in Kentucky with graduate programs that include the area of Computer Engineering, offering both MS and PhD degrees in "Computer Engineering and Computer Science". (However, it does not offer stand-alone Computer Engineering degrees.) U of L, UK, and Western Kentucky have accredited undergrad EE programs, and U of L, UK, and Eastern Kentucky have accredited undergrad CS programs, and students from any of those programs would be eligible to apply to the proposed doctoral program. Since this is a doctoral program based primarily on faculty mentorship and research work rather than coursework, and both U of L and UK allow for course transfer between programs, there is no need for an explicit articulation agreement.

13. List courses under the appropriate curricular headings.

Curriculum_Computer Engineering_Doctorate.xlsx

14. Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)?

NO

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Full Proposal - Demand: Program Demand/Unnecessary Duplication

1. Student Demand:

a. Provide evidence of student demand at the regional, state and national levels.

STEM fields are continuing their upward growth in terms of undergraduate and graduate degrees awarded. Of those degrees, the largest percentage increases in recent years have been in fields related to computer engineering. For example, from the most recent ASEE data, growth in Bachelor's degrees in Computer Engineering from 2014 to 2015 was 16.2% while combined Electrical and Computer Engineering Bachelor's grew 21.3%. At the graduate level as well, computer engineering-related programs had some of the largest percentage increases among all engineering fields. Nationally, PhD degrees awarded in Computer Engineering have grown more than 200% in the past 15 years (Yoder, 2016).
Salary growth in computer engineering continues to be strong. According to Bureau of Labor Statistics estimates, employment in computer occupations is projected to increase by 12.5 percent from 2014 to 2024; this growth is expected to result in nearly half a million new jobs, far more than in any other STEM field. Currently, the median annual wage for Computer Engineers ranges from $107K to $150K depending on factors like employment sector (industry, academia, government) and geographical location.(Bureau of Labor Statistics, 2015)
In fact, nearly all of the 10 fastest growing STEM occupations that require a bachelor's or higher degree are in the computer and mathematics groups. Some of the fastest growing of these are in computer systems design and related services. The rapid growth projected is due in large part to the projected growth for the industry of 23 percent. (Fayer, 2017)

b. Identify the applicant pool and how they will be reached.

Students will be actively recruited by faculty within our ECE and CS departments to their existing and new funded research programs, through contact on campus, at conferences and workshops and through online advertisements. We also plan to actively recruit our own UK CS, EE, and CompE undergraduate students, including through the University Scholars program as well as undergraduate research programs.
Computer Engineering is a high-demand field and there is a large pool of eligible applicants

c. Describe the student recruitment and selection process.

The graduate committee, led by the DGS for the program, will be in charge of the recruitment and selection process for the program. Faculty in the program will also personally recruit students in their area of interest to apply to the program.

d. Identify the primary feeders for the program.

All state and national undergraduate programs in EE, CS, or Computer Engineering. Primary feeders are UK undergraduate programs, and faculty-recruited graduate students in specific research areas. There are now hundreds of programs in each of these areas.

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

Estimated net increase in student enrollments is around 5-8 students total.

f. Project estimated student demand for the first five years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) - Fall Semester
2020-2021	0	4
2021-2022	0	7
2022-2023	2	10
2023-2024	2	10

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2024-2025	2	10

2. Employer Demand:

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

The following table shows a 5-year prediction of number of jobs and average salary (or salary range) for several job categories related to this degree program. The data come from the Kentucky Future Skills Report at kcews.ky.gov and the Federal Department of Labor Bureau of Labor Statistics at www.bls.gov. The categories do not exactly fit the range of jobs that graduates of this program will seek.

Job category	Regional	State	National
Network and Computer Systems administrator	85 ($61K)	395 ($53K-$77K)	1,956,500 ($81K)
Computer Systems Analyst	193 ($76K)	973 ($66K-$80k)	3,002,500 ($88K)
Software Developers, Systems Software	107 ($84K)	341 ($72K-$91K)	6,281,000 ($104K)
Computer and Information Research Scientists	6 ($103K)	20 ($91K-$112K)	139,500 ($115K)

3. Academic Disciplinary Needs:

NA

a. If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.

(Should not be blank)

4. Similar programs:

a. Are there similar programs in other Southern Regional Education Board (SREB) states and in the nation?

YES

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Please identify similar programs in other SREB states and in the nation.

There are approximately 46 doctoral programs in Computer Engineering in the nation, broadly distributed geographically. Examples of institutions offering this program.
Auburn University
New Jersey Institute of Technology
University of Connecticut
Clemson University
NYU Tandon School of Engineering
University of Delaware
Colorado State University
San Diego State University
University of Houston
FAMU-FSU College of Engineering Stony Brook University
University of Illinois at Chicago
Florida International University
The University of Alabama
University of Louisville
Michigan Technological University
The University of Alabama in Huntsville University of Oklahoma
Mississippi State University
The University of Iowa
University of Virginia
Missouri University of Science and Tech University of Arizona

b. Our records indicate the following similar programs exist at public institutions in Kentucky.

#Enr = Fall Enrollments , #Grd = Academic Year Graduates

		2019 - 20		2018 - 19		2017 - 18		2016 - 17		2015 - 16		2014 - 15	
Institution	Program	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd
University of Louisville	*Computer Science and Engineering	51		48	5	42	8	39	3	38	3	41	10

c. Does the proposed program differ from existing programs?

YES

Please explain.

Our program is at the intersection of two fields. Its focus, therefore, is on the “systems” side of computer science and the “computer” side of Electrical Engineering.

d. Does the proposed program serve a different student population (i.e., students in a different geographic area) from existing programs?

NO

e. Is access to existing programs limited?

YES

Please explain.

Only the University of Louisville offers a similar program which limits the number of students who can enroll in such a program.

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f. Is there excess demand for existing similar programs?

YES

Please explain.

The number of jobs in the field continues to grow and the demand exceeds the number of graduates of any single university in the state.

g. Will there be collaboration between the proposed program and existing programs?

NO

Please explain why there is no proposed collaboration with existing programs.

This program will be jointly administered by the ECE and CS departments. Both departments already include faculty who do research that can be considered to be in the field of Computer Engineering, and these faculty plus future strategic hires will support the course offerings and research efforts of the program.

As to collaboration, the geographic distance of the two Universities renders academic collaboration difficult. To our knowledge, there are no academic collaborative programs in Engineering between the two Universities. There have been instances of research collaboration, however, and we would expect such collaboration to be enhanced by the proposed program.Our proposed program in on-campus, not online. It is important for students to have access to laboratory facilities, which makes direct academic collaboration difficult

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Full Proposal - Cost: Cost and Funding of the Proposed Program

1. Will this program require additional resources?

NO

2. Will this program impact existing programs and/or organizational units within your institution?

YES

Please describe the impact.

The ECE and CS departments will administer this program jointly, as they do the undergraduate Computer Engineering program. The DGS and graduate committee will come from the faculty of those departments. All faculty with research related to this area will be positively affected by the addition of graduate students and programs that better align to their field.

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

There is minimal new investment required for implementing either the MS or PhD programs in this area(although as noted previously there is significant need for new faculty in this area due to the large increase in undergraduate enrollment that has already been seen, with no accompanying increase in resources).
The benefit is significant ? implementing these graduate programs is a top priority of the CS and ECE faculty in this area, because lack of the programs has impeded our ability to recruit both faculty and grad students and restricts our ability to perform cutting-edge research in this important growth area.
Computer Engineering is an area of national need, rapid workforce development, and one in which we already have an undergraduate program but not the graduate programs that are necessary to recruit faculty, support research work, or recruit TAs for those undergraduate programs. Since the undergraduate program and departmental support structure is already in place, the cost of adding the proposed program is minimal.

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A. Funding Sources, by year of program	1st year	2nd year	3rd year	4th year	5th year
	0	0	0	0	0
Total Resources Available from Federal Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No known federal resources for creation of new program in this area				
Total Resources Available from Other Non-State Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No established donors identified for this effort. Initial creation of Computer Engineering program was aided by $650k grant from Lexmark, which at that time was intended to fund undergraduate and graduate programs in this area.				
State Resources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No specific state allocations have been made.				
Internal					
Allocation :	0	0	0	0	0
Reallocation :	0	0	0	0	0
Narrative Explanation/Justification :	There is already an undergraduate program in this area operated by CS and ECE together, and an existing departmental structure with allocated faculty lines in CS and ECE. Because budgeting is at the unit level and there is no budgeting differentiation between resources at the programmatic level (i.e. specific allocations to individual undergraduate and graduate programs), there is no need for any rebudgeting to support the proposed graduate program.				
Student Tuition					
New :	10100	40600	71100	71100	71100
Existing :	30500	30500	30500	30500	30500
Narrative Explanation/Justification :	Estimated enrollments in program of 4, 7, 10, 10, 10, with about 1/3 of those students who would otherwise be in either CS or ECE. (New = 1, 4, 7, 7, 7, Existing = 3,3,3,3,3) Approximately 50% of our current student base are in-state, so a 50/50 balance has been assumed for tuition rates .				

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Total					
New :	$10,100	$40,600	$71,100	$71,100	$71,100
Existing :	$30,500	$30,500	$30,500	$30,500	$30,500
Total Funding Sources :	$40,600	$71,100	$101,600	$101,600	$101,600

B. Breakdown of Budget Expenses/Requirements	**1st year**	**2nd year**	**3rd year**	**4th year**	**5th year**
Staff: Executive, administrative, and managerial					
New :	7500	7500	7500	7500	7500
Existing :	3250	3250	3250	3250	3250
Other Professional					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Faculty					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Graduate Assistants (if master's or doctorate)					
New :	27000	27000	27000	27000	27000
Existing :	0	0	0	0	0
Student Employees					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Staff: Primary administrative and logistical support is already in place in the CS and ECE departments. New cost is reflective of the need for a new DGS position, including 1 month of summer salary, which would support both proposed MS and PhD programs (so 1/2 of position included in this proposal). Existing cost is reflective of administrative support within departments for additional students. Currently grad student logistics represents less than 1/4 time of a staff member, estimate is that additional students causes increase in workload by less than 50%, so equivalent to 1/8 of a staff person. As with DGS, 1/2 of this included in this proposal, 1/2 in the MS program proposal. GA: Budgeting 1 additional TA position in both CS and ECE to support courses, approximately 54k per year including 30k stipends and 24k tuition. As with other costs, 1/2 of this included in this proposal and 1/2 in the PhD proposal.				
Equipment and Instructional Materials					
New :	0	0	0	0	0
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Narrative Explanation/Justification :	Not applicable				
Library					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Contractual Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Academic and/or Student Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Other Support Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Faculty Development					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Assessment					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Both departments already have assessment plans and processes in place, so there is negligible new cost to implement this process.				
Student Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Faculty Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Other					
New :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				

Total					
New :	$34,500	$34,500	$34,500	$34,500	$34,500
Existing :	$3,250	$3,250	$3,250	$3,250	$3,250
Total Budget Expenses/Requirements :	$37,750	$37,750	$37,750	$37,750	$37,750

Grand Total					
Total Net Cost :	$2,850	$33,350	$63,850	$63,850	$63,850

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Full-Proposal - Assess: Program Review and Assessment

1. For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:

a. Which components will be evaluated?

Instructors will select specific assignment components and test questions to assess that match the desired SLO for the course. Specifically, CS570 And CS441 will include assessment of SLO 1 and 2. CS685 And EE580 will include assessment Of SLO 3.

A standard rubric will cover all 3 SLOs for the dissertation defense and report document.

b. When will the components be evaluated?

Instructors will be contacted by the DGS and Computer Engineering graduate committee regarding the needed assessment, and the committee will review the selected components on a semi-annual basis.

c. When will the data be collected?

Course-based assessment will be assessed by instructors during the course. All 4 SLOs will be assessed at the time of the dissertation defense

d. How will the data be collected?

For course assessment as well as for dissertation assessment, instructors will assess the applicable SLO via a standardized rubric.

e. What will be the benchmarks and/or targets to be achieved?

The rubrics will include sub-elements with categories of "below expectations"=1, "meets expectations"=2, and "exceeds expectations"=3. The mean of these sub-elements will be computed, with a benchmark of a mean value of at least 2 for each SLO.

f. What individuals or groups will be responsible for data collection?

Course instructors and faculty committee members will collect the data and give it to the DGS for aggregation and review by the graduate committee.

g. How will the data and findings be shared with faculty?

The graduate committee will review and make recommendations for action items, which will be distributed to faculty in ECE and CS departments for approval at faculty assessment meetings held each fall semester

h. How will the data be used for making programmatic improvements?

The graduate committee will make recommendations for programmatic improvements based on the assessment results.

2. What are the measures of teaching effectiveness?

Evaluation of teaching effectiveness is separate from program evaluation or evaluation of SLOs.
Instructors in the program will be individually assessed for teaching effectiveness using TCE as well as peer review and other measures in accordance with the performance evaluation standards used in each instructors home department.
If SLO assessment indicates problems with teaching effectiveness within specific core courses, that information will be shared with the department chair for discussion and follow up with instructors as a part of the regular performance evaluation process.

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3. What efforts to improve teaching effectiveness will be pursued based on these measures?

Efforts to improve teaching effectiveness will be pursued on a case-by-case basis with individual faculty involved with the program.

4. What are the plans to evaluate students' post-graduate success?

We plan to conduct an alumni survey approximately every 3-5 years. (More frequently in the first few years after the program has started operating.)

Course Title (CIP)						
Degree Program Core Courses (i.e., Courses required by ALL students in the Major--includes Premajor or Preprofessional courses)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Type of Course: program core (C) or pre-major/ pre-professional (P)**	**Credit Hours**	**Existing (E) or New (N) Course**
CS	570	**Modern Operating Systems**	Brief review of classical operating system concepts (process and memory management, process coordination, device drivers, file systems, starvation/deadlock). Modern topics of files systems (logstructured file systems, distributed file systems, memory-based file systems), operating system design (monolithic, communication-kernel, extensible/adaptable, distributed shared memory), multiprocessor issues (scheduling, synchronization, IPC), security (Internet attacks, encryption, defenses). Inspection and modification of actual operating system code (Linux).	C	**3**	**E**
EE	685	**Digital Computer Structure**	Study of fundamental concepts in digital computer system structure and design. Topics include: computer system modeling based on instruction set processor (ISP) and processor-memory-switch (PMS) models, design and algorithms for ALU, processor, control unit and memory system. Special topics include floatingpoint arithmetic, cache design, pipeline design technologies, and parallel computer architectures. Prereq: EE 380 and EE 581 or consent of instructor.	C	**3**	**E**
CS	541	**Compiler Design**	Intermediate aspects of a compilation process with an emphasis on front-end issues. Practical issues in using compiler writing tools. Code generation for expressions, control statements and procedures (including parameter passing). Symbol tables, runtime organization for simple and structured variables. Using compilers and translators for automation (filters, programs writing programs).	C	**3**	**E**
EE	580	**Embedded Systems**	Embedded System Design covers the design and implementation of hardware and software for embedded computer systems. Topics include architectural support for embedded systems, power management, analog and digital I/O, real-time processing design constraints and the design of embedded systems using a realtime operating systems. Prereq: EE/CPE 287, EE/CPE 380, and engineering standing or consent of instructor.	**C**	**3**	**N**
			Total Credit hours Required for Program Core (i.e., # of hours in degree program core) **Note: number recorded will automatically populate Core Hours in "Summary of Total Program Hours" table**		**12**	**NA**
Core Courses Required for Track(s), Concentration(s), or Speciality(s) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			Total Credit hours Required for Program Options (Track(s), Concentration(s), or Speciality) (if applicable) **Note: number recorded will automatically populate Program Option hours in "Summary of Total Program Hours" table**		**0**	**NA**
<u>GUIDED</u> Elective Courses (i.e., Specified list of Program Electives AND/OR Electives focused on a specific track/concentration/or speciality) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			# of REQUIRED Credit hours in <u>Guided Electives</u> (i.e., electives for a focused or track/concentration/speciality are). If 9 hours is required and there are 15 hours to choose from, then only 9 hours are required) **Note: number recorded will automatically populate Guided Elective hours in "Summary of Total Program Hours" table**			**NA**

FREE Elective Courses (i.e, general program electives, open to the students to choose) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			Total # of Credit Hours in Free Electives (i.e., general program electives) (if applicable) **Note: number recorded will automatically populate Free Elective Hours in "Summary of Total Program Hours" table**		**27.00**	**NA**
		Summary of Total Program Hours	**Required Core Hours (i.e., # of hours in degree program core)**		**12**	NA
			Required Program Options - Track/Concentration/Specialty Hours (if applicable)		**0**	NA
			Guided Elective Hours (e.g., focused or track/concentration/speciality area specific electives) (if applicable)		**0**	NA
			Free Elective Hours (i.e., general program electives) (if applicable)		**27**	NA
			Total # of credit hours required for Program		**39**	**NA**
		Information to be completed by PIE Office				
			# of new courses			NA
			Total # of Courses (includes new and existing)			NA
			Precentage of new courses (more than 25% may require SACS Substantive Change)		#VALUE!	NA

PROPOSED PROGRAM SUMMARY

Instituion: University of Kentucky
Program Name: Orientation and Mobility
Degree Designation: MASTER OF ARTS (MA)
Degree Level : Master's

Program Description

Orientation and mobility is how individuals with visual impairments know their position in space and how to move within the environment. It includes the concepts, skills, and techniques used to travel through the environment. The focus of orientation and mobility is to promote the maximum level of independence for an individual who is blind or visually impaired. The specialized program will address the orientation and mobility needs of children with blindness and visual impairments, individuals with complex needs, and adults with vision loss. The Orientation and Mobility (O&M) program intends to prepare instructors to fill a severe need in the Commonwealth of Kentucky. Orientation and Mobility Specialists may work with all age ranges and in a variety Orientation of educational and rehabilitative settings. The proposed program will use a hybrid model with synchronous classes offered via Zoom, face-to-face weekends, and intensive summer courses held at University of Kentucky and Kentucky School for the Blind. There will be 11-14 classes for a total of 30 or 39 graduate credit hours for a Master's of Arts degree. In year one, coursework focuses on the foundations of O&M, the impact of vision loss for learners across the lifespan, and O&M skills and techniques for independent travel. Coursework in year two will concentrate on methods in O&M, needs of individuals with complex needs, and assessment in O&M. After coursework in year two, students will complete an O&M internship in educational and rehabilitative settings totaling 350 hours as needed for national certification to become a Certified Orientation and Mobility Specialist (COMS) by the Academy for the Certification of Vision Rehabilitation and Education Professionals (ACVREP).

Will this program replace or enhance any existing programs(s) or tracks, concentrations, or specializations within an existing program? If yes, please specify

No

CIP Code: 13.1009
Credit Hours: 30
Institutional Board Approval Date: 12/10/2019
Implementation Date: 8/26/2020

Student Demand

Year 1 - 8
Year 2 - 10
Year 3 - 10
Year 4 - 12
Year 5 - 12

Market Demand

A survey was distributed at a state conference of approximately 120 vision education and rehabilitation professionals to determine the level of need for an O&M program and interest in attending the program. Of the 49% that responded, 97% of respondents stated there was a great need for a university program in O&M, and 3% stated there was a need for a university program. For level of student interest, 22% of respondents stated they were very interested, 22% were interested, and 18% had some interest in attending a university O&M program. Across the Commonwealth, there is a critical shortage in every region in exceptional children, a category in which O&M is included. Nationwide, there were approximately 1,100 postings for Low Vision Therapists, O&M Specialists, and Vision Rehabilitation Therapists as obtained by Burning Glass. The projected employment growth at the state level is estimated at 45.7% and estimated at 26.6% at the national level.

Graduates may be employed as Orientation and Mobility Specialists in a variety of settings. Orientation and Mobility Specialists may be employed in school settings under the category of vision specialists or related service providers. Other settings are adult rehabilitation agencies, the Veteran's administration, and private agencies for the blind and visually impaired. Additionally, O&M Specialists may work as an independent contractor servicing individuals who are blind and visually impaired from infancy to advanced age. Average wages for an O&M Specialist with a graduate degree will vary depending on the region of the United States, the employer, and years of experience. Average salaries range from $35,000 to $80,000. The job outlook for graduates is excellent with national job openings.

Employment Demand

	Regional	State	National
Type Of Job	**Low Vision Therapist, Orientation and Mobility Specialist**		
Avg. Wage	$0	$0	$69,179
# Jobs (Postings)	0	0	239
Expected Growth	22%	22%	24%
Type Of Job	**Special Education Teacher**		
Avg. Wage	$48,340	$48,865	$50,652
# Jobs (Postings)	131	83	18578
Expected Growth	10%	10%	10%
Type Of Job	**Vocational Rehabilitation Counselor**		
Avg. Wage	$37,724	$62,318	$42,926
# Jobs (Postings)	9	1	1330
Expected Growth	11%	11%	13%

Indicate source of market demand information

Burning Glass Technologies utilizes actual real-time job postings, BLS Data, and proprietary data models. Projections are for 2019-2028

Academic Demand

NA

Unneccessary Duplication

Similar Program(s):

Program Id	Inst code	Inst Description	Degree Designation	Program Title	Report year
8218	00199900	University of Louisville	MEd		2015

Comparison of Objectives/Focus/Curriculum to Similar Programs:
NA, Not found in program inventory

Comparison of Student Populations:
NA, Not found in program inventory

Access to Existing Programs:
NA, Not found in program inventory

Feedback from Other Institutions:
NA, Not found in program inventory

Cost

Projected Revenue over Next Five Years ($) : 2175874
Projected Expenses over Next Five Years ($) : 1201566

Will Additional faculty be needed? Yes
External funding from the Kentucky Department of Education has been secured to hire a full-time assistant or associate professor with a degree in Orientation and Mobility. The new faculty must be a Certified Orientation and Mobility Specialist (COMS) and have a minimum of three years of experience as a Certified Orientation and Mobility Specialist. Potential faculty candidates were interviewed in Spring 2019, and the search committee made a recommendation for hire. Dr. Justin Kaiser started this position in August of 2019.

Provide a budgetary rationale for creating this new program
here are approximately 3000 Certified Orientation and Mobility Specialists and professionals with the National Orientation and Mobility Certification as of October 2018. Even using conservative estimates, there should be between 2181 to 8241 additional O&M professionals to adequately provide O&M instruction to the current population of children with visual impairments across the United States. As last reported in 2007, university programs were preparing approximately 250 vision professionals per year, which is insufficient in meeting the current demand for services.

In school districts across the Commonwealth, there is an extensive demand for Certified Orientation and Mobility Specialists as more students are identified and as people move towards retirement from the profession. The majo

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Full Proposal - Basic Info

Institution :	University of Kentucky
Program Type :	Single Institution
Program Name :	Orientation and Mobility
Degree Level :	Master's
Degree Designation :	MASTER OF ARTS
CIP Code (2-Digit) :	13-EDUCATION.
CIP Code :	13.1009-Education/Teaching of Individuals with Vision Impairments Including Blindness.

Academic Unit (e.g. Department, Division, School) :	College of Education
Name of Academic Unit :	Department of Early Childhood, Special Education,
Name of Program Director :	Donna Lee

Intended Date of Implementation :	8/24/2020
Anticipated Date for Granting First Degrees :	5/5/2021
Date of Governing Board Approval :	2/21/2020

Institutional Contact Information

First Name :	Annie
Last Name :	Weber
Title :	Assistant Provost for Strategic Planning and Institutional Effectiveness
Email :	ann.weber@uky.edu
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Full Proposal - Mission: Centrality to the Institution's Mission and Consistency with State's Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

The program's mission is to prepare students for a lifetime of learning, advocacy, and service in the education and rehabilitation of individuals who are blind and visually impaired. There are three main program objectives. The first program goal is to align course standards and internship competencies with curricular standards from the Association of the Education and Rehabilitation of the Blind and Visually Impaired (AER) and with the core domain areas and clinical competencies established by the Academy for the Certification of Vision Rehabilitation and Education Professionals (ACVREP). The Association of the Education and Rehabilitation of the Blind and Visually Impaired (AER) provides university program accreditation, which faculty plans to pursue. The use of standards leads to the second program goal to develop highly skilled, prepared, and knowledgeable Orientation and Mobility Specialists to work with learners across the lifespan in various settings. Orientation and Mobility Specialists may work with infants to older adults in a variety of settings such as home, centerbased, and itinerant. Lastly, the program aims to increase the number of qualified Orientation and Mobility Specialists that exemplify high standards of professionalism across the United States, specifically addressing the needs of the Commonwealth of Kentucky. Kentucky has a severe deficit of qualified O&M Specialists to provide services to individuals across the lifespan. The majority of Certified Orientation and Mobility Specialists (COMS) are contract employees of school districts or state agencies covering vast territories. By graduating qualified candidates, we seek to reduce the shortages across the Commonwealth.

2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

The proposed program would support the institutional mission and academic strategic plan. The Orientation and Mobility (O&M) program aligns with the University of Kentucky 2015-2020 Strategic Plan of strengthening graduate education in the area of quality and distinctiveness, with the acknowledgment of hosting the only O&M program in the Commonwealth. Secondly, the program supports the strategic objective of community engagement by serving and addressing the needs of individuals who are blind and visually impaired to promote independent travel and to increase the quality of life.

3. Explain how the proposed program addresses the state’s postsecondary education strategic agenda.

The program would support the Council on Postsecondary Education’s 2016-2021 Strategic Plan by increasing degree completion, fill workforce shortages, and guide more graduates to a career path. The profession has workforce shortages in the Commonwealth of Kentucky and nationwide. It also supports the mission to encourage more people to take advantage of postsecondary opportunities especially for employees in the P-12 educational system. Finally, the program objectives are linked to the goal of creating economic growth and development and making the state more prosperous.

4. Explain how the proposed program furthers the statewide implementation plan.

The program would support the Council on Postsecondary Education’s 2016-2021 Strategic Plan by increasing degree completion, fill workforce shortages, and guide more graduates to a career path. The profession has workforce shortages in the Commonwealth of Kentucky and nationwide. It also supports the mission to encourage more people to take advantage of postsecondary opportunities especially for employees in the P-12 educational system. Finally, the program objectives are linked to the goal of creating economic growth and development and making the state more prosperous.

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Full Proposal - Quality: Program Quality and Student Success

1. List all student learning outcomes of the program.

Student learning outcomes will address the following areas: specialized knowledge, applied learning, and civic learning. One will conduct oneself with a high degree of integrity and professionalism in the workplace, community, and with consumers and students. Candidates will identify and describe the impact of visual impairments and blindness on development, psychosocial aspects, physical movement, orientation, and mobility
among learners across the lifespan. One will administer assessments to determine the present level of performance, document learner progress, and utilize the data for instructional planning and delivery in Orientation and Mobility. Candidates will develop and implement safe, appropriate, and effective lessons that target the individualized characteristics of learners based on assessment data.

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

The Orientation and Mobility curriculum is based on the curricular standards set by the Association for the Education and the Rehabilitation of the Blind and Visually Impaired (AER). Furthermore, the overall curriculum is aligned with the clinical domains and competencies set by the Academy for the Certification of Vision Rehabilitation and Education Professionals. (ACVREP). Alignment with professional standards and clinical
competencies is a program goal. The student learning outcomes are directly linked to the AER curricular standards and ACVREP domains and clinical competencies.

3. Highlight any distinctive qualities of this proposed program.

The Visual Impairment Program Faculty are recognized by state agencies and educational systems for commitment to educating all children who are blind and visually impaired and for excellence in graduating teacher candidates certified to teach children who are blind and visually impaired. Donna Lee, Clinical Associate Professor and Visual Impairment Program Faculty Chiar, is recognized for expertise in teacher preparation in visual impairments, the braille code, and tactile graphics. Gerald Abner, Clinical Instructor, has extensive clinical experience in educating students with visual impairments and complex needs and works on a statewide tactile communication project. Justin Kaiser, Assistant Professor, has experience in teacher preparation in visual impairments and served as the chair of the Orientation and Mobility division of the Association for the Education and the Rehabilitation of the Blind and Visually Impaired (AER). Rosemary Nave Stawasz has fourteen years of clinical experience in teaching children who are visually impaired in three states.
The Visual Impairment Program faculty has a range of expertise and emphasis in the field of visual impairments that will adequately meet the program objectives and student learning outcomes.

4. Will this program replace any existing program(s) or specializations within an existing program?

NO

5. Include the projected faculty/student in major ratio.

The projected faculty to student ratio in the program is one to ten in core Orientation and Mobility courses. In the skills and techniques in Orientation and Mobility courses, the ratio of faculty to students is two to eight. The current faculty numbers can support the current faculty to student ratio.

6. Is there a specialized accrediting agency related to this program?

YES

Please identify the agency.

The Association for Education and Rehabilitation of the Blind and Visually Impaired

Do you plan to seek accreditation?

YES

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Please explain your plans for accreditation.

It is AER policy that they will not accept an application for a program until it has been running for one year. So we plan to apply as soon as the program has been fully approved for one year. This should be spring 2021.

7. Attach SACS Faculty Roster Form.

Orientation-and-Mobility-Masters_Faculty Roster.pdf

8. A. Describe the library resources available to support this program. You may attach any documentation provided to SACS.

The University of Kentucky libraries satisfy the educational, research, and service missions by acquiring, organizing, and preserving academic resources that support diverse university programs. The University of Kentucky library system offers an extensive collection of printed and electronic volumes in addition to commercial databases. The library system has a collection of journals and books related to blindness and visual impairment. Graduate students will have access to the library system and electronic databases.

B. Describe the physical facilities and instructional equipment available to support this program. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.

The Orientation and Mobility program is housed in the Department of Early Childhood, Special Education, and Rehabilitation Counseling in the College of Education at Taylor Education building. Taylor Education building houses classrooms, administration, faculty offices, staff, and technology support. The faculty has access to the Education Library at Dickey Hall and additional classrooms for on-campus courses. Also, the O&M program shares a classroom space for off-campus course meetings with the Teacher Preparation Program in Visual Impairments at the Kentucky School for the Blind in Louisville. Instructional equipment specific to the needs of the O&M program has been acquired through external grant funding. Additional instructional materials and equipment such as white canes and electronic travel devices may be necessary for the future to enhance learning.

9. Clearly state the admission, and retention, and completion standards designed to encourage high quality.

The Visual Impairment Program faculty will be responsible for admissions. Students will apply to the Graduate School as well as the Visual Impairment Program. The application for the Orientation and Mobility program requires a curriculum vitae, transcripts, references, and a statement of interest. The admissions committee will review applications, conduct personal interviews if necessary, and determine entry into the program. An advisor will be assigned to each graduate student. A curriculum contract will be reviewed at entry, mid, and exit points by the advisor and student. Students failing to demonstrate the intended student learning outcomes in each semester will be contacted in writing by the advisor before the start of the next semester. A plan for improvement will be discussed and implemented. Retention and completion standards will be assessed through communication between faculty, advisors, and graduate students by evaluating student coursework.

10. Clearly state the degree completion requirements for the program.

Graduate students must complete the core courses in Orientation and Mobility coursework with a 3.0 or better. In addition to meeting the curricular requirements, students must complete a 350 O&M internship, receive a pass recommendation by the supervising Certified Orientation and Mobility specialist, and a minimum of a 3.0 in the internship course. Graduate students must complete a culminating portfolio addressing six standards and receive a minimum score of a three in all standards

Name	Total number of hours required for degree	Number of hours in degree program core	Number of hours in guided electives	Number of hours in free electives
Program	30	30	0	0

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12. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.

The proposed Orientation and Mobility program would be the only existing program in the Commonwealth of Kentucky. No similar programs exist. The Orientation and Mobility program will complement the Teacher Preparation Program in Visual Impairment (TPPVI) that prepares candidates to be a Teacher of the Visually Impaired. Articulation agreements are not necessary.

13. List courses under the appropriate curricular headings.

Orientation and Mobility Curriculum.xlsx

14. Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)?

YES

YES	Distance learning
YES	Courses that combine various modes of interaction, such as face-to-face, videoconferencing, audio-conferencing, mail, telephone, fax, e-mail, interactive television, or World Wide Web
YES	Technology-enhanced instruction
YES	Evening/weekend/early morning classes
NO	Accelerated courses
NO	Instruction at nontraditional locations, such as employer worksite
NO	Courses with multiple entry, exit, and reentry points
NO	Courses with "rolling" entrance and completion times, based on self-pacing
NO	Modularized courses

Please describe planned alternative methods of program delivery involving greater use of technology, distance education, and/or accelerated degree designs, to increase efficiency, better address student educational and workforce needs, and maximize student success, for both traditional and non-traditional students.

The alternative delivery modes in the program are ideal for adult learners at the graduate level. The program will utilize a hybrid mode to deliver course content and opportunities to apply content knowledge. The hybrid program will meet the reach remote areas and the overall needs of the Commonwealth of Kentucky. The program has been intentionally designed by taking into consideration the needs of adult learners such as employment status and place of residence. Fall and spring courses will meet synchronously using Zoom in the evening to accommodate for the work schedules of the students. By using Zoom, it allows students to meet remotely and have more direct interaction with each other and the instructor. Face-to-face meetings will balance the non-traditional aspect. Graduate students will be required to meet face-to-face once or twice a semester for content that cannot
be delivered online.

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Full Proposal - Demand: Program Demand/Unnecessary Duplication

1. Student Demand:

a. Provide evidence of student demand at the regional, state and national levels.

A survey was distributed at a state conference of approximately 120 vision education and rehabilitation professionals to determine the level of need for an O&M program and interest in attending the program. Of the 49% that responded, 97% of respondents stated there was a great need for a university program in O&M, and 3% stated there was a need for a university program. For level of student interest, 22% of respondents stated they were very interested, 22% were interested, and 18% had some interest in attending a university O&M program.
Across the Commonwealth, there is a critical shortage in every region in exceptional children, a category in which O&M is included. Nationwide, there were approximately 1,100 postings for Low Vision Therapists, O&M Specialists, and Vision Rehabilitation Therapists as obtained by Burning Glass. The projected employment growth at the state level is estimated at 45.7% and estimated at 26.6% at the national level.

b. Identify the applicant pool and how they will be reached.

The applicant pool, in general, will consist of individuals who have completed a bachelor's degree program and who are living within the Commonwealth of Kentucky. A future potential program goal would be to include outof-state applicants. One target applicant pool is current Teachers of the Visually Impaired in local school districts. The second pool extends to other educators and therapists. The third applicant pool would be to individuals with a desire and drive to work with students or clients who are blind and visually impaired to increase physical movement, ability to travel independently and to increase the overall quality of life. Teachers of the Visually Impaired may be reached through the state list serv. Other educators and therapists may be reached through recruitment materials and notifications sent to school districts across the Commonwealth. Lastly, applicants may be reached through marketing on the University of Kentucky’s website and electronic
communications to state agencies.

c. Describe the student recruitment and selection process.

Recruitment by the Visual Impairment Program and the College of Education will promote the Orientation and Mobility program among the target audiences in the teacher preparation programs with marketing materials. Faculty will promote the program through professional networks such as school systems, educational service agencies, state agencies, and private organizations throughout the Commonwealth of Kentucky by electronic and personal communication. Lastly, applicants may be reached through marketing on the University of Kentucky’s website and electronic communications to state agencies.

The Visual Impairment Program faculty will be responsible for admissions. Students will apply to the Graduate School as well as the Visual Impairment Program. The application for the Orientation and Mobility program requires a curriculum vitae, transcripts, references, and a statement of interest. The admissions committee will review applications, conduct personal interviews if necessary, and determine entry into the program.

d. Identify the primary feeders for the program.

The primary feeders for the O&M program are universities and colleges offering undergraduate degrees. The O&M program will target three groups of candidates. The first target audience is Teachers of the Visually Impaired either from the University of Kentucky’s Teacher Preparation Program in Visual Impairments or from similar programs to obtain a dual degree. The second target audience is individuals who hold an undergraduate degree in education (elementary, secondary, or special education) or in health and human services. The third target group is individuals who completed an undergraduate degree in an unrelated field and who seek a career change.

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e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

The proposed program will increased overall graduate student enrollment at the University of Kentucky in the College of Education due to the introduction of a new course of study. The program will admit ten students to a cohort each year for the first two years, then increase admission to twelve students in succeeding years.

f. Project estimated student demand for the first five years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) - Fall Semester
2020-2021	8	8
2021-2022	10	10
2022-2023	10	10
2023-2024	12	12
2024-2025	12	12

2. Employer Demand:

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

Graduates may be employed as Orientation and Mobility Specialists in a variety of settings. Orientation and Mobility Specialists may be employed in school settings under the category of vision specialists or related service providers. Another setting is at adult rehabilitation agencies, private agencies for the blind and visually impaired as Blind Rehabilitation Specialists- Orientation and Mobility or Rehabilitation SpecialistsOrientation and Mobility. Additionally, O&M Specialists may work as an independent contractor servicing individuals who are blind and visually impaired from infancy to advanced age. Average wages for an O&M Specialist with a graduate degree will vary depending on the region of the United States, the employer, and years of experience. Average salaries range from $35,000 to $80,000. The job outlook for graduates is
excellent with national job openings.

Region, State, National
Job Title Special Education Teacher
Salary $54,230 $54,799 $51,080
Projected Employment Growth 15.2%, 16.2%, 7.2%
# of Positions 440 550 37980
Job Title Vocational Rehabilitation Counselor
Salary $46,136 $62,318 $45,041
Projected Employment Growth 11.3%, 18.6%, 8.2%
# of Positions 2770 3210 271350
Job Title Low Vision Therapist, Orientation and Mobility Specialist
Salary NA NA $68,249.00
Projected Employment Growth 35.4% 45.7% 26.6%
# of Positions 1810 1340 126050

3. Academic Disciplinary Needs:

NA

a. If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.

(Should not be blank)

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4. Similar programs:

a. Are there similar programs in other Southern Regional Education Board (SREB) states and in the nation?

YES

Please identify similar programs in other SREB states and in the nation.

In the SREB region, the University of Arkansas offered a master's degree in Orientation and Mobility. Nationally, there are twelve university programs offering a graduate degree in Orientation and Mobility. The O&M programs are

- California State University LA
- Florida State University
- North Carolina Central University
- Northern Illinois University
- Salus University
- San Francisco State University
- Stephen F. Austin State University
- Texas Tech University
- University of Arkansas at Little Rock
- University of Massachusetts at Boston
- University of Pittsburgh
- Western Michigan University

b. Our records indicate the following similar programs exist at public institutions in Kentucky.

---- No Programs Exist----

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Full Proposal - Cost: Cost and Funding of the Proposed Program

1. Will this program require additional resources?

YES

Please provide a brief summary of additional resources that will be needed to implement this program over the next five years.

Current faculty is involved in recruiting, advising, and teaching courses. A new faculty member has been hired to assist in developing and teaching courses and student supervision. As the program grows, part-time faculty will be hired to assist with practicum and internship supervision. The program is currently externally funded.
Therefore, the program will continue to seek external grant funding and seek internal funding.

2. Will this program impact existing programs and/or organizational units within your institution?

NO

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

The University of Kentucky will be the only university to offer a degree in Orientation and Mobility in the Commonwealth of Kentucky. The following surrounding states do not offer a graduate degree in O&M:
Missouri, Indiana, Ohio, Tennessee, Mississippi, Alabama, Georgia Virginia, and West Virginia. The program is expected to generate revenue for the College of Education through student tuition. The program will continue to seek external grant funding. The O&M program may attract graduate students outside the education field and non-traditional students, which will increase the diversity of the candidates. Most importantly, the program will
meet the employment needs of the Commonwealth in educational and rehabilitative settings.

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A. Funding Sources, by year of program	1st year	2nd year	3rd year	4th year	5th year
	0	0	0	0	0
Total Resources Available from Federal Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	none				
Total Resources Available from Other Non-State Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	none				
State Resources					
New :	185221	190208	194314	199574	204991
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	This program is being funded by a Kentucky Department of Education grant.				
Internal					
Allocation :	0	0	0	0	0
Reallocation :	0	0	0	0	0
Narrative Explanation/Justification :	none				
Student Tuition					
New :	203010	238740	245660	253272	260884
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Tuition figured at five non-TVI and five TVI students per a cohort. Tuition rate figured with a 3% tuition increase yearly.				
Total					
New :	$388,231	$428,948	$439,974	$452,846	$465,875
Existing :	$0	$0	$0	$0	$0
Total Funding Sources :	$388,231	$428,948	$439,974	$452,846	$465,875

B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Staff: Executive, administrative, and managerial					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Other Professional					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Faculty					
New :	84315	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Existing :	81906	171208	175314	180574	185991
Graduate Assistants (if master's or doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Student Employees					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	One full-time faculy member was hired in 2017, one new full-time faculy member will start in 2019. Benefits figured at 20.45%. In total, two full-time faculty members will be dedicated to the O&M program. The yearly rate of pay increase was figured at 3%.				
Equipment and Instructional Materials					
New :	2000	2000	2000	2000	2000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Equipment funded under the Kentucky Department of Education grant.				
Library					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Contractual Services					
New :	3000	3000	3000	3000	3000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Funds for guest speakers provided by the Kentucky Department of Education grant.				
Academic and/or Student Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Advising done by faculty members.				
Other Support Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Faculty Development					
New :	4000	4000	4000	4000	4000
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Narrative Explanation/Justification :	$2,000 per an O&M faculty member for conferences, etc. funded by the Kentucky Department of Education.				
Assessment					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Student Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Faculty Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NA				
Other					
New :	10000	10000	10000	10000	10000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Travel expenses for supervising interns and teaching class at the Kentucky School for the Blind in Louisville.				
Total					
New :	$103,315	$19,000	$19,000	$19,000	$19,000
Existing :	$81,906	$171,208	$175,314	$180,574	$185,991
Total Budget Expenses/Requirements :	$185,221	$190,208	$194,314	$199,574	$204,991
Grand Total					
Total Net Cost :	$203,010	$238,740	$245,660	$253,272	$260,884

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Full-Proposal - Assess: Program Review and Assessment

1. For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:

a. Which components will be evaluated?

The student learning outcomes were developed by the UK Visual Impairment chair and faculty. Professionalism will be introduced in the spring semester of year 1 in Introduction to Skills and Techniques and reinforced in the summer semester of year 1 in Advanced Skills and Techniques. Professionalism will be applied and directly assessed in Practicum and Internship in year 2 of the program. Content knowledge will be introduced in Foundations of Orientation and Mobility (O&M) and O&M with Children in year one. Content knowledge will be reinforced in Methods of O&M and O&M for Individuals with Complex Needs and applied in Practicum and Internship in year 2. Next student outcome related to assessment will be introduced in Introduction to Skills and Techniques and Advanced Skills and Techniques in year one. It will be reinforced in Assessment in O&M and Practicum then applied in the O&M Internship. Instructional planning and delivery will be introduced in Advanced Skills and Techniques, O&M with Children and Technology in O&M in year one. In year two, instructional planning and delivery will be reinforced in O&M for Individuals with Complex Needs, and Practicum then applied in the O&M Internship.

b. When will the components be evaluated?

Data will be collected at the conclusion of each course and compiled at the beginning of each fall semester. Professionalism will be evaluated annually by a direct measure in year two. For content knowledge, the assessments will occur at the end of the fall semester in year one and at the end of the spring semester in year two. Assessment will be evaluated annually at the end of the spring semester and at the end of the Orientation and Mobility internship, which may be the summer or fall semester. Lastly, instructional planning and delivery will be evaluated annually at the end of the spring semester and at the end of the Orientation and Mobility internship, which may be the summer or fall semester.

c. When will the data be collected?

Data will be collected at the conclusion of each course and compiled at the beginning of each fall semester. Professionalism will be evaluated annually by a direct measure in year two. For content knowledge, the assessments will occur at the end of the fall semester in year one and at the end of the spring semester in year two. Assessment will be evaluated annually at the end of the spring semester and at the end of the Orientation and Mobility internship, which may be the summer or fall semester. Lastly, instructional planning and delivery will be evaluated annually at the end of the spring semester and at the end of the Orientation and Mobility internship, which may be the summer or fall semester.

d. How will the data be collected?

Data will be collected through evidence of student work, grades, and completion of the culminating portfolio.

e. What will be the benchmarks and/or targets to be achieved?

There are several benchmarks and target for the success of the Orientation and Mobility program. One benchmark to be achieved is student evaluations that meet or exceed the averages of existing graduate programs in the College of Education. Mid-program review of student work demonstrates progress and success in meeting student learning objectives. Furthermore, the program seeks to achieve a retention rate that meets or exceeds the averages of existing graduate programs in the College of Education. Lastly, the program targets gainful employment of graduates as qualified Orientation and Mobility Specialist especially in the Commonwealth of Kentucky.

f. What individuals or groups will be responsible for data collection?

The Visual Impairment Program chair and faculty will be responsible for the primary data collection regarding the program and student learning outcomes. The College of Education and the University of Kentucky will collect indirect measures of student success through surveys.

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g. How will the data and findings be shared with faculty?

Data and findings will be shared annually with Visual Impairment Program faculty and then will report to the full department.

h. How will the data be used for making programmatic improvements?

The faculty of record will assess the objectives to measure the level of achievement. If objectives were unmet, the program faculty will make recommendations and institute an improvement plan.

2. What are the measures of teaching effectiveness?

Teaching effectiveness will be measured by the University Teacher Course Evaluation process and student success in meeting the student learning outcomes. The TCE outcomes will be included in the Digital Measures report and reviewed by the College of Education during annual performance reviews. Additionally, all clinical faculty are evaluated annually by the department chair and by peers.

3. What efforts to improve teaching effectiveness will be pursued based on these measures?

Faculty may attend workshops or utilize services provided by the Center for the Enhancement of Learning and Teaching or other existing resources offered by the University of Kentucky to increase instructor effectiveness.

4. What are the plans to evaluate students' post-graduate success?

The Orientation and Mobility program will utilize data from three existing student surveys to measure postgraduate success. The College of Education distributes a yearly post-graduate survey in April to graduating students and employers to collect data regarding workforce outcomes. Institution-wide surveys regarding postgraduate success and workforce outcomes are the graduating students and the first destination survey.

Course Title (CIP)						
Degree Program Core Courses (i.e., Courses required by ALL students in the Major--includes Premajor or Preprofessional courses)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Type of Course: program core (C) or pre-major/ pre-professional (P)**	**Credit Hours**	**Existing (E) or New (N) Course**
BVI	**620**	Foundations of Orientation and Mobility	A fundamental course in the history and development of Orientation & Mobility programs, educational and rehabilitation models, and mobility systems. Philosophies, practices, standards, and ethics of O&M will be also discussed	C	**3**	**N**
BVI	**621**	Introduction to Skills and Techniques	This course is an introduction to skills and techniques used by individuals with visual impairments and instructional strategies to facilitate independent travel including the use of the long cane and adaptive mobility devices. Emphasis will be placed on the methods of independent travel. Students will have practical experience in traveling under blindfold and vision loss simulators in indoor, residential, and small business environments	C	**2**	**N**
BVI	**622**	Advanced Skills and Techniques	The course will focus on advanced skills and techniques used by individuals with visual impairments for independent travel in business and complex environments. Students will have practical experience in the use of the long cane and travel under blindfold and vision loss simulators. Students will gain experience in planning lessons and teaching skills to each other under instructor supervision.	C	**2**	**N**
BVI	**623**	Orientation and Mobility for Children	The course will address the impact and effects of a visual impairment on the overall development of children with visual impairments. Course topics will include information on locomotion, concept development, O&M skill acquisition and performance for children with visual impairments. Instructional methods, strategies, and materials for teaching Orientation & Mobility concepts and skills will also be covered.	**C**	**3**	**N**
BVI	**624**	Technology in Orientation and Mobility	The course will be an introduction to the use of electronic travel aids and electronic orientation aids as a secondary mobility system for individuals with visual impairments. The advantages and disadvantages of using electronic travel devices will be identified along with instructional strategies to incorporate the use into lessons. There will be hands-on experience with using electronic devices with an emphasis on the use of cellphone applications.	**C**	**1**	**N**
BVI	**627**	Orientation and Mobility for Individuals with Complex Needs	The course will discuss the impact and effects of health conditions and other disabilities among individuals with visual impairments on concept development, learning, and skill acquisition on O&M. Course content will discuss the roles of professionals in addressing complex needs of individuals with visual impairments and deaf-blindness. It will focus on instructional methods and strategies to address complex needs in an educational and rehabilitation setting.	**C**	**3**	**N**
BVI	**626**	Methods in Orientation and Mobility	The course will address a variety of topics, strategies, and approaches related to Orientation and Mobility instruction for individuals with visual impairments. Content will focus on adult rehabilitation, low vision, and low vision devices, mobility systems, echolocation, and Flash Sonar. The course content will also include instructional approaches used to assessing environments, teach complex travel environments and intersections, adapt for adverse weather conditions, and use various transportation systems.	**C**	**3**	**N**
BVI	**629**	Practicum in Orientation and Mobility	The practicum in Orientation and Mobility will consist of supervised, field-based experience in various settings ranging from preschool, school-based, adult rehabilitation, and geriatric settings. Site approval is required by the program coordinator	**C**	**1**	**N**
BVI	**628**	Assessment in Orientation and Mobility	The course will address strategies and methods for evaluating an individual with a visual impairment and assessing an individual's progress in Orientation and Mobility. Learners also will analyze assessment results to develop and implement appropriate O&M goals and objectives. Other content will include the strategies to select and analyze environments for safety, instruction, and assessment	**C**	**3**	**N**
BVI	**720**	Orientation and Mobility Internship	Supervised professional experience for candidates in Orientation & Mobility will be offered in an educational or rehabilitation setting serving individuals with visual impairments. A minimum of 350 hours is required. This may be completed either on a full-time or part-time basis.	**C**	**6**	**N**
RC	**525**	Human Growth and Development Across a LifeSpan		**C**	**3**	**E**
			Total Credit hours Required for Program Core (i.e., # of hours in degree program core) **Note: number recorded will automatically populate Core Hours in "Summary of Total Program Hours" table**		**30**	**NA**

Core Courses Required for Track(s), Concentration(s), or Speciality(s) (if applicable)						
Course Prefix	Course #	Course Title	Course Description	Course Required for Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
			Total Credit hours Required for Program Options (Track(s), Concentration(s), or Speciality) (if applicable) Note: number recorded will automatically populate Program Option hours in "Summary of Total Program Hours" table		0	NA
GUIDED Elective Courses (i.e., Specified list of Program Electives AND/OR Electives focused on a specific track/concentration/or speciality) (if applicable)						
Course Prefix	Course #	Course Title	Course Description	Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
			# of REQUIRED Credit hours in Guided Electives (i.e., electives for a focused or track/concentration/speciality are). If 9 hours is required and there are 15 hours to choose from, then only 9 hours are required) Note: number recorded will automatically populate Guided Elective hours in "Summary of Total Program Hours" table			NA
FREE Elective Courses (i.e, general program electives, open to the students to choose) (if applicable)						
Course Prefix	Course #	Course Title	Course Description	Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
			Total # of Credit Hours in Free Electives (i.e., general program electives) (if applicable) Note: number recorded will automatically populate Free Elective Hours in "Summary of Total Program Hours" table		0	NA
		Summary of Total Program Hours	Required Core Hours (i.e., # of hours in degree program core)		30	NA
			Required Program Options - Track/Concentration/Specialty Hours (if applicable)		0	NA
			Guided Elective Hours (e.g., focused or track/concentration/speciality area specific electives) (if applicable)		0	NA
			Free Elective Hours (i.e., general program electives) (if applicable)		0	NA
			Total # of credit hours required for Program		30	NA
		Information to be completed by PIE Office				
			# of new courses			NA
			Total # of Courses (includes new and existing)			NA
			Precentage of new courses (more than 25% may require SACS Substantive Change)		#VALUE!	NA

PROPOSED PROGRAM SUMMARY

Council on Postsecondary Education

Institution:	***University of Kentucky***
Program Name:	***Product Design***
Degree Designation	***Bachelor of Science***
CIP Code:	***50.0404***
Credit Hours:	***125***
(Tentative) Institutional Board Approval Date:	***2/21/2020***
Implementation Date:	***8/20/2020***

Program Description:

Describe the program and its aims

Product design, also known as industrial design, is a strategic problem-solving process that drives innovation, builds business success, and leads to a better quality of life through innovative products, systems, services, and experiences. The Bachelor of Science in Product Design (BSPD) is a new program in the College of Design that offers an undergraduate degree to students pursuing professional careers in product design. The BSPD is a 4-year program requiring 125 total credits, consisting of sequential design studios with continuous support courses in ergonomics and user experience (UX); a history and theory course sequence; a steady menu of technical classes in computer-aided design (CAD), visualization, and materials and manufacturing processes; research classes; entrepreneurism, integrated studios with other disciplines; and specialized short courses (modules) for advanced focus.

The BSPD program aligns with the University of Kentucky Strategic Plan by fulfilling the goal of undergraduate student success by offering a new degree choice in the Commonwealth and, for applicants outside of Kentucky, a product design degree with special emphasis on ergonomics, UX, and healthcare solutions. The BSPD is part of a suite of new offerings that include a collaboration with Biomedical Engineering (BME); some of the courses throughout the curriculum are jointly created by College of Design and BME faculty to enhance a deeper foundation in ergonomics, better preparing students for future specialization.

The BSPD program also advances the College of Design Strategic Plan by expanding program offerings in the College and creating synergy with existing degrees. The program further contributes to achieving the

Kentucky Council on Postsecondary Education Strategic Agenda by offering a new option to Kentucky students and a potential new entrepreneurial workforce in the region.

Will this program replace or enhance any existing programs(s) or tracks, concentrations, or specializations within an existing program? If yes, please specify.

This program will enhance the School of Architecture, School of Interiors, and Department of Historic Preservation existing programs by creating synergy between undergraduate students in cross-listed courses, as well as providing dual-degree and minor options within the College of Design. The program will also enhance the opportunities for undergraduates in the Department of Landscape Architecture and Biomedical Engineering.

Student Demand:

Please note the expected enrollment over the first five years of the program

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
18	37	48	71	93

Market Demand:

This is an open-ended response that will be used in CPE agenda items. Institutions should explain why this program is needed. Note if it replaces another program on campus. Remember that your audience is the CPE, not higher education administrators, faculty, or staff.

In preparation for the BSPD proposal, the College contracted with STAMATS, a higher education marketing firm to compile/assess data on the regional/national opportunity for this degree at the University of Kentucky. In the U.S., there is currently 12% growth in product design degrees and 20% growth in programs.

The manufacturing industry accounts for 18.3% of Kentucky's annual economic output; the BSPD could deliver graduates into a lucrative employment market. In 2016, there were 14,161 jobs posted for product design positions in the U.S. The data indicates that the labor market for such professionals is large and growing at approximately the same rate as the broader U.S. economy.

This BSPD will increase enrollment and program opportunities for the College of Design, offering a progressive program with lower enrollment fees, a copious job market, and salary earning potential of 21% higher than the national average. Professionals in the product design field can expect higher salaries than 59% of all positions offering $75K or more. With an emphasis on healthcare design, we can focus on a current trend in U.S expenditure: 17.1% of the GNP was on healthcare in 2014 (19.9% by 2025).

Based on STAMATS data and recent reports at the Industrial Designers Society of America (IDSA), entry level product designers can expect to make $60 - $70K, while entry level UX designers can expect $100K with significant demand over the next decade. Across the U.S. in 2016, 14,161 jobs related to product design were posted and that number has been growing steadily since 2011 but more rapidly since 2014. Nearly 1 in 5 jobs related to product design posted in 2016 were located in the Detroit area, suggesting the demand for designers for automotive design. San Francisco and

New York were the next two locations with the highest number of job postings, followed by Los Angeles, San Jose, Chicago, Boston, Seattle, Minneapolis, Phoenix, Atlanta, Washington, DC, Dallas, Portland, OR, Philadeplphia, Cleveland, Milwaukee, Charlotte, in that order.

Answer either Employer Demand or Academic Demand below

Employer Demand: [1]

If the program is designed for students to enter the workforce immediately, please complete the following table.

	Regional	State	National
Type of Job	Commercial & Industrial Designers		
Average Wage	$80,296	$76,294	$88,620
# of Openings	320	105	24,094
Growth Projections	8.1%	-2.9%	4.3%
Type of Job	Designer, All Other		
Average Wage	$59,052	$56,190	$67,533
# of Openings	352	78	23,927
Growth Projections	NA	3.3%	5.6%
Type of Job	Ergonomist		
Average Wage	$71,930	$51,548	$85,698
# of Openings	27	15	919
Growth Projections	13.36%	11.1%	9.7%
Type of Job	Industrial Engineer		
Average Wage	$74,836	$74,499	$76,477
# of Openings	916	378	30,611
Growth Projections	13.6%	11.1%	9.7%
Type of Job			
Average Wage			
# of Openings			
Growth Projections			

Please note the time frame for the projections and source of the market demand information:	Data was pulled from Burning Glass which pulls physical job postings over a 12 month period as well as BLS data. Projections are from 2019-2028

[1]

Academic Demand:

If this is not a program that is designed for students to enter the workforce immediately after graduation, please indicate the skills that graduates will attain, the types of graduate programs the graduates are most likely to attend, and the types of jobs graduates will eventually seek.

NA

Unnecessary Duplication

List any similar programs based on CIP codes or other programs that are similar but may be classified in a different CIP code.

	Program	Institution
Program 1:	**NA**	
Program 2:	**NA**	
Program 3:	**NA**	
Program 4:	**NA**	
Program 5:	**NA**	

a. **Comparison of Objectives/Focus/Curriculum to Similar Programs:** *Explain the differences in curriculum, focus, and/or objectives. If the proposed program curriculum does not differ substantially from existing programs, then describe potential collaborations with other institutions.*

NA

b. **Comparison of Student Populations***: Describe how your target student population is different from those at other institutions and explain how your program reaches this new population (e.g. the proposed program is completely online while other programs are face-to-face or hybrid).*

NA

c. **Access to Existing Programs:** *Explain how/why existing programs cannot reach your target population and/or provide evidence that existing programs do not have the capacity to meet current student demand (e.g. the number of students on enrollment waiting list).*

NA

d. **Feedback from Other Institutions:** *Summarize the feedback from colleagues at institutions with similar programs.*

NA

Cost

Please provide a summary of revenues and expenditures.

Projected Revenue over Next Five Years	$4,167,012
Projected Expenses over Next Five Years	$2,007,304

Will additional faculty be needed?

If yes, please explain how the institution will pay for these additional costs.

YEAR 1: an acting (visiting) director will be appointed for the first year, assisted by one visiting faculty and one new junior faculty member. YEAR 2: a new permanent director will be in place, one existing junior faculty, and two visiting faculty. YEAR 3: a director, two junior faculty and two visiting faculty. YEAR 4: a director, one senior faculty, two junior faculty and one visiting faculty. YEAR 5: a director, one senior faculty, three junior faculty and one visiting faculty

Provide a budgetary rationale for creating this new program:

This is an open-ended response that will be used in CPE agenda items. Institutions should explain how the program will be funded, what other programs will be affected, and why this program is considered both an efficient and effective use of funds.

Our competitive opportunity lies in the growing demand for specialized product designers, the absence of any programs in Kentucky, and the juxtaposition of the engineering and healthcare colleges at UK – close academic collaboration that will make us unique in the U.S.

The manufacturing industry accounts for 18.3% of Kentucky's annual economic output; the BSPD could deliver graduates into a lucrative employment market within its own state.

This new program will increase enrollment and program opportunities for the College of Design, which will offer a progressive program at a state university with lower enrollment fees, a copious job market, and salary earning potential of 21% higher than the national average. With an emphasis on healthcare design, we can focus on a current trend in U.S expenditure: 17.1% of the GNP was on healthcare in 2014 (19.9% by 2025).

Benchmark institutions: - Auburn: Limits admission to 45 undergraduates/year - University of Cincinnati: Confers an average of 79 Product Design degrees/year

University of Kentucky
BS - BACHELOR OF SCIENCE
50.0404-Industrial and Product Design.
Submission Date: 02/24/2020 09:28

Full Proposal - Basic Info

Institution :	University of Kentucky
Program Type :	Single Institution
Program Name :	Product Design
Degree Level :	Baccalaureate
Degree Designation :	BACHELOR OF SCIENCE
CIP Code (2-Digit) :	50-VISUAL AND PERFORMING ARTS.
CIP Code :	50.0404-Industrial and Product Design.

Academic Unit (e.g. Department, Division, School) :	College of Design
Name of Academic Unit :	College of Design
Name of Program Director :	Mitzi Vernon

Intended Date of Implementation :	8/23/2020
Anticipated Date for Granting First Degrees :	5/15/2024
Date of Governing Board Approval :	2/21/2020

Institutional Contact Information

First Name :	Annie
Last Name :	Weber
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University of Kentucky
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50.0404-Industrial and Product Design.
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Full Proposal - Mission: Centrality to the Institution's Mission and Consistency with State's Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

The following objectives illustrate the opportunity for Product Design at the University of Kentucky (UK) and in the Commonwealth.

Kentucky/Region: There are no schools in Kentucky offering a degree in Industrial or Product Design. Objective 1) offer a new design program to Kentucky high schoolers that they would otherwise have to travel outside the Commonwealth to experience. From 2017 marketing statistics, we know there is significant and growing demand for Product Design graduates that align with Kentucky's labor force. The manufacturing industry accounts for 18.3% of Kentucky's annual economic output. Since product designers are employed wherever products are mass produced, the College of Design's program will deliver graduates into a lucrative Kentucky employment market – e.g., Kentucky's motor vehicle manufacturing industry employs nearly 95,000 people and is the 3rd largest light-vehicle producer in the United States; yet there is no local resource of design talent from which to pull. Objective 2) provide manufacturing businesses a pool of local talent, in turn creating space for new businesses to emerge.

UK/College of Design: Objective 3) increase program offerings and enrollment for the College of Design, which will offer a progressive program at a state university with lower enrollment fees, a copious job market, and salary earning potential of 21% higher than the national average. The user experience (UX) and medical device specialization options will make the College and the University of Kentucky unique in the U.S., generating a national audience.

Students: Objective 4) create a distinctive product design program through collaborative specializations across campus (specifically with engineering and healthcare colleges). Nearly 90% of all Product Design jobs require a bachelor's degree, while a master's degree is preferred for nearly one in four positions. We propose both this BS and a future MS in Product Design and allow students to specialize, including UX and healthcare (UX specialists can anticipate salaries 50% higher than related design fields).

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2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

UK Mission: The proposed program supports the mission of the university by educating the next generation of leaders in product design, to address global challenges that include healthcare, economic inequity, food security, communication, transportation and climate phenomena, with innovative and sustainable solutions.

Transformational education is one of the outcomes of the novel curriculum of the proposed program. It offers prospective students a unique opportunity to combine technical and design educational experiences that lead to unique, career-transforming opportunities.

The proposed program also contributes to regional economic development. Coalescence of College of Design faculty, biomedical engineering, students and faculty from the healthcare campus and Kentucky industry representatives, will provide a new hub for industry leading product innovation, and in turn, motivate establishment of industrial manufacturing facilities in the area.

Statewide strategic agenda: The proposed BSPD provides educational opportunities that currently do not exist for Kentucky residents. It offers a creative new opportunity for obtaining a higher post-secondary education in multiple product fields including healthcare, transportation, housewares, agriculture, communication and computer technologies. This will promote attainment of the goal of 60% of the Kentucky population with a post-secondary degree.

The proposed program offers a unique new opportunity for creating new Kentucky based product design companies in addition to manufacturing companies that both employ product designers and also manfacture goods from new product development. Ensuring economic benefits from newly established companies partially satisfies one of the goals of the CPE Strategic Agenda

3. Explain how the proposed program addresses the state’s postsecondary education strategic agenda.

Statewide strategic agenda: The proposed BSPD provides educational opportunities that currently do not exist for Kentucky residents. It offers a creative new opportunity for obtaining a higher post-secondary education in multiple product fields including healthcare, transportation, housewares, agriculture, communication and computer technologies. This will promote attainment of the goal of 60% of the Kentucky population with a post-secondary degree.

The proposed program offers a unique new opportunity for creating new Kentucky based product design companies in addition to manufacturing companies that both employ product designers and also manfacture goods from new product development. Ensuring economic benefits from newly established companies partially satisfies one of the goals of the CPE Strategic Agenda

4. Explain how the proposed program furthers the statewide implementation plan.

Statewide strategic agenda: The proposed BSPD provides educational opportunities that currently do not exist for Kentucky residents. It offers a creative new opportunity for obtaining a higher post-secondary education in multiple product fields including healthcare, transportation, housewares, agriculture, communication and computer technologies. This will promote attainment of the goal of 60% of the Kentucky population with a post-secondary degree.

The proposed program offers a unique new opportunity for creating new Kentucky based product design companies in addition to manufacturing companies that both employ product designers and also manfacture goods from new product development. Ensuring economic benefits from newly established companies partially satisfies one of the goals of the CPE Strategic Agenda

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Full Proposal - Quality: Program Quality and Student Success

1. List all student learning outcomes of the program.

1: Successfully employ the design process to investigate, conceptualize and generate relevant solutions for design problems, both independently and within teams.

2: Strategically apply technical skill, knowledge and craft through two- and three-dimensional, analog and digital, prototypes to prove the feasibility of design concepts.

3: Clearly reference design history, trends in contemporary design, and current global issues in developing design strategies.

4: Convey project ideas in a clear and concise manner, through oral, written and visual formats.

5: Apply knowledge of user experience, ergonomics, contextual inquiry, user research methods and usability assessments in the design development process.

6: Perform as a professional designer as expressed through ethics, collaboration and leadership.

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

The objectives of the BSPD program are met by being the first program of its kind in the Commonwealth of Kentucky, strategically located in Lexington and also by seizing the unique opportunity to collaborate with the extensive healthcare part of the UK campus.

The curriculum is driven by the sequential Studio Sequence, which occurs every semester, and is worth 5 credit hours in each of those terms. Studios are supplemented by a sequence of Studio Support courses that are directly related to the respective studio in that semester focusing on specific skills and knowledge for the adjacent studio (e.g., ergonomics, user experience, human anatomy, etc.). In addition to these fundamental components, the UK Core courses and traditional PD (product design) Courses (e.g., computer modeling, materials and processes, professional practice, etc.) flank the central studio sequence. The most innovative aspect of the curriculum, however, is the PD Module system. Modules are essentially special topics courses with variable credit that allow flexibility for faculty or invited guests to teach focused, “deep dive,” short courses in long or compressed time. It allows for a diverse spread of topics under the following related areas: Design Competencies; Design Management; Social Impact & Innovation; Advanced Materials & Processes; Professional Development, and; Healthcare. This creates the greatest opportunity for collaborative course development with faculty in Biomedical Engineering, Nursing, Medicine, Dentistry, Pharmacy, Health Sciences and Public Health. At the undergraduate level these modules can be assembled as certificates or a minor.

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3. Highlight any distinctive qualities of this proposed program.

The proposed program is unique in three ways: it is unique to the Commonwealth of Kentucky; it is unique to most undergraduate and graduate programs in industrial/product design in the United States because of its nimble modular system of classes as a subset of the curriculum; and it is unique in the United States because of its intention to actively collaborate with Biomedical Engineering and other healthcare colleges on the campus. The proposed BSPD will confer graduates with a distinct competitive edge in the employment marketplace.

Students in the proposed program will benefit from unique learning experiences jointly contributed by internationally recognized faculty from the Colleges of Engineering, Design, Medicine, etc. These faculty will collaborate to provide mutually agreed assignments, joint lectures, designproject mentoring, as well as research-project mentoring. Students will receive from these faculty an extraordinarily rich exposure to a wide variety of classroom lectures, laboratory sessions, studio experiences, and immersion in actual industrial related healthcare challenges.

Industry representatives will contribute real-world product development challenges to senior project design students in this program, and thereby provide access to industrial technologies and learning experiences that rival those of traditional internship and co-operative arrangements.

4. Will this program replace any existing program(s) or specializations within an existing program?

YES

Please specify.

This program will enhance the School of Architecture, School of Interiors, and Department of Historic Preservation existing programs by creating synergy between undergraduate students in cross-listed courses, as well as providing dual-degree and minor options within the College of Design. The program will also enhance the opportunities for undergraduates in the Department of Landscape Architecture and Biomedical Engineering.

5. Include the projected faculty/student in major ratio.

The Bachelor of Science in Product Design curriculum is driven by sequential studios, occurring every semester (5 credit hours each term). This is where the most critical faculty-to-student ratio occurs, and we anticipate that to be no greater than 1 to 18, with a projection of 70 majors by year 4 of the program. Should the level of enrollment grow as anticipated given the potential in Kentucky and beyond, we would move to two studios per year in Year 5, retaining the ratio but doubling the majors. In other core courses that are more lecture-based, the ratio will begin at 1 to 18 and is projected to grow to 1 to 36 at the end of four years. These ratios mirror the current faculty to student ratios in the College of Design.

6. Is there a specialized accrediting agency related to this program?

NO

7. Attach SACS Faculty Roster Form.

ProductDesign_faculty roster.pdf

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8. A. Describe the library resources available to support this program. You may attach any documentation provided to SACS.

The University of Kentucky, the flagship public university for the Commonwealth of Kentucky, maintains the premier research library in the state. This library is composed of 11 major facilities: William T. Young Library, Agricultural Information Center, Education Library, Shaver Engineering Library, John A. Morris Equine Library, Lucille Caudill Little Fine Arts Library, Medical Center Library, Science Library, Special Collections, the Kentucky Transportation Center Library, and the Hunter M. Adams College of Design Library, which resides in the current main administration building for the College of Design, Pence Hall. The Design Library has an extensive collection of books and journals relating to product design via its intrinsic connection to both architecture and interior design, and a rich archive of rare books and manuscripts that concern design at multiple scales.

Between the twelve facilities comprising the library network, the university has access to 4,023,142 printed volumes, 588,428 electronic volumes, more than 400 commercial databases and archival manuscripts, and a broad collection of computer files, microforms, maps, film/video, audio and graphics. Annual collections expenditures total more than $11.1 million. In FY12, 6.6 million searches were conducted in licensed databases and 2.8 million full-text articles were downloaded.

UK Libraries collections support teaching, learning, and research in agricultural sciences, life sciences, chemistry, geological sciences, mathematics, physics, humanities, history, social sciences, economics, communications, information studies, business, fine arts, medicine, nursing, dentistry, health sciences, engineering, computer science, and veterinary science.

B. Describe the physical facilities and instructional equipment available to support this program. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.

Currently, the College of Design occupies four buildings in the core of campus. Pence Hall houses staff, administration, library, printing and plotting, computer lab, fabrication lab, lecture hall, faculty offices, design studios, review space, and classrooms. Miller Hall contains faculty offices, design studios, and review space. Bowman Hall has faculty offices, design studios, review space, and classrooms, and the Funkhouser Building holds faculty offices, design studios, review space, classrooms, and a materials library.

The Workshop and Digital Fabrication Lab is a critical component to all design degrees. Currently, this resides in the lower level of Pence Hall. The current space provides a safe, well-maintained environment in which both students and faculty can explore three-dimensional construction in natural (wood, metal) and synthetic media, 2- and 3-dimensional. Shop facilities provide standard material shaping tools, e.g. lathe, grinder, milling machine, welding, etc. and hand tools, in addition to digital fabrication equipment.

The College of Design will be moving into a renovated adaptive reuse building in Fall of 2022, which will house all existing College programs with enhanced facilities, including library, studios, offices, classrooms and fabrication labs.

9. Clearly state the admission, and retention, and completion standards designed to encourage high quality.

Admission criteria for the proposed program include: a) completion of high school with coursework GPA of 3.0 or greater, b) ACT score of 22 or greater, c) demonstrated innovation/invention interest or capabilities. Programs within the College of Design require selective admission. Product Design will follow this tradition. The admissions committee will evaluate applications, which will include a portfolio or essay component to address prior high school or other relate coursework or skillset.

Student retention begins with an annual (conclusion of the spring semester) evaluation of student progress. Bachelor of Science in Product Design faculty will evaluate student progress and if needed, recommend remedial counseling for performance improvement. The Bachelor of Science in Product Design Director will provide individualized counseling to students as needed.

Graduation requirements include: a) completion of all required coursework, b) attainment of a within-major GPA of 3.0 or greater, and c) successful defense of their senior studio project

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10. Clearly state the degree completion requirements for the program.

Requirements for successful program completion include: a) successfully earning credit for all required and elective (including UK Core) courses in the Bachelor of Science in Product Design, b) successful oral and written defense of the required senior design project, c) successful team performance in pursuit of the required senior design project, d) overall GPA of 2.5 or greater, and e) within major GPA of 3.0 or greater.

Name	Total number of hours required for degree	Number of hours in degree program core	Number of hours in guided electives	Number of hours in free electives
Program	120	83	12	6

12. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.

There is no planned articulation of the proposed BSPD with other programs in the state; there are no other programs of this nature in the Commonwealth. There are plans for articulation of this program with the concurrently proposed dual Bachelors Degrees in Biomedical Engineering and Product Design, and the proposed BS BME.

All current UK transfer policies will apply.

13. List courses under the appropriate curricular headings.

Product Design_BA_program Curriculum V2_Jan 31.xlsx

14. Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)?

NO

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Full Proposal - Demand: Program Demand/Unnecessary Duplication

1. Student Demand:

a. Provide evidence of student demand at the regional, state and national levels.

In preparation for the BSPD proposal, the College contracted with STAMATS, a higher education marketing firm to compile/assess data on the regional/national opportunity for this degree at the University of Kentucky. All projections in this proposal stem from that report and the formation of an internal and external roundtable of experts in 2017.

In the U.S., there is currently 12% growth in product design degrees and 20% growth in programs. There are no schools in Kentucky offering a degree in Industrial or Product Design.

Our competitive opportunity lies in the growing demand for specialized product designers (e.g., user experience (UX) designers), the absence of any graduates in Kentucky, and the juxtaposition of the engineering and healthcare colleges at UK –collaboration will make us unique in the U.S. Within the data collected, job titles associated with product design indicate a very high demand for UX designers, which is particularly noteworthy regarding implications for collaboration with engineering and healthcare. The most robust programs in the U.S. are integrated programs of design, engineering, and communications. The manufacturing industry accounts for 18.3% of Kentucky's annual economic output; the BSPD could deliver graduates into a lucrative employment market. In 2016, there were 14,161 jobs posted for product design positions in the U.S. The data indicates that the labor market for such professionals is large and growing at approximately the same rate as the broader U.S. economy.

This BSPD will increase enrollment and program opportunities for the College of Design, offering a progressive program with lower enrollment fees, a copious job market, and salary earning potential of 21% higher than the national average. Professionals in the product design field can expect higher salaries than 59% of all positions offering $75K or more. With an emphasis on healthcare design, we can focus on a current trend in U.S expenditure: 17.1% of the GNP was on healthcare in 2014 (19.9% by 2025).

b. Identify the applicant pool and how they will be reached.

The applicant pool for the proposed Bachelor of Science in Product Design includes all students seeking a career in product design or user experience, and especially those interested in a focus in healthcare.
Specifically identified potential applicants include:
1)high school STEM (science, technology, engineering, math) majors considering careers in healthcare related fields, transportation, athletic apparel or gear, communication systems or devices, tools, housewares, et al.
2)high-school students contemplating a career in engineering or art,
3)existing UK students who may want to consider transferring using our pending summer accelerated studio option,
4) existing UK students who seek greater depth of understanding of basic product design to augment their major degrees.
Potential applicants will be reached through a multi-modal marketing plan organized by a new advisory council formed the year before the official launch of the Bachelor of Science in Product Design. The College Recruitment Director, Communications Director and Associate Dean for Students will be actively involved with the council and the launch of the new program.

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c. Describe the student recruitment and selection process.

Recruitment efforts by the College of Design will promote the Bachelor of Science in Product Design program among the primary feeders and target audiences with marketing materials that are part of a growing collateral in the College referred to as the “card series.” Each academic unit and ancillary programs such as international study and our developing “field school” have launched a series of digital and analog recruitment cards used by our Office of Recruitment and Student Services. Additionally, faculty and administrators will use conferences and professional networks to further promote the program and will personally communicate with interested students to encourage their application. A dedicated admissions committee with the Recruitment Office will be responsible for admissions. The application requires a statement of interest and GPA and relevant test scores.

d. Identify the primary feeders for the program.

The primary feeders include, but are not limited to:
1)high school STEM (science, technology, engineering, math) majors considering careers in healthcare related fields, transportation, athletic apparel or gear, communication systems or devices, tools, housewares, packaging, et al.
2)high-school students contemplating a career in engineering or art,
3)existing UK students who may want to consider transferring using our pending summer accelerated studio option,
4) existing UK students who seek greater depth of understanding of basic product design to augment their major degrees

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

By the end of the 5th year of the program, and after the first graduating class, the total new enrollment to the campus is anticipated to be 93 from the Bachelor of Science in Product Design program. This forecast is a conservative estimate based on the STAMATS analysis of current demand and growth for product design graduates and programs across the U.S. It is also based on regional benchmark institutions, such as Virginia Tech, which grew from 2 to 60 majors within its first two program years (no other programs exist in Virginia), and based on other programs, such as Auburn, that limit enrollment, turning away applicants.

f. Project estimated student demand for the first five years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) - Fall Semester
2020-2021	0	18
2021-2022	0	37
2022-2023	0	48
2023-2024	16	71
2024-2025	19	93

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2. Employer Demand:

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

In preparation for the BSPD proposal, the College contracted with STAMATS, a higher education marketing firm to compile/assess data on the regional/national opportunity for this degree at the University of Kentucky. In the U.S., there is currently 12% growth in product design degrees and 20% growth in programs.

The manufacturing industry accounts for 18.3% of Kentucky's annual economic output; the BSPD could deliver graduates into a lucrative employment market. In 2016, there were 14,161 jobs posted for product design positions in the U.S. The data indicates that the labor market for such professionals is large and growing at approximately the same rate as the broader U.S. economy.

This BSPD will increase enrollment and program opportunities for the College of Design, offering a progressive program with lower enrollment fees, a copious job market, and salary earning potential of 21% higher than the national average. Professionals in the product design field can expect higher salaries than 59% of all positions offering $75K or more. With an emphasis on healthcare design, we can focus on a current trend in U.S expenditure: 17.1% of the GNP was on healthcare in 2014 (19.9% by 2025).

Based on STAMATS data and recent reports at the Industrial Designers Society of America (IDSA), entry level product designers can expect to make $60 - $70K, while entry level UX designers can expect $100K with significant demand over the next decade. Across the U.S. in 2016, 14,161 jobs related to product design were posted and that number has been growing steadily since 2011 but more rapidly since 2014. Nearly 1 in 5 jobs related to product design posted in 2016 were located in the Detroit area, suggesting the demand for designers for automotive design. San Francisco and New York were the next two locations with the highest number of job postings, followed by Los Angeles, San Jose, Chicago, Boston, Seattle, Minneapolis, Phoenix, Atlanta, Washington, DC, Dallas, Portland, OR, Philadeplphia, Cleveland, Milwaukee, Charlotte, in that order.

Below are statistics from the Bureau of Labor Statistics, including Commercial and Industrial Design and other related fields.

	Regional	State	National
Type of Job	Commercial & Industrial Design		
Wage	$64,980	$67,426	$65,970
Number of Openings(5 years)	15	49	41,400
Type of Job	Design, Other Design, Other	Design, Other	
Wage	$36,389	$35,584	$55,930
Number of Openings (5 year)	8	26	5,800
Type of Job	Exhibit Designers	Exhibit Designers	Exhibit Designers
Wage	$49,260	$47,185	$53,090
Number of Openings(5 year)	8	16	1,600
Type of Job	Art Director	Art Director	Art Director
Wage	$75,547	$74,538	$92,500
Number of Openings(5 year)	42	73	5,400

3. Academic Disciplinary Needs:

NA

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a. If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.

(Should not be blank)

4. Similar programs:

a. Are there similar programs in other Southern Regional Education Board (SREB) states and in the nation?

YES

Please identify similar programs in other SREB states and in the nation.

SREB
University of Houston
University of Louisiana-Lafayette
Auburn University
Georgia Institute of Technology
Savannah College of Art and Design (SCAD)
Art Institute of Fort Lauderdale
Appalachian State University
North Carolina State University
James Madison University
Virginia Tech
Maryland Institute College of Art (MICA)

b. Our records indicate the following similar programs exist at public institutions in Kentucky.

---- No Programs Exist----

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Full Proposal - Cost: Cost and Funding of the Proposed Program

1. Will this program require additional resources?

YES

Please provide a brief summary of additional resources that will be needed to implement this program over the next five years.

New faculty will be phased in during the first five years of the program. In 2019-20, an advisory council will be formed with internal and external members and a senior consultant to help develop the marketing plan for the first students for Fall 2020 and the first tenure-track, junior faculty hire for Fall 2020, in addition to two visiting instructors. In total four new faculty hires will be needed during the first five years of the Bachelor of Science in Product Design program, with the assistance of 1-2 visiting faculty each of those years. During that initial five-year period, the Bachelor of Science 20 For questions about cost and funding of the program, please contact your department chair, business officer, or associate dean for academic affairs.
The bachelor of science in Product Design will share an administrative staff position with another academic unit. The program will require classroom and studio space, workshop and technology access, and library facilities. The scale of these requirements will grow with increased enrollment; however, the anticipated new building for the College will more than accommodate this growth, and the timing more than adequate. Resources for all new faculty will be obtained from revenues derived from undergraduate tuition per new program policy.

2. Will this program impact existing programs and/or organizational units within your institution?

YES

Please describe the impact.

The Bachelor of Science in Product Design in the College of Design (CoD) will have a symbiotic relationship with the concurrently proposed BS BME in biomedical engineering in the College of Engineering (CoE).
Specifically, faculty from PD will work collaboratively with faculty from BME to teach students product design basics and supervise their work in studio exercises. Faculty from BME will work with faculty from the CoD to teach students regarding the technical constraints of engineering which are further compounded by the unique aspects of human healthcare. Faculty from BME and the CoD will co-mentor students in their senior design projects.

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

The Bachelor of Science in Product Design is a new program of study for the Commonwealth of
Kentucky in a field that has been steadily growing at the national level since 2011 and rapidly since 2014. The program will generate sufficient funding through student tuition and allocated
resources.
In preparation for this proposal, the working proforma for student and tuition revenue projections and other income and expenditures were based on the following: a roundtable event in fall of 2017 with external and internal experts in the field; the STAMATS analysis and report; the Provost's Business Office (PBO), two campus business officers; and the Office of Strategic Planning & Institutional Effectiveness (OSPIE). While Year 1 and 2 are expectedly lean and perhaps needing scaffolding from the College, by Year 5 in the program, revenue of $1.4M is projected.

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A. Funding Sources, by year of program	1st year	2nd year	3rd year	4th year	5th year
	0	0	0	0	0
Total Resources Available from Federal Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Total Resources Available from Other Non-State Sources					
New :	0	0	0	20000	20000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	We conservatively project industry sponsored senior projects by Year 4 in conjunction with the new Bachelor of Science in Biomedical Engineering.				
State Resources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Internal					
Allocation :	27000	62900	82250	126000	165006
Reallocation :	0	0	0	0	0
Narrative Explanation/Justification :	Every student in the College of Design pays a technology fee, which helps us cover software, computer lab and shop maintenance, workshop and printing materials, and salaries for those staff dedicated fully to student shop and IT support. The College of Design students provides an intensive maker education.				
Student Tuition					
New :	204736	498665	642428	1008634	1309393
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Assuming new program tuition sharing model: 60% return to college, with 3% increase each year. These figures also include both in-state and out-of state tuition.				
Total					
New :	$231,736	$561,565	$724,678	$1,154,634	$1,494,399
Existing :	$0	$0	$0	$0	$0
Total Funding Sources :	$231,736	$561,565	$724,678	$1,154,634	$1,494,399

B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Staff: Executive, administrative, and managerial					
New :	0	0	0	0	64000
Existing :	32000	32640	33280	33920	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Other Professional					
New :	144000	167000	88000	112000	0
Existing :	0	146880	319657	380883	501741
Faculty					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Graduate Assistants (if master's or doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Student Employees					
New :	0	0	0	10530	10530
Existing :	0	0	0	0	10530
Narrative Explanation/Justification :	We will use 50% of an existing Administrative Assistant each of first 4 years, and hire full time beginning Year 5. Assume 2% salary increase each year. In Year 1, we will use a consultant, one junior faculty hire, one lecturer and the Dean of the College to handle teaching. One senior faculty hire will take place to begin in Year 2 - this hire will likely be the inaugural director. We will also hire adjunct support in Year 2. We will hire a second junior faculty in Year 3. We will use 50% of an existing Administrative Assistant each of the first 4 years, and hire full time beginning Year 5. Assume 2% salary increase each year. We anticipate allocating our first graduate teaching assistant in Year 4 and adding a second in Year 5.				
Equipment and Instructional Materials					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Library					
New :	2000	2000	2000	2000	2000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	We anticipate $2,000 annually, of new support, for the Design Library,provided by the central university library.				
Contractual Services					
New :	25000	0	0	0	0
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Narrative Explanation/Justification :	For Year 1 and the prior year, we will contract with a senior academic administrative consultant to help lead the launch of the program.				
Academic and/or Student Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Other Support Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Faculty Development					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Funds for faculty conference and research travel are including in program operating support, which is listed below in the "Other" category. Computer and IT support will be included in our College IT budget and part of a package computer lease agreement.				
Assessment					
New :	0	0	0	0	7500
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	NASAD, the accrediting body for product design, may make their first visit in Year 5.				
Student Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Faculty Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	N/A				
Other					
New :	10000	10000	15000	25000	30000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	This budget includes general operational support: faculty travel, special student project funds, guest speakers, CNS fees, etc.				

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Total					
New :	$181,000	$179,000	$105,000	$149,530	$114,030
Existing :	$32,000	$179,520	$352,937	$414,803	$512,271
Total Budget Expenses/Requirements :	$213,000	$358,520	$457,937	$564,333	$626,301

Grand Total					
Total Net Cost :	$18,736	$203,045	$266,741	$590,301	$868,098

Kentucky Postsecondary Program Proposal System

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Full-Proposal - Assess: Program Review and Assessment

1. For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:

a. Which components will be evaluated?

Full assessment plan was uploaded under curriculum

b. When will the components be evaluated?

Full assessment plan was uploaded under curriculum

c. When will the data be collected?

Full assessment plan was uploaded under curriculum

d. How will the data be collected?

Full assessment plan was uploaded under curriculum

e. What will be the benchmarks and/or targets to be achieved?

Full assessment plan was uploaded under curriculum

f. What individuals or groups will be responsible for data collection?

Full assessment plan was uploaded under curriculum

g. How will the data and findings be shared with faculty?

Full assessment plan was uploaded under curriculum

h. How will the data be used for making programmatic improvements?

Full assessment plan was uploaded under curriculum

2. What are the measures of teaching effectiveness?

All Instructors of Record teaching courses in the Bachelor of Science in Product Design program will be required to use the on-line Teacher Course Evaluation (TCE) process to obtain teaching effectiveness data from each student. The Director will require TCE data from each instructor each semester he or she teaches a program-relevant course.
For the first three years of the proposed program, because of the ongoing collaborative work with Biomedical Engineering, each product design course in the curriculum will be evaluated by a combination of design, product design, and biomedical engineering faculty at the end of the spring semester of that academic year. Course evaluations will focus on student grades and all metrics obtained from course TCEs. Each instructor will be asked to provide a self-generated SWOT (strengths, weaknesses, opportunities, threats) assessment of this course and their teaching effectiveness.
The Director will review the summarized TCE data and reflective statements and provide necessary feedback to the faculty annually.

3. What efforts to improve teaching effectiveness will be pursued based on these measures?

The Bachelor of Science in Product Design Director, and, as appropriate, other unit directors in the College and in Biomedical Engineering, will attend classes taught by the Instructor of Record in which sub-standard teaching metrics exist. These, and other faculty, will provide recommendations
for curriculum modification or teaching improvement as necessary

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4. What are the plans to evaluate students' post-graduate success?

Administrative assistants in the Bachelor of Science in Product Design program and the Student Services Office will collect, organize, and distribute the following metrics evaluating post-graduate student success: a) number and type (industry/office type) of job offers received, b) starting salary (compared to U.S. national averaged for Product Design/Industrial Design/User Experience (UX) graduates), c) duration of employment at each position, d) promotions received, e) patents, products or inventions pursued, f) publications, public lectures, or media citations of the graduate.

Course Title (CIP)						
Degree Program Core Courses (i.e., Courses required by ALL students in the Major--includes Premajor or Preprofessional courses)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Type of Course: program core (C) or pre-major/ pre-professional (P)**	**Credit Hours**	**Existing (E) or New (N) Course**
PRD	130	History of Design Technology	With some reference to primitive cultures of making and production, this course covers primarily the industrialization of 19th and 20th century Western society. Special reference will be given to the designed artifact and pivotal moments of influence in invention and production. The origin of the concept of technology and the use of the term post World War I will figure into the discourse. The emphasis of the course is understanding the progression of technology through time.	C	3	N
PRD	115	Form workshop I	This is one of two required short courses (with PRD 116) of five weeks each, focusing on wood, metal and plastic work. These short courses are intended to introduce students to the College of Design workshop and the primary machines for each material through exercises that are directly related to safety and to PRD 120 Form Studio, running parallel in the fall semester. Instruction includes shop safety, types of materials, power equipment and hand tool usage, fabrication skills, mold making, casting, detailing and finishing, all emphasizing hand skills, proper and safe process and accuracy.	c	1	N
PRD	116	Form workshop II	This is the second of two required short courses, following PRD 115, of five weeks each, focusing on wood, metal and plastic work. These short courses are intended to introduce students to the College of Design workshop and the primary machines for each material through exercises that are directly related to safety and to PRD 120 Form Studio, running parallel in the fall semester. Instruction includes shop safety, types of materials, power equipment and hand tool usage, fabrication skills, mold making, casting, detailing and finishing, all emphasizing hand skills, proper and safe process and accuracy	C	1	N
prd	150	Computer-Aided Design I	An introduction to computer-aided, 2D and 3D design and modeling as applied in the product design process using both solid and surface software modeling techniques.	c	1	N
PRD	151	Computer-Aided Design II	A continuation of PRD 150 adding a broader spectrum of computer-aided design (CAD) software options to the product design student palette. At the end of the PRD 150-151 sequence students will be conversant in: 2D tools, solid modeling tools, surface modeling tools, measured drawings, computer-aided rendering, and 3D output. Prereq: PRD 150	c	1	N
PRD	160	Design Visualization: Analog	An introduction of 2D modes of representation. Emphasis is placed on the development of drawing skills to facilitate documentation, analysis and presentation in the design process. This class will prepare students to think about, analyze, and then to describe 3D form and space using analog tools. Students will practice describing and conceptualizing various forms and spaces through two-dimensional representation. The course will employ methods such as freehand sketching and rendering using traditional media such as marker, pen, and watercolor.	c	2	N
prd/egr	110	Colloquim: Topics in Product Design	Colloquium of speakers addressing a broad array of topics in the humanities and the sciences that set up design problems for discussion. Emphasis is on the role and opportunity of design in society. Student response expected within the respective studio work.	c	1	N
PRD/BME	170	Human Anatomy for Design	Explores the structure and function of the human body to facilitate understanding of the body's interface with product design. Bone, muscle, neural, circulatory, and digestive systems will be studied and considered with respect to product design-oriented tasks such as mobility, seating, physical tasks, digital and electronic interactions, etc. The course will delve into physiological themes, such as how structure and function are closely related and the need for product designers to consider the two-way flow of information/interactions from body to product and product to body, and the effects of each on product and human function. This course is part of a sequence of courses that advances in complexity over 5 semesters, and it establishes the foundation for - advanced coursework in ergonomics, materials, user interface, and user experience design	c	3	
prd	120	Form Studio	The Form Studio is an introduction to the studio discipline of design where students develop a broad understanding of all design disciplines through overarching elements and principles that connect them. We will address basic elements of design visually, conceptually, and haptically. We will focus on the process of design, discover through experimentation, develop aesthetic judgment, and find means of self-evaluation. Expect a focus on intellectual discipline, dialogue, assertion of interest, and a self-motivated search for critical issues. Studies will include 2D and 3D exercises, emphasizing materials, fabrication processes, prototype iteration, storyboarding, written documentation of design process, and verbal presentation.	c	5	
PRD	121	Product Desig Studio I	This is the first fully dedicated studio to product design, and it provides a transition from an emphasis on abstract form to primitive and utilitarian form in tools, housewares and healthcare. PRD 170 is taught in conjunction with this course to support a focus on human anatomy and physical interface with products. Prereq: PRD 120, PRD 115, PRD 116.	c	5	N
PRD-EGR	250	Computer-Aided Design: Solidworks	This course focuses on the fundamental tools of Solidworks (the industry standard CAD software for product design). Students will learn and practice using all methods of rapid representation available in the College of Design (fused deposition modeling (FDM), Objet, starch and CNC) and methods of prototype creation with vendors outside the College. Exercises and projects focus on workflow, basic rendering and drawings to make simple multi-part objects. Prereq: PRD 150- 151.	c	2	N
PRD	200	History & Theory of Product Design II	A basic understanding of the history of product design, significant design movements, designers, manufacturers, innovations in technology and material use, and intellectual property (IP) development. This is the first half of a two-part history sequence in the program. The lectures present a chronological overview of the profession of Product Design and its antecedents. Coursework includes extensive reading, in-class presentations based on independent research and writing.	c	2	N
PRD	210	History & Theory of Product Design II	A basic understanding of the history of product design, significant design movements, designers, manufacturers, innovations in technology and material use, and intellectual property (IP) development. This is the second half of a two-part history sequence in the program. The lectures present a chronological overview of the profession of Product Design and its antecedents. Coursework includes extensive reading, in-class presentations based on independent research and writing.	c	2	N
PRD	260	Design Visualization: Digital	Introductory to advanced use of the Adobe Creative Suite (Photoshop, Illustrator, InDesign). Students will be taught how to use basic brushes, layer effects, sketching in Photoshop, and shortcuts. Assignments will include how to sketch products, render materials, lighting, and graphics. The course will further focus on blending analog and digital methods through tablet tools and will introduce Keynote/Powerpoint and cloud-based services. Prereq: PRD 160.	c	2	

PRD	**261**	**Design Visualiazation: Photography & Portfolio**	A presentation and storytelling class. It focuses on how to visually communicate your projects and process succinctly through techniques that include graphic design, photography, videography, and 3D rendering in order to convey a work narrative through multiple conduits (websites, social media, presentation decks and print media). This class will also cover basic camera optics and lighting techniques for high quality digital images for print or digital portfolio applications. Discussion will include manual controls on the digital camera to obtain desired effects for representing 2D and 3D objects and manipulation of natural and artificial lighting. Further, the course will serve as an introduction to connecting with peers and professionals in preparation for internships and full-time employment. Prereq: PRD 260.	**c**	**2**	
PRD	**220**	**Product Design Studio III**	Introduction to systematic processes in design. Introduction to ergonomics and systematic planning methods in the development of industrial products in the areas of work, education and health. Development of professional presentation skills and methods. Prereq: PRD 121.	**c**	**5**	
PRD	**221**	**Product Design Studio III**	The first of four advanced product design studios introducing students to the complete design process from concept to production. Focus on advanced ergonomics and an introduction to design research methods within the design process. Students will learn about the advances in 3-D printing, bio-grown materials, wearable tech, digital printed imagery. Prereq: PRD 221.	**C**	**5**	**N**
PRD	**370**	**Design Research Methods**	Discusses procedures and methods in the collection, analysis and evaluation of data to inform the design process. The course involves exercises in developing a research question and usability research strategies for investigating problems in user/product and user/environment relationships. Most of the strategies employ ethnographic methods. The course examines the definitions of knowledge, information, and data and how they are used in research.	C	**3**	**N**
PRD/BME	**350**	**Materials & Processes**	A survey of current materials, processes, techniques and equipment used in the design of products for mass production. A significant portion of the design process is devoted to manufacturing questions - how materials are selected, shaped, and then assembled. This course will include field visits to manufacturing facilities.	C	**3**	**N**
PRD	**460**	**Portfolio for Product Design**		**C**	**2**	**N**
PRD	**451**	**Integrated Entrepreneurship**	This course focuses on the relationship between design and entrepreneurship: exploring basic business vocabulary and how design vocabulary and design processes overlap, complement and enhance business operations and opportunities. The organization of the course focuses on assembling multidisciplinary teams to engage in the process of bringing a product to market, building a business concept around a core competency in design, the structure of a design office, and the development and protections of intellectual property. The course works in parallel to PRD 420 Integrated Studio, using projects from this studio as case studies. Intrinsic points of discussion include: design project management, project organization and leadership and start-up protocol. Prereq: Senior standing or permission of instructor.	**C**	**2**	**N**
PRD	**120**	**Product Design Studio IV**	The first of four advanced product design studios introducing students to the complete design process from concept to production. Focus on advanced ergonomics and an introduction to design research methods within the design process. Students will learn about the advances in 3-D printing, bio-grown materials, wearable tech, digital printed imagery. Prereq: PRD 221.	**C**	**5**	**N**
PDR	**321**	**Product Design Studio V**	Continuation of PRD 320 as the second of four advanced product design studios introducing students to the complete design process from concept to production. Focus on advanced user experience (UX) design with an introduction to design for social impact. This studio investigates, develops and executes a specific design objective that provides innovative solutions for social impact and sustainability. Prereq: PRD 320.	**C**	**5**	**N**
PRD	**420**	**Integrated Studio II**	ntroduces transdisciplinary team-based work focusing on problem identification, detailed analysis, research and application of ergonomics and user-centered research methods for new product development. Design and construction of full scale, interactive models and spaces. Emphasis on the needs, the production and marketing factors of niche populations, such as older adults and those with disabilities. Prereq: PRD 321.	**C**	**5**	**N**
PRD	**421**	**Integrated Studio II**	Terminal design studio for Product Design majors requiring a senior thesis with/or alongside multidisciplinary students, incorporating a short multimedia final presentation in addition to 2D and 3D deliverables. Emphasis on entrepreneurship, concept to production. Prereq: PRD 420.	**C**	**5**	**N**
PRD/BME	**371**	**Ergonomics**	This course is supplemental to PRD 320 Product Design Studio III and discusses advanced concepts of ergonomics with respect to product design. Students will create 2D and 3D studies of situations requiring a diagrammatic understanding of human factors and ergonomic issues. Students will learn how to conduct a range of usability tests to evaluate and improve ergonomic conditions. Projects from PRD 321 and other studio courses within the College of Design will serve as case studies for analysis and application of course content. Prereq: PRD/BME 271.	**C**	**1**	**N**
PRD/BME	**372**	**UX + UI for Product Design**	This course is supplemental to PRD 321 Product Design Studio III and introduces principles and methodologies of user interface and interaction design as critical elements of user experience design. Students will create interaction diagrams and develop prototypes for products and/or services. Students will learn and apply principles of visual communication, typography and motion design to create visually appealing, intuitive and feedback-based user interfaces. Students will learn how to conduct a range of usability tests to evaluate and improve interface designs. Projects from PRD 321 and other studio courses within the College of Design will serve as case studies for analysis and application of course content. Prereq: PRD/BME 272.	**C**	**1**	**N**
PRD/BME	**471**	**Advanced Ergonomics**	This course is supplemental to PRD 420 Integrated Studio and discusses advanced concepts of ergonomics with respect to interdisciplinary and sponsored projects. Students will create 2D and 3D studies of situations requiring a diagrammatic understanding of human factors and ergonomic issues. Students will apply a range of usability tests to evaluate and improve ergonomic conditions in the Integrated Studio projects. Prereq: PRD/BME 371.	**C**	**1**	**N**
PRD/BME	**410**	**Colloquium: Topics in Product Design II**	Colloquium of speakers addressing a broad array of advanced topics in product design for regional, global, and niche audience design problems for discussion. Emphasis is on the role and opportunity of design in society. Student response expected within the respective studio work.	**C**	**1**	**N**
			Total Credit hours Required for Program Core (i.e., # of hours in degree program core) **Note: number recorded will automatically populate Core Hours in "Summary of Total Program Hours" table**		**34**	**NA**

Core Courses Required for Track(s), Concentration(s), or Speciality(s) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
Total Credit hours Required for Program Options (Track(s), Concentration(s), or Speciality) (if applicable) **Note: number recorded will automatically populate Program Option hours in "Summary of Total Program Hours" table**					**0**	**NA**
GUIDED Elective Courses (i.e., Specified list of Program Electives AND/OR Electives focused on a specific track/concentration/or speciality) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
PRD	**510**	**Design Competencies**	This course is one of several special topics courses in the Product Design program in the College of Design. Within these topic categories are multiple options for courses of smaller, more flexible units of credit, providing opportunities for deeper exploration of specialized areas of product design. Design Competencies includes the following specializations that focus on design-related media: Printmaking; Book Making; Branding; Packaging; Typography; Videography; Animation; 3D Media; 2D Media; Data Visualization. May be repeated unlimited under different subtitles.		**1-6**	
PRD	**520**	**Design Management**	This course is one of several special topics courses in the Product Design program in the College of Design. Within these topic categories are multiple options for courses of smaller, more flexible units of credit, providing opportunities for deeper exploration of specialized areas of product design. Design Management includes the following specializations that focus on project management and all design process: Project Budget; Team Organization; Project Leadership; Communications; Design for Manufacturing; Collaboration. May be repeated unlimited under different subtitles.		**1-6**	
PRD	**530**	**Social Impact & Innovation**	This course is one of several special topics courses in the Product Design program in the College of Design. Within these topic categories are multiple options for courses of smaller, more flexible units of credit, providing opportunities for deeper exploration of specialized areas of product design. Social Impact & Innovation focuses on any of the following: Product Design for the Developing World; Service Learning; Humanitarian & Sustainable Design; Systems Theory; Advanced History; Social Anthropology; Community Health; Food Security. May be repeated unlimited under different subtitles.		**1-6**	
PRD	**540**	**Advanced Materials & Processes**	This course is one of several special topics courses in the Product Design program in the College of Design. Within these topic categories are multiple options for courses of smaller, more flexible units of credit, providing opportunities for deeper exploration of specialized areas of product design. Advanced Materials & Processes includes the following specializations that focus on contemporary materials, information technology and modern fabrication: Mobile App Development; Sensors; Arduino; Raspberry Pi; Coding for Designers; Robotics; Advanced Materials; Advanced Manufacturing; Smart Textiles; VR/AR Interfaces. May be repeated unlimited under different subtitles.		**1-6**	
PRD	**550**	**Professional Development**	This course is one of several special topics courses in the Product Design program in the College of Design. Within these topic categories are multiple options for courses of smaller, more flexible units of credit, providing opportunities for deeper exploration of specialized areas of product design. Professional Development includes the following specializations that focus on preparation for entry into the professional world: Public Speaking; Portfolio Web Development; Career Strategy; Professional & Technical Writing; Resume & Biography. May be repeated unlimited under different subtitles.		**1-6**	
PRD	**560**	**Healthcare**	This course is one of several special topics courses in the Product Design program in the College of Design. Within these topic categories are multiple options for courses of smaller, more flexible units of credit, providing opportunities for deeper exploration of specialized areas of product design. Healthcare encompasses a wide range of specializations connecting product design to the healthcare service and product industry: History of Medical Devices; Healthcare Management; Regulatory Barriers; Assistive Devices; Design Research Methods; Clinical Observation; Medical Device Trials; Point-of-Care Instruments. May be repeated unlimited under different subtitles		**1-6**	
# of REQUIRED Credit hours in Guided Electives (i.e., electives for a focused or track/concentration/speciality are). If 9 hours is required and there are 15 hours to choose from, then only 9 hours are required) **Note: number recorded will automatically populate Guided Elective hours in "Summary of Total Program Hours" table**					**12**	**NA**

FREE Elective Courses (i.e, general program electives, open to the students to choose) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			Total # of Credit Hours in Free Electives (i.e., general program electives) (if applicable)		**0**	**NA**
		Summary of Total Program Hours	**Required Core Hours (i.e., # of hours in degree program core)**		**34**	NA
			Required Program Options - Track/Concentration/Specialty Hours (if applicable)		**0**	NA
			Guided Elective Hours (e.g., focused or track/concentration/speciality area specific electives) (if applicable)		**12**	NA
			Free Elective Hours (i.e., general program electives) (if applicable)		**0**	NA
			Total # of credit hours required for Program		**46**	**NA**
		Information to be completed by PIE Office				
			# of new courses			NA
			Total # of Courses (includes new and existing)			NA
			Precentage of new courses (more than 25% may require SACS Substantive Change)		#VALUE!	NA

PROPOSED PROGRAM SUMMARY

Council on Postsecondary Education

Institution:	***University of Kentucky***
Program Name:	***Supply Chain Engineering***
Degree Designation	***Master of Science***
CIP Code:	***14.3501***
Credit Hours:	***30***
(Tentative) Institutional Board Approval Date:	***2/21/2020***
Implementation Date:	***08/23/2020***

Program Description:

Describe the program and its aims

This two-year, 30 credit hour, online MS in Supply Chain Engineering (SCE) program is targeted at teaching students the multi-disciplinary knowledge and skills necessary to design, evaluate, and improve transformational and logistical functions in supply chains.

The SCE program and the new Supply Chain Management (SCM) MS program, proposed by the Gatton College of Business & Economics, are designed as two independent degree programs sharing a set of common core courses.

SCE is a non-thesis degree that shares three common core courses (9 credit hours) with SCM, has five Engineering core courses (15 credit hours) and one elective course (3 credit hours) from a list of recommended courses, and ends with a capstone industry project (3 credit hours). The three common core courses are codesigned by faculty from both colleges and will enroll both SCE and SCM students simultaneously; each course will be taught by faculty from either College as appropriate. The capstone industry project will be co-advised by faculty from the two Colleges. It will allow multi-disciplinary teams of students from the

two Colleges to work collaboratively on solving real-world supply chain problems proposed by industry partners.

Students in the SCE program will start in the Fall semester and complete two courses each in two consecutive Fall and Spring semesters. These courses will equip students with essential domain knowledge and skills necessary for supply chain decision making. Students will take the capstone industry project, as well as the elective course, in the Summer of the second year for degree completion.

Will this program replace or enhance any existing programs(s) or tracks, concentrations, or specializations within an existing program? If yes, please specify.

This program will help enhance the courses available to students in the online Manufacturing
Systems Engineering MS program and the online Graduate Certificate in Manufacturing Systems at the University of Kentucky. The courses in the program can also be beneficial to students in other engineering graduate programs who are interested in taking supply chain-related courses as electives.

Student Demand:

Please note the expected enrollment over the first five years of the program

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
10	10	15	15	15

Market Demand:

This is an open-ended response that will be used in CPE agenda items. Institutions should explain why this program is needed. Note if it replaces another program on campus. Remember that your audience is the CPE, not higher education administrators, faculty, or staff.

KY is a national logistics hub due to its central geographic location. The state is home to the world hub of UPS, North American hub of DHL, and the air hub of Amazon. As of 2017 the state also had 482 logistics/distribution operations. The globalization of supply sources and demand has seen a growth in supply chains and their complexity, leading to increased demand in talent. A Burning Glass (national labor database) analysis revealed that the demand for supply chain jobs will grow by approximately 7% in KY and the surrounding states in the next eight years. Several reports have highlighted the national skills gap for trained professionals in supply chain-related careers. One report estimates that the demand for professionals in this area will exceed supply by a ratio of six to one. In addition, the importance of a technically savvy workforce capable of designing, installing, and improving complex supply chains to operate with technologies such Internet of Things (IoT), digitalization, blockchain, etc., has also been well-publicized

Answer either Employer Demand or Academic Demand below

Employer Demand: [1]

If the program is designed for students to enter the workforce immediately, please complete the following table.

	Regional	State	National
Type of Job	Industrial Engineer		
Average Wage	$87,123	$82,644	$71,126
# of Openings	251	95	7,321
Growth Projections	9.7%	11.1%	9.7%
Type of Job	Manufacturing Engineer		
Average Wage	$74,423	$76,613	$74,741
# of Openings	115	54	7,363
Growth Projections	7.9%	10.7%	6.4%
Type of Job	Quality Control Systems Manager		
Average Wage	$83,680	$74,759	$75,075
# of Openings	139	95	10,103
Growth Projections	1.3%	4.8%	-.5%
Type of Job			
Average Wage			
# of Openings			
Growth Projections			
Type of Job			
Average Wage			
# of Openings			
Growth Projections			

Please note the time frame for the projections and source of the market demand information:	Data is pulled from burning glass using bls data, actual job postings, and proprietary data models. Job data is from job postings in the last 12 months and projections are from 2019-2028.

Academic Demand:

If this is not a program that is designed for students to enter the workforce immediately after graduation, please indicate the skills that graduates will attain, the types of graduate programs the graduates are most likely to attend, and the types of jobs graduates will eventually seek.

NA

Unnecessary Duplication

List any similar programs based on CIP codes or other programs that are similar but may be classified in a different CIP code.

	Program	Institution
Program 1:	**Industrial Engineering**	**University of Louisville**
Program 2:		
Program 3:		
Program 4:		
Program 5:		

a. **Comparison of Objectives/Focus/Curriculum to Similar Programs:** *Explain the differences in curriculum, focus, and/or objectives. If the proposed program curriculum does not differ substantially from existing programs, then describe potential collaborations with other institutions.*

The University of Louisville (UL) offers MS and MEng in Industrial Engineering degrees. These degrees focus on general industrial engineering principles and practices. The latter has one core course in a supply chain-related topic. The proposed MS degree is entirely focused on teaching the multi-disciplinary knowledge and skills necessary to design, evaluate, and improve transformational and logistical functions in supply chains. Therefore, the scope and objectives of the proposed program and those at UL are very different. The proposed program also has shared curriculum taught by the College of Business and Economics faculty at the University of Kentucky that are included in their proposed MS in Supply Chain Management degree. This aspect is designed to ensure Engineering students develop skills to work in multi-disciplinary teams with managers. This is also unique to the degree program proposed here and makes it very different to the existing UL programs.

b. **Comparison of Student Populations***: Describe how your target student population is different from those at other institutions and explain how your program reaches this new population (e.g. the proposed program is completely online while other programs are face-to-face or hybrid).*

The proposed MS degree is a fully online offering that targets working professionals who will be pursuing the degree on a part-time basis. In contrast, the UL degrees are offered face-to-face and primarily targets full-time students.

c. **Access to Existing Programs:** *Explain how/why existing programs cannot reach your target population and/or provide evidence that existing programs do not have the capacity to meet current student demand (e.g. the number of students on enrollment waiting list).*

Access to the UL degrees are limited to students in the Louisville and surrounding area and mostly to those who are able to attend college on a full-time basis. The proposed degree is offered online and will be accessible to any interested student throughout the state of Kentucky. It will also be accessible to working professionals employed across the state.

d. **Feedback from Other Institutions:** *Summarize the feedback from colleagues at institutions with similar programs.*

Dr. Alexander provided the following summary and (approximate) enrollment information related to their masters programs:

o MS in Industrial Engineering (MS-IE): The average enrollment about 7 students and only those without a BS degree in Industrial Engineering from UofL are admitted. There has not been active recruitment for the MS-IE program in recent years as the department is more interested in enrolling students in the PhD in Industrial Engineering. This program has also historically had a large number of international students from Asian countries. International student applications have declined in the last few years. These two factors have led to a decline in enrollment in UofL's MS-IE program.

o MEng in Industrial Engineering (MEng-IE): This program is only open to students with a BS in Industrial Engineering from UofL with three co-op rotations. Enrollment depends on how many BS alumni are interested in pursuing a graduate degree.

o MEng in Engineering Management (MEng – EM): This is a fully online degree with students enrolled from across the commonwealth, all the states and from other countries as well. Enrollment in this program has continued to increase over the years and it is a very successful program for the department.

o UofL does not have any degree or certificate programs in the supply chain area. A few courses related to the supply chain discipline are available in the MS-IE program for face-to-face students. ·

The discussions with the Chair of the Department of Industrial Engineering revealed that while the enrollment in their face-to-face program (MS-IE) has declined, the online program (MEng-EM) has continued to grow. · In addition to the above, there are some other factors about the programs at UK are noteworthy.

o The overall enrollment in Engineering programs at UK has not been declined. To the contrary, it has been increasing in recent years. Therefore, declining enrollment was not considered a concern.

o The Manufacturing Systems Engineering master's program at UK has seen significant growth in enrollment over the last 5 years, since we began offering it as an online degree. The online modality has increased accessibility significantly and this program now has students enrolled from all over the state of Kentucky as well as from across the country. The increase in enrollment since converting online is more than 5 fold.

o The curriculum for the proposed Supply Chain Engineering program is very different to the existing programs in UofL in Industrial Engineering and Engineering Management. The proposed program targets specifically the supply chain discipline.

o A market survey was conducted through the Burning Glass portal (also included in the degree proposal) shows an increasing trend in the demand for jobs in the supply chain area. An assessment of job postings in the states surrounding Kentucky (through Burning Glass) revealed there were more than 6,000 job postings in supply chain-related careers in the last 12 months and a projected 7% growth jobs over the next eight years. Therefore, the establishment of the MS in SCE degree program at UK is both compelling and timely.

o The proposed program will be able to cater to this market need, not only in the state of Kentucky but across the nation. Due to the above reasons, the trend mentioned at UofL is not a concern for the proposed program. To the contrary, discussions with UofL revealed that offering the Supply Chain Engineering MS program online will help address the industry need and grow enrollment. We are confident that the Supply Chain Engineering master's program will be able to recruit students from across Kentucky and around the country to sustain and grow enrollment and graduates.

Cost

Please provide a summary of revenues and expenditures.

Projected Revenue over Next Five Years	$1,475,000
Projected Expenses over Next Five Years	$1,520,639

Will additional faculty be needed?

If yes, please explain how the institution will pay for these additional costs.

All faculty currently have full teaching loads, delivering courses in existing programs. While they can be engaged in teaching some courses in the short term (as an overload), new faculty hiring will be required for the success and growth of the SCE program. The ME department will require one tenure-track faculty and one non-tenure-track faculty (lecturer/ part-time instructor) to deliver the new courses. One part-time instructor will also be recruited to teach in the program.

The College will commit to invest the required resources for faculty hiring is attached.

Provide a budgetary rationale for creating this new program:

This is an open-ended response that will be used in CPE agenda items. Institutions should explain how the program will be funded, what other programs will be affected, and why this program is considered both an efficient and effective use of funds.

The costs of implementing and running the MS in Supply Chain Engineering degree can be met with the new funds that will be generated from the tuition revenue. There are also other non-financial benefits from implementing this program. The program will help address a emerging, and increasingly widening, skills gaps in the supply chain area in the state, the surrounding region, and across the nation. Given there is only one other program in the country offering a MS degree in

Supply Chain Engineering, the university and the state can position itself as a center of excellence to develop talent in the supply chain area.

The collaborative approach proposed to develop and teach this program as well as the close links it will help establish with industry (for the Industry Project course) can promote interdisciplinary research and convergent research at the University of Kentucky.

University of Kentucky
MS - MASTER OF SCIENCE
14.3501-Industrial Engineering.
Submission Date: 02/26/2020 16:20

Full Proposal - Basic Info

Institution :	University of Kentucky
Program Type :	Single Institution
Program Name :	Supply Chain Engineering
Degree Level :	Master's
Degree Designation :	MASTER OF SCIENCE
CIP Code (2-Digit) :	14-ENGINEERING.
CIP Code :	14.3501-Industrial Engineering.

Academic Unit (e.g. Department, Division, School) :	College of Engineering
Name of Academic Unit :	Mechanical Engineering
Name of Program Director :	Fazleena Badurdeen

Intended Date of Implementation :	8/23/2020
Anticipated Date for Granting First Degrees :	8/5/2022
Date of Governing Board Approval :	2/10/2019

Institutional Contact Information

First Name :	Annie
Last Name :	Weber
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Full Proposal - Mission: Centrality to the Institution's Mission and Consistency with State's Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

The objective of the SCE program is to prepare students to apply scientific and mathematical principles to design, evaluate and improve transformational and logistical functions within an enterprise and among its partners across the supply chain. The specific program objectives are that, upon graduation, program graduates will:
1. Obtain employment and advance in careers appropriate to an advanced technical degree in Supply Chain Engineering.
2. Be leaders in the industrial sector or be pursuing further graduate study.
3. Use their science, technical, and professional skills to make a positive impact on society and the world.
4. Engage in continued professional development and life-long learning.

2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

UK Mission
The objective of the SCE program is to prepare students to apply scientific and mathematical principles to design, evaluate and improve transformational and logistical functions within an enterprise and among its partners across the supply chain.

The proposed SCE MS program will directly support and implement UK's strategy in (1) Graduate Education and, in (2) Research and Scholarship. This will be achieved by:
1. Facilitating learning informed by scholarship and research thereby expanding knowledge and skills
2. Serving the Commonwealth and the greater society by developing capabilities and expanding scholarship to address some of the most challenging problems faced by the industry in the supply chain domain.

3. Explain how the proposed program addresses the state’s postsecondary education strategic agenda.

One aspect of the CPE's Strategic Agenda that the proposed program will support is to "Increase degree and certificate completion, fill workforce shortages, and guide more graduates to a career path." Another aspect of the CPE agenda that will be impacted by the proposed program is that “Kentucky will be stronger by training a globally competitive, entrepreneurial workforce; educating an engaged, informed citizenry; improving the health and well-being of families; and producing new research and discoveries that fuel job creation and economic growth.”

KY is a national logistics hub due to its geographical location. The state is home to some of the large companies who are major players (e.g.: UPS, DHL, Amazon, etc.). In addition, KY is also home to some large OEMs (e.g.: Toyota, GE Appliances, Ford, etc.) and a major player in the automotive and aerospace industries. The proposed SCE MS degree will contribute to CPE's strategic objectives by offering advanced education in the supply chain area that will directly impact a number of important industry sectors in the state. The program will prepare industry-ready graduates who can help enhance the performance of supply chain operations and help increase the competitiveness of Kentucky companies to promote economic growth. Irrespective of the technologies used by companies, successful supply chains operations are essential to develop products and deliver them to end consumers. The proposed SCE program will prepare graduates who can contribute to achieving this goal. Further, the online modality will increase program accessibility statewide, as well as across the nation, and provide better opportunities to increase degree completion.

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4. Explain how the proposed program furthers the statewide implementation plan.

One aspect of the CPE's Strategic Agenda that the proposed program will support is to "Increase degree and certificate completion, fill workforce shortages, and guide more graduates to a career path." Another aspect of the CPE agenda that will be impacted by the proposed program is that “Kentucky will be stronger by training a globally competitive, entrepreneurial workforce; educating an engaged, informed citizenry; improving the health and well-being of families; and producing new research and discoveries that fuel job creation and economic growth.”

KY is a national logistics hub due to its geographical location. The state is home to some of the large companies who are major players (e.g.: UPS, DHL, Amazon, etc.). In addition, KY is also home to some large OEMs (e.g.: Toyota, GE Appliances, Ford, etc.) and a major player in the automotive and aerospace industries. The proposed SCE MS degree will contribute to CPE's strategic objectives by offering advanced education in the supply chain area that will directly impact a number of important industry sectors in the state. The program will prepare industry-ready graduates who can help enhance the performance of supply chain operations and help increase the competitiveness of Kentucky companies to promote economic growth. Irrespective of the technologies used by companies, successful supply chains operations are essential to develop products and deliver them to end consumers. The proposed SCE program will prepare graduates who can contribute to achieving this goal. Further, the online modality will increase program accessibility statewide, as well as across the nation, and provide better opportunities to increase degree completion.

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Full Proposal - Quality: Program Quality and Student Success

1. List all student learning outcomes of the program.

The student learning outcomes for the proposed program are:
• Demonstrate an understanding of supply chain fundamentals including sourcing and procurement, manufacturing process, transportation and logistics, and customer/ supplier relationship management.
• Demonstrate the ability to work in a multidisciplinary team-based environment to identify and solve contemporary supply chain problems.
• Demonstrate the ability to successfully use advanced mathematical modeling and simulation tools, as well as contemporary programming languages, to design and analyze -complex global supply chains.

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

Three areas of fundamental concepts in supply chain engineering and management are the focus in the SCE program which are: sourcing & procurement, manufacturing operations, and transportation & logistics. The Student Learning Outcomes (SLOs) for the program are to: 1)Demonstrate an understanding of supply chain fundamentals including sourcing and procurement, manufacturing process, transportation and logistics, and customer/ supplier relationship management, 2) Demonstrate the ability to work in a multidisciplinary teambased environment to identify and solve contemporary supply chain problems, and 3) Demonstrate the ability to successfully use advanced mathematical modeling and simulation tools, as well as contemporary programming languages, to design and analyze complex global supply chains.

The overall curriculum focuses on enhancing the: students' understanding of supply chain fundamentals, the ability to work in a multidisciplinary team-based environment, and the application of advanced mathematical modeling and simulation tools. The courses in the program are designed to provide students the knowledge and skills necessary for each of these. For example, the course of SCE 630: Supply Chain Strategy will cover the supply chain fundamentals; SCE 631: Production and Operations Management course will cover more specific concepts related to managing production and other operations (understanding level), and teach students the concepts and tools necessary for modeling and solving problems in this domain. The SCE 740 Industry Project
course will focus on developing students' capability to apply the knowledge gained through other courses to solve practical problems in the supply chain domain by working in a multi-disciplinary team environment. More
detailed relationships between the curriculum and the program objectives are listed in course map.

3. Highlight any distinctive qualities of this proposed program.

The proposed Supply Chain Engineering (SCE) MS program is offered by the College of Engineering (CoE) at UK but will be developed and taught jointly by faculty from both the CoE and Gatton College of Business & Economics (Gatton) at UK. The proposed degree includes a set of core courses that will also be required for the newly proposed (by Gatton) Supply Chain Management MS program. This approach is adopted to ensure students will understand the complexity of supply chain challenges and appreciate the multi-disciplinary
capabilities required to solve such problems. Students in the SCE program also are required to take additional, and more technical, courses to improve their analytical capabilities to model, evaluate and improve supply chain decision making.No other supply chain graduate program (in engineering or business) in the country has this unique structure to promote multi-disciplinary learning and problem-solving.

4. Will this program replace any existing program(s) or specializations within an existing program?

YES

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Please specify.

This program will help enhance the courses available to students in the online Manufacturing Systems Engineering MS program and the online Graduate Certificate in Manufacturing Systems at the University of Kentucky. The courses in the program can also be beneficial to students in other engineering graduate programs who are interested in taking supply chain-related courses as electives.

5. Include the projected faculty/student in major ratio.

Because the courses from this program will be taught by faculty from three units who already support multiple undergraduate and graduate programs, the faculty-to-student ratio cannot be computed for the proposed program independently of other degree programs supported by the faculty of the three units. We anticipate 25-30 new MS students enrolled through this program. If only the graduate programs and faculty in the Mechanical Engineering department (where the program will be housed) are considered the proposed program will represent an approximately 45% increase from the current total MS in Mechanical Engineering and MS in Manufacturing Systems Engineering MS enrollment.

6. Is there a specialized accrediting agency related to this program?

NO

7. Attach SACS Faculty Roster Form.

Faculty Roster_SCE_MS_Roster.pdf

8. A. Describe the library resources available to support this program. You may attach any documentation provided to SACS.

UK library resources are already sufficient to support this program.

B. Describe the physical facilities and instructional equipment available to support this program. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.

No additional physical facilities will be required to deliver the courses for this program. The meeting space required for the on-campus meetings for the Industry Project course are available. Instructional resources are also already available to support this program.

9. Clearly state the admission, and retention, and completion standards designed to encourage high quality.

Admissions: Undergraduate GPA of 3.0. Successful applicants will have an ABET accredited BS in Engineering or a closely related area.
Retention: Each student enrolled in the program will have an advising committee consisting of faculty members with expertise and resources related to supply chain engineering. Each student will work on a well-motivated, multi-discplinary team to address a real-world problem through the capstone Industry Project course.
Completion: Students are to maintain a GPA of 3.0 in all core courses and the elective course. Students are required to provide a written project report and complete an oral project defense before their faculty committee established according to Graduate School policies (as part of the required SCe 740 Industry Project course).
Committee members examine the technical competency of students at the oral defense, which acts as the program final exam.

10. Clearly state the degree completion requirements for the program.

Students in the program must meet the following requirements for degree completion.
1. Complete the three common core courses (SCE 630, SCE 631, and SCE 635)
2. Complete the engineering core courses (SCE 503, SCe 604, SCE 610, SCE 614, and SCE 632)
3. Complete an elective course
4. Complete Industry Project (SCE 740), write report and make final presentation.
Students must obtain a grade of C, or higher, for all the courses to complete the degree requirements.

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Name	Total number of hours required for degree	Number of hours in degree program core	Number of hours in guided electives	Number of hours in free electives
Program	30	27	3	0

12. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.

Other related graduate programs in the state are: MS in Industrial Engineering, MEng Industrial Engineering, and MS in Engineering Management all at the University of Louisville. Each of these programs have one, or a few, courses similar to those in the proposed supply chain engineering program, none have the indepth supply chain scope or the multi-disciplinary collaborative course development & teaching (between engineering and business colleges) approach planned for the proposed program. If students in these existing programs meet the admission criteria for the proposed MS degree, they will be eligible to transfer into the new program. The UK Graduate School regulations for credit transfer (up to nine credit hours of relevant course credits) will be applied.

13. List courses under the appropriate curricular headings.

KPPPSCourseTemplate_Supply Chain Engineering MS.xlsx

14. Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)?

YES

YES	Distance learning
YES	Courses that combine various modes of interaction, such as face-to-face, videoconferencing, audio-conferencing, mail, telephone, fax, e-mail, interactive television, or World Wide Web
YES	Technology-enhanced instruction
YES	Evening/weekend/early morning classes
NO	Accelerated courses
NO	Instruction at nontraditional locations, such as employer worksite
NO	Courses with multiple entry, exit, and reentry points
NO	Courses with "rolling" entrance and completion times, based on self-pacing
NO	Modularized courses

Please describe planned alternative methods of program delivery involving greater use of technology, distance education, and/or accelerated degree designs, to increase efficiency, better address student educational and workforce needs, and maximize student success, for both traditional and non-traditional students.

(Should not be blank)

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Full Proposal - Demand: Program Demand/Unnecessary Duplication

1. Student Demand:

a. Provide evidence of student demand at the regional, state and national levels.

KY is a national logistics hub due to its central geographic location. The state is home to the world hub of UPS, North American hub of DHL, and the air hub of Amazon. As of 2017 the state also had 482 logistics/distribution operations. The globalization of supply sources and demand has seen a growth in supply chains and their complexity, leading to increased demand in talent. A Burning Glass (national labor database) analysis revealed that the demand for supply chain jobs will grow by approximately 7% in KY and the surrounding states in the next eight years. Several reports have highlighted the national skills gap for trained professionals in supply chain-related careers. One report estimates that the demand for professionals in this area will exceed supply by a ratio of six to one. In addition, the importance of a technically savvy workforce capable of designing, installing, and improving complex supply chains to operate with technologies such Internet of Things (IoT), digitalization, blockchain, etc., has also been well-publicized

b. Identify the applicant pool and how they will be reached.

Students graduating with BS degrees in engineering and related disciplines are the primary candidates for the program. As this is an online program, it will be very attractive to those with the aforementioned degrees currently engaged in supply chain-related jobs seeking to advance in their careers.
The program will be broadly advertised to students in BS degree programs in engineering and related areas as an option for graduate education. The program will be marketed regionally and nationally to recruit industry professionals interested in pursuing an advanced degree in supply chain engineering through various channels such as web-based approaches (e.g.: Google ads, social media, etc.), professional societies, and alumni
databases, etc.
Applications (on-line applications submitted in accordance with the Graduate School Policies and including resume, relevant university transcripts, statement of purpose, letters of recommendation) will be reviewd by Director of Graduate Studies for the Supply Chain Engineering MS program, who will make the final admission decision.

c. Describe the student recruitment and selection process.

The program will be broadly advertised to students in BS degree programs in engineering and related areas as an option for graduate education. The program will be marketed regionally and nationally to recruit industry professionals interested in pursuing an advanced degree in supply chain engineering through various channels such as web-based approaches (e.g.: Google ads, social media, etc.), professional societies, and alumni databases, etc.
Applications (on-line applications submitted in accordance with the Graduate School Policies and including resume, relevant university transcripts, statement of purpose, letters of recommendation) will be reviewed by Director of Graduate Studies for the Supply Chain Engineering MS program, who will make the final admission decision.

d. Identify the primary feeders for the program.

Students graduating with BS degrees in engineering and related disciplines are the primary candidates for the program. As this is an online program, it will also be very attractive to those with the aforementioned degrees currently engaged in supply chain-related jobs seeking to advance their careers.

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

As a Master's level program, we anticipate that this program will bring an additional 25-30 students to the University.

f. Project estimated student demand for the first five years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) - Fall Semester
2020-2021	0	10
2021-2022	0	10
2022-2023	10	15

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2023-2024	10	15
2024-2025	15	15

2. Employer Demand:

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

Kentucky is a national logistics hub due to its central geographic location. The state is home to the world hub of UPS, North American hub of DHL, and the air hub of Amazon. As of 2017 the state also had 482 logistics/distribution operations with almost 62,000 full-time jobs. The globalization of supply sources and demand has seen tremendous growth in supply chains and their complexity leading to an increased demand in talent in this area. Thus, supply chain skills requirements are expected to grow strongly and steadily within the state as well as across the nation. A Burning Glass (national labor database) analysis revealed that the demand for supply chain jobs will grow by approximately 7% in KY and the surrounding states in the next eight years, higher than that rate of growth projected for the national labor market. Several reports have highlighted the national skills gap and demand for trained professionals in supply chain related careers. One report estimates that demand for professionals in this area will exceed supply by a ratio of six to one. The retiring baby boomers are projected to leave a large number of unfilled jobs in this area. In addition, the importance of a skilled, technically savvy workforce capable of designing, installing, and improving complex supply chains to operate in environments with technologies such Internet of Things (IoT), digitalization, blockchain, etc., has also been well-publicized. The only existing Supply Chain Engineering MS program in the nation is at the Georgia Tech (a full-time program and does not cater to the working professionals). The Ohio State University offers a Master of Business Logistics Engineering while MIT offers a Master of Engineering (MEng.) and a Master of Applied Science (MASc) in Supply Chain Management. Therefore, the proposed MS in SCE UK will be uniquely positioning itself to produce graduates who will be able to contribute to the workforce in an area of national need. Further, the online delivery of the SCE program will increase accessibility to interested students across the nation.

3. Academic Disciplinary Needs:

NA

a. If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.

(Should not be blank)

4. Similar programs:

a. Are there similar programs in other Southern Regional Education Board (SREB) states and in the nation?

YES

Please identify similar programs in other SREB states and in the nation.

The Georgia Institute of Technology (GA Tech) has the only other Supply Chain Engineering MS program in the nation.

b. Our records indicate the following similar programs exist at public institutions in Kentucky.

#Enr = Fall Enrollments , #Grd = Academic Year Graduates

		2019 - 20		2018 - 19		2017 - 18		2016 - 17		2015 - 16		2014 - 15	
Institution	Program	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd
University of Louisville	Industrial Engineering	10		15	12	13	5	17	15	26	24	37	25

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c. Does the proposed program differ from existing programs?

YES

Please explain.

The University of Louisville (UL) offers MS and MEng in Industrial Engineering degrees. These degrees focus on general industrial engineering principles and practices. The latter has one core course in a supply chain-related topic. The proposed MS degree is entirely focused on teaching the multi-disciplinary knowledge and skills necessary to design, evaluate, and improve transformational and logistical functions in supply chains. Therefore, the scope and objectives of the proposed program and those at UL are very different. The proposed program also has shared curriculum taught by the College of Business and Economics faculty at the University of Kentucky that are included in their proposed MS in Supply Chain Management degree. This aspect is designed to ensure Engineering students develop skills to work in multi-disciplinary teams with managers. This is also unique to the degree program proposed here and makes it very different to the existing UL programs.

d. Does the proposed program serve a different student population (i.e., students in a different geographic area) from existing programs?

YES

Please explain.

The proposed MS degree is a fully online offering that targets working professionals who will be pursuing the degree on a part-time basis. In contrast, the UL degrees are offered face-to-face and primarily targets full-time students.

e. Is access to existing programs limited?

YES

Please explain.

Access to the UL degrees are limited to students in the Louisville and surrounding area and mostly to those who are able to attend college on a full-time basis. The proposed degree is offered online and will be accessible to any interested student throughout the state of Kentucky. It will also be accessible to working professionals employed across the state.

f. Is there excess demand for existing similar programs?

YES

Please explain.

A market analysis was conducted using the Burning Glass portal. Job postings for supply chain-related careers were analyzed to evaluate demand. The analysis revealed an approximately 7% growth in supply chain related careers over the next eight years in KY and surrounding states. Other reports have also indicated that, at the national level, the demand for supply chain professionals will exceed supply by a ratio of six to one. More information is also included in the appendix.

g. Will there be collaboration between the proposed program and existing programs?

NO

Please explain why there is no proposed collaboration with existing programs.

No collaboration is planned at the onset. This is because the scope of the two programs and the delivery modalities are very different. However, the opportunities for collaboration in the long-term with faculty teaching jointly offered courses will be explored.

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Full Proposal - Cost: Cost and Funding of the Proposed Program

1. Will this program require additional resources?

YES

Please provide a brief summary of additional resources that will be needed to implement this program over the next five years.

Existing faculty within different departments have the expertise to teach courses in the program. However, all faculty currently have full teaching loads, delivering courses in existing programs. While they can be engaged in teaching some courses in the short term (as overload), new faculty hiring will be required for the success and growth of the SCE program. The ME department will require one tenure-track faculty and one non-tenuretrack person (lecturer/ part-time instructor) to deliver the new courses. Part-time instructor will also be recruited to teach in the program.

2. Will this program impact existing programs and/or organizational units within your institution?

NO

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

The costs of implementing and running the MS in Supply Chain Engineering degree can be met with the new funds that will be generated from the tuition revenue. There are also other non-financial benefits from implementing this program. The program will help address a emerging, and increasingly windening, skills gaps in the supply chain area in the state, the surrounding region, and across the nation. Given there is only one other program in the country offering a MS degree in Supply Chain Engineering, the university and the state
can position itself as a center of excellence to develop talent in the supply chain area.
The collaborative approach proposed to develop and teach this program as well as the close links it will help establish with industry (for the Industry Project course) can promote interdisciplinary research and convergent research at the University of Kentucky.

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A. Funding Sources, by year of program	1st year	2nd year	3rd year	4th year	5th year
	0	0	0	0	0
Total Resources Available from Federal Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No known federal resources for creation of new program in this area				
Total Resources Available from Other Non-State Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No non-state allocations available				
State Resources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No specific state allocations have been made.				
Internal					
Allocation :	0	0	0	0	0
Reallocation :	0	0	0	0	0
Narrative Explanation/Justification :	None				
Student Tuition					
New :	100000	100000	150000	150000	150000
Existing :	0	100000	150000	250000	325000
Narrative Explanation/Justification :	The tuition rate will be fixed tuition rate of $25,000 irrespective of whether the students are within or out of state. Students will be enrolled over a period of 5 semesters. For revenue calculations it is assumed that 2/5 of tuition is recovered in the first year of enrollment in the program, another 2/5 in the second year and 1/5 in the 3rd year following enrollment.				
Total					
New :	$100,000	$100,000	$150,000	$150,000	$150,000
Existing :	$0	$100,000	$150,000	$250,000	$325,000
Total Funding Sources :	$100,000	$200,000	$300,000	$400,000	$475,000

B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Staff: Executive, administrative, and managerial					
New :	47000	47940	48899	49877	50874
Existing :	0	0	0	0	0
Other Professional					
New :	0	0	0	0	0
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Faculty					
New :	167600	170672	173805	177002	180262
Existing :	0	7140	7283	7428	7577
Graduate Assistants (if master's or doctorate)					
New :	14850	15147	15450	15759	16074
Existing :	0	0	0	0	0
Student Employees					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Staff: A recurring commitment to 0.5 FTE for an administrative assistant, estimated at $24000/year, and to one summer month salary for the Director of Graduate Studies, estimated at $15000. This equals to $39000 plus 28% benefits in year 1; a 2% annual increase is included. Faculty: The ME department will require one tenure-track faculty and one non tenure-track person (lecturer/ part-time instructor) to deliver the new courses. Part-time instructor will also be recruited to teach in the program. The full-time faculty will be recruited in year 1 of the program. For the tenure-track faculty, 50% of the salary is charged the program budget. Benefits and a 2% annual increase is included. New sections of these courses will be offered for the proposed program and an amount equal to $7K/course is included as overload in each of the years. Graduate Assistant: One Teaching Assistant is included to support with program software development and assist with courses, as appropriate. The salary for TA @ $13.5K plus benefits in year 1 and increasing 2% is included				
Equipment and Instructional Materials					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				
Library					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				
Contractual Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Academic and/or Student Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				
Other Support Services					
New :	80000	75000	20000	20000	15000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	$50,000 is included in years 1 and 2 to support the development of comprehensive online virtual simulations and software to teach content in the online platform and provide students hands-on experience through virtual/augmented reality environments. In addition, $30K and $25K are included in years 1 and 2 for marketing expenses. An amount equal to $20K is included for years 3-5 for program marketing				
Faculty Development					
New :	30000	30000	10000	10000	10000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	An amount equal to $10k per course is included to provide support for faculty to develop online courses. This is based on the rate offered for faculty to develop online courses in other engineering programs at the University of Kentucky. The budget includes expenses for 3 courses per year for first two years and on-going expenses at $10/k.				
Assessment					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Narrative needed				
Student Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				
Faculty Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				
Other					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				

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Total					
New :	$339,450	$338,759	$268,154	$272,638	$272,210
Existing :	$0	$7,140	$7,283	$7,428	$7,577
Total Budget Expenses/Requirements :	$339,450	$345,899	$275,437	$280,066	$279,787

Grand Total					
Total Net Cost :	$-239,450	$-145,899	$24,563	$119,934	$195,213

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Full-Proposal - Assess: Program Review and Assessment

1. For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:

a. Which components will be evaluated?

Given i) three SLOs at both course-level and program-levels, ii) nine core courses, and iii) four means to evaluate SLOs, specifically as Introduced, Reinforced, Emphasized, and Applied, SLO 1 will be Introduced in SCE503, SCE604, and SCE631, Reinforced in SCE610, SCE632 and SCE635, Emphasized in SCE614 and SCE630, Applied in SCE631 and SCE740;
SLO 2 will be Introduced in SCE630 and SCE631, Reinforced in SCE614 and SCE632, Emphasized in SCE610 and SCE635, Applied in SCE604, SCE631 and SCE740;
SLO 3 will be Introduced in SCE503 and SCE604, Reinforced in SCE604 and SCE630, Emphasized in SCE630 and SCE631, Applied in SCE610, SCE632, SCE635 and SCE740.

The team of faculty from the College of Engineering and Gatton College of Business & Economics were involved in developing SLOs 1, 2 and 3 at the course-level.

In addition to the team of faculty, alumni and industry experts were involved in developing SLOs 2 and 3 at the program-level.

b. When will the components be evaluated?

Given Summer 2022 as the anticipated date for granting first degrees, and given six assessment measures (AMs), AMs 1-3 relate more to courses and will be evaluated at the end of every semester based on the courses offered, AMs 4 and 5 relate more to the program and will be evaluated annually, and AM 6 also relates more to the program but will be evaluated once in every three years, based on job placement data and alumni surveys.
As all of three SLOs are achieved according to courses offered, they will be evaluated in semesters. However, SLOs 2 and 3 are also at the program-level and will be evaluated annually based on accumulated data in semesters.

c. When will the data be collected?

Data for SLOs at the course-level, specifically AMs 1-3, will be collected at the end of each semester through TCE at UK.
Data for SLOs at the program-level, specifically, AMs 4 and 5 will be collected by semester but summarized annually through registrar information at UK, and AM 6 will be collected every three years through job placement data and alumni surveys.

d. How will the data be collected?

At the course-level, data for SLOs will be collected through Teacher and Course Evaluations (TCE) on Canvas at UK, and at the program-level, data will be collected through alumni surveys. Additional rubrics will be used to evaluate the Industry Project course that will be completed by the course instructors and/or faculty committee reviewing the student projects.

e. What will be the benchmarks and/or targets to be achieved?

Annual GPA will be used as benchmarks for SOLs at the course-level, and employment data for other disciplines will be used as benchmarks for SOLs at the program-level.

f. What individuals or groups will be responsible for data collection?

Faculty members who teach courses will be responsible for data collection at the course-level, and the graduate committee will be responsible for data collection at the program-level.

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g. How will the data and findings be shared with faculty?

Data and findings at the course-level will be shared through TCE, and those at the program-level will be shared through graduate committee meetings.

h. How will the data be used for making programmatic improvements?

TCE results will be helpful for instructors to tailor course contents according to student expectations at the course-level, and data at the program-level will be beneficial for the graduate committee to decide what courses to offer and in which semesters. The information will also be shared with the advisory board, as appropriate and feasible, to receive feedback and improve the program.

2. What are the measures of teaching effectiveness?

Student rating, Student performance, Student outcomes

3. What efforts to improve teaching effectiveness will be pursued based on these measures?

Faculty members will be expected to revise course contents, emphases in each topic, questions in assignments and quizzes. The graduate committee will communicate with industry and develop potential projects accordingly.

4. What are the plans to evaluate students' post-graduate success?

A post-graduate survey will be sent to graduates of the program 3 years after their graduation date to determine whether four learning outcomes are deemed valuable in the student's post-graduate employment.

Course Title (CIP)						
Degree Program Core Courses (i.e., Courses required by ALL students in the Major--includes Premajor or Preprofessional courses)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Type of Course: program core (C) or pre-major/ pre-professional (P)**	**Credit Hours**	**Existing (E) or New (N) Course**
SCE	**630**	**Supply Chain Strategy**	Supply Chain Strategy: Supply chain management concerns the integration of key business processes that enable fulfillment of end-customers' real needs. Central to supply chain management philosophy is integration - the socio-technical linkages that facilitate the efficient flows of information, ideas, knowledge, goods, services, and cash through the supply chain. This course will introduce students to the terminology, concepts, and skills related to supply chain management, with a focus on strategic, relational, and operations issues. Through this course, students will develop an understanding of important supply chain terminology, processes, systems, and improvement methodologies that enable effective management and strategy deployment.	C	**3**	**Existing (E) or New (N) Course**
SCE	**631**	**Production and Operations Management**	Production and Operations Management: This course will introduce students to concepts, tools, and techniques necessary for planning and control of production and other operations of an organization. Organizational processes from sourcing and inventory management to production planning and scheduling as well as quality control will be covered. Students will learn how to model and analyze operations, and to evaluate impact of various strategies on the processes and on products/service quality, productivity, efficiency, and cost effectiveness, especially when there are uncertainties.	C	**3**	**N**
SCE	**635**	**Logistics Management**	Logistics Management: This course focuses on the physical distribution, movement, and delivery of goods and services throughout the supply chain so that the right amount of materials and/or products arrive at the right place at the right time. It requires the co-ordination, organization, and management of an organization's distribution network to perform such function as facility location, transportation, storage, material handling, packaging, inventory control, order fulfillment, and reverse logistics.	C	**3**	**N**
SCE	**740**	**Industry Project**	Industry Project	**C**	**3**	**N**
SCE	**503**	**Lean Manufacturing Principles & Practices**	Lean Manufacturing Principles and Practices: This course will introduce students to the fundamentals concepts of production improvement utilizing lean manufacturing principles and practices. In addition to the lectures, web-based simulations/experiments/games will be used to help learn the application of the tools. An application project is also included where students will work to study a real-life manufacturing or service environment to assess the current state, identify improvement opportunities and develop countermeasures for implementation	**C**	**3**	**Existing (E) or New (N) Course**
SCE	**604**	**Systems Optimization and Simulation**	Systems Optimization and Simulation: This course is to equip students with rigorous modeling theories and analyzing skills, based on which to push students from Knowledge and Comprehension to Synthesis and Evaluation through simulation. Critical thinking is important to learn this course, in terms of modeling, solution seeking and justification, and perpetual improvement. Students are encouraged to think critically about existing models and available technologies, identify their relative strength and weakness, and develop new knowledge in theory and industrial application.	**C**	**3**	**N**
SCE	**610**	**Big Data & Supply Chain Analytics**	Big Data and Supply Chain Analytics: This course introduced the analytical skills necessary to work with large data sets, focusing on applications in the supply chain and in transportation. For the purpose of this course, Big Data is defined as "anything that doesn't fit in an Excel spreadsheet". This course is positioned at the intersection of coding skills, applied statistics and substantive expertise, teaching the practical skills needed to work with increasingly data sets. Main topics to be covered include: fundamentals of programming and data wrangling in Python, data visualization, applied statistical modeling and interpretation, and ethical issues in data analysis, including matters of intellectual honesty.	**C**	**3**	**N**
SCE	**614**	**Sustainable Production Systems & Supply Chain**	Sustainable Production Systems and Supply Chains: This course aims to provide students with an understanding of the sustainability opportunities and challenges facing manufacturing systems and supply chains. Students will be introduced to the 6R-based approach to sustainable manufacturing and the importance of product-process-system (manufacturing system, and supply chain) integration for improving sustainability performance. Students will also learn tools and techniques that can be used to model, measure and evaluate manufacturing systems and supply chains to improve economic and environmental performance while meeting the needs of consumers, employees, and other stakeholders will be covered.	**C**	**3**	**N**
SCE	**632**	**Strategic Supply Chain Design**	Strategic Supply Chain Design: This course will provide students an in-depth understanding of tools that can be used to design various supply chain operations (plan, source, make, and deliver) to meet performance objectives. The application of various concepts, mathematical models, and simulation tools to model the operations in complex supply chain networks, assess performance, and identify strategies to improve efficiency, profitability and sustainability of supply chains will be covered.	**C**	**3**	**N**
			Total Credit hours Required for Program Core (i.e., # of hours in degree program core) **Note: number recorded will automatically populate Core Hours in "Summary of Total Program Hours" table**		**27**	**NA**
Core Courses Required for Track(s), Concentration(s), or Speciality(s) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
Total Credit hours Required for Program Options (Track(s), Concentration(s), or Speciality) (if applicable) **Note: number recorded will automatically populate Program Option hours in "Summary of Total Program Hours" table**					**0**	**NA**

GUIDED Elective Courses (i.e., Specified list of Program Electives AND/OR Electives focused on a specific track/concentration/or speciality) (if applicable)

Course Prefix	Course #	Course Title	Course Description	Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
MFS	606	Global Issues in Manufacturing	Global Issues in Manufacturing: The need to increase quality, productivity, efficiency and sustainability in manufacturing operations spanning the product, process and systems (manufacturing systems as well as supply chain) domains is essential for companies to be successful. The increased globalization of markets and manufacturing operations, declining natural resources and negative consequences of some manufacturing practices as well as increased legislation in many regions has led to many new challenges that companies must overcome to be successful in competitive markets. This seminar course will introduce students to a variety of global issues in manufacturing through presentations by leading national and international experts in these domains. The seminars will cover a broad range of manufacturing related topics relevant to many disciplines including manufacturing, mechanical and electrical engineering. The course can also help graduate students identify topical issues that need further investigation and could become potential research topics.	P	3	E
MGT	611	Managing Effective Organizations	Managing Effective Organizations: A critical examination of behavior and performance within organizations and between orgnizations. Special attention is paid to the problem of performance at the individual, group and formal organizatonal level.	P	3	E
MFS	605	Modeling, Simulation and Control for Manufacturing	Modeling, Simulation and Control for Manufacturing: The purpose of this course is to examine methods and systems from the perspectives of modeling, simulation, and control of manufacturing facilities. The emphasis will be primarily on techniques that can be used to model and evaluate performance of systems. Students are encouraged to think critically about available technologies, identify relative strengths and weaknesses, and analyze the technologies toward developing improved solutions to factory control and information management problems.	P	3	E
MFS	613	Sustainability, Ethics and Leadership in Manufacturing Organizations	Sustainability, Ethics and Leadership in Manufacturing Organizations; This course is intended to provide future manufacturing managers and leaders a basic understanding of important theories and practices necessary to successfully manage and lead teams to achieve manufacturing organizational objectives. The course is organized into several modules. The first module will focus on developing an understanding and capability to approach ethical and sustainability concerns confronted by manufacturing organizations. This will include coverage of tools to help identify and address societal and environmental obligations of manufacturing organizations and issues confronting them that span multiple cultures and nations. Because people are one of the most important resources in any organization, the second and third modules will address organizational behavior (OB) and individual effectiveness. OB theories and practices that can be used to increase the capability to observe, understand and manage people's behavior will be covered. The last module considers safety and ergonomics as they relate to manufacturing organizations. Coverage will include tools and techniques that can be used to analyze the manufacturing workplaces and ensure its ergonomic design as well as an overview of the current state of occupational safety and health regulations	P	3	E
MFS	526	Operations Management in Lean Manufacturing	Lean Operations Management: This course will cover topics in basic lean system operations as well as the management system to support the attainment of highest customer satisfaction with respect to Safety, Quality, Cost, Productivity, Delivery and Human Resource Development. Working in teams, students apply fundamental lean tools and concepts to develop a lean operations environment capable of driving continuous improvement in a simulated factory. As the operational environment evolves, key management principles and tools are explored using the teachings of Taiichi Ohno and others considered to be the pillars of the Toyota Production System. All students must have a webcam and microphone or headset to participate in on-line team and class meetings	P	3	E
MFS	509	Leadership for a Lean System	Perhaps the most difficult part of a so-called ?lean? transformation is to establish an appropriate culture which is greatly influenced by actions of leadership. The goal of leadership is to foster the creation of a culture which allows team member engagement and drives continuous improvement focused on creating the highest value for the customer. This is accomplished by developing a ?True Lean? operational environment in which the group by themselves uses systematic problem solving to improve the work they do to help meet the organizations? targets and goals without the need for direct management involvement. The challenge is to understand how this can be accomplished. This is a distance learning course designed to provide an introduction to important leadership thinking and activities required to create and sustain a lean culture within an organization as practiced by Toyota. The primary content for this course comes from the internationally recognized University of Kentucky Lean System Program?s public Lean Executive Leadership Institute and Lean Certification courses. In addition to weekly presentations by experienced Toyota executives and others, there will be weekly activities/discussions designed to explore each topic in more depth. Topics will include: understanding the True Lean destination and core thinking, management led problem solving, understanding the path to True Lean, and developing a vision and strategy to achieve it. Other important topics discussed i	P	3	E
		# of REQUIRED Credit hours in Guided Electives (i.e., electives for a focused or track/concentration/speciality are). If 9 hours is required and there are 15 hours to choose from, then only 9 hours are required) Note: number recorded will automatically populate Guided Elective hours in "Summary of Total Program Hours" table				NA

FREE Elective Courses (i.e, general program electives, open to the students to choose) (if applicable)

Course Prefix	Course #	Course Title	Course Description	Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
		Total # of Credit Hours in Free Electives (i.e., general program electives) (if applicable)	Note: number recorded will automatically populate Free Elective Hours in "Summary of Total Program Hours" table		0	NA

		Summary of Total Program Hours	Required Core Hours (i.e., # of hours in degree program core)	27	NA
			Required Program Options - Track/Concentration/Specialty Hours (if applicable)	0	NA
			Guided Elective Hours (e.g., focused or track/concentration/speciality area specific electives) (if applicable)	0	NA
			Free Elective Hours (i.e., general program electives) (if applicable)	0	NA
			Total # of credit hours required for Program	27	NA
		Information to be completed by PIE Office			
			# of new courses		NA
			Total # of Courses (includes new and existing)		NA
			Precentage of new courses (more than 25% may require SACS Substantive Change)	#VALUE!	NA

PROPOSED PROGRAM SUMMARY

Council on Postsecondary Education

Institution:	***University of Kentucky***
Program Name:	***Supply Chain Management***
Degree Designation	***Master of Science***
CIP Code:	***52.1399***
Credit Hours:	***30***
(Tentative) Institutional Board Approval Date:	***2/21/2020***
Implementation Date:	***8/19/2020***

Program Description:

Describe the program and its aims

The Master of Science (MS) in Supply Chain Management (SCM) will be a one-year program with a 30 credit hour requirement. It will equip students with the multi-disciplinary knowledge and skills required for careers related to operations and supply chain management. The program is housed in the Department of Marketing and Supply Chain. Its target starting date is Fall 2020.

The MS SCM program and the MS in Supply Chain Engineering (SCE) program (currently being proposed by the College of Engineering) are designed as two independent degree programs sharing three common core courses (9 credit hours) and one capstone Industry Project course (3 credit hours). In addition to taking the three common core courses, students in the MS SCM program are required to take another five Business core courses (15 credit hours) and one elective course (3 credit hours) from a list of recommended courses. The elective is intended to allow students to become familiar with a subject domain. In the summer capstone Industry Project course, students will work on an industrial project at a sponsoring company under the supervision of faculty from both Gatton and the College of Engineering.

Will this program replace or enhance any existing programs(s) or tracks, concentrations, or specializations within an existing program? If yes, please specify.

No, however the proposed SCM program is developed collaboratively by the business and engineering schools at UK with courses taught by faculty from both colleges. The program is designed to develop multi-disciplinary skills in students by providing collaboration between students enrolled in both Supply Chain Management and Supply Chain Engineering (currently proposed by UK's engineering school). There is no other supply chain MS program in the United States with a such a unique structure.

Student Demand:

Please note the expected enrollment over the first five years of the program

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
20	25	30	35	40

Market Demand:

This is an open-ended response that will be used in CPE agenda items. Institutions should explain why this program is needed. Note if it replaces another program on campus. Remember that your audience is the CPE, not higher education administrators, faculty, or staff.

Kentucky is a national logistics hub due to its central geographic location. The state is within a day's drive of 65 percent of the U.S. population. It boasts a highly developed logistics and distribution infrastructure and facilities. It is home to the world hub of UPS, North American hub of DHL, and the air hub of Amazon. There are currently

482 logistics/distribution operations throughout the state that employ nearly 62,000 full-time workers. Fifteen new logistics/distribution locations or expansions have been announced through September 2017, representing a total investment of $1.9 billion and nearly 4,000 new full-time jobs. Jobs related to operations and supply chain management are expected to grow strongly within the state as well as nationwide.

With all these job opportunities in this growing area, we expect a high demand for this program.

Answer either Employer Demand or Academic Demand below

Employer Demand: [1]

If the program is designed for students to enter the workforce immediately, please complete the following table.

	Regional	State	National
Type of Job	Logistics and Supply Chain Managers		
Average Wage	$83,042	$60,624	$70,835
# of Openings	170	128	0,236
Growth Projections	11.5%	15.5%	5.4%
Type of Job	Logistic and Supply Chain Analyst		
Average Wage	$70,256	$67,488	$73,254
# of Openings	52	31	4,145
Growth Projections	6.4%	7.3%	6.9%
Type of Job	Logistic and Supply Chain Specialist		
Average Wage	$70,131	$51,795	$73,655
# of Openings	39	32	4,850
Growth Projections	6.4%	7.3%	6.9%
Type of Job			
Average Wage			
# of Openings			
Growth Projections			
Type of Job			
Average Wage			
# of Openings			
Growth Projections			

Please note the time frame for the projections and source of the market demand information:	Data pulled from Burning Glass using BLS, actual job postings, and proprietary data models. Job data is the last 12 months Projections are 2019-2028

Academic Demand:

If this is not a program that is designed for students to enter the workforce immediately after graduation, please indicate the skills that graduates will attain, the types of graduate programs the graduates are most likely to attend, and the types of jobs graduates will eventually seek.

NA

Unnecessary Duplication

List any similar programs based on CIP codes or other programs that are similar but may be classified in a different CIP code.

	Program	Institution
Program 1:	**Business Analytics**	**University of Louisville**
Program 2:		
Program 3:		
Program 4:		
Program 5:		

a. **Comparison of Objectives/Focus/Curriculum to Similar Programs:** *Explain the differences in curriculum, focus, and/or objectives. If the proposed program curriculum does not differ substantially from existing programs, then describe potential collaborations with other institutions.*

The existing program is the Master of Science in Data Analytics (MSDA) program at University of Louisville.

Their program and our proposed program are very different in terms of curriculum and focus. We teach students supply chain specific domain knowledge with a few common data analytics tools such as Excel, Solver and Tableau. Their program teaches students general data analytics methodologies with a huge emphasis on using various programming languages and packages.

Our nine core courses are: Supply Chain Strategy; Production and Operations Management; Supply Chain Modeling & Analysis; Applied Data Analytics; Quality Management & Lean Operations; Logistics Management; Strategic Sourcing & Procurement; Negotiation in Supply Chain; and Industry Project.

MSDA's ten core courses are: Programming for Analytics (Python); Introduction to Linear Algebra; Introduction to Statistical Programming (R); Story Telling with Data (Tableau); Data Analytics I & II (SAS); Data Analytics III (R); Data Mining (SAS); Data Management; and Capstone.

b. **Comparison of Student Populations***: Describe how your target student population is different from those at other institutions and explain how your program reaches this new population (e.g. the proposed program is completely online while other programs are face-to-face or hybrid).*

Due to the different curriculum focus we believe that the program will be attractive to a different population of students focused on Supply Chain Management rather than Data Analytics.

c. **Access to Existing Programs:** *Explain how/why existing programs cannot reach your target population and/or provide evidence that existing programs do not have the capacity to meet current student demand (e.g. the number of students on enrollment waiting list).*

No, but again the difference in curriculum should be attractive to a different group of students. UK's program is intended to attract those students who wants to work in the supply chain area. UL's program attracts those who like working with data and doing programming. So there is very little overlapping demand.

d. **Feedback from Other Institutions:** *Summarize the feedback from colleagues at institutions with similar programs.*

The proposed SCM is hosted in the Department of Marketing and Supply Chain. The similar program, Data Analytics, is hosted in College of Business, University of Louisville. There are ongoing research collaborations between the two units. For example, U of L organizes annual CLIK conference in early June and our department always send speakers and participants there. With the building of the two new master degree programs in the two universities, the research collaborations between the two units will be strengthened in the future. Gatton College sponsors a Supply Chain Forum annual conference in late Feb. which attracts around 150 participants. In the future, we will reach out and invite faculty and students from the new Data Analytics program at U of L to participate in our annual conference.

In addition, the proposed SCM program has close collaborations with the College of Engineering at University of Kentucky

Cost

Please provide a summary of revenues and expenditures.

Projected Revenue over Next Five Years	$4,500,000
Projected Expenses over Next Five Years	$2,001,483

Will additional faculty be needed?

If yes, please explain how the institution will pay for these additional costs.

Approximately 3 FTE faculty members will be needed to staff the program. Initially, we may need to borrow some existing faculty from other departments to teach courses on an overload basis and to rely on adjunct faculty to deliver some courses. The department has one new hire joining in Fall 2019, whom we have included on the faculty of record. The dean's office will allocate funding for a lecturer position starting Fall 2020. This lecturer will teach primarily in this proposed master program. After year three, we believe the program will generate sufficient revenue to support an

additional faculty hire. At that time, the new hire can replace the adjunct faculty. Faculty will be supported by tuiition dollars.

Provide a budgetary rationale for creating this new program:

This is an open-ended response that will be used in CPE agenda items. Institutions should explain how the program will be funded, what other programs will be affected, and why this program is considered both an efficient and effective use of funds.

The costs of implementing and running the MS in Supply Chain Management degree can be met with the new funds that will be generated from the tuition revenue. There are also other non-financial benefits from implementing this program. The program will help address an emerging, and increasingly widening skills gap in the supply chain area in the state, the surrounding region, and across the nation. Given there are no other Supply Chain Management MS degrees in the state, the university can position itself as a center of excellence to develop talents in the supply chain area for the commonwealth.

The collaborative approach proposed to develop and teach this program as well as the close links it will establish with industry (for the Industry Project course) can promote interdisciplinary research and convergent research at the University of Kentucky.

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Full Proposal - Basic Info

Institution :	University of Kentucky
Program Type :	Single Institution
Program Name :	Supply Chain Management
Degree Level :	Master's
Degree Designation :	MASTER OF SCIENCE
CIP Code (2-Digit) :	52-BUSINESS, MANAGEMENT, MARKETING, AND RELATED SUPPORT SERVICES.
CIP Code :	52.1399-Management Sciences and Quantitative Methods, Other.

Academic Unit (e.g. Department, Division, School) :	Gatton College of Business and Economics
Name of Academic Unit :	Marketing and Supply Chain Management
Name of Program Director :	Haoying Sun

Intended Date of Implementation :	8/19/2020
Anticipated Date for Granting First Degrees :	8/5/2021
Date of Governing Board Approval :	2/21/2020

Institutional Contact Information

First Name :	Annie
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Full Proposal - Mission: Centrality to the Institution's Mission and Consistency with State's Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

Kentucky is one of the logistics hubs in the country due to its central geographic location. There are currently 482 logistics/distribution operations throughout the state that employ nearly 62,000 full-time workers. Fifteen new logistics/distribution locations or expansions have been announced through September 2017, representing a total investment of $1.9 billion and nearly 4,000 new full-time jobs. However, within the state, none of the universities offer a Master of Science in Supply Chain Management program.

According to the Burning Glass national database, the job growth rate in the next five years related to operations and supply chain management positions in Kentucky and the neighboring states is 13.04%, which is higher than the 9.92% growth rate in the nation for the same job category and much higher than the 7.4% general growth rate in the nation for all jobs requiring a master's degree. Meanwhile, the salary in this field is also quite attractive, ranging from $61,947 for beginner analysts to $97,579 for more experienced managers.

Thus, one of the objectives of the proposed program is to provide trained supply chain professionals for the commonwealth to meet the rising demand in this growing sector. Another objective is to provide students with skill sets that make them competitive in today's labor market. Our program, with four common core courses shared with the College of Engineering, will provide a multi-disciplinary environment for Business and Engineering students to learn and work together collaboratively under the joint-expertise of Business and Engineering faculty. Students also have an opportunity to partner with the industry to apply knowledge and skills gained from the program to recommend solutions for real-world supply chain problems.

2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

The proposed MS SCM program will directly support and implement UK's strategy in (1) Graduate Education and (2) Research and Scholarship. This will be achieved by:
1. Facilitating learning informed by scholarship and research, thereby expanding knowledge and skills; and
2. Serving the Commonwealth and the society by developing capabilities and expanding scholarship to address some of the most challenging problems faced by industry in the supply chain domain.

3. Explain how the proposed program addresses the state's postsecondary education strategic agenda.

One aspect of the CPE's Strategic Agenda that the proposed program will support is to "Increase degree and certificate completion, fill workforce shortages, and guide more graduates to a career path." Another aspect of the CPE agenda that will be impacted by the proposed program is that "Kentucky will be stronger by training a globally competitive, entrepreneurial workforce; educating an engaged, informed citizenry; improving the health and well-being of families; and producing new research and discoveries that fuel job creation and economic growth."

KY is a national logistics hub due to its geographical location. The state is home to some of the large companies who are major players in supply chain (e.g., UPS, DHL, Amazon, etc.). In addition, KY is also home to some large OEMs (e.g., Toyota, GE Appliances, Ford, etc.) and a major player in the automotive and aerospace industries. The proposed SCM MS degree will contribute to CPE's strategic objectives by offering advanced education in the supply chain area that will directly impact a number of important industry sectors in the state. The program will prepare industry-ready graduates who can help enhance the performance of supply chain operations and help increase the competitiveness of Kentucky companies to promote economic growth. Irrespective of the technologies used by companies, successful supply chain operations are essential to develop products and deliver them to end consumers. The proposed SCM program will prepare graduates who can contribute to achieving this goal. Further, the online modality will increase program accessibility statewide, as well as across the nation, and provide better opportunities to increase degree completion.

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4. Explain how the proposed program furthers the statewide implementation plan.

One aspect of the CPE's Strategic Agenda that the proposed program will support is to "Increase degree and certificate completion, fill workforce shortages, and guide more graduates to a career path." Another aspect of the CPE agenda that will be impacted by the proposed program is that “Kentucky will be stronger by training a globally competitive, entrepreneurial workforce; educating an engaged, informed citizenry; improving the health and well-being of families; and producing new research and discoveries that fuel job creation and economic growth.”

KY is a national logistics hub due to its geographical location. The state is home to some of the large companies who are major players in supply chain (e.g., UPS, DHL, Amazon, etc.). In addition, KY is also home to some large OEMs (e.g., Toyota, GE Appliances, Ford, etc.) and a major player in the automotive and aerospace industries. The proposed SCM MS degree will contribute to CPE's strategic objectives by offering advanced education in the supply chain area that will directly impact a number of important industry sectors in the state. The program will prepare industry-ready graduates who can help enhance the performance of supply chain operations and help increase the competitiveness of Kentucky companies to promote economic growth. Irrespective of the technologies used by companies, successful supply chain operations are essential to develop products and deliver them to end consumers. The proposed SCM program will prepare graduates who can contribute to achieving this goal. Further, the online modality will increase program accessibility statewide, as well as across the nation, and provide better opportunities to increase degree completion.

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Full Proposal - Quality: Program Quality and Student Success

1. List all student learning outcomes of the program.

Learning Outcome 1: Critical Thinking
Learning Objective: Students will apply analytical, critical, and logical reasoning skills to solve complex operations and supply chain related issues

Learning Outcome 2: Identification of Ethical Issues
Learning Objective: Students will have an appreciation of ethical and societal responsibilities

Learning Outcome 3: Multidisciplinary Competence
Learning Objective: Students will work in a multidisciplinary team-based environment to identify and solve contemporary supply chain problems

Learning Outcome 4: Technological Skills
Learning Objective: Students will utilize ubiquitous business application software tools to assist decision making in a complex global supply chain setting

Learning Outcome 5: Communications Skills
Learning Objective: Students will demonstrate strong written and oral communication skills in a supply chain-related context

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2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

There are five learning outcomes (please see 2c for details):
1: develop critical thinking ability;
2: be able to identify ethical issues that arise in a supply chain context;
3: gain the competence to work in a multidisciplinary environment;
4: master business software tools to assist in decision making;
5: obtain strong communications skills.

MKT 630 is an introductory course that is cross-listed with the SCE program (currently being proposed for approval by the College of Engineering). Both engineering and business students will sit in the same session taking this course together. All five learning outcomes will be introduced in this course.

LO1 will be reinforced in the three methodology-focused courses, MKT 631, 632 and 633. It will be emphasized in the four functional area courses (i.e., MKT 634 – 637).

Since ethic issues often arise in quality, logistic, sourcing, and procurement management settings, LO2 will be reinforced in both MKT 634 and 635. Furthermore, it will be emphasized in MKT 636.

In addition to the introductory course MKT 630, there are two other core courses, MKT 631 and 635, that are cross-listed with the SCE program. Therefore, LO3 will be reinforced in these two courses.

MKT 631 also introduces students to, LO4, the use of business software tools. LO4 will be reinforced and emphasized in the two hands-on courses that will be taught in the computer lab – MKT 632 and 633.

Similar to LO1, LO5 will be touched upon in all of the core courses. It will be introduced in MKT 631 again and reinforced in MKT 632 - 636. Negotiation outcomes rely heavily on a person’s communication skills. Hence, LO5 will be emphasized in MKT 637.

Finally, students will take MKT 740, where they will apply all of the knowledge they have obtained in this program to solve real-life supply chain problems. It is again cross-listed with SCE 740. Hence, all five learning outcomes will be emphasized in MKT740 again.

MS SCM_Assessment Plan.pdf

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3. Highlight any distinctive qualities of this proposed program.

The Gatton College of Business and Economics has a number of nationally and internationally recognized faculty members with expertise in the area of supply chain management and related fields. The proposed program is hosted within the Department of Marketing and Supply Chain, where faculty members serve on the editorial boards of several premier journals in the field of supply chain management or a related field, such as POM, JMR and JM.

The Gatton College has a proven track record in providing high-quality graduate-level business education. The one year accelerated MBA program was ranked in the top 15% of all AACSB accredited U.S. business schools.

The recently launched Master of Science in Finance program shows the sign of success by doubling its enrollment in the second year.

The proposed SCM program is developed collaboratively by the business and engineering schools at UK with courses taught by faculty from both colleges. The program is designed to develop multi-disciplinary skills in students by providing collaboration between students enrolled in both SCM and SCE (currently proposed by UK's engineering school). There is no other supply chain MS program in the United States with such a unique structure.

Thus, the proposed MS in Supply Chain Management will be distinguished in its scientific depth and breadth, collaboration between engineering and business schools in its development and delivery, its nationally and internationally recognized faculty, and the proven experience in delivering graduate-level business education. It will serve UK, Kentucky and the nation as a unique place to train the next generation of business
leaders in the field of supply chain and operations management.

4. Will this program replace any existing program(s) or specializations within an existing program?

NO

5. Include the projected faculty/student in major ratio.

There are three FTE faculty in the program. The initial target enrollment will be 20. It is expected to grow to 40 students in 5 years. So the ratio is between 1:6.7 to 1:13.3

6. Is there a specialized accrediting agency related to this program?

YES

Please identify the agency.

Association to Advance Collegiate Schools of Business (AACSB)

Do you plan to seek accreditation?

YES

Please explain your plans for accreditation.

Once approved the program will fall under the Colleges existing accreditation and will be reviewed during the next cycle.

7. Attach SACS Faculty Roster Form.

MS SCM _Faculty Roster.pdf

8. A. Describe the library resources available to support this program. You may attach any documentation provided to SACS.

UK library resources are generally sufficient to support this program. The request to subscribe to a new journal, INFORMS Journal on Applied Analytics, in assisting the teaching needs of the program has been made to the library.

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B. Describe the physical facilities and instructional equipment available to support this program. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.

The three shared core courses (MKT 630, 631 and 635) will be delivered in a classroom with recording and brodcasting capability. MKT 632 and 633 will be delivered in a computer lab. MKT 740 will need multiple small group study rooms. The rest of the courses will be delivered in a regular classroom. All of these are available in the Gatton College building. No additional physical facilities will be required to deliver the courses for this program.

9. Clearly state the admission, and retention, and completion standards designed to encourage high quality.

The MS in Supply Chain Management will be housed in and administered by the Department of Marketing & Supply Chain. The day-to-day operation of the program will be the responsibility of the program director. A faculty committee will be responsible for the admissions process. The program director will make the final decisions on admission.
Admission: Students will be evaluated on standardized test scores (GMAT or GRE; either will be accepted) and undergraduate grades and major. The TOEFL will be required for non-native English-speakers who do not have a degree from an accredited U.S. university, though this requirement may be waived based on an interview or other considerations. Work experience is not required. There are no explicit minimum scores established by the UK Graduate School. Furthermore, there are no specific course pre-requisites other than college-level calculus and introductory statistics. Applicants with undergraduate degrees in business, engineering, economics, mathematics, statistics, or agrieconomics will be given priority.
Retention: Once enrolled in the program, each student will be assigned a faculty advisor, who will help the student be successful in the program.
Completion: Students must meet all requirements of the Graduate School. In particular, they must maintain a GPA of 3.0 or better. Students whose GPA falls under 3.0 are placed on probation; if they cannot improve their GPA during the probation period (one semester), they are removed from the program.

10. Clearly state the degree completion requirements for the program.

Students must meet the following requirements for degree completion:
1. Completion of the three common core courses (MKT 630, MKT 631, MKT 635)
2. Completion of the five required business courses (MKT 632, MKT 633, MKT 634, MKT 636, MKT 637)
3. Completion of the Industry Project course (MKT 640)
4. Completion of an elective course from a list of approved electives.
Students must obtain an average GPA of 3.0 or higher to complete the degree requirements

Name	Total number of hours required for degree	Number of hours in degree program core	Number of hours in guided electives	Number of hours in free electives
Program	30	27	3	0

12. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.

None of the universities in the commonwealth offer a Master of Science in Supply Chain Management program, which creates an opportunity to train professionals for jobs in this growing field. Since this is a lock-step, one year accelerated program, only fall admission is offered and transfer is not accepted.

13. List courses under the appropriate curricular headings.

Curriculum_Supply Chain Management Masters.xlsx

Justification of CIP code change.docx

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14. Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)?

YES

NO	Distance learning
YES	Courses that combine various modes of interaction, such as face-to-face, videoconferencing, audio-conferencing, mail, telephone, fax, e-mail, interactive television, or World Wide Web
NO	Technology-enhanced instruction
YES	Evening/weekend/early morning classes
NO	Accelerated courses
YES	Instruction at nontraditional locations, such as employer worksite
NO	Courses with multiple entry, exit, and reentry points
NO	Courses with "rolling" entrance and completion times, based on self-pacing
NO	Modularized courses

Please describe planned alternative methods of program delivery involving greater use of technology, distance education, and/or accelerated degree designs, to increase efficiency, better address student educational and workforce needs, and maximize student success, for both traditional and non-traditional students.

All courses taught by the Gatton faculty in this proposed program will be delivered in the traditional face-to-face, classroom seeting. There is one common core course, SCE/MKT 631 (Production and Operations Management), that will be taught by faculty from the College of Engineering. Since the MS SCE program, i.e., the independent parallel program currently proposed by CoE, will be an online program, SCE/MKT 631 will be taught as a hybrid course with students meeting in classroom half of the time and meeting online the other half of the time. In addition, to accommodate online, distant learning engineering students who will enroll in the newly proposed MS
SCE program, the two other common courses taught by the Gatton faculty, MKT/SCE 630 (Supply Chain Strategy) and MKT/SCE 635 (Logistics Management), may be delivered in evening sessions. Finally, the capstone course, MKT/SCE 740 (Industry Project), may require students to be present at a sponsoring company’s site and to use video conferencing to communicate with company sponsors.

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Full Proposal - Demand: Program Demand/Unnecessary Duplication

1. Student Demand:

a. Provide evidence of student demand at the regional, state and national levels.

Kentucky is a national logistics hub due to its central geographic location. The state is within a day's drive of 65 percent of the U.S. population. It boasts a highly developed logistics and distribution infrastructure and facilities. It is home to the world hub of UPS, North American hub of DHL, and the air hub of Amazon. There are currently 482 logistics/distribution operations throughout the state that employ nearly 62,000 full-time workers. Fifteen new logistics/distribution locations or expansions have been announced through September 2017, representing a total investment of $1.9 billion and nearly 4,000 new full-time jobs. Jobs related to operations and supply chain management are expected to grow strongly within the state as well as nationwide.

With all these job opportunities in this growing area, we expect a high demand for this program.

b. Identify the applicant pool and how they will be reached.

The program will be marketed regionally and internationally to recruit undergraduate students who are considering graduate education and are interested in pursuing an advanced degree in supply chain management.
Information sessions will be held in other colleges at the University of Kentucky, such as the College of Arts and Sciences and College of Engineering, and other universities in the commonwealth such as EKU and WKU, etc.
Open houses in conjunction with other master-level degree programs at the Gatton College will be held in major cities in Kentucky, such as Lexington, Louisville and northern Kentucky. Online marketing and advertisement (e.g., Facebook ads and other social media channels) will also be utilized aggressively to increase the awareness of the program to the targeted students.
International student recruitment efforts will be focused on a selected set of Gatton College's partner schools.
This will be marketed as a 2+2+1 program, i.e., international students finish the first two years at their home institutions and the later two years at UK. Then, they attend this master's program in their fifth year of study at UK. The application process will be streamlined for these 2+2+1 students.

c. Describe the student recruitment and selection process.

The program will be marketed regionally and internationally to recruit undergraduate students who are considering graduate education and are interested in pursuing an advanced degree in supply chain management.
Information sessions will be held in other colleges at the University of Kentucky and other universities in the commonwealth. Open houses in conjuction with other master level degree programs at the Gatton College will be held in major cities in Kentucky. Online marketing and advertisement (e.g., Facebook ads and other social media channels) will also be utilized aggressively to increase the awareness of the program to the targeted students.
International student recruitment efforts will be focused on a selected set of Gatton College's partner schools.
This will be marketed as a 2+2+1 program, i.e., international students finish the first two years at their home institutions and the later two years at UK. Then, they attend this master program in their fifth year of study at UK. The application process will be streamlined for these 2+2+1 students.
Applications (on-line applications submitted in accordance with the Graduate School Policies and including resume, relevant university transcripts, statement of purpose, letters of recommendation) will be reviewd by the SCM program admission committee consisting of 2-3 faculty members. The program director will make the final admission decision.

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d. Identify the primary feeders for the program.

Current college students who had calculus and introductory statistics courses, and who want to obtain graduate degrees immediately after getting their bachelor's degrees are the target students. For example, a 4 th year undergrauate student majoring in Business, Engineering, Economics, Agrieconomics, Mathematics, Statistics or a related major, who wants to work in the field of supply chain management and has a high GPA will be a good candidate. Both domestic and international students will be recruited. A diverse student body with various cultural and academic backgrounds will be highly valuable to students' learning and training to be a successful supply chain professional – one who works well with individuals from diverse backgrounds and academic disciplines.
Primary feeders include UK's undergraduates in the Gatton College of Business and Economics, College of Arts and Sciences, College of Engineering, and College of Agriculture, as well as similar undergraduates at other public and private higher-education institutions in KY.

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

We anticipate an increase in the number of students enrolled in the Gatton College. A few students of this program will come from the Gatton undergraduate programs. But we are expecting to have a significant number of students from other colleges and universities, as well as a few young professionals from the industry to enroll in the program. Since no other supply chain management programs exist in the state of Kentucky, we are optimistic about recruiting.

f. Project estimated student demand for the first five years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) - Fall Semester
2020-2021	20	20
2021-2022	25	25
2022-2023	30	30
2023-2024	35	35
2024-2025	40	40

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2. Employer Demand:

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

Table 1 shows the projected job growth rate in the next five years for graduates with a master's degree in SCM from the Burning Glass national database. The job growth rate related to operations and supply chain management positions in Kentucky and the neighboring states is 13.04%, which is higher than the 9.92% growth rate in the nation for the same job category and much higher than the 7.4% general growth rate in the nation for all jobs requiring a master's degree. Meanwhile, the salary in this field is also quite attractive. Table 2 shows the statistics on the salary for two representative positions: Logistics and Supply Chain Managers and Logistics and Supply Chain Analysts/Specialists.

Table 1: Job growth in the next five years for people with a master's degree

	Selected Occupations	Geography	Relative Growth
Selected States*	13.04%	8.20%	Average
Nationwide	9.92%	7.40%	Average

* Selected states include Kentucky, Georgia, Virginia, West Virginia, Illinois, Indiana, Ohio, Alabama, Tennessee, North Carolina, Missouri, and South Carolina

Table 2: Salary Statistics

Occupation Group	25th Percentile	Average	75th Percentile
Logistics and Supply Chain Managers	$65,919	$81,984	$97,579
Logistics and Supply Chain Analysts /Specialists	$61,947	$72,365	$80,471

Note: In general, 25th percentile corresponds to people with 0-2 years of experience; average corresponds to people with 3 -5 years of experience; and 75th percentile corresponds to people with 6 more years of experience

3. Academic Disciplinary Needs:

N/A

a. If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.

(Should not be blank)

4. Similar programs:

a. Are there similar programs in other Southern Regional Education Board (SREB) states and in the nation?

YES

Please identify similar programs in other SREB states and in the nation.

The following universities also have an MS degree in Supply Chain Management: University of Florida, University of Alabama, University of Arkansas, University of Tennessee, and University of Texas at Dallas. There is one MS program in International Logistics at the Texas A&M International University in Texas.

b. Our records indicate the following similar programs exist at public institutions in Kentucky.

#Enr = Fall Enrollments , #Grd = Academic Year Graduates

		2018 - 19		2017 - 18		2016 - 17		2015 - 16		2014 - 15		2013 - 14	
Institution	Program	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd	#Enr	#Grd
University of Louisville	*Business Analytics	48											

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c. Does the proposed program differ from existing programs?

YES

Please explain.

The existing program is the Master of Science in Data Analytics (MSDA) program at University of Louisville. Their program and our proposed program are very different in terms of curriculum and focus. We teach students supply chain specific domain knowledge with a few common data analytics tools such as Excel, Solver and Tableau. Their program teaches students general data analytics methodologies with a huge emphasis on using various programming languages and packages.

Our nine core courses are: Supply Chain Strategy; Production and Operations Management; Supply Chain Modeling & Analysis; Applied Data Analytics; Quality Management & Lean Operations; Logistics Management; Strategic Sourcing & Procurement; Negotiation in Supply Chain; and Industry Project.

MSDA's ten core courses are: Programming for Analytics (Python); Introduction to Linear Algebra; Introduction to Statistical Programming (R); Story Telling with Data (Tableau); Data Analytics I & II (SAS); Data Analytics III (R); Data Mining (SAS); Data Management; and Capstone.

d. Does the proposed program serve a different student population (i.e., students in a different geographic area) from existing programs?

NO

e. Is access to existing programs limited?

NO

f. Is there excess demand for existing similar programs?

YES

Please explain.

We attract those who wants to work in the supply chain area. Their program attracts those who like working with data and doing programming. So there is very little overlapping demand.

g. Will there be collaboration between the proposed program and existing programs?

YES

Please explain the collaborative arrangements with existing programs.

The proposed SCM is hosted in the Department of Marketing and Supply Chain. The similar program, Data Analytics, is hosted in College of Business, University of Louisville. There are ongoing research collaborations between the two units. For example, U of L organizes annual CLIK conference in early June and our department always send speakers and participants there. With the building of the two new master degree programs in the two universities, the research collaborations between the two units will be strengthened in the future. Gatton College sponsors a Supply Chain Forum annual conference in late Feb. which attracts around 150 participants. In the future, we will reach out and invite faculty and students from the new Data Analytics program at U of L to participate in our annual conference.

In addition, the proposed SCM program has close collaborations with the College of Engineering at University of Kentucky

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Full Proposal - Cost: Cost and Funding of the Proposed Program

1. Will this program require additional resources?

YES

Please provide a brief summary of additional resources that will be needed to implement this program over the next five years.

Existing faculty members within different departments have the expertise to teach the majority of the courses in the program. However, a new lecturer will be hired to lead the Industry Project (MKT 740) and teach one or two other courses in the program (in case the existing faculty cannot teach a course due to scheduling conflicts). One or two part-time instructors will also be recruited to teach in the program.

2. Will this program impact existing programs and/or organizational units within your institution?

NO

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

The costs of implementing and running the MS in Supply Chain Management degree can be met with the new funds that will be generated from the tuition revenue. There are also other non-financial benefits from implementing this program. The program will help address an emerging, and increasingly widening skills gap in the supply chain area in the state, the surrounding region, and across the nation. Given there are no other Supply Chain Management MS degrees in the state, the university can position itself as a center of excellence to develop talents in the supply chain area for the commonwealth.

The collaborative approach proposed to develop and teach this program as well as the close links it will establish with industry (for the Industry Project course) can promote interdisciplinary research and convergent research at the University of Kentucky.

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A. Funding Sources, by year of program	1st year	2nd year	3rd year	4th year	5th year
	0	0	0	0	0
Total Resources Available from Federal Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	None				
Total Resources Available from Other Non-State Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	None				
State Resources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	None				
Internal					
Allocation :	0	0	0	0	0
Reallocation :	137000	139055	141141	143258	145407
Narrative Explanation/Justification :	We are assuming a recurring investment from the Gatton College for a senior lecturer position. The above numbers include salary and fringe benefits, and assume a 1.5% annual increase in salary.				
Student Tuition					
New :	600000	750000	900000	1050000	1200000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	The MS SCM program will be launched in FY20 with 20 students, growing to a steady state of 40 in FY24. The program will be priced at $30,000 initially ($25,000 in-state and $35,000 out-of-state) and the pro forma assumes no increases in tuition. The enrollment will be capped at 40.				
Total					
New :	$600,000	$750,000	$900,000	$1,050,000	$1,200,000
Existing :	$137,000	$139,055	$141,141	$143,258	$145,407
Total Funding Sources :	$737,000	$889,055	$1,041,141	$1,193,258	$1,345,407

B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Staff: Executive, administrative, and managerial					
New :	25000	25000	25000	25000	25000
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Other Professional					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Faculty					
New :	213890	221944	230028	238143	246291
Existing :	250000	256250	262656	269223	275953
Graduate Assistants (if master's or doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Student Employees					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	$25,000 per year will go to support a stipend and research support for the director of the program. New: Salary (plus benefit) for one FT senior lecturer; Overload teaching payments to the two faculty from other departments in Gatton; Salary for two adjuct professors (PT); Revenue sharing to the College of Engineering for providing POM course and other electives. Existing: Salary (plus benefit) for one FT assistant professor.				
Equipment and Instructional Materials					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	None needed				
Library					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				
Contractual Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				
Academic and/or Student Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Other Support Services					
New :	50000	50000	50000	50000	50000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Scholarship to attract top students.				
Faculty Development					
New :	10000	10000	10000	10000	10000
Existing :	13000	13000	13000	13000	13000
Narrative Explanation/Justification :	Travel to professional conferences. Membership dues. Taking students to participate in case competitions. Build a student chapter with CSCMP (Council of Supply Chain Management Professionals), etc.				
Assessment					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				
Student Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				
Faculty Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	No additional resources needed				
Other					
New :	50000	50000	50000	50000	50000
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Student recruitment and retention. Program Marketing				
Total					
New :	$348,890	$356,944	$365,028	$373,143	$381,291
Existing :	$263,000	$269,250	$275,656	$282,223	$288,953
Total Budget Expenses/Requirements :	$611,890	$626,194	$640,684	$655,366	$670,244
Grand Total					
Total Net Cost :	$125,110	$262,861	$400,457	$537,892	$675,163

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Full-Proposal - Assess: Program Review and Assessment

1. For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:

a. Which components will be evaluated?

See assessment plan added to curriculum

b. When will the components be evaluated?

See assessment plan added to curriculum

c. When will the data be collected?

See assessment plan added to curriculum

d. How will the data be collected?

See assessment plan added to curriculum

e. What will be the benchmarks and/or targets to be achieved?

See assessment plan added to curriculum

f. What individuals or groups will be responsible for data collection?

See assessment plan added to curriculum

g. How will the data and findings be shared with faculty?

See assessment plan added to curriculum

h. How will the data be used for making programmatic improvements?

See assessment plan added to curriculum

2. What are the measures of teaching effectiveness?

See assessment plan added to curriculum

3. What efforts to improve teaching effectiveness will be pursued based on these measures?

See assessment plan added to curriculum

4. What are the plans to evaluate students' post-graduate success?

See assessment plan added to curriculum

Course Title (CIP)						
Degree Program Core Courses (i.e., Courses required by ALL students in the Major--includes Premajor or Preprofessional courses						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Type of Course: program core (C) or pre-major/ pre-professional (P)**	**Credit Hours**	**Existing (E) or New (N) Course**
MKT	630	**Supply Chain Strategy**	SUPPLY CHAIN STRATEGY. This course concerns the integration of key business processes that enable fulfillment of end-customers' real needs. Central to supply chain management philosophy is integration - the socio-technical linkages that facilitate the efficient flows of information, ideas, knowledge, goods, services, and cash through the supply chain. This course will introduce students to the terminology, concepts, and skills related to supply chain management, with a focus on strategic, relational, and operations issues. Through this course, students will develop an understanding of important supply chain terminology, processes, systems, and improvement methodologies that enable effective management and strategy deployment.	C	**3**	**E**
MKT	631	**Production and Operations Management**	PRODUCTION AND OPERATIONS MANAGEMENT. This course will introduce students to concepts, tools, and techniques necessary for planning and control of production and other operations of an organization. Organizational processes from sourcing and inventory management to production planning and scheduling as well as quality control will be covered. Students will learn how to model and analyze operations, and to evaluate impact of various strategies on the processes and on products/service quality, productivity, efficiency, and cost effectiveness, especially when there are uncertainties.	C	**3**	**N**
MKT	632	**Supply Chain Modeling and Analysis**	SUPPLY CHAIN MODELING & ANALYSIS. This course teaches students how to make business decisions based on the data and quantitative models. It introduces students to the optimization methods used in business – primarily linear and integer programming. The concepts are studied mainly in the context of applications to the operations and supply chain management field. Examples from other business disciplines such as finance and human resource management are included too. In this course, students learn to model the business problems on Excel spreadsheets, analyze and solve the models, and then interpret the solutions obtained to make recommendations to managers.	C	**3**	**N**
MKT	633	**Applied Data Analytics**	APPLIED DATA ANALYTICS. In today's business settings, knowledge workers increasingly rely on datadriven decision-making strategies. This course provides the necessary data analytics background for subsequent coursework dealing with topics such as quality control, inventory management, sourcing, and logistics management. It introduces students to the Normal distribution, Decision Tree Analysis, Demand Forecasting, and Interactive Data Visualization, all of which rely on data as the grist to help generate useful managerial information and insights.	**C**	**3**	**N**
MKT	634	**Quality Management and Lean Operations**	QUALITY MANAGEMENT & LEAN OPERATIONS. This course focuses on the principles, and practices of total quality management (TQM) and lean operations. Topics that are covered include: process focus; continuous improvement; service quality; customer satisfaction; process control and capability; Six-Sigma methodology and tools; economics of quality; and organizational learning.	**C**	**3**	**N**
MKT	635	**Logistics Management**	LOGISTICS MANAGEMENT. This course focuses on the physical distribution, movement, and delivery of goods and services throughout the supply chain so that the right amount of materials and/or products arrive at the right place at the right time. It requires the co-ordination, organization, and management of an organization's distribution network to perform such function as facility location, transportation, storage, material handling, packaging, inventory control, order fulfillment, and reverse logistics.	**C**	**3**	**N**
MKT	636	**Strategic Sourcing and Procurement Management**	STRATEGIC SOURCING AND PROCUREMENT. Sourcing and procurement are the processes of acquiring goods and services to support an organization's operations. Once tactical functions in vertically integrated firms, sourcing and procurement have now become a core capability vital to an organization's success in the wake of specialization, disintegration and globalization during the past decades. Today's complex supply chain landscape poses tremendous challenges, but also generously rewards world-class management. This calls for professionals trained to understand and manage the subject on a strategic level. This is an advanced course that aims to educate students about strategic considerations and complex decision-making processes in sourcing and procurement. The course broadens and enhances students' knowledge and skills to manage sourcing and procurement related issues through a mixture of lectures and case analyses and discussions. Students will learn how to systematically and effectively approach complicated supply chain management problems on strategic sourcing, supplier selection, and inventory planning by integrating and applying the knowledge, analytics skills, and ways of thinking that they acquired in prior SCM coursework.	**C**	**3**	**N**
MKT	637	**Negotiation in Supply Chain**	NEGOTIATION IN THE SUPPLY CHAIN. This course focuses on developing your negotiating skills and making you a more confident negotiator. By the conclusion of this course, you will have improved your ability to diagnose negotiation situations, strategize and plan upcoming negotiations, and engage in more fruitful negotiations, even in situations where you are dealing with difficult negotiation partners. Because negotiating agreements is as much art as science, learning in this course will take place mainly by doing experiential exercises, and research on negotiations will be used to supplement this learning. You will be placed into numerous realistic negotiation settings, and you will need to prepare for, participate in, and analyze your negotiations.	**C**	**3**	**E**
MKT	740	**Industry Project**	INDUSTRY PROJECT. This is a team-based industry project course where collaborative teams of Supply Chain Engineering and Supply Chain Management students are paired with a company or organization. Each company or organization provides the team with a supply chain related problem of importance. Student teams are co-advised by Engineering and Business faculty who have direct contact with the company. The faculty co-advisers will mentor and guide each team to work together collaboratively to propose solutions for a real-world supply chain problem facing an industry partner.	**C**	**3**	**N**
DS						
			Total Credit hours Required for Program Core (i.e., # of hours in degree program core) **Note: number recorded will automatically populate Core Hours in "Summary of Total Program Hours" table**		**27**	**NA**
Core Courses Required for Track(s), Concentration(s), or Speciality(s) (if applicable)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Course Required for Track (T), Concentration (C) or Specialty (S)**	**Credit Hours**	**Existing (E) or New (N) Course**
			Total Credit hours Required for Program Options (Track(s), Concentration(s), or Speciality) (if applicable) **Note: number recorded will automatically populate Program Option hours in "Summary of Total Program Hours" table**		**0**	**NA**

GUIDED Elective Courses (i.e., Specified list of Program Electives AND/OR Electives focused on a specific track/concentration/or speciality) (if applicable)

Course Prefix	Course #	Course Title	Course Description	Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
SCE	614	Sustainable Production Systems and Supply Chains	SUSTAINABLE PRODUCTION SYSTEMS AND SUPPLY CHAIN. This course aims to provide students with an understanding of the sustainability opportunities and challenges facing manufacturing systems and supply chains. Students will be introduced to the 6R-based approach to sustainable manufacturing and the importance of product-process-system (manufacturing system, and supply chain) integration for improving sustainability performance. Students will also learn tools and techniques that can be used to model, measure and evaluate manufacturing systems and supply chains to improve economic and environmental performance while meeting the needs of consumers, employees, and other stakeholders.	P	3	N
MFS	606	Global Issues in Manufacturing	GLOBAL ISSUES IN MANUFACTURING. (3) The need to increase quality, productivity, efficiency and sustainability in manufacturing operations spanning the product, process and systems (manufacturing systems as well as supply chain) domains is essential for companies to be successful. The increased globalization of markets and manufacturing operations, declining natural resources and negative consequences of some manufacturing practices as well as increased legislation in many regions have led to many new challenges that companies must overcome to be successful in competitive markets. This seminar course will introduce students to a variety of global issues in manufacturing through presentations by leading national and international experts in these domains. The seminars will cover a broad range of manufacturing related topics relevant to many disciplines including manufacturing, mechanical and electrical engineering. The course can also help graduate students identify topical issues that need further investigation and could become potential research topics. (Same as EE/ME 606.)	P	3	E
MFS	613	Sustainability, Ethics, & Leadership in Manu. Orga.	SUSTAINABILITY, ETHICS, AND LEADERSHIP IN MANUFACTURING ORGANIZATIONS. This course is intended to provide future manufacturing managers and leaders a basic understanding of important theories and practices necessary to successfully manage and lead teams to achieve manufacturing organizational objectives. The course is organized into several modules. The first module will focus on developing an understanding and capability to approach ethical and sustainability concerns confronted by manufacturing organizations. This will include coverage of tools to help identify and address societal and environmental obligations of manufacturing organizations and issues confronting them that span multiple cultures and nations. Because people are one of the most important resources in any organization, the second and third modules will address organizational behavior (OB) and individual effectiveness. OB theories and practices that can be used to increase the capability to observe, understand and manage people's behavior will be covered. The last module considers safety and ergonomics as they relate to manufacturing organizations. Coverage will include tools and techniques that can be used to analyze the manufacturing workplaces and ensure its ergonomic design as well as an overview of the current state of occupational safety and health regulations. Prereq: Graduate standing.	P	3	E
MKT	430G	Service Marketing Management	SERVICES MARKETING MANAGEMENT. (3) This course addresses marketing and management issues and problems faced by service organizations. Marketing and management concepts are broadened and applied to the service organizations. Topics related to service quality, the marketing mix, and service delivery are covered. Prereq: MKT 300, MGT 301. (Same as MGT 430.)	P	3	E
MGT	610	Global Management	GLOBAL MANAGEMENT. (3) This course examines the problems of managing a business enterprise which spans international boundaries. Students will develop an understanding of the political, social, economic, and technological factors driving globalization and will consider the impact of these forces on competition, markets, industry structure, and organization.	P	3	E
MGT	697	Leadership, Communications, & Ethics	LEADERSHIP, COMMUNICATIONS AND ETHICS. Political, historical, and philosophical perspectives on the meaning and processes of top management leadership. Applications of leadership perspective to the development of organizational culture, ethics and values, stakeholder relations, business-government relations, and competitiveness.	P	3	E
CPH	600	Mgmt of Public Health Organizations	HEALTH SERVICES AND SYSTEMS ORGANIZATION. (3) An introduction to the health care delivery system in the United States, including its composition, functioning, the interrelationships of organizations and professional groups within the system in various settings, health care terminology, and major problems and issues in the delivery of health services. Prereq: College of Public Health graduate program enrollment or permission of instructor	P	3	E
PA	602	Strategic Planning and Organizational Change in the Public and Nonprofit Sectors	HEALTH SERVICES AND SYSTEMS ORGANIZATION. (3) An introduction to the health care delivery system in the United States, including its composition, functioning, the interrelationships of organizations and professional groups within the system in various settings, health care terminology, and major problems and issues in the delivery of health services. Prereq: College of Public Health graduate program enrollment or permission of instructor.	P	3	E
HMT	588	Strategic Mgmt in the Hosp & FD Service Industry	STRATEGIC MANAGEMENT IN THE HOSPITALITY AND FOOD SERVICE INDUSTRY. A course requiring students to use integrative skills to evaluate theories and applications regarding decision making, strategic planning and management concepts specific to hospitality and food service organizations. Prereq: Graduate student status or HMT 120, HMT 210, HMT 270, HMT 308, MGT 301 and MKT 300	P	3	E

# of REQUIRED Credit hours in Guided Electives (i.e., electives for a focused or track/concentration/speciality are). If 9 hours is required and there are 15 hours to choose from, then only 9 hours are required)
Note: number recorded will automatically populate Guided Elective hours in "Summary of Total Program Hours" table — Credit Hours: | NA

FREE Elective Courses (i.e, general program electives, open to the students to choose) (if applicable)

Course Prefix	Course #	Course Title	Course Description	Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course

Total # of Credit Hours in Free Electives (i.e., general program electives) (if applicable) — **Note: number recorded will** — Credit Hours: **9** | **NA**

		Summary of Total Program Hours	**Required Core Hours (i.e., # of hours in degree program core)**	**27**	NA
			Required Program Options - Track/Concentration/Specialty Hours (if applicable)	**0**	NA
			Guided Elective Hours (e.g., focused or track/concentration/speciality area specific electives) (if applicable)	**0**	NA
			Free Elective Hours (i.e., general program electives) (if applicable)	**9**	NA
			Total # of credit hours required for Program	**36**	**NA**
		Information to be completed by PIE Office			
			# of new courses		NA
			Total # of Courses (includes new and existing)		NA
			Precentage of new courses (more than 25% may require SACS Substantive Change)	#VALUE!	NA

PROPOSED PROGRAM SUMMARY

Council on Postsecondary Education

Institution:	***University of Kentucky***
Program Name:	***Teacher Preparation in Visual Impairment***
Degree Designation	***Master of Arts***
CIP Code:	***13.1009***
Credit Hours:	***33 credits***
(Tentative) Institutional Board Approval Date:	***2/21/2020***
Implementation Date:	***5/15/2020***

Program Description:

Describe the program and its aims

The Teacher Preparation Program in Visual Impairments is designed to train Teachers of the Visually Impaired (TVIs) to work with children from preschool through graduation who are blind and visually impaired, including those with and without additional disabilities. TVIs modify instruction and materials for students to gain access to the core curriculum, as well as teach the expanded core curriculum, which consist if nine specific skill areas such as assistive technology, independent living, and sensory efficiency that are needed for post-graduation success. The current TVI certification program consists of three tracks, one for initial teaching candidates, one for initial teaching candidates that are employed as a TVI while enrolled in the program (alternate certification), and the last for those candidates who already hold a teaching degree and/or certification in another area. The master's degree will be inclusive to all three of these certification programs and will consist of the core Visual Impairment (VI) classes.

The TVI program uses a hybrid model with synchronous classes offered via Zoom, face-to-face weekends, and intensive summer courses held at University of Kentucky and Kentucky School for the Blind (KSB) in Louisville.

There are ten core VI classes for the program that focus specifically on visual impairments, the final one consisting of student teaching or field experience. The total credit hours for the degree program is 33. It should be noted that the degree requirements are different from Kentucky teacher certification requirements, which may require additional coursework.

Will this program replace or enhance any existing programs(s) or tracks, concentrations, or specializations within an existing program? If yes, please specify.

This program will supplement the current VI certification program.

Student Demand:

Please note the expected enrollment over the first five years of the program

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
13	28	30	30	30

Market Demand:

This is an open-ended response that will be used in CPE agenda items. Institutions should explain why this program is needed. Note if it replaces another program on campus. Remember that your audience is the CPE, not higher education administrators, faculty, or staff.

Teachers of the Visually Impaired are considered a critical shortage area across the nation. The current certification program has been running at or above capacity since the first cohort started in 2013. Despite 59 TVIs completing the program, 35 of the 39 current students are working on the job while in the program on "emergency" certifications. At present, there are numerous unfilled positions for TVIs across Kentucky, with little hope they will find a teacher.

Answer either Employer Demand or Academic Demand below

Employer Demand: [1]

If the program is designed for students to enter the workforce immediately, please complete the following table.

	Regional	State	National
Type of Job	Special Education Teacher		
Average Wage	$48865	$48340	$50652
# of Openings	83	131	18578
Growth Projections	10%	10.43%	9.9%
Type of Job	Vocational Rehabilitation Counselor		
Average Wage	$62,318	$37,724	$42926
# of Openings	1	9	1330
Growth Projections	10.9%	10.9%	12.6%
Type of Job	Low Vision Therapist, Orientation and Mobility Specialist		
Average Wage	NA	NA	$69,179
# of Openings			239
Growth Projections	23.1%	21.8%	23.8%
Type of Job			
Average Wage			
# of Openings			
Growth Projections			
Type of Job			
Average Wage			
# of Openings			
Growth Projections			

Please note the time frame for the projections and source of the market demand information:	Market Demand data was pulled from Burning Glass and utilizes BLS data, actual job postings, and proprietary data models. Salary is 12-month averages. And Projections are 2019-2030.

Academic Demand:

If this is not a program that is designed for students to enter the workforce immediately after graduation, please indicate the skills that graduates will attain, the types of graduate programs the graduates are most likely to attend, and the types of jobs graduates will eventually seek.

NA

Unnecessary Duplication

List any similar programs based on CIP codes or other programs that are similar but may be classified in a different CIP code.

	Program	Institution
Program 1:	**NA**	**NA**
Program 2:		
Program 3:		
Program 4:		
Program 5:		

a. **Comparison of Objectives/Focus/Curriculum to Similar Programs:** *Explain the differences in curriculum, focus, and/or objectives. If the proposed program curriculum does not differ substantially from existing programs, then describe potential collaborations with other institutions.*

   Not applicable

b. **Comparison of Student Populations***: Describe how your target student population is different from those at other institutions and explain how your program reaches this new population (e.g. the proposed program is completely online while other programs are face-to-face or hybrid).*

   Not applicable

c. **Access to Existing Programs:** *Explain how/why existing programs cannot reach your target population and/or provide evidence that existing programs do not have the capacity to meet current student demand (e.g. the number of students on enrollment waiting list).*

   Not applicable

d. **Feedback from Other Institutions:** *Summarize the feedback from colleagues at institutions with similar programs.*

   Not applicable

Cost

Please provide a summary of revenues and expenditures.

Projected Revenue over Next Five Years	$1,800,226
Projected Expenses over Next Five Years	$1,633,713

Will additional faculty be needed?

If yes, please explain how the institution will pay for these additional costs.

No

Provide a budgetary rationale for creating this new program:

This is an open-ended response that will be used in CPE agenda items. Institutions should explain how the program will be funded, what other programs will be affected, and why this program is considered both an efficient and effective use of funds.

This program is the only one in Kentucky that trains Teachers of the Visually Impaired (TVIs). The current teacher certification program has been in high demand, as UK is the only university in Kentucky that trains Teachers of the Visually Impaired (TVIs). As of August 2019, the program has certified 59 TVIs since it started in 2013 and has another 38 currently enrolled in the program. Each cohort has been running at or above capacity due to the severe shortages in this area, as indicated by the Kentucky Department of Education's (KDE) critical shortage area list. In addition, over 95% of the teacher candidates in the program were employed as their school district's TVI while completing the program, since no fully certified TVIs were available. This shortage of TVIs extends nationally, as there is a critical shortage across the U.S. The program will be supported by a grant from the KDE.

University of Kentucky
MS - MASTER OF SCIENCE
13.1009-Education/Teaching of Individuals with Vision Impairments Including Blindness.
Submission Date: 02/24/2020 09:24

Full Proposal - Basic Info

Institution :	University of Kentucky
Program Type :	Single Institution
Program Name :	Teacher Preparation Program in Visual Impairments
Degree Level :	Master's
Degree Designation :	MASTER OF SCIENCE
CIP Code (2-Digit) :	13-EDUCATION.
CIP Code :	13.1009-Education/Teaching of Individuals with Vision Impairments Including Blindness.

Academic Unit (e.g. Department, Division, School) :	College of Education
Name of Academic Unit :	Department of Early Childhood, Special Education a
Name of Program Director :	Donna Brostek Lee

Intended Date of Implementation :	5/15/2020
Anticipated Date for Granting First Degrees :	5/15/2021
Date of Governing Board Approval :	2/21/2020

Institutional Contact Information

First Name :	Annie
Last Name :	Weber
Title :	Assistant Provost for Strategic Planning and Institutional Effectiveness
Email :	ann.weber@uky.edu
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Full Proposal - Mission: Centrality to the Institution's Mission and Consistency with State's Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

1. The Teacher Preparation Program in Visual Impairments will align course standards with the Council for Exceptional Children (CEC) Initial Special Education Standards for Blind and Visual Impairments and maintain program approval through the Commonwealth of Kentucky

2. The program will develop highly skilled, prepared, and knowledgeable Teachers of the Visually Impaired (TVIs) to work with children of all ages and ability levels, that have visual impairments and blindness.

3. The program will increase the number of qualified Teachers of the Visually Impaired (TVIs) that exemplify high standards of professionalism across the United States, specifically addressing the needs of the Commonwealth of Kentucky.

2. Explain how the proposed program relates to the institutional mission and academic strategic plan.

Mission:
The Teacher Preparation Program in Visual Impairments aligns with the University of Kentucky 2015-2020 Strategic Plan of strengthening graduate education in the area of quality and distinctiveness, with the acknowledgment of hosting the only TVI program in the Commonwealth. Secondly, the program supports the strategic objective of community engagement by serving and addressing the needs of children who are blind and visually impaired and increase their post-graduation success.

3. Explain how the proposed program addresses the state's postsecondary education strategic agenda.

The program would support the Council on Postsecondary Education's 2016-2021 Strategic Plan by increasing degree completion, fill workforce shortages, and guide more graduates to a career path. The profession has workforce shortages in the Commonwealth of Kentucky and nationwide. It also supports the mission to encourage more people to take advantage of postsecondary opportunities especially for employees in the P-12 educational system. Finally, the program objectives are linked to the goal of creating economic growth and development and making the state more prosperous

4. Explain how the proposed program furthers the statewide implementation plan.

The program would support the Council on Postsecondary Education's 2016-2021 Strategic Plan by increasing degree completion, fill workforce shortages, and guide more graduates to a career path. The profession has workforce shortages in the Commonwealth of Kentucky and nationwide. It also supports the mission to encourage more people to take advantage of postsecondary opportunities especially for employees in the P-12 educational system. Finally, the program objectives are linked to the goal of creating economic growth and development and making the state more prosperous

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Submission Date: 02/24/2020 09:24

Full Proposal - Quality: Program Quality and Student Success

1. List all student learning outcomes of the program.

The following outcomes address specialized knowledge, intellectual skills, applied learning, and civic learning for working with children who are blind and visually impaired:

1. Communication and Professionalism
• Teacher candidates will conduct oneself with a high degree of integrity and professionalism in the workplace, community, and with consumers and students.

2. Assessment
• Teacher candidates will administer assessments to determine the present level of performance, document learner progress, and utilize the data for instructional planning and delivery.

3. Instructional Planning and Delivery
• Teacher candidates will plan and implement effective lessons that target the individual learner characteristics based on continuous assessment data. These lessons will demonstrate modifications to the core content and provide instruction in the Expanded Core Curriculum (ECC).

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

The TVI curriculum is based on the curricular standards set by the Council for Exceptional Children (CEC) Initial Specialty Set: Blind and Visual Impairments, as well as maintaining program approval through the Commonwealth of Kentucky for teacher certification. Alignment with professional standards is a program goal. The student learning outcomes are directly linked to the CEC BVI standards.

3. Highlight any distinctive qualities of this proposed program.

The Visual Impairment Program Faculty are recognized by state agencies and educational systems for commitment to educating all children who are blind and visually impaired and for excellence in graduating teacher candidates certified to teach children who are blind and visually impaired. Donna Lee, Clinical Associate Professor and Visual Impairment Program Faculty Chair, is recognized for expertise in teacher preparation in visual impairments, the braille code, and tactile graphics. Gerald Abner, Clinical Instructor, has extensive clinical experience in educating students with visual impairments and complex needs and works on a statewide tactile communication project. Justin Kaiser, Clinical Assistant Professor, has experience in teacher preparation in visual impairments and served as the chair of the Orientation and Mobility division of the Association for the Education and the Rehabilitation of the Blind and Visually Impaired (AER).

4. Will this program replace any existing program(s) or specializations within an existing program?

YES

Please specify.

It will become an option as part of the current VI certificaton program.

5. Include the projected faculty/student in major ratio.

There are approximately 15 students to a cohort, with two full-time faculty serving two cohorts. There are also two additional part-time faculty that support students during practicum and field experience

6. Is there a specialized accrediting agency related to this program?

YES

Please identify the agency.

CAEP

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Do you plan to seek accreditation?

YES

Please explain your plans for accreditation.

Currently our unit is accredited through CAEP (NCATE) and this program will be included when we are up for renewal in 2022. We do plan to seek approval through EPSB for this program as well as seeking accreditation through AER.

7. Attach SACS Faculty Roster Form.

TVI_MS_Faculty Roster.pdf

8. A. Describe the library resources available to support this program. You may attach any documentation provided to SACS.

The University of Kentucky libraries satisfy the educational, research, and service missions by acquiring, organizing, and preserving academic resources that support diverse university programs. The University of Kentucky library system offers an extensive collection of printed and electronic volumes in addition to commercial databases. The library system has a collection of journals and books related to blindness and visual impairment. Graduate students will have access to the library system and electronic databases.

B. Describe the physical facilities and instructional equipment available to support this program. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.

The Teacher Preparation Program in Visual Impairments is housed in the Department of Early Childhood, Special Education, and Rehabilitation Counseling in the College of Education at Taylor Education building. Taylor Education building houses classrooms, administration, faculty offices, staff, and technology support. The faculty has access to the Education Library at Dickey Hall and additional classrooms for on-campus courses.
Also,Visual Impairment Program has a classroom for off-campus course meetings at the Kentucky School for the Blind in Louisville. Instructional equipment specific to the needs of the VI program has been acquired through external grant funding from the Kentucky Department of Education.

9. Clearly state the admission, and retention, and completion standards designed to encourage high quality.

The Visual Impairment Program faculty will be responsible for admissions. Students will apply to the Graduate School as well as the Visual Impairment Program. The application for the Teacher Preparation Program in Visual Impiarments requires a resume, transcripts, references, and a biographical statement of interest. The admissions committee will review applications, conduct personal interviews if necessary, and determine entry
into the program. An advisor will be assigned to each graduate student. A curriculum contract will be reviewed at entry, mid, and exit points by the advisor and student. Students failing to demonstrate the intended student learning outcomes in each semester will be contacted in writing by the advisor before the start of the next semester. A plan for improvement will be discussed and implemented. Retention and completion standards will be assessed through communication between faculty, advisors, and graduate students by evaluating student coursework.

10. Clearly state the degree completion requirements for the program.

Students must complete all 10 courses, 33 credit hours, or core VI classes with an overall GPA of 3.0 or higher.

Name	Total number of hours required for degree	Number of hours in degree program core	Number of hours in guided electives	Number of hours in free electives
Experienced with Visual Impairments	33	33	0	0
New of Visual Impairments	39	39	0	0
Program	33	33	0	0

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12. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.

The Teacher Preparation Program in Visual Impairments is the only program in Kentucky that prepares Teachers of the Visually Impaired. Articulation agreements are not necessary

13. List courses under the appropriate curricular headings.

KPPPSCourseTemplate.xlsx

TPVI_Assessment Plan.pdf

14. Will this program utilize alternative learning formats (e.g. distance learning, technology-enhanced instruction, evening/weekend classes, accelerated courses)?

YES

YES	Distance learning
YES	Courses that combine various modes of interaction, such as face-to-face, videoconferencing, audio-conferencing, mail, telephone, fax, e-mail, interactive television, or World Wide Web
YES	Technology-enhanced instruction
YES	Evening/weekend/early morning classes
NO	Accelerated courses
YES	Instruction at nontraditional locations, such as employer worksite
NO	Courses with multiple entry, exit, and reentry points
NO	Courses with "rolling" entrance and completion times, based on self-pacing
NO	Modularized courses

Please describe planned alternative methods of program delivery involving greater use of technology, distance education, and/or accelerated degree designs, to increase efficiency, better address student educational and workforce needs, and maximize student success, for both traditional and non-traditional students.

(Should not be blank)

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Full Proposal - Demand: Program Demand/Unnecessary Duplication

1. Student Demand:

a. Provide evidence of student demand at the regional, state and national levels.

Teachers of the Visually Impaired are considered a critical shortage area across the nation. The current certification program has been running at or above capacity since the first cohort started in 2013. Despite 59 TVIs completing the program, 35 of the 39 current students are working on the job while in the program on "emergency" certifications. At present, there are numerous unfilled positions for TVIs across Kentucky, with little hope they will find a teacher.

b. Identify the applicant pool and how they will be reached.

The applicant pool, in general, will consist of individuals who have completed a bachelor's degree program and who are living within the Commonwealth of Kentucky. A future potential program goal would be to include out-of-state applicants. One target applicant pool is current teachers in local school districts. The second pool extends to other educators and therapists. The third applicant pool would be to individuals with a desire and drive to work with students who are blind and visually impaired but do not have a teaching background. Other educators and therapists may be reached through recruitment materials and notifications sent to school districts across the Commonwealth. Lastly, applicants may be reached through marketing on the University of Kentucky’s website and electronic communications to state agencies.

c. Describe the student recruitment and selection process.

Recruitment by the Visual Impairment Program and the College of Education will promote the Teacher Preparation Program in Visual Impairments among the target audiences in the teacher preparation programs with marketing materials. Faculty will promote the program through professional networks such as school systems, educational service agencies, state agencies, and private organizations throughout the Commonwealth of Kentucky by electronic and personal communication. Lastly, applicants may be reached through marketing on the University of Kentucky’s website and electronic communications to state agencies.
The Visual Impairment Program faculty will be responsible for admissions. Students will apply to the Graduate School as well as the Visual Impairment Program. The application for the Teacher Preparation Program in Visual Impairments requires a resume, transcripts, references, and a biographical statement of interest. The admissions committee will review applications, conduct personal interviews if necessary, and determine entry into the program.

d. Identify the primary feeders for the program.

One target audience is individuals who hold an undergraduate degree in education (elementary, secondary, or special education) or in health and human services. A second target group is individuals who completed an undergraduate degree in an unrelated field and who seek a career
change.

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

There will likely not be an increase of students, but instead a change to degree seeking, as opposed to certification only.

f. Project estimated student demand for the first five years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) - Fall Semester
2020-2021	0	13
2021-2022	13	28
2022-2023	15	30
2023-2024	15	30

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2024-2025	15	30

2. Employer Demand:

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

Teachers of the Visually Impaired (TVIs) work for public school systems. Salaries for TVIs in Kentucky are based on rank, which is determined by the Kentucky Education Professional Standards Board (EPSB) and each school district. The number of open positions for TVIs in Kentucky has varied from around 15-30 per a year.

Type of Job

?Special Education Teacher

	State	Regional	National
?Average Wage	$48,865	$48,340	$50,652
# of Openings	83	131	18578
Growth Projections	10%	10.43%	9.9%

Type of Job

Vocational Rehabilitation Counselor

Average Wage	$62,318	$37,724	$42,926
# of Openings	1	9	1330
Growth Projections	10.9%	10.9%	12.6%

Type of Job ?Low Vision Therapist, Orientation and Mobility Specialist

Average Wage	NA	NA	$69,179
# of Openings	NA	NA	239
Growth Projections	23.1%	21.8%	23.8%

3. Academic Disciplinary Needs:

This program is the only one in Kentucky that trains Teachers of the Visually Impaired (TVIs).

a. If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.

(Should not be blank)

4. Similar programs:

a. Are there similar programs in other Southern Regional Education Board (SREB) states and in the nation?

YES

Please identify similar programs in other SREB states and in the nation.

Florida State offers an on-campus program master's degree program.

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b. Our records indicate the following similar programs exist at public institutions in Kentucky.

---- No Programs Exist----

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Full Proposal - Cost: Cost and Funding of the Proposed Program

1. Will this program require additional resources?

NO

2. Will this program impact existing programs and/or organizational units within your institution?

NO

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

This program is the only one in Kentucky that trains Teachers of the Visually Impaired (TVIs).

A. Funding Sources, by year of program	1st year	2nd year	3rd year	4th year	5th year
	0	0	0	0	0
Total Resources Available from Federal Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Total Resources Available from Other Non-State Sources					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
State Resources					
New :	0	0	0	0	0
Existing :	226342	233132	240126	247330	254750
Narrative Explanation/Justification :	This program is being funded by a Kentucky Department of Education grant.				
Internal					
Allocation :	0	0	0	0	0
Reallocation :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Student Tuition					
New :	339075	349247	359724	370516	381631
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Figured at 15 students per a cohort, with two active cohorts. 3% tuition rate increase figured each year				
Total					
New :	$339,075	$349,247	$359,724	$370,516	$381,631
Existing :	$226,342	$233,132	$240,126	$247,330	$254,750
Total Funding Sources :	$565,417	$582,379	$599,850	$617,846	$636,381

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Staff: Executive, administrative, and managerial					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Other Professional					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Faculty					
New :	0	0	0	0	0
Existing :	267221	275237	283495	292000	300760
Graduate Assistants (if master's or doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Student Employees					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	The faculty include two full-time faculty members, as with two part-time.				
Equipment and Instructional Materials					
New :	0	0	0	0	0
Existing :	5000	5000	5000	5000	5000
Narrative Explanation/Justification :	Funded through KDE				
Library					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Contractual Services					
New :	0	0	0	0	0
Existing :	5000	5000	5000	5000	5000
Narrative Explanation/Justification :	Funds for guest speakers covered under KDE grant.				
Academic and/or Student Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Other Support Services					
New :	0	0	0	0	0
Existing :	0	0	0	0	0

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B. Breakdown of Budget Expenses/Requirements	1st year	2nd year	3rd year	4th year	5th year
Narrative Explanation/Justification :	Not applicable				
Faculty Development					
New :	0	0	0	0	0
Existing :	8000	8000	8000	8000	8000
Narrative Explanation/Justification :	Shared with Orientation and Mobility faculty under KDE grant.				
Assessment					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Student Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Faculty Space and Equipment (if doctorate)					
New :	0	0	0	0	0
Existing :	0	0	0	0	0
Narrative Explanation/Justification :	Not applicable				
Other					
New :	0	0	0	0	0
Existing :	25000	25000	25000	25000	25000
Narrative Explanation/Justification :	Travel money provided by KDE grant for supervising students and technical assistance across the state.				
Total					
New :	$0	$0	$0	$0	$0
Existing :	$310,221	$318,237	$326,495	$335,000	$343,760
Total Budget Expenses/Requirements :	$310,221	$318,237	$326,495	$335,000	$343,760
Grand Total					
Total Net Cost :	$255,196	$264,142	$273,355	$282,846	$292,621

Kentucky Postsecondary Program Proposal System

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Full-Proposal - Assess: Program Review and Assessment

1. For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:

a. Which components will be evaluated?

See assessment plan submitted under curriculum

b. When will the components be evaluated?

See assessment plan submitted under curriculum

c. When will the data be collected?

See assessment plan submitted under curriculum

d. How will the data be collected?

See assessment plan submitted under curriculum

e. What will be the benchmarks and/or targets to be achieved?

See assessment plan submitted under curriculum

f. What individuals or groups will be responsible for data collection?

See assessment plan submitted under curriculum

g. How will the data and findings be shared with faculty?

See assessment plan submitted under curriculum

h. How will the data be used for making programmatic improvements?

See assessment plan submitted under curriculum

2. What are the measures of teaching effectiveness?

See assessment plan submitted under curriculum

3. What efforts to improve teaching effectiveness will be pursued based on these measures?

See assessment plan submitted under curriculum

4. What are the plans to evaluate students' post-graduate success?

See assessment plan submitted under curriculum

Course Title (CIP)						
Degree Program Core Courses (i.e., Courses required by ALL students in the Major--includes Premajor or Preprofessional courses)						
Course Prefix	**Course #**	**Course Title**	**Course Description**	**Type of Course: program core (C) or pre-major/ pre-professional (P)**	**Credit Hours**	**Existing (E) or New (N) Course**
BVI	**580**	**Itroduction to Visual Impairments**	**This course will provide an introduction to the educational programs and services for students with blindness and visual impairments. Content of this course will focus on the historical foundation of the field, the developmental and psychosocial aspects of individuals with visual impairments, an overview of legislation, influential agencies, and service delivery methods. The impact of vision loss on early childhood development will also be covered.**	C	**3**	**E**
BVI	**582**	**Anatomy and Physiology of the Eye**	**This course will cover the anatomy and physiology of the eye, including visual development. Causes of ocular and neurological visual impairment will be addressed, treatments, and their impact on learning. Course topics will include optics, low vision devices and services, environmental adaptations, and interpreting eye reports. Learners will have the opportunity to directly observe a low vision evaluation and will learn the components of a functional vision assessment.**	C	**3**	**E**
BVI	**583**	**Braille Codes I**	**This course is designed to teach the literary braille code. Students will become proficient in transcribing both uncontracted and contracted braille utilizing a Perkins Brailler, slate and stylus, and six-key entry computer software with proper formatting. Students will also learn appropriate techniques for reading braille both tactually and visually. In addition, the history of the braille code will be covered as well as current resources.**	C	**3**	**E**
BVI	**611**	**Teaching Methods for Students with VI**	**This course is designed to examine how to teach and modify the core curriculum for students who are blind or visually impaired. Topics will include: adaptation of general education classroom materials, IEP development and implementation, lesson planning, and braille literacy. Prospective teachers will develop organization skills and strategies necessary to be efficient in delivery of services as a teacher of the visually impaired.**	C	**3**	**N**
BVI	**614**	**Braille Codes II**	**This course studies advanced braille codes with a special emphasis on braille mathematics utilizing Unified English Braille (UEB) and the Nemeth Code. Other codes covered are music and foreign language (French, German, and Spanish). Braille formats will also be taught, including how to correctly transcribe and format materials for braille users, including preparing worksheets and tests for students. Competency in using the Cranmer Abacus will also be mastered.**	**C**	**3**	**N**
BVI	**615**	**Assistive Technology for Students with VI**	**This course introduces a wide variety of technologies for people who are blind or visually impaired. Students will learn about Universal Design for Learning (UDL) as it relates to technology, as well as proprietary software and hardware. Technologies covered include, but are not limited to: Screen readers, screen magnification, electronic note takers, refreshable braille displays, braille translation programs, magnification hardware, scanning and OCR programs, and accessible digital book options. A wide variety of computers, tablets, and smart phone options will be explored. Instructional strategies for teaching technology skills will be emphasized.**	**C**	**3**	**N**
BVI	**616**	**Expanded Core Curriculum for BVI**	**The Expanded Core Curriculum (ECC) is the body of knowledge and skills that are needed by students with visual impairments due to their unique needs. This course will explore all nine areas of the ECC including: compensatory or functional academic skills, orientation and mobility, social interaction skills, independent living skills, recreation and leisure skills, career education, use of assistive technology, sensory efficiency skills and self-determination. Participants will have the opportunity to observe and work with students in a summer program and teach skills from the ECC.**	**C**	**3**	**N**
BVI	**617**	**Visual Impairment and Multiple Disabilities**	**This course is designed to provide students with knowledge and skills necessary to design and implement programs for persons who have visual impairments and additional disabilities. Topics include assistive technology, augmentative and alternative communication, literacy instruction, sensory processing, adaptive behavior, and self-help skills. An emphasis will be placed on adaptations that enhance functioning for persons with developmental delays, autism, medical conditions, deaf-blindness, communication disorders, and those with common syndromes and eye disorders related to multiple disabilities.**	**C**	**3**	**N**
BVI	**618**	**Assessment of Students with VI**	**This course covers various types of assessments used to evaluate students who are blind or visually impaired. Participants will discuss testing and assessment including the development of standardized tests and their applicability for individuals with visual impairments, as well as alternate assessments. Students will practice assessing and planning educational programs for students with visual impairments by completing a Functional Vision/Learning Media Assessment, as well as assessments in assistive technology and the Expanded Core Curriculum.**	**C**	**3**	**N**

BVI	710	Student Teaching/Field Experience in VI	This is a supervised student teaching/field experience working with children, preschool through graduation age, who are blind or visually impaired. Candidates will apply best practices for working with children who are blind or have low vision, including those with additional disabilities. Successful completion of this course will demonstrate the candidate's ability to apply methods of teaching that include assessment, program planning and implementation, appropriate environmental and academic modifications, and instruction in the Expanded Core Curriculum. Candidates will also have to demonstrate appropriate classroom and/or caseload management strategies based on their placement.	c	6	N
			Total Credit hours Required for Program Core (i.e., # of hours in degree program core) Note: number recorded will automatically populate Core Hours in "Summary of Total Program Hours" table		33	NA

Core Courses Required for Track(s), Concentration(s), or Speciality(s) (if applicable)

Course Prefix	Course #	Course Title	Course Description	Course Required for Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
			Total Credit hours Required for Program Options (Track(s), Concentration(s), or Speciality) (if applicable) Note: number recorded will automatically populate Program Option hours in "Summary of Total Program Hours" table		0	NA

GUIDED Elective Courses (i.e., Specified list of Program Electives AND/OR Electives focused on a specific track/concentration/or speciality) (if applicable)

Course Prefix	Course #	Course Title	Course Description	Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
			# of REQUIRED Credit hours in Guided Electives (i.e., electives for a focused or track/concentration/speciality are). If 9 hours is required and there are 15 hours to choose from, then only 9 hours are required) Note: number recorded will automatically populate Guided Elective hours in "Summary of Total Program Hours" table			NA

FREE Elective Courses (i.e, general program electives, open to the students to choose) (if applicable)

Course Prefix	Course #	Course Title	Course Description	Course Required for Program (P), Track (T), Concentration (C) or Specialty (S)	Credit Hours	Existing (E) or New (N) Course
Total # of Credit Hours in Free Electives (i.e., general program electives) (if applicable)				**Note: number**	**0**	**NA**

Summary of Total Program Hours	Required Core Hours (i.e., # of hours in degree program core)	33	NA
	Required Program Options - Track/Concentration/Specialty Hours (if applicable)	0	NA
	Guided Elective Hours (e.g., focused or track/concentration/speciality area specific electives) (if applicable)	0	NA
	Free Elective Hours (i.e., general program electives) (if applicable)	0	NA
	Total # of credit hours required for Program	**33**	**NA**
Information to be completed by PIE Office			
	# of new courses		NA
	Total # of Courses (includes new and existing)		NA
	Precentage of new courses (more than 25% may require SACS Substantive Change)	#VALUE!	NA

ASSESSMENT PLAN

Teacher Preparation Program in Visual Impairments

Teacher of the Visually Impaired

MS

General Information

- Degree: Teacher of the Visually Impaired, MS
- Department: Early Childhood, Special Education, and Rehabilitation Counseling
- College: Education
- CIP: 13.1009
- Major Begin Date: January 2019 (or Fall 2019 if not possible)

Teacher Preparation Program in Visual Impairments Overview

❖ Program Mission

Prepare teachers for a lifetime of learning, advocacy, and service in the education of children who are blind and visually impaired, including those with multiple disabilities.

❖ Program Objectives

1. The Teacher Preparation Program in Visual Impairments will align course standards with the Council for Exceptional Children (CEC) Initial Special Education Standards for Blind and Visual Impairments and maintain program approval through the Commonwealth of Kentucky

2. The program will develop highly skilled, prepared, and knowledgeable Teachers of the Visually Impaired (TVIs) to work with children of all ages and ability levels, that have visual impairments and blindness.

3. The program will increase the number of qualified Teachers of the Visually Impaired (TVIs) that exemplify high standards of professionalism across the United States, specifically addressing the needs of the Commonwealth of Kentucky.

Assessment Plan

I. Introduction

The approach to assessment in the Teacher Preparation Program in Visual Impairments entails measuring student progress towards the student learning outcomes (SLO) in the core ten Visual Impairment graduate courses. Assessment may take the form of pre and post-course questions that directly assess the SLO or scoring student work from courses with rubrics that can measure value-added over the course of the curriculum. All outcomes will be assessed within a two-year cycle using direct and indirect methods.

II. Assessment Oversight, Resources

The Visual Impairment Program Faculty chair will serve as the assessment coordinator. Other Visual Impairment Program faculty members may participate in the evaluation of student work pertaining to learning outcomes.

III. Program-Level Learning Outcomes

Teacher Preparation Program in Visual Impairments Learning Outcomes

- Communication and Professionalism
  - Teacher candidates will conduct oneself with a high degree of integrity and professionalism in the workplace, community, and with consumers and students.
- Assessment
  - Teacher candidates will administer assessments to determine the present level of performance, document learner progress, and utilize the data for instructional planning and delivery.
- Instructional Planning and Delivery
  - Teacher candidates will plan and implement effective lessons that target the individual learner characteristics based on continuous assessment data. These lessons will demonstrate modifications to the core content and provide instruction in the Expanded Core Curriculum (ECC).

Accreditation Standards

- The Teacher Preparation Program in Visual Impairments is an approved teacher certification program in Visual Impairments throughout the Commonwealth of Kentucky. Program standards are derived from the Council for Exceptaional Children (CEC), Initial Specialty Set: Blind and Visually Impaired.

IV. Curriculum Map

	Outcome		
	SLO #1 Teacher candidates will conduct oneself with a high degree of integrity and professionalism in the workplace, community, and with consumers and students.	**SLO #2 Teacher candidates will administer assessments to determine the present level of performance, document learner progress, and utilize the data for instructional planning and delivery.**	**SLO #3 Teacher candidates will plan and implement effective lessons that target the individual learner characteristics based on continuous assessment data. These lessons will demonstrate modifications to the core content and provide instruction in the Expanded Core Curriculum (ECC).**
BVI 580 Intro to VI	**I**	**I**	**I**
BVI 582 Anatomy of Eye		**I**	
BVI 583 Braille I			**I**
BVI 611 Methods of VI	**R**	**R**	**R**
BVI 614 Braille II			**A**
BVI 615 Assistive Tech VI		**R**	**A**
BVI 616 ECC for VI	**R**		**A**
BVI 617 VI Multiple Disabilities	**R**		**A**
BVI 618 Assessment in VI		**A**	
BVI 710 Field Experience	**A**	**A**	**A**

I- Introduced
R- Reinforced
A- Applied

V. Assessment Methods and Measures

Direct methods:

- Lesson plan observations and Rubric for Instructional Development and Effectiveness for Teachers of Students with Visual Impairments (RIDE) scores
- Lesson plans adaptation project
- Functional Vision/Learning Media Assessment
- Skills and disposition evaluation from supervisors used at the program level for practicum and field experiences
- Completed exit portfolio

Indirect methods:

- Grades in core VI courses
- Student self-reflections

SLO	Assessment Measure	Type of Measure	Year in Curriculum
1	BVI 580, BVI 611, and BVI 616: *Practicum Evaluation Forms, UK Skills and Dispositions Form*	Direct	1
	BVI 710 *Field Experience Forms - UK Skills and Dispositions Form*	Direct	2
2	BVI 618 *Functional Vision/Learning Media Assessment*	Direct	2
	BVI 710 *Lesson Plan Observations/RIDE Scores*	Direct	2
3	BVI 611 *Lesson Plan Adaptations Project*	Direct	1
	BVI 616 *Lesson Plan Observation/RIDE Score*	Direct	1
	BVI 710 *Exit Portfolio*	Direct	2
	BVI 710 *Lesson Plan Observations/RIDE Scores*	Direct	2

VI. Data Collection and Review

The Visual Impairment Program Faculty chair will coordinate data collection. Data will be gathered annually for all outcomes for all students. For artifacts collected from course work, faculty members teaching the course will collect and analyze the data. When necessary, a second reviewer of student work will be selected from the Visual Impairment Program faculty. Data will be discussed and reviewed by Visual Impairment Program faculty chair and Visual Impairment faculty.

VII. Assessment Cycle and Data Analysis

Assessment of student learning outcomes will be done annually. The program will follow a two-year assessment cycle. Two outcomes will be measured in year one and three outcomes will be measured in year two.

Student Learning Outcome	Cycle	Academic Year	Reporting Cycle
Communication and Professionalism	Year 1 & 2	2019-2020 2020-2021	
Assessment	Year 2	2020-2021	
Instructional Planning and Delivery	Year 1 & 2	2019-2020 2020-2021	

Assessment results will be reviewed and analyzed by the Undergraduate Affairs Committee (including the Director of Undergraduate Studies) and the Department Chair at the end of the Spring semester. Benchmarks will be adjusted as necessary after discussion in Undergraduate Affairs Committee. The assessment measures and methods will be evaluated and aligned with student learning outcomes every three years. Programmatic improvements will be discussed and improvement actions will be planned prior to the first or second Department of Biology Faculty Meeting of the Fall semester. The dissemination of the analysis/ interpretation of assessment results and the approval of the plan for improvement will take place at the first or second Department of Biology Faculty Meeting of the Fall semester. Assessment reports will be completed no later than October 1st of every year and turned in to the college's assessment coordinator for review. Final reports will be sent to the university's assessment office no later than October 31st of every year.

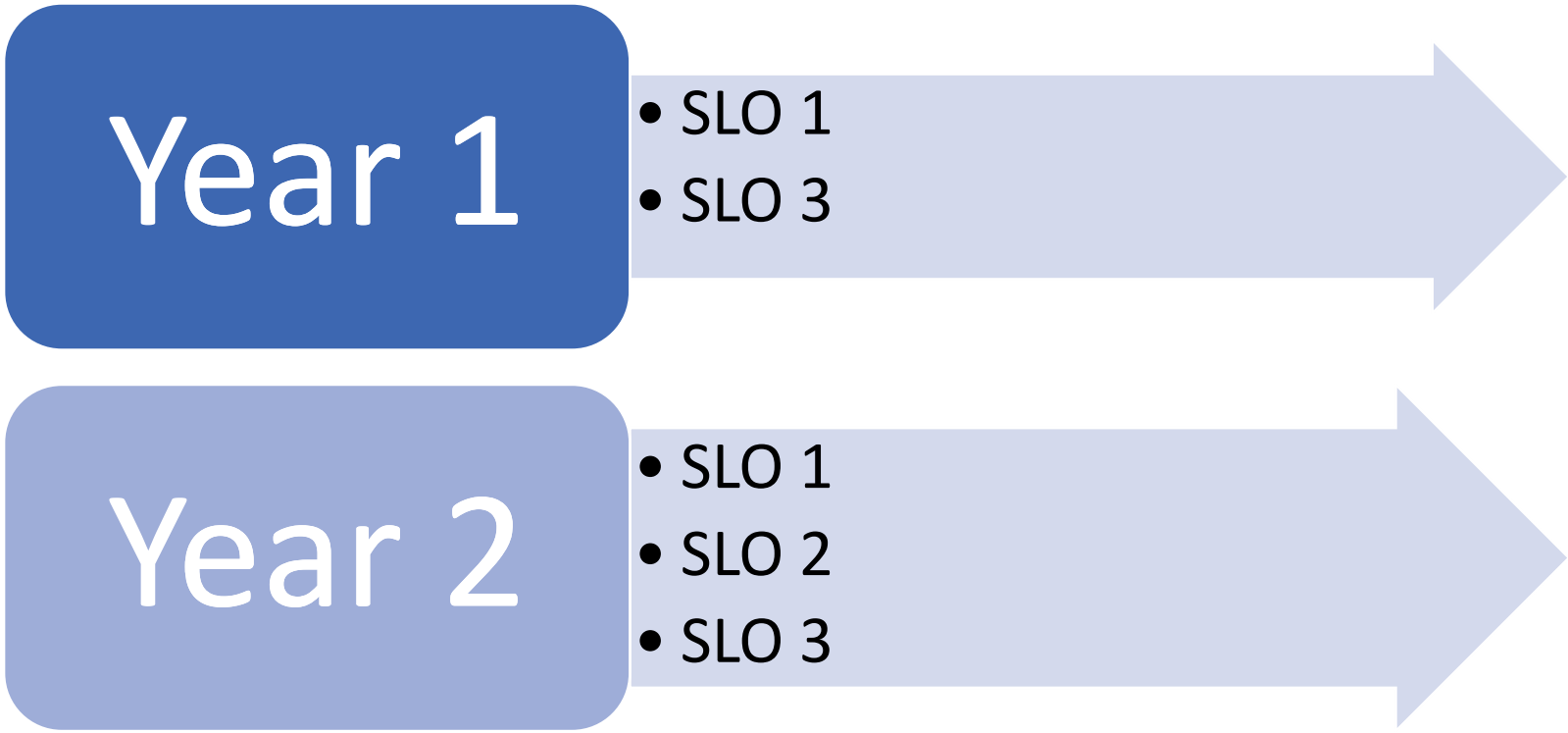
VIII. Teaching Effectiveness

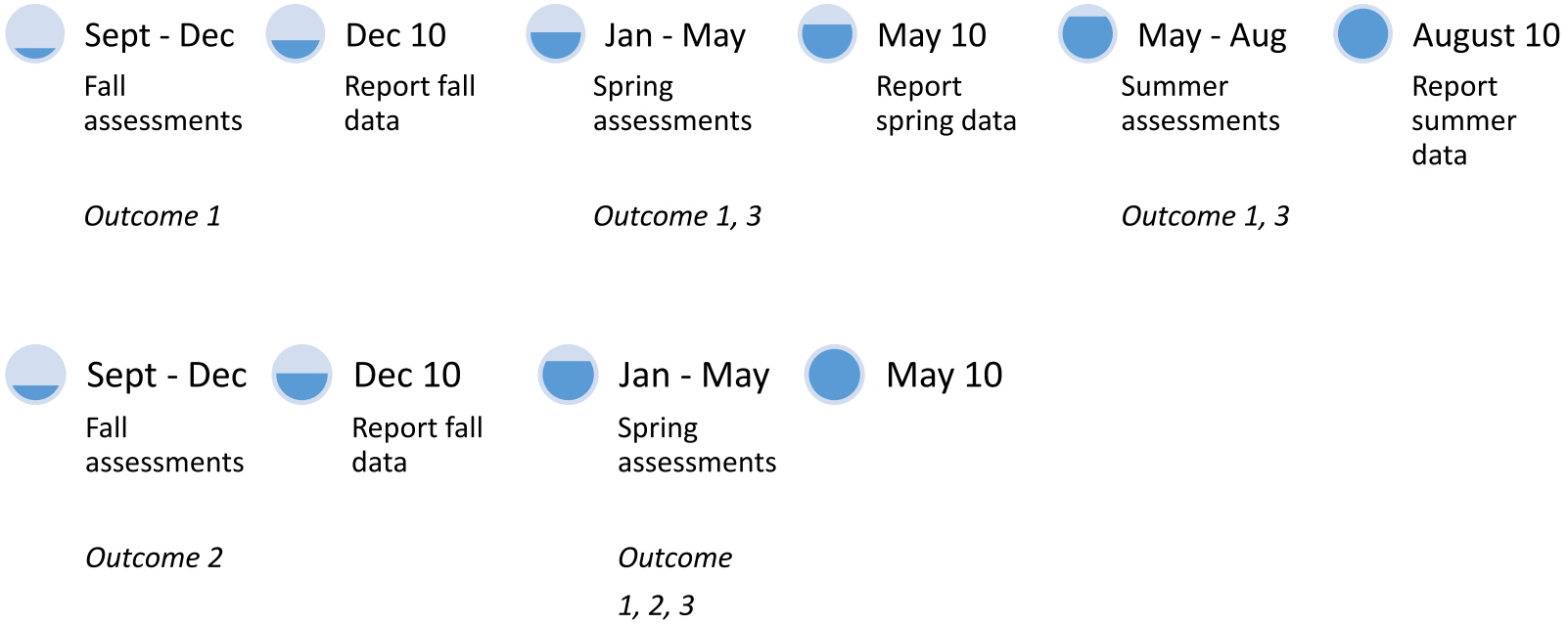
All University of Kentucky instructors will use the University Teacher Course Evaluation (TCE) process for students to evaluate the instructor each semester. The TCE outcomes will be included in the Digital Measures report and reviewed by the department chair and the instructor during performance evaluations. Reviews will occur on an annual basis. To increase instructor effectiveness, Visual Impairment Program faculty may attend workshops or utilize services provided by the Center for the Enhancement of Learning and Teaching.

IX. Post-Graduate Success

To measure post-graduate success, the Teacher Preparation Program in Visual Impairments will utilize data from three existing student surveys. The College of Education distributes a yearly post-graduate survey in April to graduating students and employers to collect data regarding workforce outcomes. Institution-wide surveys regarding post-graduate success and workforce outcomes are the graduating student and the first destination survey.

X. Appendices


Year 1
• SLO 1
• SLO 3
Year 2
• SLO 1
• SLO 2
• SLO 3


Sept - Dec
Fall assessments
Outcome 1
Dec 10
Report fall data
Jan - May
Spring assessments
Outcome 1, 3
May 10
Report spring data
May - Aug
Summer assessments
Outcome 1, 3
August 10
Report summer data
Sept - Dec
Fall assessments
Outcome 2
Dec 10
Report fall data
Jan - May
Spring assessments
Outcome 1, 2, 3
May 10

TITLE: Engineering in Kentucky: A Sector Analysis of Labor Market Information and Program Demand.

DESCRIPTION: CPE staff will discuss the results of a sector analysis on engineering supply and demand in Kentucky.

PRESENTERS: David Mahan, CPE's Assoc. Vice President for Data, Research and Advanced Analytics

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SUPPORTING INFORMATION

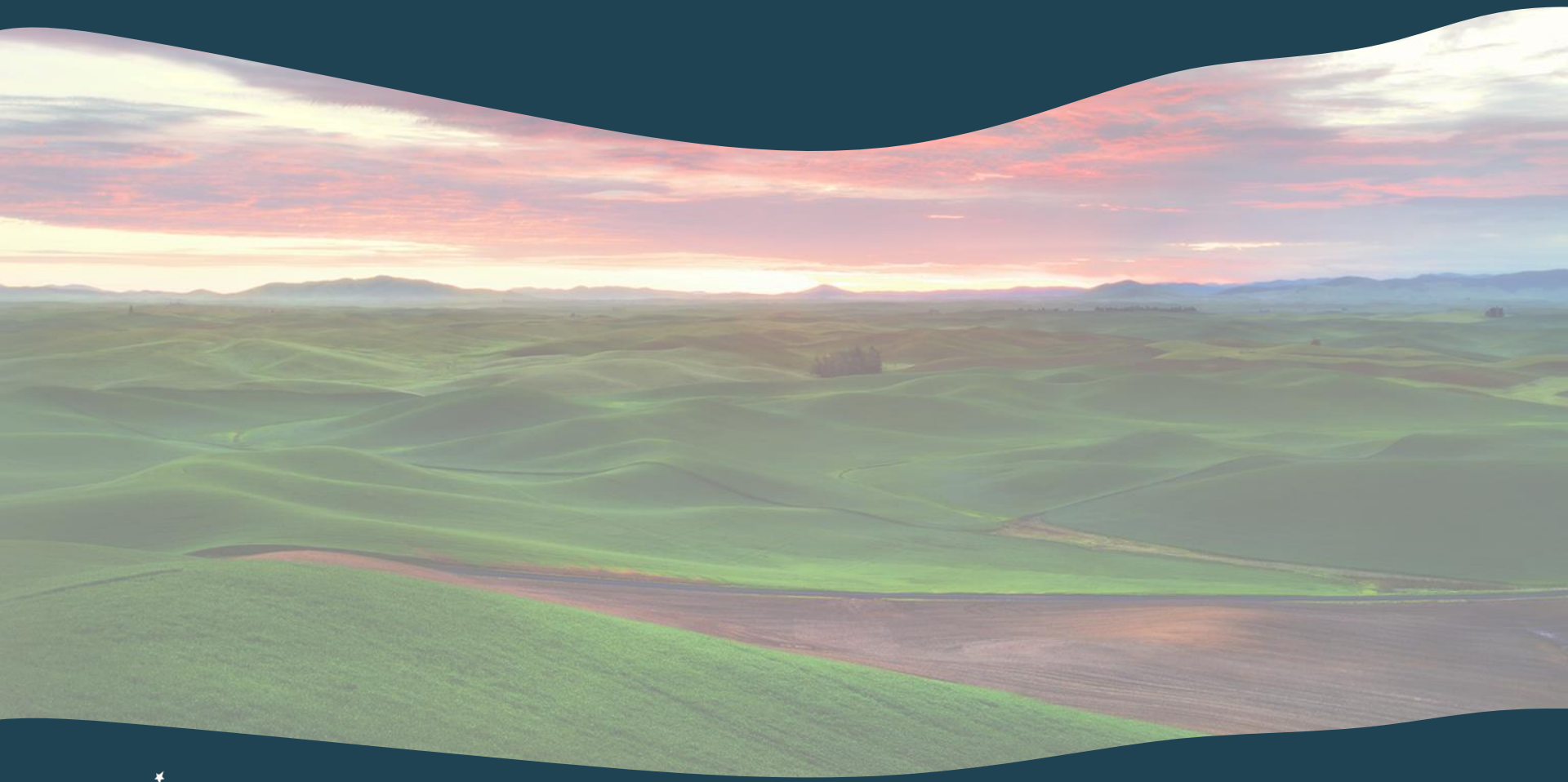
To gain better insight into economic conditions and workforce trends, CPE partnered with Emsi, a labor market analytics firm that serves higher education, economic and workforce development, talent acquisition, and site selection. In the report, Emsi focuses on the engineering sector by:

- Providing an overview of engineering occupations and industries through traditional labor market information and a job postings analysis;
- Conducting a program demand gap analysis of Kentucky institutions' engineering program offerings; and
- Analyzing migration patterns and other qualitative characteristics that help explain why Kentucky engineering alumni stay in or migrate out of the state.

Emsi also provided an environmental scan of the state's economy to provide context for the engineering sector. Data around the engineering sector are provided for the state and, where pertinent, by region. The regions are based on the four Kentucky Workforce Planning Regions (WPRs) with an added Kentuckiana Local Workforce Area (LWA) distinct from the Central WPR, to analyze Louisville and Lexington areas separately.

Dr. Mahan will provide additional information regarding the results of the study.

ENGINEERING SECTOR ANALYSIS



Emsi & KY CPE Presentation

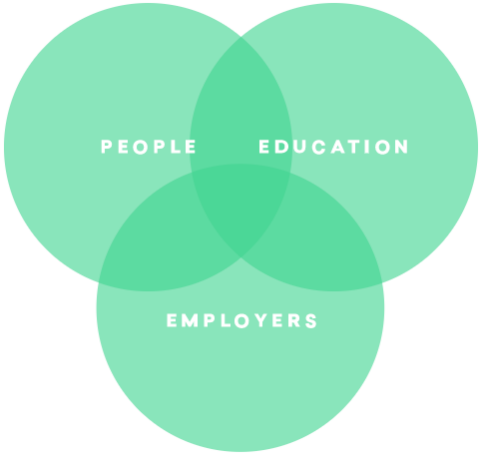
Academic and Strategic Initiative Committee
KY Council on Postsecondary Education (CPE)
3.25.20

Engineering Sector Analysis in Kentucky
Labor Market Information, Program Demand Gap Analysis, & Migration Analysis

Anna Brown
Economist, Vice President, Higher Education Consulting
Emsi

David Mahan
Assoc. VP, Data, Research and Advanced Analytics
KY Council on Postsecondary Education (CPE)

About Emsi



Economic Modeling Specialist International (EMSI) founded in 2001

Data analytics: Emsi uses labor market data software and consulting to connect and inform people, education, and business.

Emsi covers more than 99% of the workforce, is compiled from a wide variety of government sources, job postings, and online profiles and résumés.

Focus on alumni outcomes to serve higher education

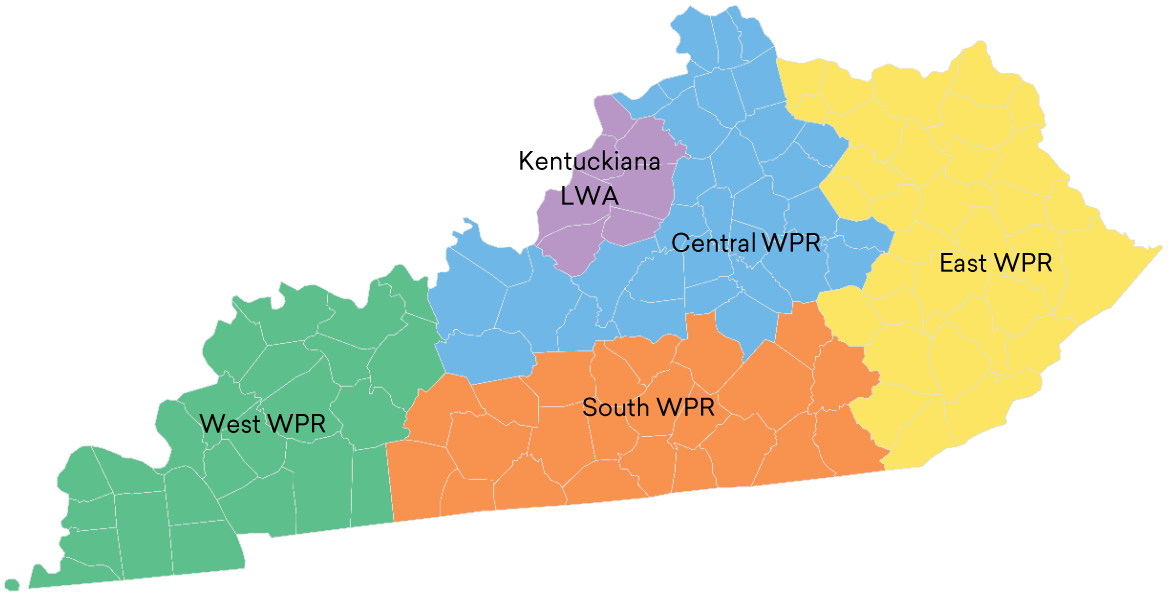
Research Question

Where are there misalignments between the workforce demand and the supply of KY college and university engineering graduates?

- Job growth projections
- Comparing the number of annual job openings and graduates
- KY engineering alumni migration analysis
- KY engineers' wages
- Program demand gap analysis (academic program recommendations)

INTRODUCTION

Kentucky's WPRs and the Kentuckiana LWA

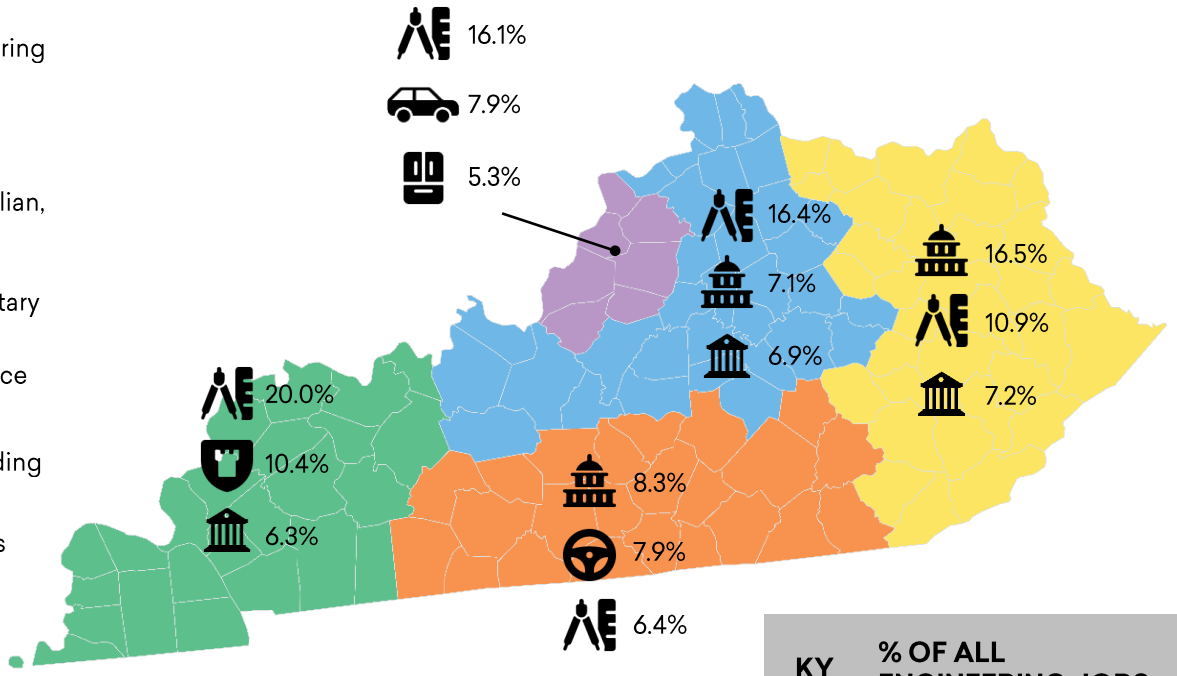


Kentucky has four Workforce Planning Regions (WPRs), and the city of Louisville and its surrounding counties comprise the Kentuckiana Local Workforce Area (LWA), an area within the Central WPR.

Industry overview: largest engineering employers in Kentucky's WPRs and the Kentuckiana LWA by industry

INDUSTRY

- Automobile & Light Duty Motor Vehicle Manufacturing
- Engineering Services
- Federal Government, Civilian, Excluding Postal Service
- Federal Government, Military
- Major Household Appliance Manufacturing
- State Government, Excluding Education & Hospitals
- Other Motor Vehicle Parts Manufacturing

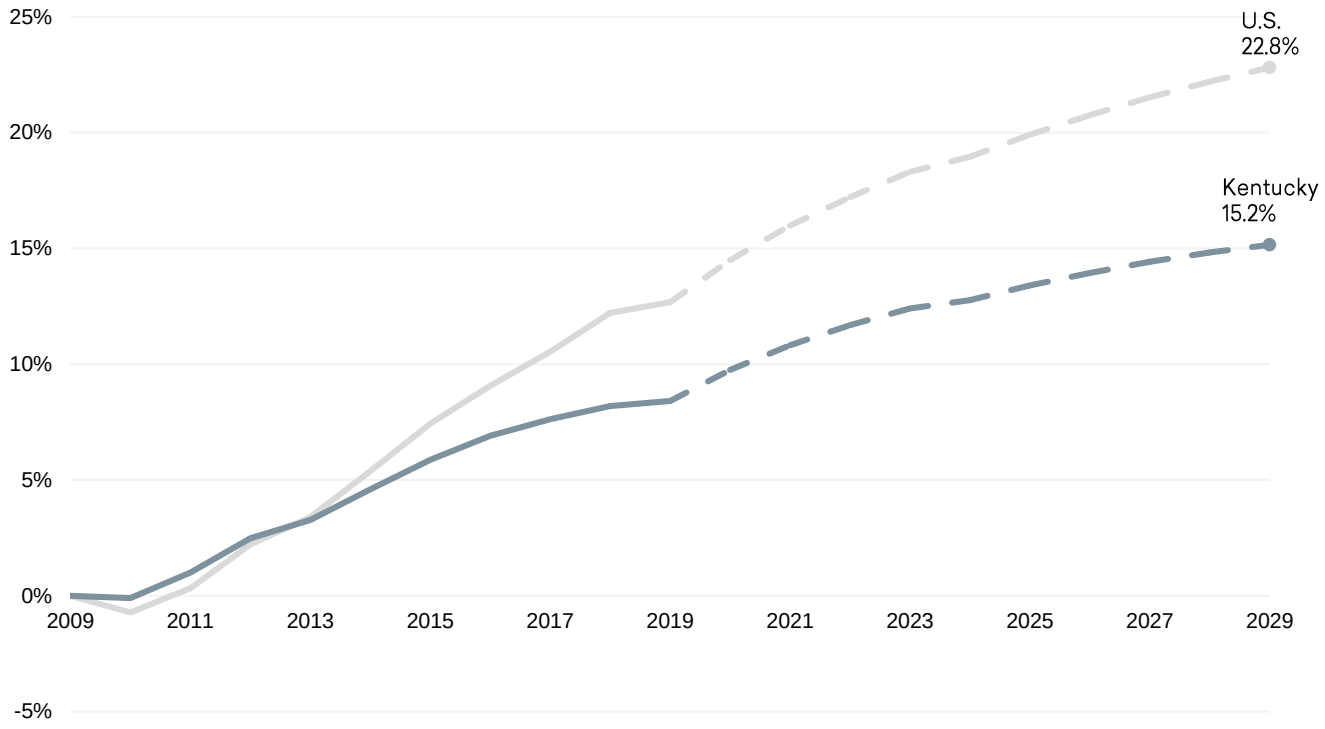


KY	% OF ALL ENGINEERING JOBS
	15.7%
	6.3%
	5.7%

Source: Emsi Employees & Self-Employed 2019.4.

KENTUCKY TOTAL JOB GROWTH

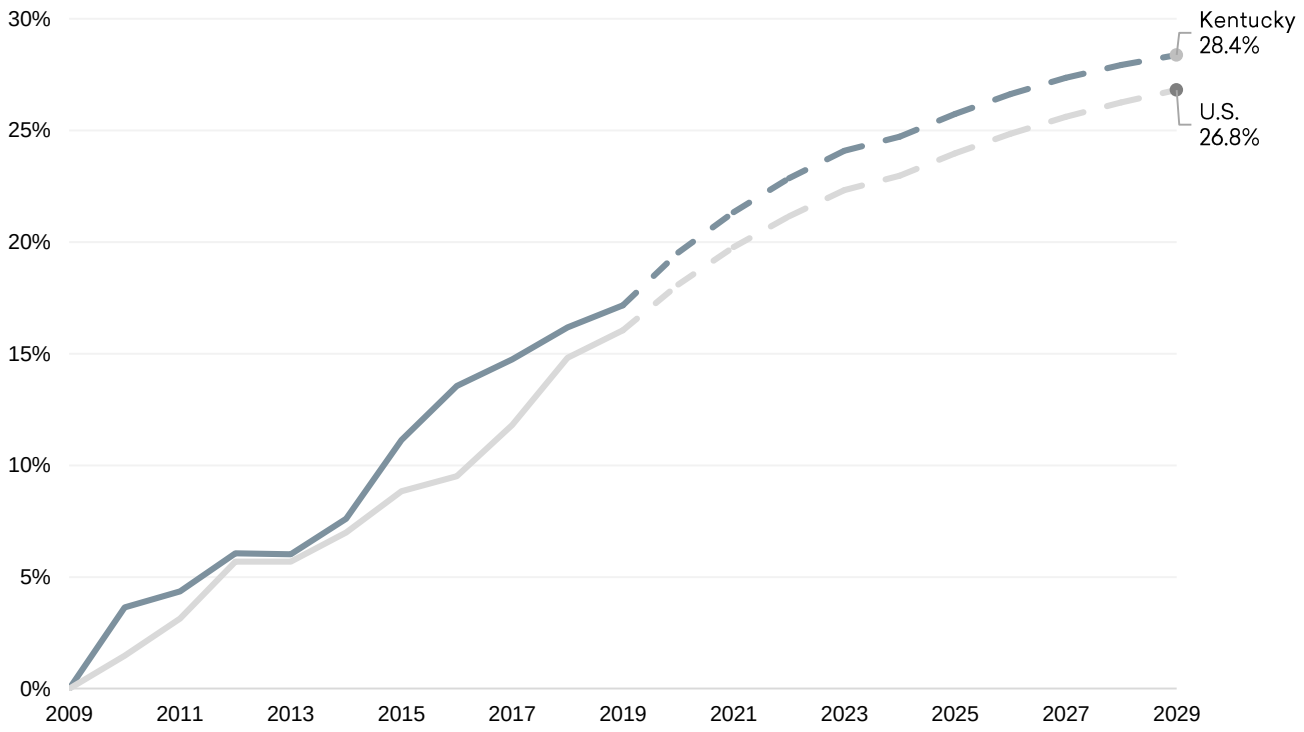
Kentucky and U.S. job growth across all occupations



Kentucky's job declines in the years following the 2008 Recession were similar to that of the U.S. But after 2013, the state's job growth was less than that of the U.S. Using Emsi's job projections, job growth from 2009 to 2029 in Kentucky and the U.S. is expected to be 15% and 23%, respectively.

KENTUCKY ENGINEERING JOB GROWTH

Kentucky and U.S. job growth across engineering occupations

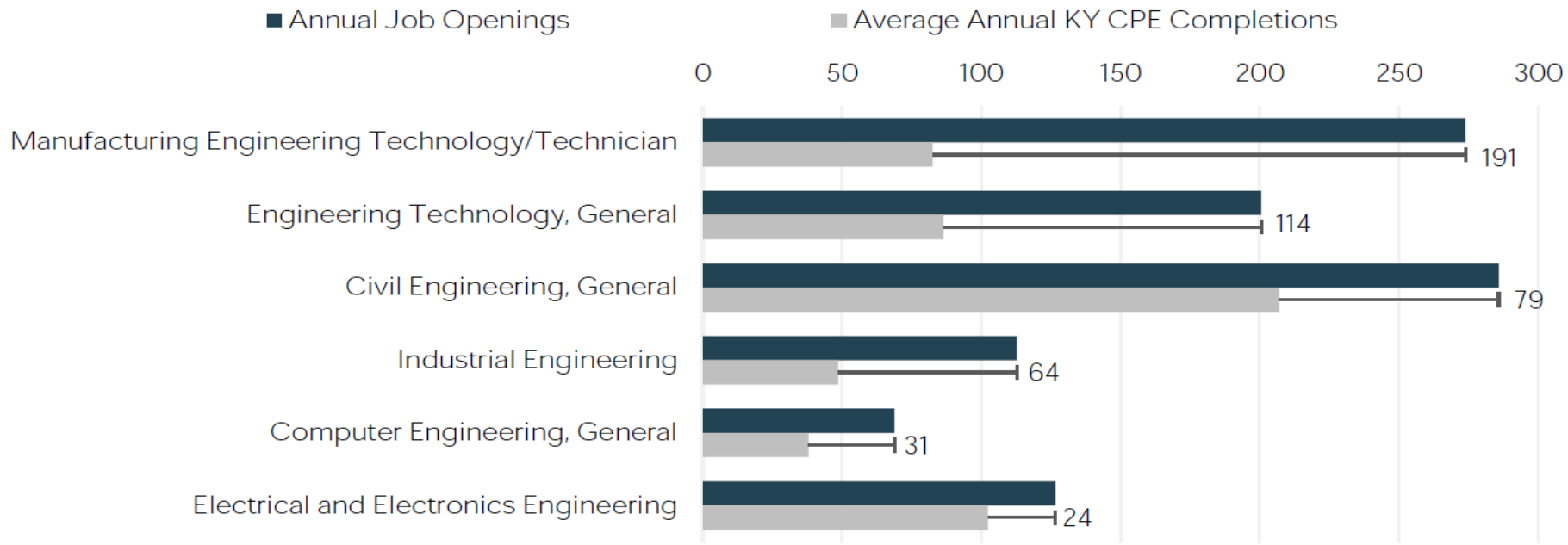


Contrary to the previous slide, Kentucky's engineering job growth consistently outperforms the job growth in engineering jobs across the U.S. Kentucky supported around 23,290 engineering jobs in 2009. By 2019, that number increased to around 27,290 jobs, for a 17.2% job growth. For context, the job growth for engineers in the U.S. between 2009 and 2019 was 16.0%. Engineering jobs are projected to grow by another 11.2% in Kentucky and 10.8% across the U.S. from 2019 to 2029, for a total 2009 to 2029 job growth of 28.4% for Kentucky and 26.8% for the U.S.

JOB OPENINGS AND GRADUATES

A large state gap exists for the industrial engineer occupation. Civil engineers also are in demand.

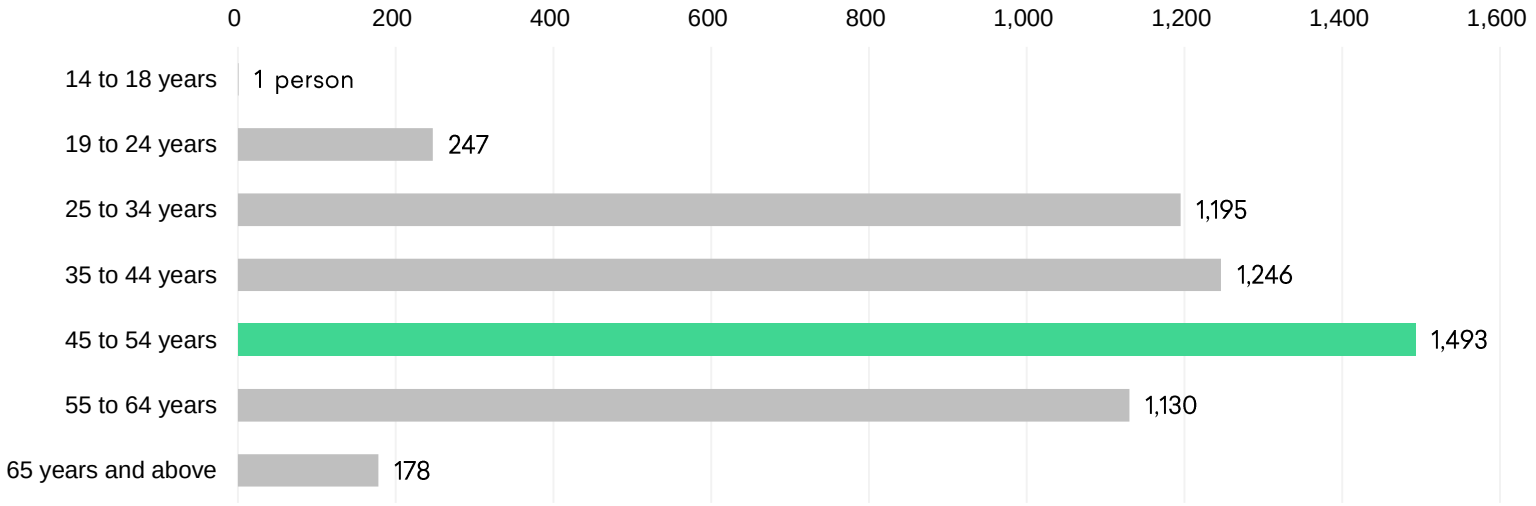
Figure 17: Kentucky's BACH+ Degree Level Engineering Programs with a Gap



Surplus in chemical and mechanical engineering graduates may find employment in the industrial engineering occupation.

JOB OPENING POTENTIAL

Kentucky's industrial engineers by age group



Source: Emsi Employees & Self-Employed 2019.4.

The most industrial engineers, the largest engineering occupation in the state, are in the 45 to 54 years age band, indicating a graying out of their workforce in the next decade. Electrical engineers and architectural & engineering managers also have many workers on the verge of retirement. Among all the engineering occupations, mechanical engineers are the most evenly split across the three age bands encompassing ages 25 to 54 years.

MIGRATION ANALYSIS

In-state and out-of-state migration of Kentucky's engineering alumni* by sector, with state and national comparisons of all alumni

	ENGINEERING ALUMNI			ALL ALUMNI		
SECTOR	PROFILES	% IN-STATE	% OUT-OF-STATE	PROFILES	% IN-STATE	% OUT-OF-STATE
State University	22,045	51%	49%	477,491	56%	44%
KCTCS	2,384	68%	32%	67,634	68%	32%
AIKCU	1,220	72%	28%	57,111	65%	35%
Kentucky	26,835	54%	46%	748,030	56%	44%
U.S.	**3,710,527**	**43%**	**57%**	**94,180,933**	**44%**	**56%**

* Based on students completing an engineering program (CIP codes 14 and 15) from an educational institution in Kentucky.

State universities include Eastern Kentucky University, Morehead State University, Murray State University, Northern Kentucky University, the University of Louisville, the University of Kentucky, and Western Kentucky University. KCTCS refers to the Kentucky Community & Technical College System, and AIKCU refers to the Association of Independent Kentucky Colleges & Universities. Source: Emsi Profile Analytics.

Around 54% of the alumni from Kentucky's engineering programs remain in Kentucky, which is slightly fewer when compared to all majors (56%). However, more of Kentucky's engineering alumni stay in the state (54%) compared to engineering alumni in the U.S. remaining in their states (43%).

MIGRATION ANALYSIS

Top occupations of Kentucky engineering alumni* from all state institutions with top state **2019 salaries**

	2019 MEDIAN ANNUAL WAGE (STATE RANKING)					
OCCUPATION	**KY**	**IN**	**OH**	**FL**	**TN**	**TX**
Industrial Engineers (n = 1,477)†	$76,406 (4)‡	$71,496 (6)	$80,679 (3)	$73,671 (5)	$80,721 (2)	$102,281 (1)
Mechanical Engineers (n = 1,139)	$84,861 (2)	$77,569 (5)	$77,467 (6)	$83,006 (4)	$83,566 (3)	$94,544 (1)
All Other Engineers (n = 849)	$78,392 (3)	$70,629 (6)	$89,795 (2)	$77,813 (4)	$75,737 (5)	$109,737 (1)
Architectural & Engineering Managers (n = 838)	$114,665 (6)	$116,343 (5)	$128,574 (2)	$124,396 (3)	$119,372 (4)	$154,152 (1)
Electrical Engineers (n = 658)	$86,745 (4)	$81,221 (6)	$83,806 (5)	$90,464 (3)	$90,924 (2)	$99,625 (1)

* Based on students completing an engineering program (CIP codes 14 and 15) from an educational institution in Kentucky.

† The number in parentheses after the occupation name represents the number of engineering alumni from Kentucky institutions in the U.S.

‡ The number in parentheses after the annual wage represents the rank of the state from high to low wages across the occupation.

Source: Emsi Profile Analytics and Employees & Self-Employed 2019.4.

The top states where Kentucky engineering alumni move to are Indiana, Ohio, Florida, Tennessee, and Texas. Kentucky's wages are competitive with the states where alumni migrate to, except for the wages for architectural & engineering managers in Texas.

KY ENGINEERS' WAGES

Top occupations of Kentucky engineering alumni* from all state institutions with top state **2009 salaries**

	2009 MEDIAN ANNUAL WAGE (STATE RANKING)					
OCCUPATION	**KY**	**IN**	**OH**	**FL**	**TN**	**TX**
Industrial Engineers (n = 1,477)†	$66,556 (6)‡	$69,081 (3)	$70,814 (2)	$66,720 (5)	$67,999 (4)	$80,394 (1)
Mechanical Engineers (n = 1,139)	$68,185 (5)	$68,201 (4)	$66,346 (6)	$72,062 (2)	$69,179 (3)	$83,568 (1)
All Other Engineers (n = 849)	$73,205 (5)	$69,215 (6)	$81,729 (4)	$88,065 (2)	$86,227 (3)	$95,125 (1)
Architectural & Engineering Managers (n = 838)	$94,556 (4)	$93,765 (5)	$104,780 (3)	$109,989 (2)	$89,131 (6)	$127,474 (1)
Electrical Engineers (n = 658)	$73,004 (5)	$74,437 (4)	$70,988 (6)	$75,954 (3)	$82,278 (2)	$88,160 (1)

* Based on students completing an engineering program (CIP codes 14 and 15) from an educational institution in Kentucky.

† The number in parentheses after the occupation name represents the number of engineering alumni from Kentucky institutions in the U.S.

‡ The number in parentheses after the annual wage represents the rank of the state from high to low wages across the occupation.

Source: Emsi Profile Analytics and Employees & Self-Employed 2019.4.

Wages for Kentucky engineers have for the most become more competitive compared to other states over the past 10 years. Specifically, wages are now more competitive for all of the above-listed engineering occupations except for architectural & engineering managers, which dropped from a rank of four to a rank of six.

PROGRAM DEMAND GAP ANALYSIS

Summary

- Kentucky's overall job growth is projected to be slower than the U.S. over the next decade (15% and 23%, respectively), however Kentucky engineering jobs are growing slightly faster than engineering jobs in the U.S. (28% compared to 27%).
- Kentucky's wages are fairly competitive to the states where engineering alumni are migrating. More Kentucky engineering alumni stay in the state (54%), compared to the portion of engineering alumni in the U.S. staying in their state (43%).
- Population growth in Kentucky is projected to be slower than the U.S. over the next 10 years (6% and 11%, respectively). Attainment levels in Kentucky remain lower than the national average.
- Statewide unemployment in Manufacturing is high comparable to the U.S., but the industry encompasses a variety of unskilled jobs, as well as engineering jobs that typically require bachelor's and graduate degrees and face low levels of unemployment.

PROGRAM DEMAND GAP ANALYSIS

Summary

- Bachelor's+: The Manufacturing Engineering Technology program is area of expansion at the bachelor's degree level and above, driven by the industrial engineer occupation. Related programs such an mechanical engineering may also fill the industrial engineer occupation need. Other programmatic areas of opportunity are civil engineering and computer engineering, especially in Kentuckiana LWA.
- KCTCS: While the Quality Control & Safety Technologies/Technicians, program looks to be an area of expansion at the certificate and associate degree levels, demand is driven by an occupation not directly related to engineering or requiring high levels of postsecondary education.

The results of this study
were prepared by