DEPARTMENT OF
HIGHER EDUCATION &
WORKFORCE DEVELOPMENT

New Program Report

Date Submitted:
02/12/2024

Institution
University of Missouri-Kansas City

Site Information

Implementation Date:
8/1/2024 12:00:00 AM

Added Site(s):

Selected Site(s):

University of Missouri-Kansas City, 5100 Rockhill Road, Kansas City, MO, 64110

CIP Information

CIP Code:
144701

CIP Description:
A program that prepares individuals to apply mathematical and scientific principles to the design and development of computer systems. Includes instruction in computer architecture, cybersecurity, electronic circuits, electromagnetism, electronic materials and design, micro-fabrication methods and techniques, signal and image processing, and wireless communication networks.

CIP Program Title:
Electrical and Computer Engineering

Institution Program Title:
Electrical and Computer Engineering

Degree Level/Type

Degree Level:
Doctoral Degree (Research PhD)

Degree Type:
Doctor of Philosophy (PHD)

Options Added:

Collaborative Program:
N

Mode of Delivery

Current Mode of Delivery

Classroom

Student Preparation

Special Admissions Procedure or Student Qualifications required:
Students who meet the requirements below will be considered for regular admission. Students who do not meet some of the requirements but shows high potential, may be considered for provisional admission.

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Students who do not qualify for admission to the Ph.D. program, may be considered for the M.S. in Electrical
Engineering.

Minimum Recommended Ph.D. Admission Requirements:
1. GPA (Bachelor or equivalent Degree): 3.5 in the scale of 4 (or equivalent)
2. GPA (MS or equivalent Degree if any): 3.5 in the scale of 4 (or equivalent)
3. GRE (Quantitative) minimum score = 85%
4. TOEFL iBTS minimum Score = 89 or IELTS minimum score = 6.5
5. Prior Projects or Publications (Preferred)*
6. Internationally Acceptable Accreditation of the Prior Degree Awarding Institutes

• Prior research project and/or publication record is not required for admission into ECE Ph.D. program. However, doctoral faculty members give very high value to the students with such backgrounds.

Direct or Expedited Ph.D.
It is not required to have an MS or equivalent degree to apply to ECE Ph.D. program. Well-qualified and motivated students with a Bachelor's degree may be accepted directly into the program.

Academic Preparation
Applicants must have a bachelor and/or a master's degree in electrical and/or computer engineering, electronics, communications engineering or any other field requiring substantial training in at least one of the above fields and in mathematics.

Aptitude for Advanced Work
Students must demonstrate an aptitude for advanced-level work through national/international standardized exams such as the GRE.

Proficiency in English
Students must demonstrate proficiency in oral and written communication in English through national/international standardized English exams such as TOEFL, verbal portion of the GRE, etc. Students may be required to improve oral and written communication scores in English before enrolling in chosen disciplines.

• For students with a North American (USA and Canada) B.S. or M.S. degree the English Proficiency requirement is exempt

Recommendation Letters
Students must provide at least 3 recommendation letters from professors from previous institution(s). If the applicant has been out of school for several years, letters from supervisors (technical) will be acceptable. However, even in this situation, a letter from the last academic institution is highly recommended. A
letter from a UMKC faculty member in Computer Science Electrical Engineering (CSEE) must be provided if student has taken courses from or worked with CSEE faculty.

Statement of Goals and Objectives
Applicants must provide a 250 - 500 word essay on his/her goals and objectives of pursuing the Ph.D. in the chosen fields.

Specific Population Characteristics to be served:
n/a

Faculty Characteristics

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Special Requirements for Assignment of Teaching for this Degree/Certificate:
All faculty with teaching responsibilities in the PhD, Electrical and Computer Engineering program will have a terminal degree, PhD or professional doctoral degree (MD, PharmD).

Estimate Percentage of Credit Hours that will be assigned to full time faculty:
Full time faculty will teach 100% of coursework/credit hours in the program.

Expectations for professional activities, special student contact, teaching/learning innovation:
Faculty teaching in the program will be expected to engage in professional activities and teaching/learning innovation activities including research, and participation and presentations at professional organizations and societies. Faculty will also be expected to mentor and advise students while enrolled in the program and while engaging in independent research.

Student Enrollment Projections Year One-Five

Year 1	**Full Time: 28**	**Part Time: 0**	
Year 2	**Full Time: 33**	**Part Time: 0**	
Year 3	**Full Time: 33**	**Part Time: 0**	**Number of Graduates:** 5
Year 4	**Full Time: 33**	**Part Time: 0**	
Year 5	**Full Time: 33**	**Part Time: 0**	**Number of Graduates:** 5

Percentage Statement:
n/a

Program Accreditation

Institutional Plans for Accreditation:
The proposed Engineering PhD programs fall under the purview of the university's institutional accreditation. The university is accredited by the Higher Learning Commission, one of the regional accrediting bodies recognized by the US Department of Education. It ensures that the institution and all its programs, including the proposed PhD program, meet the established standards of academic quality.

To ensure our PhD programs meet the highest standards, we will adhere to guidelines and curricular recommendations provided by influential professional organizations such as the Institute of Electrical and Electronics Engineers (IEEE). Although not equivalent to accreditation, these guidelines offer a robust framework for maintaining academic and research excellence. Additionally, we will continually monitor and evaluate the program's performance in areas like faculty research output, student success, and alignment with industry trends and demands. This continuous assessment will enhance our program's reputation and ensure we deliver a high-quality education to our doctoral students. Lastly, while there is no specific timeline for accreditation given the context of doctoral programs, we commit to maintaining the university's existing institutional accreditation status and upholding the standards expected by our accrediting body, the Higher Learning Commission.

Program Structure

Total Credits:
42

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Residency Requirements:
Ph.D. students must satisfy the doctoral residency requirement by satisfactory completion of at least 18 credits in no more than 24 consecutive months. When satisfying the residency requirement, all Ph.D. students are subject to the following restrictions:

• The doctoral residency requirement must be satisfied no later than the end of the semester in which the student completes his or her comprehensive examinations.

• Students must achieve a cumulative graduate grade-point average of at least 3.0 in all courses counted toward satisfying the residency requirement

General Education Total Credits:
42

Major Requirements Total Credits:
42

Course(s) Added

COURSE NUMBER	CREDITS	COURSE TITLE
xxxxx	12	Dissertation
xxxxx	3	- 24 Communication and Signal Processing courses
xxxxx	3	- 21 Materials, Devices, and Sensors at the Nanoscale courses
xxxxx	3	- 12 Electric Vehicles and Batteries courses
xxxxx	3	- 24 Robotics and Control courses
xxxxx	3	- 33 Electromagnetics, Radio Frequency (RF) circuits, Microwave, Terahertz (THz) Science and Engineering courses
xxxxx	3	- 36 Hardware Security, Cyber-Physical Systems and Engineering courses
xxxxx	3	- 45 Power Systems and Renewable Engineering courses
xxxxx	3	- 36 Computer Vision, Multimedia and Artificial Intelligence (AI) courses
xxxxx	3	- 24 Computer Engineering, VLSI, and Embedded Systems Design courses

Free Elective Credits:
0

Internship or other Capstone Experience:
12 credit hours of dissertation are required.

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Assurances

I certify that the program is clearly within the institution's CBHE-approved mission. The proposed new program must be consistent with the institutional mission, as well as the principal planning priorities of the public institution, as set forth in the public institution's approved plan or plan update.

I certify that the program will be offered within the proposing institution's main campus or CBHE-approved off-site location.

I certify that the program will not unnecessarily duplicate an existing program of another Missouri institution in accordance with 6 CSR 10-4.010, subsection (9)(C) Submission of Academic Information, Data and New Programs.

I certify that the program will build upon existing programs and faculty expertise.

I certify that the program can be launched with minimal expense and falls within the institution's current operating budget.

I certify that the Institution has conducted research on the feasibility of the proposal and it is likely the program will be successful. Institutions' decision to implement a program shall be based upon demand and/or need for the program in terms of meeting present and future needs of the locale, state, and nation based upon societal needs, and/or student needs.

Contact Information

First and Last Name: Zandra Kent

Email: zlkhd4@umsystem.edu

Phone: 573-882-6756

New Degree Proposal
FULL PROPOSAL

Basic Program Information

Sponsoring University: University of Missouri – Kansas City

College or School: School of Science and Engineering

Department: Electrical and Computer Engineering (EMS)

Proposed Program Title: Electrical and Computer Engineering

Degree Level/Type: Doctoral

Emphasis Areas: None

Program Modality: In-person

If online component: n/a

Program CIP Code[1]: 14.4701

Implementation: August 2024

Expected Date of First Graduation: May 2025

Proposal Author(s): Masud Chowdhury, EMS Division Director

Name, phone, and email of person primarily responsible for the proposal:

Professor Masud Chowdhury, EMS Division Director -- masud@umkc.edu (816-235-2432).
Professor John Kevern, NBE Director – kevernj@umkc.edu (816-235-5977).

Individual(s) Responsible for Success of the Program:

Professor Masud Chowdhury, EMS Division Director.

[1] A selection of CIP codes can be viewed on the National Center for Education Statistics website: https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55

Table of Contents

Executive Summary

UMKC currently offers a PhD in Interdisciplinary Studies under CIP code 30.0000 (Multi-/Interdisciplinary Studies, Other; Defined as "any instructional program multi/interdisciplinary studies not listed above," National Center for Education Statistics). As part of a comprehensive strategy to improve academic and research excellence, inclusive of Carnegie R1 classification, UMKC seeks to close the current, catch-all interdisciplinary PhD and create eight (8) discipline-specific and more narrow interdisciplinary PhD programs from the over 20 primary disciplines within the current within it.

This transition will allow for the following: Carnegie credit for degree conferrals across STEM, Social Science, and Humanities disciplines, improved research ranking and reputation as a discovery enterprise, advantage in recruiting high quality students and faculty, and enhanced clarity and validity with students and employers regarding the curricula offered as part of our doctoral degrees.

This proposal focuses on a new **Electrical and Computer Engineering PhD** that can be delivered with existing courses, faculty, staff, student support services, assistantship funding, and other resources currently allocated among three electrical and computer engineering primary disciplines within the Interdisciplinary PhD.

The Electrical and Computer Engineering PhD program's main goal is to prepare the next generation of scholars for a wide range of research opportunities in academia, industry, and national labs. It will continue to provide students with the background, research skills, and tools to advance the state of the art in Engineering. The transition from an Interdisciplinary PhD to a PhD in Electrical and Computer Engineering is beneficial because a significant number of our current doctoral students are from overseas, where the current name confuses potential employers and researchers. In some countries who seek to send large numbers of students to UMKC, the Interdisciplinary PhD is deemed to be unacceptable.

We currently supervise a wide range of doctoral dissertations in the following areas of Electrical and Computer Engineering:

1. Computer Engineering, VLSI, and Embedded Systems Design
2. Hardware Security, Cyber-Physical Systems, and Engineering
3. Materials, Devices, and Sensors at the Nanoscale
4. Electromagnetics, Radio Frequency (RF) circuits, Microwave, Terahertz (THz) Science and Engineering
5. Communication and Signal Processing
6. Computer Vision, Multimedia, and Artificial Intelligence (AI)
7. Power Systems and Renewable Engineering
8. Robotics and Control
9. Electric Vehicles (EV) and Batteries

The proposed PhD program in Electrical and Computer Engineering mirrors the existing doctoral program, maintaining academic rigor through a balanced curriculum. This curricula includes

foundational courses, advanced coursework, research seminars, and a comprehensive doctoral dissertation, all drawn from the existing structure and resources of the doctoral program.

As with the current doctoral program, a minimum of 30 classroom credits are required, including fundamental and advanced courses along with seminars. Additionally, a doctoral dissertation necessitates a minimum of 12 research credits. Students can select their 30 credits of coursework from ECE topics. Non-ECE courses can also be selected after discussion and approval by the student's Primary Adviser.

1. Introduction

The PhD in Interdisciplinary Studies (30.0000) was launched in 1989. For many years it has provided UMKC students the opportunity to develop as scientists and scholars in their chosen field by combining two or more disciplines of study. The Interdisciplinary PhD at UMKC originally included 26 distinct disciplines, ranging from STEM to social sciences to the humanities. Despite its strength as a highly flexible doctoral degree, it limits our ability to attract highly competitive PhD students who want a narrower disciplinary focus, as well as prospective students who are seeking STEM certified doctoral education. Most recently, we have learned that the current Interdisciplinary PhD program is not recognized by Carnegie in their university classification system—a significant barrier in our progress toward becoming a Carnegie R1 institution.

To address these challenges, we aim to transition the current Interdisciplinary PhD program into eight (8) distinct PhD programs that will be attractive to students (evidenced by historical enrollment data) and that will be recognized by Carnegie. These include **Computer Science, Economics, Education, Engineering (Electrical and Computing; Civil; and Mechanical), Humanities, plus a multidisciplinary PhD in Natural Sciences**. These doctoral research programs were selected after extensive review and discussion with doctoral faculty across the university because they are the strongest historic enrollments, core faculty of active researchers, and greatest potential for ongoing success at UMKC. Together they promise to have a significant impact on our ranking as a research institution, and the workforce in the Kansas City and greater MO area through the research and post-graduate employment outcomes produced by the graduates.

This proposal focuses on the **PhD in Electrical and Computer Engineering**.

Impact:

The impact of this broad degree transition, including the **PhD in Electrical and Computer Engineering**, will be the following: Carnegie credit for degree conferrals across STEM, Social Science, and Humanities disciplines, improved research ranking and reputation as a discovery enterprise, advantage in recruiting high quality students and faculty, and enhanced clarity and validity with students and employers regarding the curricula offered as part of our doctoral degrees.

2. University Mission & Program Analysis

2.A. Alignment with University Mission & Goals

The needs of the Greater Kansas City region are of the utmost importance and drive what UMKC is doing. The university is a change agent and plays a vital role in economic development and workforce development for the region. The new proposed PhD degrees in Engineering will support our mission of economic development of the region and the nation by educating the specialized graduate-level engineers necessary to build the necessary infrastructure for economic development. Therefore, the proposed Engineering PhD programs align seamlessly with the broader goals of the campus, college, and department as detailed in https://www.umkc.edu/about/strategic-plan.html.

Successful PhD programs are necessary for the department and the college to show a comprehensive program that attracts future students to maintain the increase in enrollment at the BS, MS, and PhD levels. In addition, PhD students are the key components of maintaining and expanding our research excellence at the department and college levels. Finally, PhD programs in Civil Engineering, Electrical and Computer Engineering, and Mechanical Engineering will expand the number and quality of our STEM graduates, which will help advance the research classification of UMKC in general.

2.B. Duplication & Collaboration within Campus, Across System

The proposed Electrical and Computer Engineering PhD program already exists in the form of the three electrical and computer engineering related primary disciplines within the Interdisciplinary PhD program, and there is no threat of duplication with programs across the UM System. The proposed title and code changes reflect the correct Engineering CIP codes as per the current course requirements: this will attract students who might have been deterred by the esoteric Interdisciplinary PhD title. This change will make our existing doctoral program more attractive.

The Electrical and Computer Engineering PhD program is diverse and wide enough to allow for multiple successful programs across the UM System. Moreover, we have established several niche areas in this area of Engineering with several years of demonstrated success.

Examples of these areas, which are unique to UMKC, are Radio Frequency and Electromagnetics, which have received tens of millions of funding from ONR, DARPA, and NSF over the last few years. Through this funding, we acquired state of the art equipment and facilities only available in a handful of universities worldwide. Therefore, UMKC has a significant edge over these competitors in terms of equipment in areas of national and international interest.

3. Business-Related Criteria & Justification

3.A. Market Analysis

3.A.1. Rationale & Workforce Demand for the Program

Electrical and Computer Engineering (ECE) applications are pervasive in all industries and all aspects of our lives. Even industries such as the automobile industry have been transformed into mainstream ECE with the surge in interest in Electric Vehicles (EV). EV's share of the global market is expected to increase to 30% by 2030, which is expected to lead to a surge in demand for ECE PhD graduates in a wide range of areas offered by UMKC, such as "6. Computer Vision, Multimedia and Artificial Intelligence (AI)", "7. Power Systems and Renewable Engineering", "9. Electric Vehicles and Batteries". In addition, even though 5G telecommunication has only been recently introduced, plans for 6G are already underway to meet an insatiable demand for higher data rates and bandwidth. This will also lead to significant demand for ECE PhD graduates to generate devices compatible with the new 6G capabilities in the coming decades. To serve the 6G demand, PhD graduates in "1. Computer Engineering, VLSI, and Embedded Systems Design", "2. Hardware Security, Cyber-Physical Systems and Engineering", "3. Materials, Devices, and Sensors at the Nanoscale," "4. Electromagnetics, Radio Frequency (RF) circuits, Microwave, Terahertz (THz) Science and Engineering", "5. Communication and Signal Processing". Similarly, estimates predict that 70% of the world's population will live in a smart city by 2050. The technology necessary to achieve this vision will require many ECE PhD graduates over the coming few decades. The previous areas are just a few examples out of many emerging areas like nanotechnology, biomedical, biometrics, and defense-related applications. Evidence of this huge demand for ECE PhD graduates is demonstrated in the several lucrative offers our recent ECE interdisciplinary PhD graduates receive from institutes such as Amazon, Apple, Google, intel, Qualcomm, IBM, Black and Veatch, Burns McDonnell. The interdisciplinary PhD program's broad curriculum serves as an excellent basis for the proposed program. A seamless transition to the new program can be facilitated by leveraging the resources, faculty, and infrastructure currently dedicated to the interdisciplinary PhD program, obviating the need for additional expenditure.

The impact of the proposed Electrical and Computing Engineering PhD can be projected from the current success of the interdisciplinary PhD program with ECE as the primary discipline. Over the last decade, ECE interdisciplinary PhD graduates have received numerous international, national and UMKC awards from the leading conferences in their respective areas. This has been a great marketing element in helping to recruit further doctoral and BS/MS students to the ECE program at UMKC. Furthermore, ECE interdisciplinary PhD students have helped us perform the proposed tasks in several grants from NSF, DARPA, NIST, ONR, and ARL. This success enabled us to generate additional grants to push the research portfolio of UMKC and the state of Missouri. Finally, interdisciplinary PhD ECE graduates have joined leading institutes upon graduation. By serving as UMKC ambassadors, they helped transfer their industrial experience back to UMKC through teaching courses, providing ideas and funding for senior design projects, and helping with grants to UMKC. Therefore, our interdisciplinary PhD ECE alumni serve as role models to our current students by demonstrating their success. Finally, the proposed PhD

program will continue to train students in some of the hottest areas in Electrical and Computer Engineering over the coming few decades. Many of these graduates stay in the Kansas City area bolstering the success of the technological capabilities and institutes within Kansas City and the wider Missouri area.

3.A.2. Student Demand for the Program

Student demand is evidenced by our previous five-year enrollment trends in three primary disciplines within the current UMKC interdisciplinary PhD program (Computer Networks and Computer Systems, Electrical and Computer Engineering, and Telecommunication Networking). These primary discipline have ranged from 1-40 students/year with an average of 32.8 students/year. Combined, the proposed Electrical and Computing Engineering PhD is estimated to have between 32-33 students/year. Pending approval, we will encourage current interdisciplinary PhD students to switch to the new degree program in Fall 24; those who want to complete their degree within the existing interdisciplinary PhD program will be allowed to do so. Admission to the existing interdisciplinary PhD program will be suspended in Fall 24 and program teach out will begin. This period of transition is reflected in the enrollment projections below.

Table 1a. Student Enrollment Projections (anticipated total number of students enrolled in the program during the first five fall semesters following implementation.)

Year:	1	2	3	4	5
Full-time	28	33	33	33	33
Part-time	0	0	0	0	0
Total	30	33	33	33	33

Table 1b. Projected Number of Degrees Awarded

Year:	1	2	3	4	5	6	7	8	9	10
# of Degrees Awarded	5	5	5	5	5	5	5	5	5	5

3.B. Financial Projections

Research-based doctoral education (i.e., PhD) differs in key ways from professional doctoral education (e.g., JD, MD, PharmD, DDS, etc.). These differences can be found in the curricular and academic experiences, size of the student cohorts, and relationship of the program to the University mission. As such, there are significant differences in the financial models between research-based and professional doctoral programs. Research-based doctoral programs (e.g., PhD), in contrast to professional doctoral programs (e.g., JD, MD, PharmD, etc.), generally accept a smaller cohort of new students each year and often offer full or partial financial support in the form of tuition waivers and graduate assistantships. PhD students, in turn, make significant contributions to faculty research through their work on research studies (e.g., data collection), dissemination of research findings (e.g., manuscript/monograph writing), and grant writing. PhD students also provide critical support to the educational mission of the University through

mentorship and instruction of undergraduate students. In most instances, PhD programs are revenue neutral or have a financial cost that is offset by by positive impact on University research productivity and support of undergraduate education.

In the sections that follow, we have estimated the costs and revenues associated with the PhD in Electrical and Computer Engineering. ***Notably, because we are using the same resources, the net revenue and financial impact of the PhD in Electrical and Computer Engineering is the same as the three primary disciplines within the existing interdisciplinary PhD program.***

3.B.1. Additional Resources Needed

No new resources are needed, inclusive of instructional costs, assistantship funding, marketing, or other university overhead.

3.B.2. Revenue

Revenues are generated from tuition (net scholarshipping) and remain the same as the existing interdisciplinary PhD program.

3.B.3. Net Revenue

No new one-time expenses are needed because all resources exist within the current interdisciplinary PhD program. Similarly, recurring expenses are not new, and are estimated based on the current interdisciplinary PhD program. Existing recurring expenses and revenues will shift from the interdisciplinary PhD to the new PhD, with the majority of that shift happening in year 1, as most current students transfer to the new degree program.

Faculty salaries are estimated at .10 FTE (representing 25% of their overall teaching workload) for the current faculty who participate in teaching and mentorship within the interdisciplinary PhD. Notably, most courses are co-taught with advanced undergraduate and/or master's level students, thereby inflating the FTE specific to PhD students; this inflation is offset by the variable amount of time spent mentoring dissertations. Staff estimates represent staff support time within the academic unit. Institutional overhead includes library and all central campus enrollment management and student support staff. Other includes assistantship stipends and associated tuition remission.

Table 2. Financial Projections for Proposed Program for Years 1 Through 5.

	Year 1	Year 2	Year 3	Year 4	Year 5
1. Expenses per year					
A. One-time					
New/Renovated Space	0	0	0	0	0

Equipment	0	0	0	0	0
Library	0	0	0	0	0
Consultants	0	0	0	0	0
Other	0	0	0	0	0
Total one-time	0	0	0	0	0
B. Recurring					
Faculty	98572	98572	98572	98572	98572
Staff	5000	5000	5000	5000	5000
Benefits	37285	37285	37285	37285	37285
Equipment	0	0	0	0	0
Library	0	0	0	0	0
Institutional Overhead	9408	11088	11088	11088	11088
Other	407840	509800	509800	509800	509800
Total recurring	558105	661,745	661,745	661,745	661,745
Total expenses (A+B)	558105	661,745	661,745	661,745	661,745
2. Revenue per year					
Tuition/Fees	138297	162993	162993	162993	162993
Institutional Resources	0	0	0	0	0
State Aid -- CBHE	0	0	0	0	0
State Aid -- Other	0	0	0	0	0
Total revenue	138297	162993	162993	162993	162993
3. Net revenue (loss) per year	(419,808)	(498,752)	(498,752)	(498,752)	(498,752)

3.B.4. Academic and Financial Viability

There is no net difference in academic and financial viability between the existing primary disciplines within the interdisciplinary PhD and the new PhD in Electrical and Computer Engineering. The enrollment projections described above will ensure we achieve a degree conferral threshold consistent with MDHE expectations, as well as advance our Carnegie ranking. There is a financial cost, consistent with doctoral education in general, and funds will be reallocated from the existing PhD program to the new PhD program so that we remain financially net neutral.

3.C. Business Plan: Marketing, Student Success, Transition & Exit Strategies

3.C.1. Marketing Plan

The marketing plan for UMKC's newly coded and titled PhD programs in Engineering will continue to use the following strategies, which we have used successfully for the interdisciplinary PhD:

1- Offer new research areas with many exciting employment opportunities.
2- Advertise the success of previous doctoral students in terms of local, national, and international awards. We will encourage our doctoral students to participate more in these competitions.
3- Use our alums as ambassadors to recruit new students.
4- Focus heavily on online platforms and social media, considering their extensive reach and the tech-oriented nature of our target audience. Platforms such as LinkedIn, Facebook, and academic forums can facilitate reaching prospective students locally, nationally, and internationally.

The target population will continue to be highly qualified graduates of other state schools and domestic students across the nation, including local UMKC undergraduates and the international population of students through our extensive global network in countries like India, Pakistan, Bangladesh, Saudi Arabia, and Egypt. Employees of local industry interested in pursuing a PhD degree as part of their existing duties or in a part-time format will also continue to be a primary target.

3.C.2. Student Success Plan

No additional student support services will be needed to support or retain students in the PhD in Electrical and Computer Engineering program. Current enrollment, retention and graduation trends for this program are on track with institution and national averages, and the program will continue to provide current levels of faculty and staff resources to support students through graduation.

3.C.3. Transition Plan

The people primarily responsible for the success of the PhD in Electrical and Computer Engineering program are: Professor Masud Chowdhury, EMS Division Director, and Kevin Truman, SSE Dean. Program leadership is supported by program faculty and the School of Graduate Studies staff.

3.C.4. Exit Strategy

If full-time enrollment in the PhD in Electrical and Computer Engineering drops below 20 students, the School of Science and Engineering will evaluate a temporary hiatus or program closure, depending on the reason for the low enrollment (e.g., temporary funding challenge, market demand, etc.).

4. Institutional Capacity

The proposed PhD in Electrical and Computer Engineering is designed to utilize existing infrastructure, faculty, and resources, thereby negating the necessity for any additional expenses. The program will repurpose the existing faculty resources, student support services, laboratories, equipment, and technology from the current doctoral program.

5. Program Characteristics

5.A. Program Outcomes

Program Goals

Students in the Ph.D. Program will acquire:

- grounding in the discipline
- the ability to integrate the principles and theories of the disciplines
- the ability to effectively communicate findings and approaches to solving research problems;
- research skills, such as approaches, methods, ethical principles, and tools to pursue a research line of inquiry;
- the ability to form effective teams to solve novel research questions

5.B. Program Design & Content

The course requirements for the Electrical and Computer Engineering Ph.D. will remain consistent with those of the previous Interdisciplinary PhD program. No new resources will be required. The coursework requirements include:

- A total of 30 credit hours of total coursework beyond an MS degree in Engineering;
- At least 12 dissertation hours in the primary area;

5.C. Program Structure

5.C.1. Program Structure Form

1. **Total Credits Required for Graduation: 42**

2. **Residence requirements, if any:** Ph.D. students must satisfy the doctoral residency requirement by satisfactory completion of at least 18 credits in no more than 24 consecutive months. When satisfying the residency requirement, all Ph.D. students are subject to the following restrictions:

- The doctoral residency requirement must be satisfied no later than the end of the semester in which the student completes his or her comprehensive examinations.
- Students must achieve a cumulative graduate grade-point average of at least 3.0 in all courses counted toward satisfying the residency requirement.

3. **General education**
    a. Total general education credits: **n/a**

Courses (specific course or distribution area and credit hours):

The PhD in Electrical and Computer Engineering offers a rigorous curriculum designed to provide students with advanced knowledge and skills in a wide range of ECE topics. Students must complete 30 credits of coursework plus 12 dissertation research credits. Students can select their 30 credits of coursework from ECE topics. Non-ECE courses can also be selected after discussion and approval by the student's Primary Adviser.

1. Computer Engineering, VLSI, and Embedded Systems Design

E&C-ENGR 5528	Advanced Embedded Systems	3
E&C-ENGR 5535	HDL-Based Digital Systems Design	3
E&C-ENGR 5542	Introduction to VLSI Design	3
E&C-ENGR 5590	Special Topics in Electrical And Computer Engineering (Advanced Computer Architecture)	3
E&C-ENGR 5533	Analog Integrated Circuit Design	3
E&C-ENGR 5534	Computer Arithmetic	3
E&C-ENGR 5537	Mixed-Signal Integrated Circuit Design	3
E&C-ENGR 5642	Advanced VLSI Design	3

2. Hardware Security, Cyber-Physical Systems and Engineering

E&C-ENGR 5528	Advanced Embedded Systems	3
E&C-ENGR 5535	HDL-Based Digital Systems Design	3
E&C-ENGR 5542	Introduction to VLSI Design	3
E&C-ENGR 5590	Special Topics In Electrical And Computer Engineering (Advanced Computer Architecture)	3

E&C-ENGR 5534	Computer Arithmetic	3
E&C-ENGR 5642	Advanced VLSI Design	3
CSEE 5110	Network Architecture I	3
E&C-ENGR 5577	Wireless Communications	3
E&C-ENGR 5580	Digital Signal Processing	3
E&C-ENGR 5570	Principles of Digital Communication Systems	3
CSEE 5111	Network Architecture II	3
CSEE 5113	Network Routing	3

3. Materials, Devices, and Sensors at the Nanoscale

E&C-ENGR 5590	Nanoscale Devices & Circuits	3
E&C-ENGR 5535	Nanoelectronics II: Nanoscale Integration & Manufacturing	3
E&C-ENGR 5647	Emerging Interdisciplinary Research in Nanotechnology	3
E&C-ENGR 5590	Nanoelectromagnetics and Plasmonics	3
PHYSICS 5530	Quantum Mechanics I	3
PHYSICS 5531	Quantum Mechanics II	3
PHYSICS 5535	Optical Properties of Matter	3

4. Electromagnetics, Radio Frequency (RF) circuits, Microwave, Terahertz (THz) Science and Engineering

E&C-ENGR 5513	Advanced Principles of RF/Microwave Engineering	3
E&C-ENGR 5590	Terahertz in 6G and beyond: from imaging to communications	3

E&C-ENGR 5590	Nanoelectromagnetics and Plasmonics	3
E&C-ENGR 5590	Numerical Methods in EM	3
E&C-ENGR 5590	Introduction to Microwave Engineering	3
E&C-ENGR 5518	Advanced Radar Systems & Techniques	3
E&C-ENGR 5512	Microwave Remote Sensing	3
E&C-ENGR 5590	RF Experimental Design	3
PHYSICS 5535	Optical Properties of Matter	3
PHYSICS 5520	Electromagnetic Theory and Applications I	3
PHYSICS 5521	Electromagnetic Theory and Applications II	3

5. Communication and Signal Processing

CSEE 5110	Network Architecture I	3
E&C-ENGR 5577	Wireless Communications	3
E&C-ENGR 5580	Digital Signal Processing	3
E&C-ENGR 5570	Principles of Digital Communication Systems	3
CSEE 5111	Network Architecture II	3
CSEE 5113	Network Routing	3
COMP-SCI 5514	Optical Fiber Communications	3
COMP-SCI 5573	Information Security and Assurance	3

6. Computer Vision, Multimedia and Artificial Intelligence (AI)

E&C-ENGR 5578	Multimedia Communication	3
E&C-ENGR 5582	Computer Vision	3
E&C-ENGR 5316	Neural and Adaptive Systems	3
E&C-ENGR 5590	Supervised Learning and Feature Extraction	3
E&C-ENGR 5586	Pattern Recognition	3
E&C-ENGR 5584	Advanced Digital Image Processing	3
COMP-SCI 5530	Principles of Data Science	3
COMP-SCI 5540	Principles of Big Data Management	3
COMP-SCI 5542	Big Data Analytics and Applications	3
COMP-SCI 5561	Advanced Artificial Intelligence	3
COMP-SCI 5565	Introduction to Statistical Learning	3
COMP-SCI 5565	Deep Learning	3

7. Power Systems and Renewable Engineering

E&C-ENGR 5536	Power Electronics II (Utility Applications)	3
E&C-ENGR 5567	Power Systems II	3
E&C-ENGR 5590	Introduction to Smart Grid	3
E&C-ENGR 5560	Electric Power Distribution Systems	3
E&C-ENGR 5557	Fundamentals of Solar Photovoltaic Cells	3

E&C-ENGR 5559	Introduction to Photovoltaic Systems	3
E&C-ENGR 5590	Introduction to Photovoltaic Systems	3
E&C-ENGR 5590	Wind Energy	3
E&C-ENGR 5563	Sustainable Energy System Engineering	3
E&C-ENGR 5590	Introduction to Power System Protection	3
E&C-ENGR 5590	Power Quality	3
E&C-ENGR 5565	Auxiliary Electric System Design	3
E&C-ENGR 5664	Lightning and Switching Surges in Power Systems	3
E&C-ENGR 5672	Advanced Power System Protection	3
E&C-ENGR 5590	Transmission System Planning	3

8. Robotics and Control

E&C-ENGR 5558	Automatic Control System Design	3
E&C-ENGR 5556	Advanced Instrumentation and Control	3
E&C-ENGR 5582	Computer Vision	3
E&C-ENGR 5316	Neural and Adaptive Systems	3
E&C-ENGR 5590	Supervised Learning and Feature Extraction	3
E&C-ENGR 5584	Advanced Digital Image Processing	3
MEC-ENGR 5559	Robotics and Unmanned Systems	3

MEC-ENGR 5557	Mechatronics System Design	3

9. Electric Vehicles and Batteries

E&C-ENGR 5536	Power Electronics II (Utility Applications)	3
MEC-ENGR 5559	Robotics and Unmanned Systems	3
MEC-ENGR 5557	Mechatronics System Design	3
MEC-ENGR 460	Electromechanical Conversion	3

4. **Free elective credits**
   a. Total free elective credits: n/a

5. **Requirement for thesis, internship or other capstone experience:**
   12 credit hours of dissertation are required.

6. **Any unique features such as interdepartmental cooperation:**
   n/a

5.D. Program Goals and Assessment

All UMKC programs are required to submit an annual summary of program assessment efforts (assessment plans, findings & discussions, and recommendations). The Electrical and Computer Engineering Ph.D. program will maintain the established assessment protocol currently in place for all Interdisciplinary Ph.D. disciplines. The following outcomes have been identified:

1. Students will demonstrate a thorough degree of knowledge in the discipline.
2. Students will demonstrate an ability to use proper investigation techniques for the discipline.
3. Students will effectively use oral and written forms of communication to convey their ideas.

Applicable student learning outcomes will be assessed at the following program, academic milestones: 1) Comprehensive Exams; 2) Dissertation/Research Proposal; and 3) Dissertation Defense.

At the milestone of Dissertation Defense, program targets for student performance across all Student Learning Outcomes have been set to meet or exceed average ratings of 3.5 for all (100%

of) students assessed. For example, one component of students' ability to use proper investigation techniques will be evaluated by the following rubric and rating scale:

Superior (4)	Good (3)	Acceptable (2)	Unacceptable (1)	Cannot Judge
Cutting edge methodology or novel application of existing method	Incremental advance in application of methodology and careful plan for execution of research	Conventional use of methodology and adequate plan for execution of research	Inappropriate use of method; use of method that cannot adequately address research question	Outside area of expertise

5.E. Student Preparation

The minimum criteria for admission to the UMKC graduate school can be found via the UMKC catalog.

Electrical and Computer Engineering Program Admission Requirements

A student who meets the minimum discipline requirements stated below will be considered for regular admission to the Ph.D. program. A student who does not meet some of the requirements but shows high potential for advanced-level work, may be considered for provisional admission. Admission also depends on factors such as number of seats available, resources available in the area of student's interest, the quality of previous work, etc. A student who does not qualifying for admission to the Ph.D. program, may be considered for admission to the M.S. in Electrical Engineering program.

Minimum Recommended Ph.D. Admission Requirements:

1. GPA (Bachelor or equivalent Degree): 3.5 in the scale of 4 (or equivalent)
2. GPA (MS or equivalent Degree if any): 3.5 in the scale of 4 (or equivalent)
3. GRE (Quantitative) minimum score = 85%
4. TOEFL iBTS minimum Score = 89 or IELTS minimum score = 6.5
5. Prior Projects or Publications (Preferred)*
6. Internationally Acceptable Accreditation of the Prior Degree Awarding Institutes

- ***Prior research project and/or publication record is not required for admission into ECE Ph.D. program. However, doctoral faculty members give very high value to the students with such backgrounds.***

Direct or Expedited Ph.D. Program

It is not required to have an MS or equivalent degree to apply to ECE Ph.D. program. We accept well-qualified and motivated students with a Bachelor's degree directly into our Ph.D. program. We actively encourage students in the ***Direct Ph.D. Program*** to try to complete the doctoral study within 4 or 5 years after the Bachelor degree. To complete the Ph.D. degree in an

expedited timeline, first, the student has to be dedicated and well qualified. Second, the student must make a comprehensive plan at the beginning of the doctoral study to complete all the relevant steps within a strict timeline, which is challenging but not impossible.

Clarification of Minimum Requirements and Decision Process

Academic Preparation

The applicant must have a bachelor and/or a master's degree in electrical and/or computer engineering, electronics, communications engineering or any other field requiring substantial training in at least one of the above fields and in mathematics with a GPA of 3.5 or better, cumulative as well as in the major field; and a GPA of 3.5 or better in all post-baccalaureate or post-master's degree work.

Aptitude for Advanced Work

The student must demonstrate an aptitude for advanced-level work through national/international standardized examinations such as the GRE. The expected performance level is the 85th percentile in the quantitative portion of the GRE examination.

- In rare occasion, ECE Ph.D. Discipline Coordinator exempts GRE requirement for students with outstanding publication or scholarly records in internationally renowned journals, conferences or similar forums.

Proficiency in English

The student must demonstrate his or her proficiency in oral and written communication in English through national/international standardized English examinations such as TOEFL, verbal portion of the GRE, etc. Because of this test, the student may be required to improve his or her oral and written communication in English before enrollment in the courses of the chosen disciplines.

- For students with a North American (USA and Canada) B.S. or M.S. degree the English Proficiency requirement is exempt.

Recommendation Letters

The student must provide at least three recommendation letters from professors from his or her previous institution(s). If the applicant has been out of school for several years, recommendation letters from his or her supervisors (technical) will be acceptable. However, even in this situation, a recommendation letter from his or her last academic institution is highly recommended. A recommendation from a faculty member in the Computer Science Electrical Engineering (CSEE) Department at UMKC must be provided if the student has taken courses from or worked with the CSEE faculty.

Statement of Goals and Objectives

The applicant must provide a 250 to 500 words essay on his/her goals and objectives of pursuing the Ph.D. in the chosen fields.

5.F. Faculty and Administration

The people primarily responsible for the success of the PhD in Electrical and Computer Engineering program are: Professor Masud Chowdhury, EMS Division Director, and Kevin Truman, SSE Dean

All faculty with teaching responsibilities in the PhD, Electrical and Computer Engineering program will have a terminal degree, PhD or professional doctoral degree (MD, PharmD). Full time faculty will teach 100% of coursework/credit hours in the program. Faculty teaching in the program will be expected to engage in professional activities and teaching/learning innovation activities including research, and participation and presentations at professional organizations and societies. Faculty will also be expected to mentor and advise students while enrolled in the program and while engaging in independent research.

5.G. Alumni and Employer Survey

The UMKC Alumni Affairs Office, and External Relations team engage with UMKC alumni and the community through several opportunities designed to maintain connections, gather feedback, provide engagement opportunities, and create an environment of continuous improvement.

Graduating students are surveyed through an exit survey at the point of graduation and followed up with at 6-months post degree conferral if the student was still seeking employment at graduation or did not respond to the initial survey request. Alumni affairs and external relations provides opportunities for alumni to participate in student research competitions such as the Three Minute Thesis. Alumni are also engaged through on campus events, opportunities to serve on boards, volunteer, and nominate and receive alumni awards.

5.H. Program Accreditation

The proposed Engineering PhD programs fall under the purview of the university's institutional accreditation. The university is accredited by the Higher Learning Commission, one of the regional accrediting bodies recognized by the US Department of Education. It ensures that the institution and all its programs, including the proposed PhD program, meet the established standards of academic quality.

To ensure our PhD programs meet the highest standards, we will adhere to guidelines and curricular recommendations provided by influential professional organizations such as the Institute of Electrical and Electronics Engineers (IEEE). Although not equivalent to accreditation, these guidelines offer a robust framework for maintaining academic and research excellence. Additionally, we will continually monitor and evaluate the program's performance in areas like faculty research output, student success, and alignment with industry trends and demands. This continuous assessment will enhance our program's reputation and ensure we deliver a high-quality education to our doctoral students. Lastly, while there is no specific timeline for accreditation given the context of doctoral programs, we commit to maintaining the

university's existing institutional accreditation status and upholding the standards expected by our accrediting body, the Higher Learning Commission.

6. Appendices

- Letters of support
  - Ian M. Colrain; President and CEO, MRIGlobal
  - Chris Isaacson; EVP & COO, Cboe Global Markets
  - Kevin Truman; Dean, School of Science and Engineering- UMKC
  - Praveen Edara; Interim Dean, College of Engineering- MU
  - Robin Stubenhofer; National Security Campus, Kansas City
  - David Borrok; Vice-Provost and Dean, College of Engineering and Computing- Missouri S&T
  - Jennifer Lundgren; Provost and Executive Vice Chancellor- UMKC
  - Stephen John Dilkes; Associate Dean, School of Graduate Studies- UMKC

Letters of Support for

the PhD Program in

Engineering

MRIGlobal

The science you expect.
The people you know.

Ian M. Colrain, PhD
President & Chief Executive Officer
icolrain@mriglobal.org

To: University of Missouri Board of Curators

MRIGlobal is an independent not for profit research institute in its 80th year, headquartered in Kansas City adjacent to UMKC. Our mission is "to improve the lives of people through innovative scientific and engineering research", and we provide advanced biology, chemistry and engineering services to the US federal government and multiple national and international companies. We are constantly looking to hire Ph.D. level scientists in Kansas City and our other locations.

I am in full support of the re-categorizing UMKC's current iPhD to regular Ph.D.s in Engineering, Computer Science, and the Natural Sciences disciplines—namely Physics, Chemistry, Mathematics and Statistics, Biology, and Earth and Environmental Science. This change will offer multifaceted benefits to your students and to industry.

Ph.D. is standard designation for those completing such an intensive course of graduate study in a specialized area in their chosen field. Employers that hire Ph.D.'s value the degree program and what it represents. When looking for interns, post-doctoral fellows or new hires, the current iPhD designation likely is a hindrance for the student. Funding agencies might also be confused as to what an iPhD program represents. I have reviewed hundreds of NIH grant applications over the past two decades and admit that I would be puzzled by such a degree title, assuming it reflected a less prestigious degree. In the highly challenged current funding environment, it is likely leaving UMKC graduates at a disadvantage when applying for competitive grant mechanisms.

MRIGlobal serves clients from around the world. The current iPhD program designation would be a challenge to explain or categorize to international collaborators or partners. A shift to the more universally understood Ph.D. label will make it clear that students are earning Ph.D.s when they complete their program and that they would be able to add the value to the customer, usually associated with attainment of that degree.

Sincerely,

Ian M. Colrain Ph.D

President and CEO, MRIGlobal.

Professorial Fellow, School of Psychological Sciences, The University of Melbourne, Australia.

Professor of Internal Medicine (Volunteer), KU Medical Center, The University of Kansas.

Cboe
Global Markets

October 9, 2023

To: University of Missouri Board of Curators

Cboe Global Markets (Cboe) is a large, international financial services company. We do hire Ph.D graduates as they have specialized knowledge in various fields that Cboe values. As a member of the School of Science and Engineering (SSE) Executive Advisory Board, Dean Kevin Truman has asked me for a letter of support related to the proposed change from iPhD designation to Ph.D designation for these programs in the SSE.

I am in complete support of this change. It makes sense to change the designation to Ph.D. which is what is on the diploma when the student graduates. I can well imagine the challenges in their home countries and institutions when international students try to explain or categorize the unusual 'iPhD' designation. These likely impact UMKC graduate student recruitment rates as well as hiring decisions made by companies that do not understand what iPhD program means.

It is also my understanding that this change will help UMKC correctly count their awarded doctoral degrees in ranking systems such as Carnegie's. This is expected to elevate their research status, enhance their ranking, and bolster their enrollment figures. Ph.D students are vital to innovation and creative solutions in many industries which require a highly trained workforce.

I have no doubt that this change will improve the reputation of the UM system and the higher education landscape within Missouri. Please feel free to contact me if you need any additional information.

Sincerely,

Chris Isaacson, EVP, COO
Cboe Global Markets

UMKC

School of Science and Engineering
Office of the Dean

September 29, 2023

To: University of Missouri Board of Curators

Re: Support and Commitment to the SSE's iPhD to Ph.D. Transition

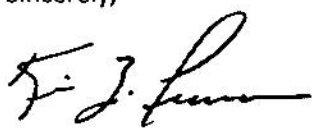
As Dean of the School of Science and Engineering I am writing to express my full commitment to transitioning our interdisciplinary Ph.D. (iPhD) degrees to Ph.D. for the School of Science and Engineering (SSE)'s Computer Science, Engineering, and Natural Sciences programs.

I want to emphasize that this transition primarily consists of code and title changes that do not necessitate allocating new resources. We intend to name programs with industry and academic standards, ensuring that we are appropriately recognized for the exceptional work already underway at our school, and improve our faculty and student recruitment and retention.

By transitioning to standard and well-known Ph.D. designations, we strategically position UMKC to enhance its research status especially through Carnegie ranking: historically, under the iPhD moniker, our related activities have not been correctly recognized given that we could not use the right CIP codes. Further, our international students have struggled to justify this unconventional naming to their host countries and institutions. This no-cost move is essential to rectify these issues, ensuring that our institution receives the recognition it deserves for its outstanding contributions to STEM research in our state and beyond.

In conclusion, I would like to reiterate the dedication of my team and myself to this transition. We believe these changes will strengthen our institution's reputation and bolster our research and enrollment, making us an even more effective member of the UM system. We look forward to accomplishing this positive shift together.

Sincerely,



Kevin Z. Truman, Ph.D., F.ASCE
Dean, School of Science and Engineering

UNIVERSITY OF MISSOURI-KANSAS CITY
Flarsheim Hall, Room 534 | 5110 Rockhill Road | Kansas City, MO 64110
o: 816-235-1285 | sse.umkc.edu

University of Missouri

Dean's Office
College of Engineering
W1006 Thomas & Nell Lafferre Hall
Columbia, MO 65211
PHONE 573-882-0948
EMAIL muengrdean@missouri.edu
WEB engineering.missouri.edu

October 5, 2023

Dear UM Board of Curators:

I am writing this letter to support Dean Truman's proposal to transition the iPhD program to PhD program at UMKC's School of Science and Engineering. The College of Engineering at MU has partnered with UMKC's Engineering School for many years on both teaching and research initiatives and we look forward to continued collaborations after this transition.

Sincerely,

Praveen Edara

Praveen Edara, Ph.D., P.E.
Interim Dean
College of Engineering
University of Missouri-Columbia
Email: edarap@missouri.edu

KANSAS CITY NSC National Security Campus

14520 Botts Road
Kansas City, MO 64147
816-488-2000
kcnsc.doe.gov

October 4, 2023

To: University of Missouri Board of Curators

I fully support the proposed change from iPhD designation to Ph.D designation. While there are many reasons to support this change, I will focus on those that are very impactful for the students and the university.

The current designation is confusing to industry as it is unclear what it means. This lack of understanding can hurt the UMKC School of Science and Engineering iPhD graduates during the hiring process. It can also hurt funding opportunities by federal agencies such as NSF, DoD, DoE, etc. because the iPhD is not well understood. Prospective Ph.D students will be easier to recruit leading to more Ph.D graduates. I would expect many positive impacts from changing the name (and CIP coding) of the UMKC iPhD. programs to the traditional Ph.D.

Honeywell has been involved with UMKC programs for several years via senior design programs, career fairs, serving on advisory boards and equipment donations. Please let me know if you need any additional information.

Sincerely,

Robin Stubenhofer

The Department of Energy's Kansas City National Security Campus is managed and operated by Honeywell Federal Manufacturing & Technologies, LLC under contract number DE-NA0007839

Cboe
Global Markets

October 9, 2023

To: University of Missouri Board of Curators

Cboe Global Markets (Cboe) is a large, international financial services company. We do hire Ph.D graduates as they have specialized knowledge in various fields that Cboe values. As a member of the School of Science and Engineering (SSE) Executive Advisory Board, Dean Kevin Truman has asked me for a letter of support related to the proposed change from iPhD designation to Ph.D designation for these programs in the SSE.

I am in complete support of this change. It makes sense to change the designation to Ph.D. which is what is on the diploma when the student graduates. I can well imagine the challenges in their home countries and institutions when international students try to explain or categorize the unusual 'iPhD' designation. These likely impact UMKC graduate student recruitment rates as well as hiring decisions made by companies that do not understand what iPhD program means.

It is also my understanding that this change will help UMKC correctly count their awarded doctoral degrees in ranking systems such as Carnegie's. This is expected to elevate their research status, enhance their ranking, and bolster their enrollment figures. Ph.D students are vital to innovation and creative solutions in many industries which require a highly trained workforce.

I have no doubt that this change will improve the reputation of the UM system and the higher education landscape within Missouri. Please feel free to contact me if you need any additional information.

Sincerely,

Christopher A. Isaacson

Chris Isaacson, EVP, COO
Cboe Global Markets

MISSOURI S&T | College of Engineering and Computing

October 6, 2023

Dear University of Missouri Board of Curators,

I am writing to express my support for the proposed transition of UMKC's interdisciplinary PhD programs within their School of Science and Engineering to several individual Ph.D. programs with new CIP codes.

Our understanding is that this change will correct and improve how their degrees are being counted through the CIP code system. This change should benefit UMKC and the UM System and will have no foreseeable impact at Missouri S&T.

Sincerely,

David Borrok
Vice-Provost and Dean
College of Engineering and Computing

October 5, 2023

Dear University of Missouri Board of Curators-

UMKC aims to achieve Carnegie R1 classification in the next 5-7 years. A critical action step toward this goal is to appropriately classify our research-based doctoral program CIP codes so that they are recognized in the Carnegie classification system. With this goal in mind, I am in full support of the transition of the PhD program in interdisciplinary studies (iPhD; not currently recognized by Carnegie) into eight independent PhD programs that are recognized in the Carnegie classification system. In addition to the critical role these programs will play in our degree program conferral data, this transition aligns with our strategic plan goals of: exceptional student learning, success, and experience (pillar one), helping UMKC become a thriving discovery enterprise (pillar two), transforming our community and region with impactful engagement (pillar three), and preparing students for the global workforce (pillar four). The program transition has been fully considered and planned by the faculty and leadership of UMKC, and is supported by the appropriate curricula, staffing, and market demand.

The **curricula** for the eight PhD programs will remain largely unchanged and is reviewed in detail on a program-by-program basis in the proposal. No additional instructional, student support, library, or assistantship resources will be necessary for this transition to be successful. Students will continue to be supported by existing faculty, staff, and student support structures on campus, and we will transition as many students as possible into the new degree programs by Fall 2024 to maximize doctoral degree conferrals in the coming years. Notably, students who do not want to transition will have the opportunity to remain in the iPhD program through degree completion; if our doctoral program proposal is approved, no new students will be admitted to the iPhD in the future and the program will be closed.

The **market demand** for each of these programs is currently strong, and we anticipate the transition will only enhance it. The 8 programs included in our proposal have the highest rates of student interest, graduation, employment, and long-term research synergy potential at UMKC. While we anticipate demand for each program to remain stable in the short term, the renaming of these programs is likely to have an immediate impact on our national and regional reputation as a

Administrative Center, Room 300g | 5115 Oak Street | Kansas City, MO 64112
o: 816-235-1107 | provost@umkc.edu | umkc.edu/provost

research institution. Although we will keep our enrollments stable in the early years of this transition, faculty will be expected to increase assistantship funding through externally funded grants, thereby allowing us to increase student enrollment while also supporting our campus research goals.

I'm happy to answer any questions about this overall doctoral program transition or the individual programs included in it.

Best regards,

Jennifer D. Lundgren, PhD
Provost and Executive Vice Chancellor

UMKC

School of Graduate Studies

October 5, 2023

Dear Members of the Board of Curators,

The Graduate Council at UMKC has voted to express its full support for the proposed transition from our current Interdisciplinary Ph D program to PhD's in the areas of Computer Science, Economics, Education, Engineering, Humanities, and Natural Sciences.

We are convinced that this transition would elevate the university's research status by giving us credit for doctoral research in the areas of STEM, Humanities, and Social Sciences. While we would be using new CIP codes and titles, these doctoral degrees can be delivered with existing faculty, courses, and administrative staff. The required courses for the newly titled and coded doctorates are unchanged from those required in the current Interdisciplinary PhD program, except that the secondary disciplines now only require nine hours of courses (under the current system, the "co-discipline" sometimes requires as many as fifteen hours of coursework). This promises to improve completion rates.

This change of codes and titles will better reflect the specialized research and academic focus within these designated areas, which can significantly contribute to elevating the university's research profile. This has the potential to increase funding opportunities from federal agencies, private organizations, and philanthropic sources. With focused academic programs, we can tailor our research proposals to meet the specific needs and priorities of these funding agencies, ultimately increasing our chances of securing research grants and contracts.

We strongly believe that these more narrowly focused doctoral programs will elevate our research reputation, improving our university's standing as a discovery enterprise, attracting a higher caliber of faculty and students, enhancing our regional, national, and international appeal as a go-to institution for advanced research and education.

In sum, because the proposed transition aligns with our university's long-term goals and aspirations, potentially giving us greater research prominence, increased funding, and a more dynamic academic environment that will advance the mission and reputation of UMKC and the entire UM-System, we request the Board of Curators to approve this proposal.

Thanks for your consideration.

Stephen Dilks

Stephen John Dilks,
Associate Dean, School of Graduate Studies
Chair, UMKC Graduate Council.

120 Atterbury | 5000 Holmes Street | Kansas City, MO 64110-2499 | p 816-235-1301 | f 816-235-1310 | sgs.umkc.edu