PROPOSED PROGRAM SUMMARY

Instituion: University of Kentucky
Program Name: Computer Engineering Technology
Degree Designation: BACHELOR OF SCIENCE (BS)
Degree Level : Baccalaureate

Program Description

The proposed Bachelor of Science (BS) in Computer Engineering Technology (CPT) degree offers students opportunities to acquire the knowledge, skills, and strengths to develop the engineering acumen for becoming technical leaders. It prepares students to succeed in the design, implementation, integration, and support of computer-based and network systems that are critical to the success of enterprises, projects, research and development, and technical goals. In this increasingly interconnected world, technical experts with the ability to understand, link, use and integrate computer hardware, software and networks, and who can evolve systems as needs change, are in high and ever-increasing demand.

The proposed four-year BS in CPT is designed as a feeder-completer program in which students earn an Associate in Applied Science (AAS) in CPT from the Bluegrass Community and Technical College (BCTC) and then a BS in CPT from the University of Kentucky (UK). In this arrangement, the UK will offer only Junior and Senior level coursework.

The proposed curriculum provides in-depth knowledge of hardware and software design, development, applications and maintenance. It is based on a solid academic foundation with intensive classroom and laboratory experiences. Students gain strong background knowledge and expertise in cutting-edge developments and applications, and programming languages currently used in industry. Students learn and experience industrial-standard approaches to developing application software as well as state-of-the-art problem-solving techniques for code and firmware development with networking and web operations. The hardware focus of the curriculum is in digital systems design and development. From low-level gate design to high-end microprocessors and current/advancing bus standards, students gain an architectural understanding of computer systems. The curriculum includes in-depth design and analyses of combinational logic, sequential logic and state machines, microcontroller systems, microprocessor systems, and state-of-the-art computer technology.

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: 15.1201
Credit Hours: 127
Institutional Board Approval Date: 2/18/2021
Implementation Date: 8/16/2021

Student Demand

Year 1 - 10
Year 2 - 34
Year 3 - 86
Year 4 - 130
Year 5 - 145

Market Demand

The Kentucky Council on Postsecondary Education (KY CPE) recently published in April 2020 it's Engineering Sector Analysis in Kentucky. The report assesses and discusses labor market information along with program demand gap and migration analyses. It evaluates the effectiveness of Kentucky institutions in meeting workforce demand in the engineering sector. The KY CPE report identifies a large gap existing in the area of Engineering Technology, an area considered critical for meeting manufacturing job openings and in-state BS educational opportunities.

The KY-CPE findings are consistent with a national trend in which the skills shortages in manufacturing have been well documented. The following highlights a few examples.

In November 2017, McKinsey Global Institute published a report titled "Making it in America: Revitalizing US manufacturing." The report outlined how multiple technology advances are converging and changing manufacturing industries and driven by an explosion in the volume of available data, developments in?analytics?and machine learning, new forms of human-machine interactions, intelligent robots, interconnected supply chains, and an ability to transmit digital instructions to the physical world. These complementary technologies can run smart, cost-efficient, and automated plants that produce large volumes or highly customized products. Concomitantly, increased knowledge and technology skills are required on factory floors.

In a December 2019 article published in the Wall Street Journal, entitled "American Factories Demand White-Collar Education for Blue-Collar Work," the authors defined how new manufacturing jobs that require more advanced skills are driving the education level needed by factory workers. For the first time, manufacturers are on track to employ more college graduates than workers with a high-school degree or less education; this change, in part, coincides with manufacturing shifts toward automation that has increased factory output.

Deloitte and the Manufacturing Institute have been tracking skills shortages for the past 17 years. They have documented how skill shortages continue to swell and threaten to impede the current growth and productivity in the US manufacturing industry. In their November 14, 2018 report entitled "The jobs are here, but where are the people?", Deloitte and the Manufacturing Institute explored the depths of today's talent shortage in manufacturing and how jobs are changing due to technology and automation. They predicted a 53% shortage of skills in the US manufacturing industry by 2028.

In response to local, state and national skills needs, the proposed Program partners the UK with the BCTC and creates a unique, joint feeder-completer educational opportunity within Kentucky.

Employment Demand

	Regional	State	National
Type Of Job	**Computer Hardware Engineer**		
Avg. Wage	$88,815	$81,785	$99,862
# Jobs (Postings)	37	15	10895
Expected Growth	4%	0%	5%
Type Of Job	**Computer Programmers**		
Avg. Wage	$75,051	$71,861	$81,595
# Jobs (Postings)	757	372	67511
Expected Growth	0%	0%	0%
Type Of Job	**Computer Support Specialist**		
Avg. Wage	$47,023	$45,267	$52,457
# Jobs (Postings)	1747	1139	146267
Expected Growth	9%	16%	11%
Type Of Job	**Computer Systems Analyst**		
Avg. Wage	$78,426	$76,596	$85,291
# Jobs (Postings)	2829	1191	219915
Expected Growth	4%	11%	9%
Type Of Job	**Computer Systems Engineers/Architects**		
Avg. Wage	$101,376	$98,193	$103,258
# Jobs (Postings)	2154	1036	258333
Expected Growth	9%	11%	9%

Indicate source of market demand information

Burning Glass Technology. Job postings for the last 12 months and projections are from 2019-2028 and are based on Bureau of Labor Statistics projections

Academic Demand

NA

Unneccessary Duplication

Similar Program(s):

Program Id	Inst code	Inst Description	Degree Designation	Program Title	Report year
6508	00927500	Northern Kentucky University	BS		2015

Comparison of Objectives/Focus/Curriculum to Similar Programs:
This is a closed program

Comparison of Student Populations:
This is a closed program

Access to Existing Programs:
This is a closed program

Feedback from Other Institutions:
This is a closed program

Cost

Projected Revenue over Next Five Years ($) : 4383936
Projected Expenses over Next Five Years ($) : 3499292

Will Additional faculty be needed? Yes
The Engineering Technology Department will collaborate with the Institute of Research for Technology Development (IR4TD) and will share resources. IR4TD will make available $1.5 million. Besides, the Toyota Motor North America (TMNA) is donating $4.25 million to support the new Department; per the donor's requests, the TMNA funds are to be allocated as follows:

A $2 million endowment to create the Toyota Engineering Technology Diversity Scholarship

A $1 million endowment to create the Toyota Engineering Technology Distinguished Professorship

$1.25 million for Engineering Technology Laboratory Enhancement, faculty recruitment, and general expenses. This amount supports both the Computer Engineering Technology and Lean Systems Engineering Technology programs

Provide a budgetary rationale for creating this new program
The BS in CPT is expected to increase revenue by attracting a new pool of students to UK. It is also projected to increase retention rates and, therefore, generate tuition dollars.

Also, faculty in the CPT program will be engaged in activities with industry partners, through consulting services and applied research. These activities are estimated to generate income projected as follows: Yr2: $100K, increasing $25K yearly after that.