


Board of Regents

University System of Ohio

 John R. Kasich, Governor
 John Carey, Chancellor

INITIAL INQUIRY REQUEST TO OFFER A NEW PROGRAM

Date of submission: *Date to come (sent after EPC)*

Name of institution: Kent State University

Primary institutional contact for this request:

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Name of new program: Bachelor of Science degree in Mechatronics Engineering Technology

For institutions that are already approved/authorized by the chancellor

- New degree designation
 New program within an existing degree (e.g., major, minor, concentration)
 New technical certificate program
 New licensure/endorsement area (educator preparation)

Delivery options (check all that apply):

- Campus-based
 Online/hybrid delivery
 Flexible or accelerated delivery
 Offering the program at a new offsite location
 Offering the program at an existing offsite location
 Program contains off-campus experiences (e.g., internship, clinical, practicum, student teaching)

The institution will be seeking specialized accreditation for the program:

- No Yes

If “yes,” provide the name of the accrediting agency:

Kent State University will seek accreditation for the degree program from the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). ABET accredits more than 3,100 programs at more than 600 colleges and universities worldwide, including Kent State’s associate degree programs in mechanical engineering technology and electrical/electronic engineering technology.

Provide a brief description of the request.

Kent State University proposes to offer a Bachelor of Science degree in Mechatronics Engineering Technology, to be administered by the university’s College of Applied Engineering, Sustainability and Technology on the Kent Campus.

This program is existing as a concentration within the college’s Applied Engineering major. The goal is to elevate the concentration to a separate degree program (major) and align the curriculum more fully with ABET accreditation standards.

Explain the academic unit’s rationale for making the request.

Mechatronics is an emerging field, revolving around the design, construction and operation of automated systems, robots and intelligent products. Mechatronic devices can be found in agriculture, hospitals, buildings, homes, automobiles, manufacturing plants, toy and entertainment industry and in aids for the elderly and disabled.

The U.S. Department of Labor has classified both robotics engineers and robotics technicians as “bright outlook” occupations.¹ With increasing demand in the robotics industry, there will be more demand for employees, see table 1.

Table 1: Robotic Industry Data

Robots Ordered by North American Companies in 2015 31,464²	Predicted Growth of Industrial Robotics Market by 2020 \$41.17 billion³	New Robotics-Related Jobs by 2020 500,000+⁴
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Kent State’s mechatronics program was established in fall 2013 as one of four concentration within the Applied Engineering major.⁵The mechatronics program started with three enrolled students and has since then grown quickly, see table 2.

Table 2: Student Enrollment (15th Day Census) in Mechatronics Concentration

Fall 2013	Fall 2014	Fall 2015	Fall 2016
3	12	26	36

Revisions are planned for the curriculum, but the base infrastructure for the proposed Mechatronics Engineering Technology major is already in place. Due to the gradual development of the concentrations in the Applied Engineering major to meet their respective market needs, the percentage of major courses for each of the concentrations has reduced to be 10 percent of the entire curriculum. Since the Ohio Department of Higher Education requires concentrations to comprise a minimum 50 percent of the major curriculum, this program is not in compliance.

¹ Bright Outlook Occupations 2014-2024. Occupational Information Network (O*NET), U.S. Department of Labor. Retrieved from www.onetonline.org/help/bright.

² Robotic Industries Association (February 10, 2016). North American Robotics Market Sets New Records in 2015. Retrieved from www.robotics.org/content-detail.cfm/Industrial-Robotics-News/North-American-Robotics-Market-Sets-New-Records-in-2015/content_id/5951.

³ Allied Market Research (May 2014). Industrial Robotics Market is Expected to Reach \$41.17 Billion, Globally, by 2020. Retrieved from www.alliedmarketresearch.com/press-release/industrial-robotics-market-is-expected-to-reach-41-17-billion-globally-by-2020.html.

⁴ Williams, T. (October 23, 2015). Breakout Career: Robotics Will Create Over 500,000 New Jobs by 2020. GoodCall. Retrieved by www.goodcall.com/news/breakout-career-robotics-will-create-over-500000-new-jobs-by-2020-02211.

⁵ The remaining three Applied Engineering concentrations are computer engineering technology, mechanical engineering technology and applied engineering and technology management.

Furthermore, the Applied Engineering major is accredited by the Association of Technology, Management and Applied Engineering (ATMAE). The college will seek to have its mechanical engineering technology program accredited, instead, by ABET. With different curriculum, learning outcomes and accreditation standards, the Applied Engineering and Mechatronics programs have gone down separate paths and now need to be made separate degree programs.

The college has also proposed establishing a Mechatronics Engineering major, which will dovetail well with the Mechatronics Engineering Technology major, giving students options from which to pursue based on their interests and skill level.

Engineering and engineering technology are separate, but related, fields, with different ABET accrediting commissions and separate accreditation criteria. Curriculum and career opportunities are different too, see table 3.

Table 3: Comparison Between Engineering and Engineering Technology

	Engineering (Bachelor's)	Engineering Technology (Bachelor's)
Curriculum	<ul style="list-style-type: none"> ▪ Focus on theory and conceptual design ▪ Require mathematics that are high level and theoretical (e.g., calculus, calculus-based science) 	<ul style="list-style-type: none"> ▪ Focus on application and implementation ▪ Require mathematics that are more practical (algebra, trigonometry, applied calculus) and hands-on laboratories
Career	<ul style="list-style-type: none"> ▪ Mechanical engineers investigate complex electrical/mechanical problems and develop engineering methods to address them. 	<ul style="list-style-type: none"> ▪ Mechanical engineering technologists manage and support the design, operation and analysis of mechanical devices connected with automated systems, robots and computer-integrated manufacturing.

There are no similar baccalaureate programs offered by public universities in Northeast Ohio. The closest is Bowling Green State University, which offers a Mechatronics Engineering Technology major within its Bachelor of Science in Technology degree. Purdue University Calumet is the only university in the country with an ABET-accredited Bachelor of Science degree in Mechatronics Engineering Technology.

Several public colleges in the state offer associate degree programs in robotics, mechatronics or automation engineering technology, including Stark State College, University of Rio Grande, North Central State College, James A Rhodes State College, Terra State Community College and Lorain County Community College.

Indicate whether additional faculty and staff will be needed to support the proposed request.

It is anticipated that the college will hire one additional full-time tenure-track faculty member with a doctorate in mechatronics engineering, electrical engineering or related field. This faculty member will support the current Mechatronics concentration and proposed Mechatronics Engineering Technology major. Later, the faculty member will transition to the proposed Mechatronics Engineering major. The college will determine if additional faculty will be needed based on enrollment projections each year in the proposed program.