

**BACCALAUREATE COUNCIL  
Sixth Meeting/2021-22 Academic Year  
February 10, 2022**

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**COLLEGE OF ENGINEERING AND ENGINEERING TECHNOLOGY**

**Mechatronics Engineering**

Other Catalog Change **CEET21.22.AUDIT.01** Online catalog link 2021-2022 Undergraduate Catalog

**Requirements outside Program (76-77-80-81)**

CSCI 240 - Computer Programming in C++ Credits: 4

**CHEM 210 – General Chemistry I Credits: 3**

**CHEM 212 – General Chemistry Laboratory I Credits: 1**

ELE 210 - Engineering Circuit Analysis Credits: 3

ELE 210U - Engineering Circuit Laboratory Project Credits: 1

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**Total Hours for a Major in Mechatronics Engineering: 106-107-110-111**

*Rationale:*

*General chemistry is being added meet the math and science requirements specified by the accreditation agency, ABET. Although this course adds 4 credits to the major requirements, it can be counted as the general education requirement for an elective in any Knowledge Domain and would therefore add only one credit to the graduation requirements. The Mechatronics Program will seek approval from the Department of Chemistry regarding the availability of the course to the Mechatronics majors.*

**Engineering Technology**

Other Catalog Change **CEET21.22.AUDIT.02** 2021-22 Undergraduate Catalog [Link](#)

**Mission**

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**Vision**

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**Program Educational Objectives**

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Upon completion of the baccalaureate degree, Department of Engineering Technology graduates will

- ~~Apply scientific, mathematical, and engineering principles to analyze, develop, and implement systems.~~
- ~~Communicate effectively and work cohesively on team-based projects.~~
- ~~Apply technical knowledge demanded by today's innovation driven industrial workplace.~~
- ~~Understand the need for continued professional development to enhance technical and professional skills.~~
- ~~Develop applied solutions that meet ethical, cultural, and environmental needs of society.~~

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- Apply engineering knowledge and tools to solve technical problems, design products, and improve processes that strive to meet the ethical, cultural, and environmental needs of society.
- Be effective team members who can lead, collaborate, and communicate effectively with cross-functional teams.
- Become successful professionals and leaders in their fields.
- Pursue professional development through continuing education, industry-specific certifications, and involvement in professional organizations.



**Student Outcomes**

*Rationale:*

The Program Educational Objectives were recently reevaluated and updated by the department. These changes need to be reflected in the catalog.

**CEET21.22.10.02**

New Course:

2021-2022 Catalog

**CIP CODE: 14.3501**

**ISYE 485: APPLIED ADVANCED OPTIMIZATION**

Advanced optimization concepts and software, with the focus on models and engineering applications. Major topics include basics of stochastic programming, robust optimization, conic programming, and applications.

**PRQ: ISYE 370.**

**Credits: 3**

*Rationale:*

The skill of using optimization to solve complex decision-making problems is one of the core competences of industrial and systems engineers. Specifically, the general steps of optimization-based decision-making include developing an optimization model, designing a computational algorithm, interpreting results and implementing the solution. Over the past two decades, optimization-based technology has become one of the engines for emerging industries such as machine learning, revenue management, finance technology, bioinformatics, urban logistics, sharing economy and internet of things. The underlying optimization theory has been extensively developed in recent decades as a result of the growing complexity of the new, rapidly changing problems in these industries. Industrial engineers and operations research professionals have greatly contributed to tackling such challenging problems with efficient algorithms, robust modeling techniques and theoretical development. Some advanced optimization methods have proven to be flexible, tractable, robust and efficient, and therefore, widely applied. This course introduces the models and computer solvers of a selected few of such advanced optimization methods.

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Existing ISYE courses cover classic and fundamental optimization methods. Adding this course to the curriculum will further equip ISYE students with modern optimization tools for successfully solving a large class of complex decision-making problems.

**Prerequisite.** The prerequisite for the course is ISYE 370. ISYE 370 provides the basic concepts and methods for optimization and operations research. This course introduces advanced optimization methodology with recent development in research and practice. The material of this course enriches the models and methods applicable to quality control (ISYE 430), data analytics (ISYE 470) and scheduling (ISYE 474).

**Duplication.** The department has consulted with OMIS, MATH and CSCI departments.

OMIS department has no concerns, although they indicate that there is potential slight overlap with OMIS 628 (MSDA 628X) Supply Chain Business Analytics and OMIS 665/MSDA 665X Big Data Analytics for Business. These two courses focus on classic optimization methodology and big data techniques for supply chain problems and business scenarios. The overlapping content is highly limited. ISYE 678 emphasizes advanced optimization and its engineering applications. We have obtained letters from the OMIS department to support these claims.

## **UNIVERSITY**

New Course                    **UNIV21.22.01.01**

**CIP CODE: 30.9999**

**UNIV 301: Leadership and Career Accelerator**

**A foundational, interdisciplinary course that prepares students for the increasingly competitive, globalized job marketplace by introducing students to professional networks, cultivates teamwork skills, strengthens professional communication skills across modalities, and develops leadership skills through project management of a cohort capstone. An additional focus is on individual development through authentic narrative building. This allows students to create professional, yet meaningful, resumes, interview answers, reciprocal networking connections, and a roadmap for success beyond the classroom.**

**Credits: 3**

### Rationale:

Providing students the opportunity to cultivate their skills and work habits, participate in interactive experiences, and build their network, the Braven Accelerator interdisciplinary course helps students get a leg up on the competition. As more employers capitalize on their own personal and professional networks to recruit talent, exposing students directly to employers through hands-on engagement for a culminating capstone project and ongoing mentoring ensures our students will have greater access to

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opportunities for internships and after graduation. Additionally, as research shows that low-income and first generation college students struggle as compared to their peers when it comes to attainment of solid job opportunities after graduation, the Braven Accelerator course focus towards underrepresented populations ensures those students gain the social capital needed to succeed in their career pursuits.