

# MECHANICAL ENGINEERING (CAPITAL)

## Integrated Undergrad-Grad Programs

### Integrated B.S. in Mechanical Engineering And M.S. in Mechanical Engineering

Requirements listed here are in addition to requirements listed in GCAC-210 Integrated Undergraduate-Graduate (IUG) Degree Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-210-integrated-undergraduate-graduate-degree-programs/>).

This Integrated Undergraduate/Graduate (IUG) degree program combines the Bachelor of Science (B.S.) in Mechanical Engineering with the Master of Science (M.S.) in Mechanical Engineering offered at the following campuses:

#### Undergraduate Degree

- Behrend
- Berks
- Harrisburg

#### Graduate Degree

- Harrisburg

The graduate portion of this IUG is currently offered as face-to-face residential instruction at Harrisburg. While the undergraduate curriculum for this IUG may be completed at multiple campuses, the ease and feasibility of completing the integrated program may be heavily dependent upon the location of the graduate instruction. Please discuss the feasibility of completing the IUG with a representative for the graduate program.

Students must apply to the program via the Graduate School application for admission, and must meet all the admission requirements of the Graduate School and the Mechanical Engineering graduate program for the Master of Science (M.S.) degree, listed on the Admission Requirements tab. Before applying to the Graduate School, students must have completed entrance to their undergraduate major, have completed no less than 60 credits, and be admitted no later than the end of the second week of the semester preceding the semester of expected conferral of the undergraduate degree. Transfer students must have completed at least 15 credits at Penn State to enroll in an IUG.

In consultation with an adviser, students must prepare a plan of study appropriate to this integrated program, and must present their plan of study to the head of the graduate program or the appropriate committee overseeing the integrated program prior to being admitted to the program. The plan should cover the entire time period of the integrated program, and it should be reviewed periodically with an adviser as the student advances through the program.

Students must fulfill all degree requirements for each degree in order to be awarded that degree, subject to the double-counting of credits as outlined below. Degree requirements for the B.S. in Mechanical Engineering are listed in the Undergraduate Bulletin. Degree requirements for the M.S. in Mechanical Engineering are listed on the Degree Requirements tab.

Up to 12 credits may be double-counted towards the degree requirements for both the graduate and undergraduate degrees; a minimum of 50% of the double-counted credits must be at the 500 or 800 level. Independent study courses and credits associated with the culminating experience for the graduate degree cannot be double-counted.

Code	Title	Credits
<b>Courses Eligible to Double Count for Both Degrees</b>		
ME 401	Refrigeration and Air Conditioning	3
ME 408	Energy Systems	3
ME 431	Internal Combustion Engines	3
ME 432	Rocket Propulsion	3
ME 445	Microcomputer Interfacing for Mechanical Engineers	4
ME 455	Automatic Control Systems	3
ME 456	Introduction to Robotics	3
ME 461	Finite Elements in Engineering	3
ME 491	Bioengineering Applications of Mechanical Engineering	3
ME 512	Heat Transfer–Conduction	3
ME 513	Heat Transfer–Convection	3
ME 523	Numerical Solutions Applied to Heat Transfer and Fluid Mechanics Problems	3
ME 555	Linear System Theory and Control	3
ME 556	Robotic Concepts	3
ME 590	Colloquium	1
BIOE 503	Fluid Mechanics of Bioengineering Systems	3
EMCH 500	Solid Mechanics	3
EMCH 524A	Mathematical Methods in Engineering	3
IE 424	Process Quality Engineering	3
IE 550	Manufacturing Systems	3
IE 566	Quality Control	3
MATSE 403	Biomedical Materials	3
MATSE 436	Mechanical Properties of Materials	3
MATSE 514	Characterization of Materials	3
MATSE 535	Geometrical Crystallography	3

Students must sequence their courses so all undergraduate degree requirements are fulfilled before taking courses to count solely towards the graduate degree. #Students must complete the undergraduate degree requirements within the typical time to degree for the undergraduate major. In the semester in which the undergraduate degree requirements will be completed, IUG students must apply to graduate, and the undergraduate degree should be conferred at the next appropriate Commencement. If students accepted into the IUG program are unable to complete the M.S. degree, they are still eligible to receive their undergraduate degree if all the undergraduate degree requirements have been satisfied.