

APPENDIX A

Pathway to Masters Program (3+1+1 Program) *Engineering Science and Mechanics Department*

For Pathway Program students intending to apply to the Engineering Science and Mechanics One Year M.S. Degree:

Prerequisites for entry into the Pathway Program

Participating Departments will fully inform applicants of the prerequisite knowledge they need in order to be prepared for the required Penn State coursework, as demonstrated on their transcripts from the home institution.

Required prerequisite preparation to enroll in undergraduate Pathway Program courses

- Wave motion and quantum physics
- Strength of materials
- Differential equations
- Electric circuit analysis
- Physics, electricity and magnetism
- Calculus and vector analysis

Additional recommended prerequisite preparation to enroll in undergraduate Pathway Program courses

- Computer programing

Pathway Program Admission Requirements*

- Copies of Transcripts showing all previous coursework. Transcripts plus translated transcripts.
- Resume

**Students will be required to officially apply to the one year master's program in the fall semester of Year 1 once enrolled in Penn State courses.*

Courses offered through the Program for undergraduate students in Year 1

The Engineering Science and Mechanics Department has identified and will ensure availability in a minimum of 12 credits per semester for Pathway Program students. Courses for Pathway students intending to apply to the Engineering Science and Mechanics One Year M.S. Degree are listed below:

FALL SEMESTER: Take E SC 312, 414M, 433H, and 9 credits Required

COURSE	CREDITS	TITLE
E SC 312	3	Engineering Applications of Wave, Particle, and Ensemble Concepts
E SC 414M	3	Elements of Material Engineering
E SC 433H	1	Engineering Science Research Laboratory Experience

Select 9 credits from the following courses*:

E SC 407H	3	Computer Methods in Engineering Science, Honors
E SC 404H	3	Analysis in Engineering Science
E SC 450	3	Synthesis and Processing of Electronic and Photonic Materials
E SC 481	3	Elements of Nano/Micro-electromechanical Systems Processing and Design

*** Other courses may be selected with permission from the Undergraduate Officer**

SPRING SEMESTER: Take E SC 400H and 12 credits

COURSE	CREDITS	TITLE
E SC 400H	3	Electromagnetic Fields

Select 12 credits from the following courses*:

E SC 419	3	Electronic Properties and Applications of Materials
E SC 482	3	Micro-Optoelectromechanical Systems (MOEMS) and Nanophotonics
E SC 483	3	Simulation and Design of Nanostructures
E SC 450	3	Synthesis and Processing of Electronic and Photonic Materials
E SC 445	3	Semiconductor Optoelectronic Devices
E MCH 400	3	Advanced Strength of Materials and Design
E MCH 402	3	Applied and Experimental Stress Analysis
E MCH 403	3	Strength Design in Materials and Structures
E MCH 407	3	Computer Methods in Engineering Design
E MCH 409	3	Advanced Mechanics
E MCH 416H	3	Failure and Failure Analysis of Solids
E MCH 440	3	Nondestructive Evaluation of Flaws
E MCH 471	3	Engineering Composite Materials

*** Other courses may be selected with permission from the Undergraduate Officer**