Engineering Science

STEM

TRANSFER DEGREE | M | MIDDLETOWN CAMPUS

Program Description

The Associate in Science degree program in Engineering Science is designed specifically to enable students to transfer, with junior status, to the upper-level engineering college or university of their choice, where they can complete the Bachelor of Science degree in Engineering. As such, the program provides the same core courses that would be encountered in the first two years of study at most four-year institutions offering engineering degrees in the following disciplines: aeronautical engineering, architectural engineering, biological engineering, chemical engineering (ChE), civil engineering (CE), computer engineering, electrical engineering (EE), environmental engineering, geological engineering, materials engineering, mechanical engineering (ME), and nuclear engineering.

Core courses in calculus, chemistry, engineering physics and engineering science constitute the nucleus of this program. Selected courses in the liberal arts support and enhance this central core.

To begin the two year program, students must be at the mathematical level of Calculus 1 (MAT 205) or must have completed either College Trigonometry* (MAT 122) or Pre-Calculus Mathematics* (MAT 131).

Students who do not meet the above requirements should not be discouraged. Many students, who have either missed some foundational courses or who have family/job commitments, opt to take the extended program, which prepares them for Calculus 1 (MAT 205). Although this path will require more than four semesters, it enables students to reach their educational goal and to work as professional engineers in the above-mentioned fields. Students taking the extended option should meet with their advisor to arrange a planned course of study.

The Engineering Science program at SUNY Orange strives to form a student's ability to think critically in real time, to develop a professional work ethic built on cooperation and group problem solving, and to provide the rigorous conceptual and ethical framework required in a field where professional competence is expected.

**These prerequisite courses may be taken in the summer.*

Program Outcomes

Students will:

- demonstrate literacy in the mathematical, computational and scientific languages of Engineering Science
- demonstrate competency in written, oral and graphic communication skills, including applications to engineering science
- demonstrate literacy in a programming language and in computer assisted techniques for engineering problem solving and design
- plan, organize and implement laboratory experiments and prepare a formal detailed laboratory report of findings

Admission Criteria

Admission to this program requires that students be high school graduates or have high school equivalency diplomas (HSEs). If students are not high school graduates, they may be eligible for admission to the College’s 24 Credit Hour Program. If students are home schooled, they may be eligible for admission.

Students must have tested into or completed MAT 205 (Calculus 1) to begin progress toward this degree. If recent high school graduates have concerns about their mathematics preparation they should consider taking MAT 131 (Pre-Calculus Mathematics) during the summer before their entrance into the program.

Transfer Options

SUNY Orange has special relationships with upper-level colleges and universities for transfer. These transfer institutions include:

- Clarkson University
- Manhattan College
- New Mexico Tech
- Ohio State University
- Penn State University
- Rensselaer Polytechnic University (RPI)
- Stevens Institute of Technology
- SUNY Binghamton
- SUNY Buffalo
- SUNY New Paltz.
- SUNY Stony Brook
- Syracuse University
- University of Colorado
- University of Dayton

- University of Illinois

Your Career Coach

Career opportunities exist in the following fields:

- private sector engineering firms
- research and development opportunities in private and public sector
- engineering positions in city, state or federal agencies
- excellent background for other fields, i.e. law or medicine

Explore careers with Career Coach

Engineering Science Gateway Courses:

- Gateway courses: MAT 205, CHM 101, PHY 103
- Key courses: MAT 205, MAT 206, MAT 207, MAT 214, PHY 103, PHY 104, PHY 203, CHM 101, CHM 102
- Engineering Electives: EGR 214, GLG 110, EGR 220, EGR 212, PHY 204, EGR 218, MAT 211, EGR 216
  - Students majoring in chemical, biological or environmental engineering should plan to take: CHM 201 and CHM 202. (CHM 202 may be substituted for EGR 206 with permission from the department chair)
  - Computer Engineering majors should take: CSC 101, CSC 102 and CSC 201. (CSC 101 may be substituted for EGR 102 and CSC 201 may be substituted for EGR 206 with the permission of the department chair)

Courses above have been recommended by the department to help introduce you to the program (Gateway courses) and guide you in selecting courses that will provide you with the best academic experience (Key courses and suggested Electives).

First Semester

Course #	Course Name	P, C, P/C	Cr
ENG 101	Freshman English 1	P	3
CHM 101	General Chemistry 1	P	4
PHY 103	Physics for Science and Engineering 1	P	4
MAT 205	Calculus 1	P	4
EGR 101	Intro to Engineering Design	P/C	3
	Total Semester Credits		18

Milestones

During this semester, students should:

- Meet with your departmental advisor
- Join the Engineering Club

Second Semester

Course #	Course Name	P, C, P/C	Cr
ENG 102	Freshman English 2	P	3
PHY 104	Physics for Science and Engineering 2	P, P/C	4
CHM 102	General Chemistry 2	P	4
MAT 206	Calculus 2	P	4
EGR 102	Programming for Engineers	P/C	3
	Total Semester Credits		18

Milestones

During this semester, students should:

- Visit the Transfer Fair
- Seek out scholarship opportunities

Third Semester

Course #	Course Name	P, C, P/C	Cr
_____	SUNY Social Science (GE 3)		3
PHY 203	Physics for Science and Engineering 3	P, P/C	4
MAT 207	Calculus 3	P	4
EGR 205	Statics	P, P/C	4
_____	Engineering Elective *		3
	Total Semester Credits		18

Milestones

During this semester, students should:

- Apply to and visit transfer school(s)
- Check your progress with your advisor
- Seek leadership opportunities through the Engineering Club or Student Senate

Fourth Semester

Course #	Course Name	P, C, P/C	Cr
_____	SUNY American History (GE 4)		3
MAT 214	Differential Equations and Series	P	4
EGR 206	Dynamics	P	4
_____	Engineering Elective *		3
	Total Semester Credits		

Milestones

During this semester, students should:

- Seek out scholarship opportunities
- Apply for graduation

TOTAL DEGREE CREDITS: 68

Notes:

Students must take a minimum of two courses from the following depending on their area of specialization:

- Physical Geology (GLG 110)
- Thermodynamics (EGR 214) - Summer
- Solid Mechanics (EGR 220) - Spring
- Circuit Theory (EGR 212) - Spring
- Modern Physics (PHY 204)
- Materials Science (EGR 218) - Fall
- Linear Algebra (MAT 211) - Fall/Summer
- Engineering Computations (EGR 216)

Students majoring in chemical, biological or environmental engineering should plan to take:

- Organic Chemistry I (CHM 201) and Organic Chemistry II (CHM 202)
- CHM 202 may be substituted for EGR 206 with permission from the department chair

Computer engineering majors should take:

- Computer Science I and II (CSC 101 and 102) and Data Structures (CSC 201)
- (CSC 101 may be substituted for EGR 102 and CSC 201 may be substituted for EGR 206, with the permission of the department chair)

Proper advising is crucial for proper course selection.