

# Engineering Science

Degree Awarded: Associate in Science

## Recommended Course Sequence

First Semester-Fall	Credits
ENG 101 Freshman English 1	3
CHM 105 General Chemistry 1	4
PHY 103 Physics for Science & Eng. 1	4
MAT 205 Calculus 1	4
EGR 101 Engineering 1	3
PES 100 Concepts of Physical Wellness	1
<b>Second Semester-Spring</b>	
ENG 102 Freshman English 2	3
PHY 104 Physics for Science & Eng. 2	4
CHM 106 General Chemistry 2	4
MAT 206 Calculus 2	4
EGR 102 Engineering 2	3
PES ____ Physical Education (two)	1
<b>Third Semester-Fall</b>	
____ SUNY Social Science (GE 3)	3
PHY 203 Physics for Science & Eng. 3	4
MAT 207 Calculus 3	4
EGR 205 Mechanics 1 (Statics)	4
____ Engineering Elective	3
<b>Fourth Semester-Spring</b>	
____ SUNY American History (GE 4)	3
MAT 214 Differential Equations & Series	4
EGR 206 Mechanics 2 (Dynamics)	4
____ Engineering Elective	3
____ Engineering Elective	2/3

Total Credits: 72-73

*Note: Students must take a minimum of three courses (eight credits) from the following depending on their area of specialization:*

*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 209) fall/summer*

*Engineering Computations (EGR 216)*

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

*Organic Chemistry I (CHM201) and*

*Organic Chemistry II (CHM202)*

*Computer Engineering majors should take:*

*Computer Science II (CSC 102) and*

*Data Structures (CSC 201).*

*(Organic Chemistry II or Data Structures may be substituted for Mechanics II with the permission of the department chair.) Proper advising is crucial for proper course selection.*

## 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 B.S. 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
- 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.*

## Admission Criteria

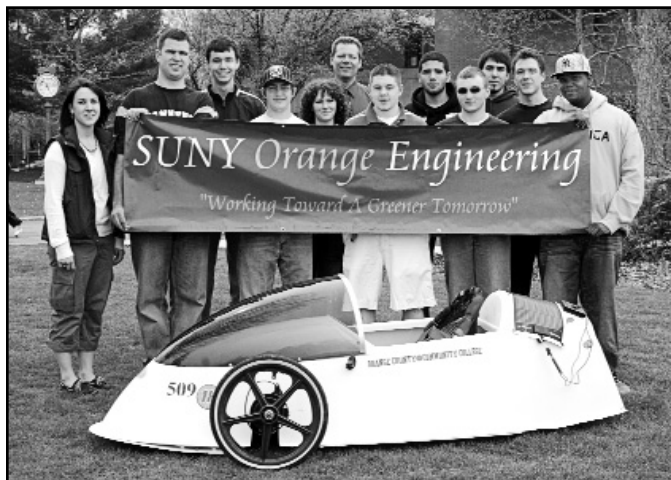
Admission to this program requires that students be high school graduates or have high school equivalency diplomas (GEDs). If students are not high school graduates, they may be eligible for admission to the College's 24 Credit Hour Program. If students are home schooled, they may be eligible for admission. (See pages 7 through 13 for more details on the admission process for all applicants.)

Students must have tested into or completed Calculus 1 (MAT 205) to begin progress toward this degree. If recent high school graduates have concerns about their mathematics preparation they should consider taking Pre-Calculus Mathematics (MAT 109) during the summer before their entrance into the program.

## Student Learning Outcomes

Students will:

- demonstrate literacy in the basic mathematical, computational and scientific languages of Engineering Science.
- demonstrate a mastery of communication skills, both written and oral, especially in their applications to Engineering Science.
- demonstrate literacy in a programming language and in computer assisted techniques for engineering design.
- plan, organize and implement laboratory experiments and prepare a formal detailed laboratory report of findings.
- set up and solve Engineering Science problems, using advanced mathematical techniques, with and without computers.
- conduct herself or himself in a professional manner consistent with acceptable standards and ethics.



## Career Opportunities

- 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

## Transfer Opportunities

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

## Contact Information

Science, Engineering and  
Architecture Department Chair  
341-4571  
Admissions Office  
(845) 341-4030