ENGINEERING SCIENCE

Associate in Science Degree | Transfer Degree | Department of Engineering, Physics and Technology

Program Description

The Engineering Science curriculum is designed for students with a special interest in engineering and provides a thorough preparation in mathematics and physical science.

Graduates of this program may transfer to a senior college to continue their education in engineering and earn a baccalaureate degree in engineering.

Learning Outcomes

Upon successful completion of the Engineering Science program requirements, students will be able to:

1. Students will solve problems using principles of mathematics and science applied to engineering problems.
2. Students will begin to understand concepts within Chemical, Mechanical and Biomedical Engineering.
3. Students will demonstrate their ability to solve a variety of mathematical and engineering problems using MATLAB.
4. Students will deduce and solve differential equations for RC, RL or RLC circuits.
5. Students will demonstrate a working knowledge of the circuit-voltage relations for resistors, capacitors and inductors.
6. Students will show proficiency in using programming language to solve a variety of engineering problems.
7. Students will show understanding of configurations and principles of basic electronic circuits and master the circuit calculation theories.
8. Students will design and implement an electronic circuit that can generate, modulate and transmit a signal.
9. Students will demonstrate how to analyze digital system electrical diagrams.

ENGINEERING SCIENCE CURRICULUM (PATHWAYS)

60 Credits required for AS Degree

Curriculum Coordinator: Dr. Ajaz Sana

Required Core

A. English Composition (6 Credits)

B. Mathematical and Quantitative Reasoning[1]

- MTH 28 College Algebra and Elementary Trigonometry[2,4] *OR* MTH 28.5 College Algebra and Elementary Trigonometry (Corequisite) (3 Credits)

C. Life and Physical Science[1]

- PHY 31 Physics I (4 Credits)

SUBTOTAL 13

Flexible Core

A. World Cultures and Global Issues[3] (3 Credits)

B. U.S. Experience in its Diversity[3] (3 Credits)

C. Creative Expression[3] (3 Credits)

D. Individual and Society[3] (3 Credits)

E. Scientific World[1]

- PHY 32 Physics II (4 Credits) AND
- CHM 11 General Chemistry I (4 Credits)

SUBTOTAL 20

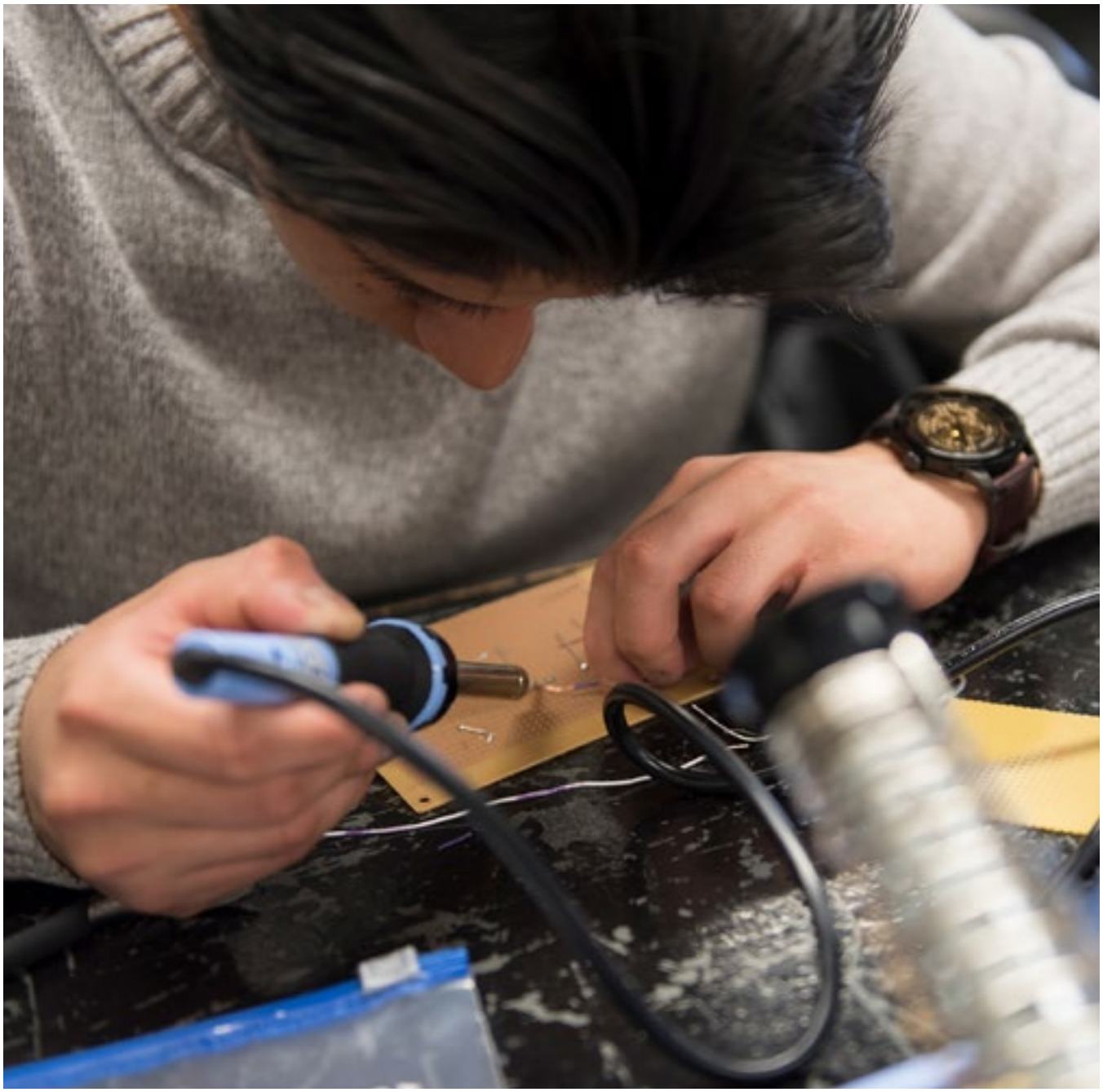
Major Requirements

- EGR 11 Introduction to Engineering Design (1 Credit)
- EGR 21 Analysis Tools for Engineers *OR* EGR 31 Circuit Analysis (2-3 Credits)[4]
- MTH 30 Pre Calculus Mathematics[2] (4 Credits)
- MTH 31 Analytic Geometry and Calculus I (4 Credits)
- MTH 32 Analytic Geometry and Calculus II (4 Credits)
- MTH 33 Analytical Geometry and Calculus III (4 Credits)
- MTH 34 Differential Equations and Selected Topics in Advanced Calculus (4 Credits)
- PHY 33 Physics III (4 Credits)
- Restricted Electives[4] (4 Credits)

SUBTOTAL 27

[1] This program has received a waiver to require students to take specific STEM/STEM Variant courses in Required Area B, Required Area C and Flexible Area E. If students transferring into this program complete different courses in these areas, they will be certified as having completed the Common Core requirements, but it may not be possible for them to finish their degree within the regular number (60) of credits.

[2] Select from the following to reach 60 credits (available only if student places out of MTH 28 and/or MTH 30):
- CHM 12 General Chemistry II (4 Credits)
- CHM 31 Organic Chemistry I (5 Credits)
- EGR 21 Analysis Tools for Engineers (2 Credits)
- EGR 31 Circuit Analysis (3 Credits)
- ENG 223 Scientific and Technical Writing (3 Credits)
- ELC 96 Digital Systems I (4 Credits)

[3] In choosing courses to fulfill Pathways Flexible Core requirements for Areas A, B, C and D, students are strongly advised to select courses from no fewer than three (3) different departments.

[4] Students who place out of MTH 28 can use one elective credit toward EGR 31. Students who do not place out of MTH 28 should select EGR 21 so as to not exceed the 60-credit limit for the program.