## GENERAL ENGINEERING (ENGR)

### ENGR 100
**Engineering Physics**
The overall objective of the course is to prepare secondary school students to be successful in a typical university freshmen-level introduction to engineering curriculum. Students will use hands-on project work, presentations, and discussion to gain a broad perspective of a number of individual engineering disciplines. Students will understand and apply the various aspects of the engineering design process, understand and apply creative and analytical problem solving methods to various situations and improve their ability to use technical-based communication. The format of projects will be written, oral, or graphical.

**Lecture:** 3 **Lab:** 0 **Credits:** 3

### ENGR 111
**Introduction to Engineering and Design**
This course introduces the student to the basic concepts and practices common to engineering. The engineering design process is presented through examples and hands-on projects. Along with fundamental engineering principles, communication skills, computer applications, and professional ethics will be included. Upon successful completion, the student will have been provided a foundation for further study in engineering.

**Lecture:** 2 **Lab:** 0 **Credits:** 2

### ENGR 112
**Introduction to Robotics**
Introductory experience to the field of robotics. Included in this experience will be the engineering design process, a university-level programming language, and open-ended problem solving strategies. Students, working in small hands-on teams, will be presented with several authentic design challenges. To meet these challenges, students will design, build, and program an appropriate LEGO® EV3 robot with National Instruments LabVIEW software. Teams will document and present their design solutions. Additional topics may include motor control, gear ratios, torque, friction, sensors, timing, program loops, logic gates, decision-making, and timing sequences. The course incorporates Next Generation Science Standards (NGSS).

**Lecture:** 2 **Lab:** 0 **Credits:** 2

### ENGR 200
**Entrepreneurship NOW! – Introduction to the Entrepreneurial Mind Set**
This course introduces students to the basic skill set that changes a student’s perspective from one of passive reception and learning to active participation and purposeful exploration to create value. This is a hands-on course where students learn to climb Mount Everest as a team, learn and practice the five disciplines for creating value, spark creativity and invention, learn the IIT-way to design, prototype, prototype and prototype, elevator pitching, and practice what they have learned by competing in a mini-innovation chase. The winners receive free courses at IIT to continue their journey to perfect the entrepreneurial mind set.

**Lecture:** 0 **Lab:** 4 **Credits:** 2

### ENGR 411
**Fabrication Practices for Engineers**
The course will provide an overview of standard shop practices, machining theory, measurement, mechanical drawing, dimensioning requirements, tolerances, material selection, fastener selection, and shop safety. This course will provide basic instruction on the proper use and complimentary capabilities of standard machine tools. Hand tools, drill press, lathe, mill, band saw, CNC machines, laser cutters and 3D printers will be used by students. Students will fabricate a variety of parts that will demonstrate the capabilities of individual machine tools.

**Lecture:** 0 **Lab:** 5 **Credits:** 2

### ENGR 496
**Practical Engineering Training**
This course is a mentored, immersive practical engineering training. Students learn under the direction of professional engineers and practicing engineers by working on real engineering projects. The student will perform hands-on engineering, including learning and developing/applying engineering principles and concepts to complete the project assigned to the student. The student will apply engineering ethics and safety during their practical engineering training. Students will communicate the results of their work in written and oral communications. Students will receive assignments of varying complexity consistent with their undergraduate standing.

**Lecture:** 0 **Lab:** 9 **Credits:** 3

### ENGR 497
**Special Topics: Introduction to Research**
This course introduces students to research methods, techniques for measurement and data analysis, lab safety, and contemporary issues related to research in a university setting. Students will be introduced to research proposal development, scientific literature reviews, measurement techniques, statistical data analysis, design of experiments, good laboratory practice, and proper presentation techniques. Ethics and intellectual property topics related to research will also be covered. During this course, students will be involved in hands-on experimentation in order to practice their measurement and data analysis skills as well as test their hypotheses. Experiments will focus on the engineering themes of energy, water, health, and security.

**Lecture:** 0 **Lab:** 3 **Credits:** 3

### ENGR 498
**Undergraduate Research Immersion: Team**
This course provides a faculty-mentored immersive research experience as a part of a student team. Research topics are determined by faculty mentor’s area of research.

**Lecture:** 0 **Lab:** 6 **Credits:** 3

### ENGR 499
**Undergraduate Research Immersion: Individual**
This course provides a faculty-mentored immersive research experience. Research topics are determined by faculty mentor’s area of research.

**Lecture:** 0 **Lab:** 6 **Credits:** 3