# STEM Course Descriptions

## Freshman Year

### Foundations in STEM

Prereq uisite s:

- 90 or higher in Middle School Physical Science and Algebra I/Geometry

Foundation in STEM integrates Science, Technology, Engineering, and Mathematics. Students will learn about the engineering design process, modeling, systems and systems thinking, materials, and fabrication. Students will explore various types of engineering (civil, mechanical, electrical, biomedical, etc.) throughout this course. In addition, interactive and hands-on activities comprise a major part of this course.

## Sophomore Year

### Engineering Design/Technology

Prerequisites:

- 85 or higher in Foundations in STEM

Engineering Design/Technology will build upon the footings of Foundations in STEM. Students will focus on the core elements of engineering fundamentals and design. Students will investigate and complete complex and interactive build projects that include computer, software, electrical, mechanical, communications, power, energy and environmental engineering. Students will learn the critical elements required in every engineer's tool box. This continued study will focus on understanding and applying an engineering perspective to every case study and project pursued.

### Anatomy and Physiology Honors

Prerequisites:

- 85 or higher in Foundations in STEM

Anatomy and Physiology Honors is a course in which students will study the structures and functions of the human body from both a cellular and systematic perspective. Topics include body organization, cell structure and function, tissue classification, integumentary system, skeletal system, muscular system, nervous and sensory systems, endocrine system, cardiovascular system, blood and lymphatic systems, immune system, respiratory system, digestive system, urinary system, and reproductive system. Medical terminology will be learned for each body system. In addition, diseases and pathophysiology within each of the human body systems will be discussed. Various laboratory activities including several dissections will be completed in order to apply the information learned.

Textbook: Pearson Essentials of Human Anatomy and Physiology

# Junior Year

## Robotics

Prerequisites:
- 85 or higher in Engineering

Robotics further invokes a student's engineering and design process knowledge through utilization of robotics theory and application using mechanisms, machines, and various robotic systems. Student will pursue quantitative elements of mechanical and electrical engineering focused on robotics application. Projects will alternate between emphasizing both individual and team builds. Course work will include the analysis of robotic history, future career path possibilities, enhanced engineering design process, dynamic programming, and integration of robotic movements through each project build. The required projects allow first-hard experience in designing, building, and presenting complex robotic projects with an international focus on improving the world around us.

## Biotechnology

Prerequisites:
- 85 or higher in Anatomy and Physiology Honors

Biotechnology integrates Science, Technology, Engineering, and Mathematics. Students will be introduced to the scientific concepts and laboratory research techniques currently used in the field of biotechnology. Students will develop the laboratory, critical thinking, and communication skills currently used in the biomedical industry. Students will explore and evaluate career opportunities in the medical and biotechnology fields. Students will complete various laboratory experiments and hands-on activities in order to understand and reinforce biomedical concepts.

Textbook: Biotechnology: A Laboratory Skills Concept

# Senior Year

## Engineering Capstone or Biomedical Capstone

Prerequisites:
- 85 or higher in Robotics or Biomedical Science

Students will complete their Engineering or Biomedical STEM track with a Capstone course comprised of two elements:

- A full semester internship
- A full semester Capstone Project

The internship must be related to the student's STEM track, and the student will be responsible for securing internship location with the assistance and approval of the Capstone instructor. The Capstone Project must be approved by the Capstone instructor and incorporate a high level of learned STEM principles and techniques. Both the internship and the Capstone Project require a formal presentation displaying research, findings, and results as defined by the Capstone instructor.