

#### Biotechnology 1 03091 Grades:10-12 College Prep -No

- Students will use multiple modern molecular lab techniques such as micropipetting, DNA extraction, DNA amplification and visualization of DNA on electrophoresis gels to investigate authentic research questions. Students will learn how to prepare DNA for sequencing and how to interpret DNA sequences; learn how to grow and work with bacteria and other micro-organisms using sterile technique, how to clone genes and to introduce genes into bacteria. Classes may collaborate with a research lab to do authentic research-based projects. Students will acquire skills needed to pursue higher education or to enter industry workforce in careers related to Biotechnology. Prerequisites are Biology 1, 2 or 1 year Lab Science Credit.

#### Biotechnology 2 03092 Grades: 10-12 College Prep- No

Students will use multiple modern molecular lab techniques such as micropipetting, DNA extraction, DNA amplification and visualization of DNA on electrophoresis gels to investigate authentic research questions. Students will learn how to prepare DNA for sequencing and how to interpret DNA sequences; learn how to grow and work with bacteria and other micro-organisms using sterile technique, how to clone genes and to introduce genes into bacteria. Classes may collaborate with a research lab to do authentic research-based projects. Students will acquire skills needed to pursue higher education or to enter industry workforce in careers related to Biotechnology. Prerequisites are Biology 1, 2 or 1 year Lab Science Credit.

#### Engineering Design 15283 Grades: 9-12 College Prep-No

- Engineering Design introduces students to computer-aided design, including the creation of geometric forms, interpreting 2D and 3D drawings of objects, and editing isometric and perspective drawings in a professional CAD environment. Students learn the steps of the design process by modeling and building various designs to be 3D printed or built by hand. Projects include orthographic projections of 3D objects, isometric drawings, designing a 3D container, and applying math and geometry skills to models and engineering processes. Students will also receive introductory lessons in the engineering design process. The course will introduce the basics of circuit building with breadboards and microcontrollers. Basic coding will be introduced through work with Arduino, Raspberry Pi, or a similar open source coding system.

#### Engineering Design 15284 Grades: - 9-12 College Prep-No

- Engineering Design introduces students to computer-aided design, including the creation of geometric forms, interpreting 2D and 3D drawings of objects, and editing isometric and perspective drawings in a professional CAD environment. Students learn the steps of the design process by modeling and building various designs to be 3D printed or built by hand. Projects include orthographic projections of 3D objects, isometric drawings, designing a 3D container, and applying math and geometry skills to models and engineering processes. Students will also receive introductory lessons in the engineering design process. The course will introduce the basics of circuit building with breadboards and microcontrollers. Basic coding will be introduced through work with Arduino, Raspberry Pi, or a similar open source coding system.