

Career & Technology - Science, Technology, Engineering and Math Cluster

Course: **ADVANCED ELECTRONICS**

Course Description: Students enrolled in this course will demonstrate knowledge and applications of advanced circuits, electrical measurement, and electrical implementation used in the electronics and computer industries. Through use of the design process, students will transfer advanced academic skills to component designs in a project-based environment. Additionally, students explore career opportunities, employer expectations, and educational needs in the electronics industry. Student must pass safety test with 100% mastery.

NEISD # **8255** Credit: 2.0 Term: Full Year Grade Placement: 11-12

Prerequisites: Electronics

Special Notes:

Course: **ADVANCED ENGINEERING DESIGN AND PRESENTATION**

Course Description: This course will provide students the opportunity to master computer software applications in a variety of engineering and technical fields. This course further develops the process of engineering thought and application of the design process. Student must pass safety test with 100% mastery.

NEISD # **8253** Credit: 2.0 Term: Full Year Grade Placement: 10-12

Prerequisites: Engineering Design and Presentation

Special Notes: *Student must provide their own transportation.*

Course: **CONCEPTS OF ENGINEERING AND TECHNOLOGY**

Course Description: This course provides an overview of the various fields of science, technology, engineering, and mathematics and their interrelationships. Students will use a variety of computer hardware and software applications to complete assignments and projects. Upon completing this course, students will have an understanding of the various fields and will be able to make informed decisions regarding a coherent sequence of subsequent courses. Further, students will have worked on a design team to develop a product or system. Students will use multiple software applications to prepare and present course assignments. Student must pass safety test with 100% mastery.

NEISD # **8250** Credit: 1.0 Term: Semester Grade Placement: 9-10

Prerequisites:

Special Notes:

Course: **ELECTRONICS**

Course Description: Students enrolled in this course will demonstrate knowledge and applications of circuits, electronic measurement, and electronic implementation. Through use of the design process, students will transfer academic skills to component designs in a project-based environment. Students will use a variety of computer hardware and software applications to complete assignments and projects. Additionally, students explore career opportunities, employer expectations, and educational needs in the electronics industry. Student must pass safety test with 100% mastery.

NEISD # **8254** Credit: 1.0 Term: Full Year Grade Placement: 10-12

Prerequisites:

Special Notes:

Course: **ENGINEERING DESIGN AND PRESENTATION**

Course Description: Students enrolled in this course will demonstrate knowledge and skills of the process of design as it applies to engineering fields using multiple software applications and tools necessary to produce and present working drawings, solid model renderings, and prototypes. Students will use a variety of computer hardware and software applications to complete assignments and projects. Through implementation of the design process, students will transfer advanced academic skills to component designs. Additionally, students explore career opportunities in engineering, technology, and drafting and what is required to gain and maintain employment in these areas. Student must pass safety test with 100% mastery.

NEISD # **8252** Credit: 1.0 Term: Full Year Grade Placement: 9-12

Prerequisites:

Special Notes:

Course: **ENGINEERING DESIGN AND PROBLEM SOLVING**

Course Description: This course is intended to stimulate students' ingenuity, intellectual talents, and practical skills in devising solutions to engineering design problems. Students use the engineering design process cycle to investigate, design, plan, create, and evaluate solutions. At the same time, this course fosters awareness of the social and ethical implications of technological development. Student must pass safety test with 100% mastery.

NEISD # **8258** Credit: 1.0 Term: Full Year Grade Placement: 11-12

Prerequisites:

Special Notes: *Student must provide their own transportation.*

Course: **ENGINEERING MATHEMATICS**

Course Description: This is a course where students solve and model robotic design problems. Students use a variety of mathematical methods and models to represent and analyze problems involving data acquisition, spatial applications, electrical measurement, manufacturing processes, materials engineering, mechanical drives, pneumatics, process control systems, quality control, and robotics with computer programming. Student must pass safety test with 100% mastery.

NEISD # **8251** Credit: 1.0 Term: Full Year Grade Placement: 9-12

Prerequisites:

Special Notes:

Course: **PRACTICUM IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATH**

Course Description: The practicum course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the science, technology, engineering, and mathematics career cluster. The practicum is designed to give students supervised practical application of previously studied knowledge and skills. Practicum experiences can occur in a variety of locations appropriate to the nature and level of experience. Student must pass safety test with 100% mastery.

NEISD # **8260** Credit: 2.0 Term: Full Year Grade Placement: 12

Prerequisites: 8258

Special Notes: *Student must provide their own transportation.*

Course: **PRINCIPLES OF TECHNOLOGY**

Course Description: Students conduct laboratory and field investigations, use scientific methods during investigations and make informed decisions using critical thinking and scientific problem solving. Various systems will be described in terms of space, time, energy and matter. Students will study a variety of topics that include laws of motion, conservation of energy, momentum, electricity, magnetism, thermodynamics and characteristics and behavior of waves. Students will apply physics concepts and perform laboratory experimentations for at least 40% of instructional time using safe practices. Student must pass safety test with 100% mastery. To receive credit in science, students must meet the 40% laboratory and fieldwork requirement.

NEISD # **6697** Credit: 1.0 Term: Full Year Grade Placement: 10-12

Prerequisites: 1 unit high school science and Algebra I

Special Notes:

Course: **ROBOTICS AND AUTOMATION**

Course Description: Students enrolled in this course will demonstrate knowledge and skills necessary for the robotic and automation industry. Through implementation of the design process, students will transfer advanced academic skills to component designs in a project-based environment. Students will build prototypes or use simulation software to test their designs. Additionally, students explore career opportunities, employer expectations, and educational needs in the robotic and automation industry. Student must pass safety test with 100% mastery.

NEISD # **8094** Credit: 1.0 Term: Full Year Grade Placement: 9-12

Prerequisites:

Special Notes:

Course: **SCIENTIFIC RESEARCH AND DESIGN**

Course Description: This course introduces students to the principles of environmental engineering. Topics will include material balances, environmental chemistry, risk assessment, air quality, water quality, and waste water treatment. Quantitative evaluation of environmental, technical and economic problems with control of pollutants in air, water, and land will also be discussed.

NEISD # **8259**

Credit: 1.0

Term: Full Year

Grade Placement: 11-12

Prerequisites: 1 unit of high school science

Special Notes: