

Pre-Engineering



Course Description:

This course is intended for any student interested in exploring a career in engineering or as a technician. Activities include creating solutions to engineering problems using tools, machines, computer systems, and a variety of materials. Students will explore product designs, construct prototypes, models, and testing apparatuses by using CADD systems, computer modeling, and simulations. The role and impact of engineering are explored along with career opportunities in technical and engineering fields.

The course assumes no previous knowledge of engineering or drafting. Students will employ engineering and scientific concepts in the solution of engineering design problems. In addition, students use the most current issued 3D solid modeling design software package to help them design solutions to solve proposed problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges that increase in difficulty throughout the course. Students will also learn how to document their work, and communicate their solutions to their peers and members of the professional community.

Standards:

This course is designed in alignment with the Iowa Core Curriculum 21st century technological literacy skills, as well as the ITEA Standards for Technological Literacy.

What will my classes be like?

Ever wondered how to design something new or draw out an idea to show your friends? Stop wondering and do it! Discover the role of an engineer in taking an idea from the design process to manufacturing or production. Produce an incredible, working prototype of your project with 3D printing and laser technology. You will work on projects, activities, and problems not only of interest to you, but that have global and human impacts. Work in teams to design and improve products, document your solutions, and communicate them to others.

Course Goals / Objectives:

Pre-Engineering focuses on engaging in hands-on, real-world projects. Students will understand how the material covered in class can be applied in their everyday lives. Learning activities will include teacher-led instruction, cooperative learning, and project-based learning. Technology will be used to enhance students learning, and provide real-world applications.

Engineering is a profession that contributes to change and improvements in our world. It creates imaginative and visionary solutions to the challenges of the 21st century – the problems of feeding the world, how we will use energy and continue to protect our environment. Engineering and technology play a vital role in the quality of everyday life and wealth creation. Appropriate attitudes relative to the professional social obligations of the engineer, and the relationships between math, science, technology and society need to be learned. Real world, open-ended engineering problems that cover a wide range of content will be presented.

Pre-Engineering

Course Outline:

Unit1: Design Process (8 days)

Unit2: Technical Sketching and Drawing (6 days)

Unit3: Measurement and Statistics (6 days)

Unit4: Modeling Skills (8 days)

Unit5: Geometry of Design (7 days)

Term 2 EXAM

Unit6: Reverse Engineering (7 days)

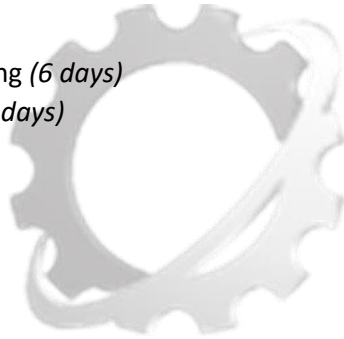
Unit7: Documentation (12 days)

Unit8: Advanced Computer Modeling (6 days)

Unit9: Design Team (17 days)

Unit10: Design Challenges (5 days)

CUMULATIVE FINAL EXAM



Assessment Standards / Grading Practices:

Projects will be graded with a rubric. Daily work will be graded by points. Assessments will be given throughout the semester.

All students must maintain an Engineering Notebook to pass the class. They will be checked periodically throughout semester.

Student Engagement Evaluation- Students will have a grade scale of 5 points per day based on the following criteria:

- 5 - Exceptional, present, organized, on task, engaged in activities and classroom work
- 4 - Good, present, on task and engaged in class activities most of time
- 3 - Good, tardy, on task and engaged in class activities most of the time
- 2- Poor, disorganized, not engaged in class activities
- 1 - Poor, tardy, disorganized, not engaged in class activities
- 0 - not present, no activities made up

Credit for incomplete or missing work is available upon completion

Behavior Expectations:

***Every student must return a signed copy of this syllabus, before beginning work in the lab area. ***

- It is the expectation of this class that students follow the expectations as outlined in the 2016-17 student handbook
- Work safely
- Report any injury to me immediately after it happens.

Pre-Engineering

- You are responsible for the tools and equipment you are using. If you break something because of carelessness, you are responsible for it.
- Report anything that is missing or damaged immediately.
- Clean up at the end of each class period.
- No food or drink are to be brought into the classroom. Individual music players cannot be worn during class without approval from the instructor. Cell phones must be kept out of sight during class or they will be put into my desk drawer for the remainder of the class period.

******STUDENTS WHO ARE DISRUPTIVE OR POSE A THREAT TO THEMSELVES OR OTHERS MAY BE REMOVED FROM CLASS AND SENT TO THE AP OFFICE. ******

Communication:

The best way to contact me with questions or concerns is via email (joebormann@dbqschools.org). You may also reach me by telephone 563-552-5258. Messages left will be returned as soon as possible. I also update PowerSchool on a regular basis.

Parent Awareness:

Parents/guardians and students should both be aware of the requirements of the class. Remove, sign, and date below to indicate you have read this syllabus and are aware of the expectations and responsibilities of the class. Return to Mr. Bormann.

Student Name (Print): _____

Student Signature: _____ Date: _____

Parent/Guardian Signature: _____ Date: _____