Introduction to Engineering Design (IED)
Course Syllabus
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Course Description: Introduction to Engineering Design (IED) is one of three foundation courses in the Project Lead The Way (PLTW) high school pre-engineering program at South High. It is a course for students who are interested in exploring design and engineering. The major focus of the IED course is to expose students to the design process, engineering standards, research and analysis, technical documentation, global and human impacts, communication methods, and teamwork. IED gives students the opportunity to develop skills and understanding of course concepts through activity-, project-, and problem-based learning.

Students will employ engineering and scientific concepts in the solution of engineering design problems. In addition, students use a 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.

Students will have the opportunity to earn college credit or an honors grade depending upon their level of academic success.

Assessment

Lab Grade – Many of the activities for this course are completed in class, especially those requiring the use of computer software. This category includes small or short term assignments, particularly those testing a new skill, and any homework assignments. It also includes grades for attendance, attitude, effort and participation within the classroom.

• Tests & Projects (approx. 50% each) – Tests cover a range of topics within a larger unit, while Projects refers to the final product and presentation of a design project. This category reflects more on the result of student activity rather than the process.

• Final Exam (20%) – A cumulative test over the semester's material.

• Progress Report Grades – The current grade shown in Infinite Campus at the end of assignments due by the end of a marking period will be included in that six-weeks grade. The only grade that carries over is the semester grade.

• National Exam EOC (20%)– Near the end of the second semester, a national end of course exam will be administered for this course. This represents the Final Exam grade for the second semester, and is cumulative for the entire year.

Assessment continued

• Late Work – Late work will be accepted, with a penalty of 20% per school day. No late work will be recorded that is turned in within five days of the end of a grading period. Extensions related to illness and family travel are made on a case-by-case basis.
• Cheating is defined as turning in any work that is not you own, including copying down someone else's homework. Cheating will warrant a zero on the assignment plus additional disciplinary action.

Parkway Honors Grading Scale
The grading scale used will be the following:
 H (5.0) 97% A (4.5) 90% B (3.5) 80% C (2.5) 70% D (1.5) 60% F (0) below 60%

Course Outline

SEMESTER I
Technical Sketching/Modeling – Develop sketching and dimensioning skills used throughout the IED course, both by hand and using Autodesk Inventor CAD software. Introduce use of Engineering Notebook.
Design Process – Introduce steps in Design Process.   Apply these skills along with others developed in course to complete a Project.
Measurement and Statistics – Develop measurement and material properties concepts and skills. Apply these skills to materials using Project Portfolio and Engineering Notebook.
Advanced Modeling – Miniature Train Project Extend 3D modeling skills and apply to development of Miniature Train Project.

SEMESTER II
Reverse Engineering – Introduce steps in Reverse Engineering Analysis. Apply these skills to assigned Project.
Product Improvement – Introduce product improvement concepts, and extend technical documentation skills using CAD software. Use these skills to complete a Project.
Design Challenge – Mechanical Toy Project Design and build a mechanical toy, using the Design Process, documented in your Engineering Notebook and Project Portfolio.
Virtual Design – Team Project Work with team to implement and document the Design Process, using your Engineering Notebook, 3D Modelling software and Project Portfolio.

Suggestions for Success
• Read sections as they are assigned, or beforehand. The more familiar you are with the material ahead of class, the better you will understand the concepts and their application in class.
• Take notes, both as you study material on your own, and during class. Leave plenty of blank space around the notes to fill in additional information or example problems. Consider using loose-leaf paper with binders to aid in organizing your notes.
• Write out definitions to vocabulary terms and concept topics in your own words. The practice will help strengthen your command of the content and also illuminate any gaps in your understanding, which you may then work to correct.
• Do assignments on time. Practice scheduling when you will spend time on this course (both in and out of class). This will become more important for projects that require a significant period of time to complete.
• Investigate other resources, especially the web. Make of habit of searching the web, both for video and print resources. This may apply to the topic of the day, but could include any IED-related topic, whether it is because you need extra help or you are simply curious.
• Get help early, either from a study group, a study partner, or your teacher. Do not wait until you are way behind to address the problem. The content in this course tends to build on prior knowledge, so it is important to stay current and nip problems in the bud.
• Catch up quickly if you are absent. Check with me as soon as you return to school to find out what you missed. If you are going to miss school for an extended period of time, discuss how this with me ahead of time.
 • Be prepared for class every day. Most of the suggestions above relate to this, but this also includes bringing appropriate materials to class (notes, paper, pencil).
 • Behave yourself. Tardiness, sleeping, disrespectful or disruptive comments or actions, making a mess, or otherwise acting out has no place in this class. Do not become the example