Digital Electronics (DE)
Course Syllabus
Instructor: Mr. Oakley

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Purpose

This honors course introduces students to applied digital logic, a key element of careers in engineering and engineering technology. This course explores the smart circuits found in watches, calculators, video games and computers. Students use industry-standard computer software in testing and analyzing digital circuitry. They design circuits to solve problems, export their designs to a printed circuit auto-routing program that generates printed circuit boards, and use appropriate components to build their designs. Students use mathematics and science in solving real-world engineering problems. This course covers several topics, including: analog and digital fundamentals, number systems and binary addition, logic gates and functions, Boolean algebra and circuit design, decoders, multiplexers and de-multiplexers. Students can receive 3 semester hours of transcribed college credit. A weighted grade is given for this course.

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.

• 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 possible additional disciplinary action.

<u>Parkway Honors Grading Scale</u>
   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%

<u>Course Outline</u>

SEMESTER I

Introduction to the history of engineering and how civil and architectural engineers differ in their approaches to building structures.

Residential design concepts incorporating site selection, foundation types, wood framing, water supply, waste water removal, property drainage, electrical needs, cost efficiency and analysis, and green architecture as it relates to home construction.

Culminating residential design project incorporating all information learned through hand calculations and necessary drawings to present their concept ideas.

SEMESTER II

Commercial wall and roof building systems, land use and development, and structural efficiency.

Structures including the design and use of different commercial beams, columns, footings. Chasing loads and beam analysis is included.

Commercial services including utilities, plumbing, wastewater, electric and HVAC.

Site considerations including surveying and leveling, soil testing, storm water management, landscaping, cut and fill, and road design.

Culminating commercial design project incorporating all information learned through hand calculations and necessary drawings to present their concept ideas.

National EOC Exam Cumulative over the full year, this exam is used to determine eligibility for college credit

<u>Suggestions for Success</u>
• 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