Digital Electronics is the study of electronic circuits that are used to process and control digital signals. In contrast to analog electronics, where information is represented by a continuously varying voltage, digital signals are represented by discrete voltages or logic levels. This distinction allows for greater signal speed and storage capabilities and has revolutionized the world of electronics.

**Class Overview**

Digital Electronics

alexander.herman@qacps.org

**Expectations**

Be Respectful

Be Present

Be Prepared

Be Mindful

**Grading Policies**

Progress Assessments are warm ups, classwork, exit tickets, check-ins, and discussions. Progress Assessments are 50% of the overall grade.

Mastery Assessments are quizzes, tests, and projects. Mastery Assessments are 50% of the overall grade.

PLTW has not announced if there will be an End of Course (EoC) Assessment. In Spring 2020, student grades were the only requirement to apply for college credits. In prior years, the EoC is used as the Final Exam.

**Course Content**

- Foundations of digital electronics
- Scientific and engineering notation
- Electronic component identification
- Basic soldering and PCB construction
- Electron theory and circuit theory laws
- Circuit simulation
- Breadboard prototyping
- Component datasheets and troubleshooting
- Combinational logic, analysis and design
- Binary, Octal and Hexadecimal number systems
- Boolean algebra and DeMorgan's Theorem
- AND-OR-INVERT, NAND only, and NOR only logic designs
- Binary adders and two's complement arithmetic
- Combinational logic design with field programmable gate arrays
- Sequential logic analysis and design
- Flip-flops, latches, and their applications
- Asynchronous OR synchronous counter design with small and medium scale integrated circuits
- Sequential logic design with field programmable gate arrays
- Introduction to state machines
- Introduction to microcontrollers
- Software development for an introductory microcontroller
- Real-world interface: introduction to hardware controls
- Process control with a microcontroller

**Materials Needed**

- Engineering Notebook
- Pen Blue or Black Ink Only
- Student Laptop
- Colored Pencils or Pens

I am also asking that anyone who might be willing to donate, please consider Tissues, Cleaning Wipes, Hand Sanitizer, and/or supplies listed above. Thank you!

All students at Queen Anne’s County High School are expected to conduct themselves with great pride in academics and the community at large. To this end, it is expected that all students will maintain academic integrity in every assignment. Work must be completed individually unless otherwise directed by the teacher. Plagiarism is a severe offense at QACHS and will result in immediate consequences.

**Academic Honesty**
Synchronous Tuesday and Friday 11:55-12:40
Asynchronous Monday and Thurs’ 11:55-12:40
Check-in Day Wednesday 11:55-12:40
Office Hours Monday, Tues’, Thurs’, Fri’ 8:00-10:15 or 2:00-3:30 by appointment for students and parents to have extra time as needed

Students will have three days from the assigned due date to submit work late; each day after that, the assignment will be docked 10% off the final score. Teachers will establish a due date and a deadline for each assignment. After the deadline, late work will not be accepted. In extenuating circumstances, please work with the teacher directly.

Synchronous – Join the video conference on time and have materials ready. These materials include pencil, paper, calculator and any websites needed to complete math work. Have Schoology open and ready to go in a browser. You are expected to be on the video conference for the duration of class. Please find a quiet place in your house and give yourself an area to work.

Asynchronous – Assignments that are asynchronous are to be done on your own; however, I am available for help during the designated asynchronous period. Also during this time you may be asked to attend a video conference for small group instruction. Small group instruction, if assigned, is mandatory.

Check-in Day – Every Wednesday there will be a brief 10 minute video conference or check in to provide a brief period of instruction and to ensure all students are on track with the current assignments. Students will also complete an asynchronous assignment on check-in day.

Office Hours – Every day except for Wednesday there are Office Hours set aside for reteaching, 1:1 or group tutoring, small group instruction and student/parent meetings. You may schedule a time during office hours for tutoring. You may also attend a tutoring or instructional video conference during office hours. Office hours are considered part of the school day, so tutoring or conferences scheduled during this time are mandatory. If there is an instructional conflict during the requested time, we will work together to find a time that works.

Lab safety and health:

It is the responsibility of the students to follow the training of safe practices in the technology and engineering education lab. The safety program consists of more than lecturing and posting safety rules and regulations. It includes instruction that actively involves the students in learning and choosing behaviors that promote the safe use of equipment that is used in the technology and engineering education lab. The implementation and promotion of safe practices in the technology and engineering education lab to prevent incidents and injuries to students are the responsibility of everyone. It is the student’s responsibility to adhere to all safety rules and regulations within the classroom.

Schoology
My.PLTW.Org
Edmentum
YouTube
Google Classroom

DIGITAL ELECTRONICS
Mr. Herman
alexander.herman@qacps.org

Fall 2020

ONLINE LEARNING SCHEDULE

ONLINE LEARNING EXPECTATIONS

POLICY CHANGES

RESOURCES

PROJECT LEAD THE WAY

PLTW
Parent/Guardian Questionnaire

Contact Info

Name: ____________________________________________

Relationship to Student: __________________________

Email: ____________________________________________

Preferred Phone: (_____)_______-_______________
   □ Cell  □ Home  □ Work

Would you like to receive email updates?
   □ Yes  □ No

Questions

1. Do you have internet access at home?
   □ Yes  □ No  □ Yes, but Spotty or Slow

2. How and When is the best way to contact you? (Example: Email/ Any time)

________________________________________

3. What are your student’s strengths?

4. What skills would you like your student to improve?

5. What is something your student has done that has made you proud?

6. Do you have any questions?

Is there anything else about your student or you that you would like me to know?

Sign Here to signify that you have reviewed the syllabus information:

X

Emergency Procedures:

All emergency procedures (fire drills, weather drills, etc.) have been reviewed with the students as they pertain to evacuation and/or shelter in place situations. Each drill’s instructions are specific to the classroom location and crisis situation. If you have any questions or concerns about what your student should do in the case of an emergency, please speak to your student and/or email me directly.