Course Name: Digital Electronics Course Number: 7255

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The contents of this syllabus support the Massachusetts DECE Vocational Technical Education Frameworks: Manufacturing, Engineering and Technology Cluster - Engineering Technology.

Course Description:

This is a course in applied digital logic. Students are introduced to the digital circuits found in video games, watches, calculators, digital cameras and thousands of other devices. The course covers the application of digital logic and how digital devices are used to control automated equipment. The course uses industry standard, electronic design software to build circuits. Students will be prepared to take the online "End of Course" exam through Rochester Institute of Technology for college credit.

Texts/Instructional Materials:

Electronic curriculum: https://pltw.instructure.com/courses/378625
Class Web Site: http://infotech66.tripod.com
Schoology site for assignment submission.

Optional Materials:

Breadboard Companion (BBCIII) Power Supply kit, PLD Companion and prototyping breadboard (http://www.breadboardcompanion.net/Products.html). This set allows Digital Electronics students to complete many assignments without the need to transport large and bulky "suitcases" to and from school. This set is available from Quincy High School for $35.00. Please make checks payable to "Quincy High School CTE".

Portfolios:

Students are required to keep a portfolio of their work. This is done in two ways. Students will keep a notebook of written projects, lab reports, observations, notes, and journal entries. For this students should have a standard three ring binder of approximately 2" or more. Secondly students will keep an electronic portfolio of their work. This information will be stored on a classroom file server computer. Although not required, it is highly recommended that students have a USB flash memory device to back up files and make files available for homework assignments.

Assessment Methods:

Portfolios
Teacher Observations
Oral presentations
Projects
Notebooks
Diagnostic testing
Oral Exams
Interdisciplinary activities
Simulations
Open ended questions
Word problems
Lab Experiments & Report s
Multimedia presentations
Objective Tests/Quizzes
Exams
Mid-Year Exam
Final Exam
Essays
Research papers
Presentations
Attendance
Class Participation
Document Analysis
Homework
Technical Projects

Grading Policy:

20% - Lab Projects/Class work
20% - Employability skills *
20% - Homework/Projects/Portfolio
20% - Quizzes/Tests
20% - Mid-Term/Final Exams

Students will be graded on a percentage basis according to the student handbook guidelines as follows:

99-97=A+
96-93=A
92-90=A-
89-87=B+
86-83=B
82-80=B-
79-77=C+
76-73=C
72-70=C-
69-67=D+
66-63=D (minimum passing)
Below 63 (failing)

Competency based, hands-on type activities will be graded based on the level of proficiency of the task to be evaluated. A sample grading structure is as follows:

Grade	Performance Level
4 (A Level)	**Highly Proficient**: Can complete the skill quickly and accurately with initiative and can direct others in performing the skill.
3 (B Level)	**Competent**: Can do all parts of the task. Needs only a spot check of completed work and meets minimum entry level requirements for speed and accuracy.
2 (C Level)	**Partly Proficient**: Can perform the task satisfactorily, but requires periodic supervision and/or assistance and may not meet entry level requirements for speed and accuracy.
1 (D Level)	**Limited**: Can perform parts of the skill satisfactorily, but requires considerable assistance and supervision.
0 (Failing)	Not Competent: Cannot perform the skill satisfactorily without assistance.

Employability:

Employability is about being able to find and keep fulfilling work. There are several soft skills necessary to develop in order to be successful in any career. The National Association of Colleges and Employers lists these top 10 skills employers seek:

1. Communication Skills (Oral and Written)
2. Honesty/Integrity
3. Teamwork Skills
4. Strong Work Ethic
5. Analytical Skills
6. Flexability/Adaptability
7. Interpersonal Skills
8. Motivation/Initiative
9. Computer Skills
10. Detail Oriented

General Class Guidelines:

HOMEWORK: Students can expect a significant amount of homework (reading, review questions, on-line research, etc.). Homework preparation is essential in order to keep "lecture" time brief and have more hands-on time. Homework will be graded and will be combined with the class portfolio to represent 20% of the class grade. In order to complete assignments students will be expected to have Internet access and an active e-mail account. Though a computer at home may make homework completion easier, this does not mean that a home computer is necessary. Students can access the Internet at the Quincy Public Library and other locations.

LATE ASSIGNMENTS: Homework and class assignments are expected to be completed on-time. Late assignments will generally not be accepted. In the event of an excused absence, homework due the day of the absence will be accepted on the first day the student returns to class following the absence. Homework assigned that day will be given one day for each day absent to make up the work. Note that this grace period does not apply to pre-assigned homework or assignments posted on the class Web site.

ATTENDANCE: Students are expected to be in class, on time, each class period. Class activities will begin promptly at the starting bell. Attendance is counted as an employability grade and is graded quarterly. Three unexcused tardies and/or dismissals will be counted as one unexcused absence.

Term Attendance	Points
Perfect Attendance	10
1 Absence	9
2-3 Absences	8
4-5 Absences	7
6 Absences	6
7 or More Absences*	0

* 7 or more unexcused absences constitute course failure for the term – See handbook for details.

"Requirements for Vocational Technical Certification – All students who successfully complete their course of study will receive a High School Diploma and a Certificate of Technical Proficiency. Any student who misses more than 14 days due to absences, including suspensions, cannot accrue the necessary shop hours and related instruction to be eligible for a Technical Certificate" – QHS Student-Parent Handbook.

CLASS CUTS: Class Cuts are dealt with severely. If a student chooses to cut a class he/she will receive a "0" for any daily class grade given as well as any homework, assignment, quiz or test due during the class cut. Class cuts will also be factored into the Employability Skills grade in that employers want employees who will come to work. Lastly, per the student handbook, class cuts will be turned in to the student's dean who may apply additional consequences, and the cut will result in a 5 point deduction in class grade. See the student handbook for a complete schedule of grade reductions for class cuts.

TERM PROJECTS: As many as 4 major term projects will be assigned throughout the course. The bulk of these projects will be completed outside of class. Ample time will be given to complete the projects. Some projects will be individual efforts and some may be collaborative projects. Teams for collaborative work will be selected at random by Mr. Holmes.

FIELD TRIPS AND DISMISSALS: In order for students to be allowed to miss class for a school sponsored activity (field trips, sports, etc.) must be in good standing with a class average of 70 or higher. Students who are not in good standing (including but not limited to missing assignments, in danger of failing, and/or showing poor employability skills) will not be permitted to miss class. In such event the student's sign-out sheet will be marked to indicate that the student is not in good standing. Attending a school sponsored activity without prior approval will be deemed a class cut and will be handled accordingly.

COURSE TIMELINE:

Quarter 1:

- Unit 1: Foundations in Electronics
    - Lesson 1.1 Introduction to Electronics
    - Lesson 1.2 Introduction to Circuit Design

Quarter 2:

- Unit 2: Combinational Logic
    - Lesson 2.1 AOI Combinational Logic Design
    - Lesson 2.2 Alternative Design: Universal gates and K-Mapping
    - Lesson 2.3 Specific Combinational Logic Designs
    - Lesson 2.4 Introduction to Programmable Logic Devices

Quarter 3:

- Unit 3: Sequential Logic
    - Lesson 3.1 Sequential Logic Circuit Design
    - Lesson 3.2 Asynchronous Counters
    - Lesson 3.3 Synchronous Counters

Quarter 4:

- Unit 4: Controlling Real Word Systems
    - Lesson 4.1 Introduction to State Machines
    - Introduction to Microcontrollers