<u>Imperial Valley College</u>
COURSE SYLLABUS FOR DIGITAL LOGIC CIRCUITS (ELTR 240)
3.0 Credit Units. CRN: 30272   Summer 2021
Ricardo Jiménez, Professor. Email: ricardo.jimenez@imperial.edu

Course Description:
A continuation of ELTR220. The advanced study of applied digital electronic systems such as those found in computing, audiovisual, and other mechatronics equipment.

Class Hours:
M-T-W-Th: 5:30—9:10 PM, Room 3110.

Lecture & Laboratory Course Goals And Objectives:
Upon successful completion of this course, the student will be able to:
1. Understand the theory of decimal, binary, and hexadecimal codes, which is the essential factor in making digital circuits operate properly.
2. Analyze and reduce digital circuits using Boolean Algebra and Karnaugh Maps.
3. Explain the operation of combinatorial circuits in different configurations.
4. Apply K Maps in digital electronic circuits using logic gates
5. Compare and contrast the newer digital logic families
6. Compare PLDs systems based on GAL architectures
7. Apply microcontrollers for control applications
8. Write Code for Microcontrollers for real-world applications
9. Analyze new devices and systems proposed by authors in journals and trade magazines and appraise the value of these advances for redesign of systems.

Detail Course Schedule by weeks:
1. Number systems and Codes
    Boolean Algebra, and Reduction Techniques (Maxterms, Minterms)
    Digital Logic Gates, and Logic Oscillators,
2. Decoders, Displays, Encoders, Magnitude Comparators,
    Multiplexers and Demultiplexers (CD4051)
    Flip-Flops for Sequential and Binary Counter Circuits
3. Decade/BCD Counters and Frequency Division, Memories,
    Introduction to Microcontrollers and Assembler Language
    Instruction set and basic applications
4. Design of projects for real-world digital applications
    Design of methods for advanced applications
5. Methods for timing measurements
    Methods and code to solve real-world applications
6. Assembling and testing Final Projects
    Final Examination and Projects presentations

Discussion Of Assignments And Instructional Methods:
Discussion of assignments and instructional methods will be a combination of all methods of instruction, which can be classified as telling, lecturing, or discussing; showing or demonstrating.

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Statement Of Grading Procedures:
1. Homework, Assignments:	10%
2. Lab. Experiments and Reports:	50%
3. Mid-Term Exam:	20%
4. Final Exam:	20%

Attendance Policy:
A student may be excluded (drop) from further attendance in a class during the semester when absences after the close of registration have exceeded the number of class hours, which the class meets per regular semester week (5 hours 30 minutes = two classes).
A student who is tardy two times may be considered as having been absent one class.
More than Two absences (5 hours 30 minutes) after the close of registration: Drop

Textbooks :
The PIC Microcontroller Engineer's Notebook, Vol II, 1st Edition, © 2018 by Ricardo Jimenez. ISBN: 978- 1-7325906-0-1. *[available at amazon.com]*
The PIC Microcontroller Notebook, 15 Instrumentation Practices for the PIC12F752, Vol 3. 1st Ed. ©2019 by Ricardo Jimenez. ISBN: 978-1-7325906-1-8. [available at Amazon.com]
Digital Electronics Principles and Applications, Third Edition. Tokheim. Mc Graw Hill. ISBN: 0-07-830981-6.
Please join this group for details about textbooks and other materials:
https://www.facebook.com/groups/ivc.eletr240

Required Materials:
Scientific Calculator or similar Cell phone App. Gikfun PC boards to assemble projects.
All other materials with the exception of textbooks and calculator will be supplied.
Accommodations For Disabilities:
Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP & S) office as soon as possible.
Policy On Plagiarism And Cheating:
If cheating or plagiarism is discovered, a student may be dropped from the course with a grade of "F".
All lectures and photos from the board will be uploaded to the Canvas group to keep a record of the lectures and Lab experiments.