

Course Syllabus: CET 2113C - [Digital Systems II CET-2113C-20806](#)

(3 Credit hours)

Professor's Information:

Instructor: Prof. Arif Rafay
Office: West Campus, Bldg. 11 – Room 253
Phones: 407.443.1023 (cell)
Email: arafay@valenciacollege.edu
Office Hours: After class (if you prefer) and by email

Textbook(s): *Digital Systems Principles & Applications* by Tocci,
11th Edition, ISBN: 0-13-510382-7

Lab Manual(s): *Digital Systems Laboratory Manual* by Dr. Nasser Hedayat

Prerequisites: CET 2112C

Class Time and Location: Thursday, 5:30 – 9:00 PM, Bldg. 11 – Room 246

Office Hours

Monday: 12:00 noon to 1:00 pm

Tuesday: 1:00 pm to 5:00 pm

Wednesday: 11:00 am to 1:00 pm

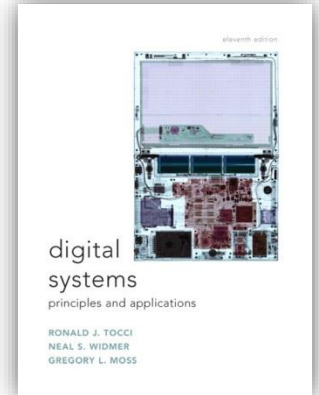
Thursday: 11:00 am to 1:00 pm

Friday: 8:00 am to 12:00 noon

Catalog Course Description: Intermediate lecture/laboratory course in computer technology. Introduces various digital subsystems (logic assemblies) and their use in digital computing and control systems and provides analytical tools necessary to perform analyses and problem diagnoses. Topics include counter/shift register systems and applications; digital subsystems using integrated circuit logic chips encoding/decoding techniques; data interfacing and busing; multiplex/demultiplex systems; analog/digital conversion techniques; static/dynamic memory systems; and computer system organization. Laboratory projects and demonstrations provide practical insight into capabilities and limitations of alternative methods of data transfer, storage and interface conversion commonly utilized in digital computing or control system applications. (Special Fee: \$62.00)

Course Learning Outcomes: Students will be able to learn:

- the basic concepts on digital counters and registers
- integrated Circuit Logic Families
- about MSI logic circuits
- about interfacing with Analog World
- about Memory Devices
- about Programmable Logic Devices



Student and Performance Assessment:

Laboratory Experiments ¹	300	Grade Scales
Homework	100	A 90 – 100 %
Two Exams	400	B 80 – < 90 %
Final Exam ²	200	C 70 – < 80 %
.....		D 60 – < 70 %
.....		F < 60 %

¹ No Late work will be accepted.

² Final Exam will be comprehensive

DISCLAIMER: Changes in this syllabus may be made at anytime at the instructor’s discretion.

Important Dates:

Monday, January 16	MLK Birthday – College is closed.
Wed, Jan 20 – Fri Jan 29	No Show Reporting Period
Mon. – Sun., Mar. 13 – 17	Spring Break
Friday, March 31, 2017	<u>Withdrawal deadline for “W” Grade</u>
Mon. – Sun., Apr. 24 –Apr 28	Final Exams Week
Tuesday, May 2	Final Grades Viewable in ATLAS

Tentative Course Outline for CET 2113C – CRN 23806; Spring 2017				
Date Thursday	Chapter	Lecture Material	Laboratory Experiment	Assignment due
01/12	7 Sections 7.1–7.4	Asynchronous Counters; Propagation Delay; Synchronous counters; Changing MOD # of counters; Discussion of 7493 IC (MOD-16 asynchronous counter)	None	None
01/19	7 Sec. 7.6	Discussion of 7490 (BCD counter); Cascading of 7490 ICs; Presettable Counters; Discussion of 74192/74193 ICs (Presettable BCD/MOD16 Counters)	Exp. 12	Pre-lab – Exp. 12
01/26	7 Sec. 7.10	Designing synchronous counters that can count in a specific order	Exp. 13	Pre-lab – Exp. 13 Exp. 12 Lab Report
02/02	7 Sections 7.15–7.20 & 9 (Sec. 9.1)	Integrated Circuit Registers; Shift Register Counters; Decoders; Discussion of 74LS138 IC (3 line-to-8 line decoder)	Exp. 14	Pre-lab – Exp. 14 Exp. 13 Lab Report
02/09 11	Exam I (Chapter 7)		No Lab	Pre-lab – Exp. 15 Exp. 14 Lab Report
02/16	9 Sections 9.4 & 9.6	Encoders; Discussion of Priority Encoder IC (74147); Multiplexers; Discussion of 74151 IC (8 Input Mux); Cascading of Multiplexers	Exp. 15	Pre-lab – Exp. 15
02/23	9 Sections 9.7–9.8	Multiplexer Applications; Demultiplexers; 74138 IC as a Demux	Exp. 16	Pre-lab – Exp. 16 Exp. 15 Lab Report

03/02	9 Sections 9.10, 9.12–9.14	Magnitude Comparator; Data Busing (Brief Discussion)	Exp. 17	Pre-lab – Exp. 17 Exp. 16 Lab Report
03/09	Exam II (Chapter 9) Discussion of One-shot Circuits (5-22)			
03/16	Spring Break			
03/23	11 Sections 11-1, 11-2, 11-6, 11-9	Digital vs. Analog; Digital-to-Analog Conversion; DAC Applications; ADC (Digital Ramp)	Exp. 18	Pre-lab – Exp. 18 Exp. 17 Lab Report
03/30	11 Sec. 11-11	ADC (Successive-Approximation); Discussion of ADC0804 IC	Exp. 11	Pre-lab – Exp. 11 Exp. 18 Lab Report
04/06	12 Sections 12-2 – 12-4, 12-7, 12-8, 12-12, 12-13	Memory Terminology, General Memory Operation; CPU-Memory Connection; Brief Discussion of ROMs and RAMs	Exp. 20	Pre-lab – Exp. 20 Exp. 11 Lab Report
04/13	8 Selected topics from various Sections	Digital IC terminologies; Fan out of ICs; Propagation Delay of Signals	Exp. 19	Pre-lab – Exp. 19 Exp. 20 Lab Report
04/20		Review		
04/27	FINAL EXAM (Comprehensive)			

Lab (Assignments) Requirements

- A written lab report will accompany every exercise done in this course. All Labs will be due the week following the start of the lab unless decided otherwise by the Professor. It is the student's responsibility that all labs are handed in by the due date.
- Every report should be typed. **NO** hand written reports (including hand-drawn tables within the body of the report or scanned materials) will be accepted.
- All labs must be done **during assigned lab** time. Labs will only be accepted if performed during the assigned class time *unless prior approval by the instructor is granted.*
- **Pre-Lab (MultiSIM)** reports must be prepared and presented before the same day as the lab is being performed. Remember that grades are assigned for this pre-lab report.
- **Lab Approval** – All lab exercises must be approved and signed by the instructor or lab personnel. Labs without signatures will not be accepted.
- *Must be ready to perform the required laboratory exercises upon arrival to the lab.*

Lab Report Writing Tips

All Lab Reports must include the following format and sections:

COVER PAGE: Includes Title of the Laboratory, your name, Course Title & Number, Submitted to: Instructor Name, Department Label, and Date of Submission – all in the same order.

INTRODUCTION: What are your goals or objectives in this lab? Explain what you are attempting to learn. In your lab manual or your lecture notes, look up the theory behind what experiment you are performing and discuss away.

PARTS LIST: All parts and equipment used should be listed in this section.

DISCUSSION: *An in-depth description of the background and theoretical information researched relevant to the experiment. When applicable, governing laws and/or equations should be included.*

1. In your own words discuss the important topics related to the experiment. Use the textbook, MultiSIM and other resources to assist you with the necessary information required for this section of the report.
2. Include **sketches, diagrams, drawings and pictures taken** of the experimental Set-Up and how you intend to fulfill your purpose.

VALIDATION OF DATA AND RESULTS:

Measured data and calculations; presentation of data through tables and graphs; sketch of experimental configuration; and discussion of experimental results, sources of error(s), and accuracy of measurements.

Refer specifically to the data collected during your experiment. Discuss any trends that you observed in your data. Do these data trends support the theory behind this lab? Why or why not?

ANSWERS TO LAB QUESTIONS: Some lab exercises have questions at the end. They must be answered in this section of the Lab Report.

CONCLUSION: Briefly summarize the results of the experiment. Did the experiment yield the desired results? Give your interpretation of the results. What has been learned; recommendation for future work or improvements in the experiment.

Departmental Rules and Requirements

- ❑ **Absolutely no food or drinks** are allowed in the classrooms or laboratories.
- ❑ **All lab works are due during the scheduled time** (no exceptions).
- ❑ It is highly recommended to visit the **EET Open Lab (bldg. 9, Room 211)** for assistance and practice.
- ❑ **Exams:**
 - Are given at the **beginning of the class**.
 - Work **must be properly and adequately organized and shown to earn credit**.
 - No make-up exams are permitted unless **prior arrangement** with instructor has been made and **approved**.
- ❑ There are no **dropped** exam scores.

- ❑ Final exam is required. Failing to take the final exam will result in grade F.
- ❑ You are expected to be in class **on time**. You are responsible for any information and/or assignments given during class, whether you are present or not.
- ❑ **More than two (2) unexcused absences could result in withdrawal from the course or grade F.**
- ❑ It is your responsibility to withdraw from the course. Failure to do so may result in grade F.
- ❑ **You are encouraged to ask relevant questions during class.**
- ❑ If you wish to discuss your grades please visit my office. *Valencia prohibits disclosure of grades over the phone or e-mail except through your Atlas account.*
- ❑ No audio or video recording allowed in class unless prior permission is granted from professor and every other student in the class.
- ❑ **Cheating:** Using any human, written, electronic, or other resource in any manner not explicitly authorized by the instructor will result in a grade of zero on the exam(s) or assignment(s) involved. Any student caught cheating; the instructor has the right to withdraw the student from the class and recommend expulsion from the program.
- ❑ **Disruptive Behavior:** Any student engaging in disruptive behavior will be advised on the first offense and will be **dropped** from the course on the second offense.

Students are strongly encouraged to read the Valencia policy Manual *Student Code of Conduct* and *Computer Acceptable Usage* and *Student Core Competencies* found at the following links:

<http://valenciacollege.edu/generalcounsel/policy/ValenciaCollegePolicy.cfm?policyID=180>,

<http://valenciacollege.edu/competencies>

Students with disabilities who qualify for academic accommodations must provide a letter from the Office for Students with Disabilities (OSD) and discuss specific needs with the professor, preferably during the first two weeks of class. The Office for Students with Disabilities determines accommodations based on appropriate documentation of disabilities (West Campus SSB 102, ext. 1523).

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