Course Title: Engineering 240 – Digital Systems Fridays: 19:05 – 22:10 K103

Instructor: Dr. Clifton Phillips e-mail address:
Phone: (619) 656-9480 clifton.phillips@cox.net

Text: C. H. Roth, Fundamentals of Logic Design, 5th ed., Thompson Learning, 2004.

Web Site: http://members.cox.net/techlink

Description of course: This course involves modeling, analysis, and design of digital systems, primarily at the Logic Design Level. It also includes combinational and sequential networks. Transfer Credit: CSU and/or private colleges and universities. Transfer Credit: UC.

Lecture: 3 Hours/week

Advisory: Completion of Math 096 with grade of C or better.
Limitation on Enrollment: The course is not open to students with previous credit for PHYN 265: Digital Systems.

Course Objectives: Students will apply switching theory to the solution of logic design problems. They will apply the basic theory of switching networks, use Boolean Algebra to analyze and synthesize switching networks, design logic gate networks with specified relationships between inputs and outputs, and use simplification schemes to minimize part count and cost while providing optimum performance. Students will also design and analyze sequential circuits using flip-flops and logic gate networks.

Attendance Requirements: It is the **student's responsibility** to add, drop, or withdraw from classes before the deadlines stated in the class schedule. Petitions to add, drop, or withdraw after the deadline will not be approved without proof of circumstances beyond the student's control which made him/her unable to meet the deadline. Lack of money to pay fees is not considered an extenuating circumstance. Students anticipating difficulty in paying fees before the add deadline should check with the Financial Aid Office about sources of funds or other alternatives for which they may be eligible. If you decide to withdraw from this course, you are reminded to do so before the drop deadline (see San Diego Mesa College Schedule). If you fail to withdraw by the required date and you stop coming to class, a final grade will be assigned to you.

Instructors Attendance Policy: Attendance is critical t teaching and learning. You will fall behind in acquiring course content and skills if you do not attend class regularly. Realizing that situations may develop which are beyond your control and which may interfere with your attendance, a maximum of 4 absences has been established. This is in compliance with Mesa College policy on attendance. Refer to college catalog. If you miss class, make arrangements with a classmate to keep you informed on lecture topics, handouts and assignments. This information is integral part of the instruction and may not be found in the reference texts.

Classroom Behavior and Student code of Conduct: Students are expected to respect and obey standards of student conduct while in class and on the campus. The student Code of Conduct, disciplinary procedure, and student due process (Policy 3100, 3100.1 and 3100.2) can be found in the current college catalog in the section Academic Information and Regulations pages 39-51, and at the office of the Dean of Student Affairs (H-500). Charges of misconduct and disciplinary sanctions may be imposed upon students who violate these standards of conduct or provisions of college regulations. As your instructor, I have the following expectations of your behavior in class.

1. Promote a courteous learning atmosphere by exhibiting mutual respect and consideration of the feelings, ideas, and contributions of others.
2. Demonstrate respect for your work, as well as the work of others, by recognizing and acknowledging strengths and improvements.
3. Demonstrate respect for tools, equipment, and supplies in the classroom.
4. Practice consideration for others by creating a clean learning environment and promote a learning environment where debate and discussion provides clarity to subject matter.
5. Recognize everyone's opportunity to contribute information in a relevant and meaningful manner by not monopolizing discussions, interrupting, interjecting irrelevant, illogical or inappropriate questions of comments.
6. Don't bring food into class.
7. Keep cell phones and pagers in silent mode.
8. This course will be conducted in accordance with the college student code of conduct and basic standards of academic honesty. Cheating, plagiarism or other forms of academic dishonesty are not acceptable and will not be tolerated. Violations of standards of academic honesty will be reported to the school dean for appropriate action.

Accommodation of Disability: Students with disabilities who may need academic accommodations should notify their professor immediately.

Evaluation and Grading: There will be five exams, including the final, given in this course. There will also be the opportunity to develop software/hardware projects. The final grade will be established on the basis of a total of 500 points, with each exam being worth 100 points. Students may substitute their special project grade for any of the exams up to a maximum of two. The first special project may be combinational logic. A second special project must be sequential.

Grades will be established on the basis of the following scale:

	>	439 points -- A
390	-	439 points -- B
340	-	389 points -- C
300	-	339 points -- D
	<	300 points -- F

Note: This scale may vary based on overall class performance.

Make up Exams: Note the course schedule and plan your availability. There will be no make up exams. Serious events or medical emergencies, or military activity causing missing an exam will have to be answered with a special project up to the limitation stated above. No project will accepted without prior coordination with the instructor.

Projects: Up to two exams may be made up by projects. This does not include the final exam. The first project can be a combinational class digital network. The second project must be a sequential class digital network. If you choose to do a project you must provide your own digital systems kit. Last years digital systems student body paid approximately ~$50.00 for a project kit. I need to OK your project before you start. I will compare your design to the performance. Students are on their own for purchasing parts for the special projects.

Identification: Positive photo identification is required when the first exam is issued. California driver's license, State of California ID card, military ID, SDSU or UCSD photo ID, or San Diego Mesa College photo ID and passports are acceptable proof of who you are. You will not receive a grade without authenticating who you are.

Statement of Retention: Students, please discuss your plans to withdraw from class with your instructors. They may have other options for you that may allow you to continue in class.

Digital Systems Schedule

Friday Date	Friday Lecture
1/30	Introduction, Number Systems
2/6	Number Systems and Conversion
2/13	Holiday
2/20	Boolean Algebra
2/27	Boolean Algebra / Applications
3/6	Applications continued , Exam 1 (19:30-21:05) ID's
3/13	Karnaugh Maps
3/20	Quine-McCluskey Method, Multi Level Gates
3/27	Multi Level Gates (cont), Exam 2 (19:30-21:05)
4/3	MUX, Decoders, PLCs, FPGA
4/10	Spring Break
4/17	Latches and Flop-Flops, Exam 3 (19:30-21:05)
4/24	Sequential Circuit Design, Applications / Presentations
5/1	Sequential Circuit Design , Applications / Presentations
5/8	Applications / Presentations, Exam 4 (19:30-21:05)
5/15	Review and future look-ahead / Presentations
5/22	Final Exam (18:00-21:05)

1. Office hours will be held each day after class and/or by appointment.
2. A REA problem solver or Schaum's outline is recommended for classical solved problems.

"When I got back to Boston, I went to the library and discovered a book by Motoo Kimura on the subject. Much to my disappointment, all our discoveries were covered in the first few pages. When I called Richard and told him what I had found, he was elated. "Hey, we got it right!", he said. "Not bad for amateurs". In retrospect I realize that in almost everything we worked on together, we were both amateurs. In digital physics, neural networks, even parallel computing, we never knew what we were doing. But the things that we studied were so new that none of the others working in these fields knew what they were doing either. It was amateurs who made the progress."[1]

1. W. Daniel Hills, "Richard Feynman and the Connection Machine," Physics Today, February 1989, pp83.