# CS 4341/TE 4341 COURSE SYLLABUS

# **COURSE INFORMATION:**

Course Number:	CS 4341/TE 4341, Section 501	
	(Tues./Thurs. 7:00pm – 8:15pm in ECSN 2.112), Fall 2015	
Course Title:	Digital Logic and Computer Design	
Credit Hours:	3	

#### **CONTACT INFORMATION:**

Name:	Laurie Thompson
Office Location:	SPN 2.220 – D2
<b>Telephone Number:</b>	TBD
Office Hours:	Tuesdays & Thursdays 1:30pm. – 3:00pm. Location: SPN 2.220 – D2
	Wednesdays 6:00pm – 7:00pm. Location: ECSS 4.403
Email Address:	Laurie.Thompson@utdallas.edu or select Laurie Thompson from the UT Dallas Email in
eLearning. Emails must have a Subject that begins with "CS4341-Sect501:"	
	TE4341-Sect501".

Information on how to contact course TAs/graders will be provided when the individuals performing these functions are assigned to the course.

## **COURSE PRE-REQUISITES AND CO-REQUISITES:**

 Pre-requisites:
 CE 2310 or EE 2310 or CS 3340 or SE 3340 or TE 3340

 PHYS 2326
 CS 4141/TE 4141

A sequence of labs will be assigned and graded for CS 4141/TE 4141, these are separate from the assignments made in CS 4341/TE 4341. Students earn separate grades for CS 4341/TE 4341 and CS 4141/TE 4141.

The start of lab sessions will not be until several weeks into the semester and will be announced in this course and in the eLearning section of this course.

## **DESCRIPTION:**

CS 4341 - Digital Logic and Computer Design (3 semester credit hours) Boolean algebra and logic circuits; synchronous sequential circuits; gate level design of ALSU, registers, and memory unit; register transfer operations; design of data path and control unit for a small computer; Input-Output interface. Credit cannot be received for both courses, (CS 4341 or TE 4341) and (CE 3320 or EE 3320). Prerequisites: (CE 2310 or EE 2310) or (CS 3340 or SE 3340 or TE 3340) and PHYS 2326. Corequisite: (CS 4141 or TE 4141). (Same as TE 4341) (3-0) S

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# STUDENT LEARNING OBJECTIVES/OUTCOMES:

- Ability to perform conversions among decimal, binary, octal and hexadecimal number systems
- Ability to analyze, minimize, and design gate-level combinational logic circuits using Boolean algebra and 3 and 4 variable Karnaugh Maps
- Ability to analyze, design, and utilize combinational components such as adders, multiplexers, and decoders
- Ability to analyze and design simple synchronous sequential circuits
- Ability to design registers and counters
- Ability to understand gate-level RAM and ROM chips, utilize ROM chips in combinational design, and interconnect memory circuits to construct larger memories
- Ability to design an Arithmetic-Logic-Unit and a data path, given specific register transfer requirements and using gates and components
- Understand the use of a variety of address modes
- Understand single-cycle, multi-cycle and pipelined MIPS processor designs
- Understand the use of I/O interfaces, Memory Mapped I/O, program-controlled transfer, interruptinitiated transfer, and priority interrupt mechanism

# **REQUIRED TEXTBOOK:**

Digital Design and Computer Architecture, Second Edition, by David Harris, Morgan Kaufmann. ISBN: 978-0-12-394424-5.

# **REQUIRED READING (Provided on eLearning):**

Exploring Digital Logic with Logism, First Edition, by George Self.

## **SUGGESTED READING:**

Logic and Computer Design Fundamentals, Fourth Edition, by M. Morris Mano and Charles Kime, Prentice Hall, 2007. ISBN: 978-0-13-198926-9.

# **OTHER MATERIALS:**

Other materials including the syllabus, assignments, slides, the publication describing Logism, etc. will be posted on eLearning.

## https://elearning.utdallas.edu

We will be using a software application called Logisim as an aid to learning about digital logic circuits. Logism is available for download free at:

# **TENTATIVE COURSE CALENDAR:**

Date	Class Material	Reading Assignment
August 25	Review of syllabus & eLearning Access	Chapter 1 Sections 1.1-1.6
August 27	Chapter 1: Introduction; Logic Levels	
September 1	Chapter 1: Introduction; Logic Levels	
September 3	Chapter 1: Introduction; Logic Levels	Chapter 2
September 8	Chapter 2 Combinational Logic Design	Exploring Digital Logic with Logism
September 10	Chapter 2 Combinational Logic Design	
September 15	Chapter 2 Combinational Logic Design	
September 17	Chapter 2 Combinational Logic Design	Chapter 3
September 22	Chapter 3 Sequential Logic Design	
September 24	Chapter 3 Sequential Logic Design	
September 29	Exam #1	
October 1	Chapter 3 Sequential Logic Design	
October 6	Chapter 3 Sequential Logic Design	
October 8	Chapter 3 Sequential Logic Design	Chapter 5
October 13	Chapter 5 Digital Building Blocks	
October 15	Chapter 5 Digital Building Blocks	
October 20	Chapter 5 Digital Building Blocks	Chapter 6
October 22	Chapter 6 Architecture	
October 27	Chapter 6 Architecture	
October 29	Chapter 6 Architecture	
November 3	Exam #2	
November 5	Chapter 7 Microarchitecture	Chapter 7
November 10	Chapter 7 Microarchitecture	
November 12	Chapter 7 Microarchitecture	Material provided by the instructor
November 17	Memory Systems	
November 19	Memory Systems	
November 24	Fall Break – No Class	
November 26	Thanksgiving Holiday – No Class	
December 1	Memory Systems	Chapter 8
December 3	Chapter 8 Input and Output (I/O) Systems	
December 8	Chapter 8 Input and Output (I/O) Systems	
December 17,	Final Exam	
8:00pm		

The instructor reserves the right to modify this calendar as she deems necessary. Please see eLearning for discussions/announcements regarding changes to the calendar.

# **SUGGESTED PRACTICE:**

Read your assigned reading before the lecture.

## **GRADING POLICY:**

Your course average will be calculated as follows:

Assignments – 15%

The instructor will drop your lowest assignment grade.

Quizzes - 5%

Both announced and unannounced/pop quizzes may also be given in lecture.

Exam #1 – 25%: September 29, 2015

Exam #2 – 25%: November 3, 2015

Final Exam – 30%: December 17, 2015 at 8:00pm

The instructor intends to assign letter grades as shown below. An average with a fractional portion of five tenths or above will be rounded up to the next whole number for determining the letter grade.

Averages	Letter grade
97+	A+
93-96	А
90-92	A-
87- 89	$\mathbf{B}+$
83-86	В
80-82	B-
77-79	C+
73-76	С
70-72	C-
67-69	D+
63-66	D
60-62	D-
Below 60	F

# The instructor reserves the right to lower the average required to receive a particular letter grade.

# UT DALLAS POLICIES AND PROCEDURES:

For information on University Policies on Student Conduct and Discipline, Academic Integrity, Copyrights, Email Use, Class Attendance, Withdrawal from Class, Student Grievance Procedures, Incomplete Grade Policy, AccessAbility Services, Religious Holy Days, and information about technical support and other student assistance resources please go to <a href="http://go.utdallas.edu/syllabus-policies">http://go.utdallas.edu/syllabus-policies</a>.

# **COURSE & INSTRUCTOR POLICIES:**

## Academic Integrity:

All assignments, quizzes, and exams for this course are to be individual efforts. You are not to collaborate with other students. Prior to the assignment due date you are not to: discuss assignment solutions with other students. Copying of assignments, quizzes, or exams, in whole or in part, from other students will be considered an act of scholastic dishonesty. Copying of assignments from the Internet will be considered an act of scholastic dishonesty.

You are not to view, copy, or distribute assignments or assignment solutions from previous semester or from the Internet.

## **Course Assignments:**

All assignments will be announced using eLearning. You will be given at least one week to complete each assignment. Late assignments will not be accepted.

## Attendance:

The instructor expects you to attend the lectures for this course. There is a strong, direct correlation between class attendance and class performance. Students who regularly attend class and pay attention to the lecture tend to make significantly higher grades than those who do not.

## **Student Responsibilities:**

You are responsible for all material discussed in lecture whether you are present for lecture or not.

Students are expected to be respectful to each other and to the course instructor. Disruptive behavior in the classroom will not be tolerated.

- Please make every effort to be on time to lecture. Do not begin packing up to leave before lecture has ended.
- Electronic devices including cell phones, PDAs, and music players may not be used in the classroom. You will be required to leave lecture if you break this rule.
- If your laptop becomes a distraction to you, your classmates, or the instructor you will lose the privilege of having a laptop in lecture. Laptops should only be used in lecture for taking notes or viewing lecture slides. You may not use your laptop to work on assignments for this or any other course during lecture.
- You may be required to sit in assigned seats for lectures.
- Raise your hand if you have a question or a comment to make about the material presented. The instructor may or may not entertain your question.

You are responsible for all material supplied on eLearning (including discussion postings) whether you choose to read them or not.

## Grading Concerns:

If you think there is a mistake in the grading of your assignment, quiz, or exam and would like to request that it be regraded, you must notify both the TA and the instructor of this in writing within two weeks after the date the grade is posted in the grade book on eLearning.

Your request for regrade may be sent using email. Your request must describe in detail what you perceive as the problem with the grading.

It is possible that your assignment, quiz, or exam grade may decrease when it is regraded.

## **Quiz and Exam Policies:**

All exams are closed book and closed notes.

You must bring a photo ID to each examination.

You may be required to sit in assigned seats for quizzes and examinations.

PDAs, computers, cell phones, other electronic devices, and backpacks will not be allowed at the desks during examinations. These and other personal belongings will be left at the front of the classroom or other designated location.

Make-up quizzes and examinations will be administered **only for well-documented emergencies**. A student must make every attempt possible, via telephone and email, to notify the instructor that he/she will miss a scheduled quiz or exam **prior** to the scheduled date and time or **immediately** thereafter. **If notification is not received in a timely manner, no makeup will be given.** See the information below for the instructor's policy regarding religious holy days.

Make-ups will not be given for missed pop quizzes.

## **Religious Holy Days:**

You must notify this instructor in writing of any religious holy days that will prevent you from attending class as scheduled by census day (**September 9, 2015**). If the holy day coincides with a scheduled quiz or examination, you must request a makeup quiz or examination in writing, this exam will be scheduled before the original quiz or exam date. If the holy day coincides with an unannounced quiz, you will be given an opportunity to make up the quiz provided that you have previously notified the instructor as required above. Students will be informed on eLearning of the due date of all assignments at least one week in advance. If a religious holy day will prevent you from submitting an assignment on the due date, you must submit the assignment early via eLearning.

## Other:

Extra credit work will not be given to individual students.