Digital Design
EEL 4712C

Class Periods: MWF, Period 2 (8:30am to 9:20am)
Location: Zoom
Academic Term: Spring 2021

Instructor:
Gregory Stitt
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352-392-5348
Office Hours: MT (Period 3), Benton 315

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
Please contact through the Canvas website
- Edward Finch (finchw4@ufl.edu, Sections: TBD, Office Hours: TBD, NEB211)
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Course Description
Advanced modular logic, design languages, finite state machines and binary logic.

Course Pre-Requisites / Co-Requisites
EEL3701

Course Objectives
Students will gain fundamental knowledge and understanding of principles and practice in digital design through class lectures, reading assignments, and lab experiments using VHDL and field-programmable gate arrays.

Materials and Supply Fees
- An FPGA-based laboratory board (will be provided to you)
- Digilent Analog Discovery (must be purchased):
http://www.digilentinc.com/Products/Detail.cfm?Prod=ANALOG-DISCOVERY

Professional Component (ABET):
This course consists of 4 credits of Engineering Design;

Relation to Program Outcomes (ABET):
The table below is an example. Please consult with your department's ABET coordinator when filling this out.

Outcome	Coverage*
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	High

2.	An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	High
3.	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	Medium
4.	An ability to communicate effectively with a range of audiences	Low
5.	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	
6.	An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	
7.	An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	

Required Textbooks and Software
- Instructor-provided references, linked from class website

Recommended Materials
- Fundamentals of Digital Logic with VHDL Design
- Brown, S. D. and Vranesic, Z. G
- Second or third edition

Course Schedule

Week 1:   VHDL Intro, Combinational Logic
Week 2:   Arithmetic operations, Lab 1
Week 3:   Synthesis Coding Guidelines, Testbenches
Week 4:   Carry-lookahead Adders, For-generate, Lab 3, Misc VHDL
Week 5:   Sequential Logic, Finite State Machines
Week 6:   Finite State Machines w/ Datapaths, Midterm 1
Week 7:   Finite State Machines w/ Datapaths, Cont., VGA
Week 8:   2-process FSMD, Interfacing protocols, Misc VHDL
Week 9:   FPGA Architectures
Week 10-11:   MIPS architecture, Midterm 2
Week 12:   Metastability, Tri-state Buffers, Buses
Week 13:   Design-Space Exploration, Architecture Tradeoffs
Week 14-15:   Digital Design Research

Attendance Policy, Class Expectations, and Make-Up Policy

State whether attendance is required and if so, how will it be monitored?   What are the penalties for absence, tardiness, cell phone policy, laptop policy, etc.   What are the arrangements for missed homework, missed quizzes, and missed exams? This statement is required: Excused absences must be consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation.

Evaluation of Grades

- Midterm1: 20% (Friday, Feb 19)
- Midterm2: 20% (Friday, March 19)
- Midterm3: 20% (Wed, April 21)
- Labs/Homework: 40%

Grading Policy

Percent	Grade	Grade Points
90 - 100	A	4.00
87- 89.9	A-	3.67
84 – 86.9	B+	3.33
80 – 83.9	B	3.00
77- 79.9	B-	2.67
74 – 76.9	C+	2.33
70 – 73.9	C	2.00
70.0 - 73.3	C-	1.67
67- 69.9	D+	1.33
64 – 66.9	D	1.00
60 – 73.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate Program Coordinator
• Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*: https://care.dso.ufl.edu

On-Line Students Complaints*: http://www.distance.ufl.edu/student-complaint-process.