ECE 3401 Digital Systems Design – Spring 2026

Tues/Thurs 12:30pm-1:45pm, in person at ITE 119

***Course Description**: Three Credits. Prerequisite: CSE 2300 or 2301.* Design and evaluation of control and data structures for digital systems. Hardware design languages are used to describe and design alternative register transfer level architectures and control units with a micro-programming emphasis. Consideration of computer architecture, memories, digital interfacing timing and synchronization, and microprocessor systems.

Tentative Schedule: Combinatorial and Sequential Logic Design Techniques; Hardware Description Language, VHDL; Design Modeling, Simulation, Synthesis, and Verification; State Machine (SM) Designs; Datapath Designs**;** Microprogramming; Design Examples, including RISC-V Processor**;** High Level Synthesis (HLS)**;** Programmable Logic Devices**;** Computer-aided Design**;** Verification, Testing, and Security of Digital Designs**;** Verilog HDL

Instructor: Professor Omer Khan
Office: ITE 447 Email: khan@uconn.edu
Office Hours: After class or by appointment via email
Course Website: https://cag-uconn.github.io/courses/ece3401_s26/

TAs: Hanan Khan and Afif Siddiqi
Office hours: Tuesdays 1:45pm-3pm in ITE 330; Thursdays 1:45pm-3pm in ITE 401A

Textbook (recommended supplement to lectures):
Digital Systems Design Using VHDL by Charles H. Roth, Jr. and Lizy Kurian John, 3rd Edition

Software Tools:
This course has a programming component using VHDL software. Assignments will include designing and simulating hardware design modules using open-source GHDL and GTKWave toolchain. Follow the toolchain setup guide at https://cag-uconn.github.io/courses/VHDL-Toolchain.pdf

Grading Policy*:		
	Programming and Homework Assignments	35%
	Midterm Exam #1	17.5% (tentative: late Feb)
	Midterm Exam #2	17.5% (tentative: early April)
	Final Exam	30%

* Late submission of assignments will *not* be accepted
* The final letter grade will be assigned using a grade curve
* Attendance is strongly encouraged for successfully completion of this course

The ECE Department takes the issue of academic integrity in education and research very seriously. Any instances of academic and scholarly misconduct (cheating, plagiarism, falsification/distortion of data, etc.), if substantiated, will have major consequences for the student. Please read the academic misconduct policy, and ensure that you maintain the highest ethical standards in all your work.

The Center for Students with Disabilities (CSD) at UConn provides accommodations and services for qualified students with disabilities. If you have a documented disability for which you wish to request academic accommodations and have not contacted the CSD, please do so as soon as possible. The CSD is located in Wilbur Cross, Room 204 and can be reached at (860) 486-2020 or at csd@uconn.edu. Detailed information regarding the accommodations process is also available on their website.