Course Description: Three Credits. Prerequisite: CSE 2300. 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 microprogramming emphasis. Consideration of computer architecture, memories, digital interfacing timing and synchronization, and microprocessor systems.

Instructor: Professor Omer Khan
Office: ITEB 447   Email: khan@uconn.edu
Office Hours: Tuesday 11am-Noon or by appointment via email
Course Website: http://www.engr.uconn.edu/~omer.khan/courses/ece3401_s19/index.html

TA: Akif Rahman
Email: akif.rehman@uconn.edu
Office Hours: Monday 4-6pm ITE 138, Thursday 4:30-6:30pm ITE 134, Friday 4-5pm ITE 138

Textbook (supplemental to lectures): Available through UConn Bookstore
Digital Systems Design Using VHDL by Charles H. Roth, Jr. and Lizy Kurian John, 3rd Edition

Software Tools:
This course has a lab and project component using VHDL and software tool-chains. Assignments will include designing and simulating hardware design modules using VHDL.

ECS learning center in rooms ITEB 134 and 138 have machines with the required software. The TA’s office hours reflect the lab and project help hours as well.

Grading Policy:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Lab and Project Assignments</td>
<td>25%</td>
</tr>
<tr>
<td>Midterm Exam #1</td>
<td>17.5%  (tentative: early Mar)</td>
</tr>
<tr>
<td>Midterm Exam #2</td>
<td>17.5%  (tentative: early Apr)</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
</tbody>
</table>

Rules:
Participation in lab and project assignments is required to get a passing grade for the course. Late assignments will not be accepted. We will check assignments for academic dishonesty. Turn off all electronics during classes, including laptops, tablets, phones etc.

Tentative Schedule:
- Logic Design Techniques and Hardware Description Language
- VHDL: Design Modeling, Simulation, Synthesis, and Verification
- State Machine (SM) Charts
- Microprogramming
- High Level Design Example of a Microcontroller
- Memory Design
- Programmable Logic Devices
- Timing Synchronous and Computer-aided Design
- Verification and Testing of Digital Designs