Course name	**ECE 42100 Advanced Digital System Design**
Credit and contact hours	(3 cr.) Class 3
Course coordinator's name	Lauren Christopher
Textbook	Ashenden, Peter, *Digital Design, an Embedded Systems Approach Using VHDL,* Elsevier, 2008, ISBN 978-0-12-369528-4.
Course information	ECE 42100 Advanced Digital System Design (3 cr.) P: ECE 27000 and ECE 26300. Class 3. Advanced topics in digital design. Boolean logic. Logic optimization, VLSI and ASIC design basics. Design. Simulation. Placement and routing. Logic synthesis. FPGA structure. FPGA implementation. FPGA design flow. Verilog and VHDL coding. **Prerequisites/ Co-Requisite** P: ECE 27000, ECE 26300 **Required, Elective, or Selected Elective:** EE Elective, Adv CE Elective
Goals for the course	Upon successful completion of the course, students should be able to 1. Understand complex digital design principles [1,6] 2. Write synthesizable Verilog/VHDL programs [1,2,6] 3. Understand FPGA structure and usage [1,6] 4. Understand ASIC and FPGA design flow [1,2,6] 5. Design, verify, test and present a complex digital system in FPGA hardware [1,2,3,5,6]
List of topics to be covered	1. Course Instructions, advanced topics in logic (2 classes) 2. Advanced topics in sequential logic (3 classes) 3. VLSI design basics (3 classes) 4. FPGA structure (4 classes) 5. Verilog/VHDL basics (4 classes) 6. Advanced Verilog/VHDL coding (4 classes) 7. Hardware/Software co-design and partitioning (2 classes) 8. FPGA design flow based on Verilog/VHDL (3 classes) 9. FPGA system implementation, verification and testing (3 classes) 10. Quizzes and Exams (2-4 classes)
Syllabi approved by	Lauren Christopher
Date of approval	04/09/2019