Course name	**ECE 55900 MOS VLSI Design**
Credit and contact hours	(3 cr.) Class 3
Course coordinator's name	Lauren Christopher
Textbook	*CMOS VLSI Design: A Circuits and Systems Perspective,* 4th Ed., Neil Weste and David Harris, Pearson, ISBN 9780321547743
Course information	ECE 55900 MOS VLSI Design (3 cr.) P: ECE 25500 and ECE 27000 and senior standing or Graduate Standing. Class 3. Introduction to most aspects of large-scale MOS integrated circuit design, including device fabrication and modeling; useful circuit building blocks; system considerations; and algorithms to accomplish common tasks. Most circuits discussed are treated in detail, with particular attention given those whose regular and/or expandable structures are primary candidates for integration. All circuits are digital and are considered in the context of the silicon-gate MOS enhancement-depletion technology. Homework requires the use of existing IC mask layout software; term projects assigned. **Prerequisites/ Co-Requisite** P: ECE 25500 and ECE 27000 and senior standing or Graduate Standing **Required, Elective, or Selected Elective:** EE Elective, CE Elective
Goals for the course	Upon successful completion of the course, students should be able to 1. An ability to analyze MOS circuits. [1,6] 2. An ability to synthesize MOS circuits. [1,2,6] 3. Experience in oral presentation, teamwork, and document preparation for a finished design. [1,3,5] 4. An ability to create and simulate a hierarchical digital design using commercial grade CAD software. [1,2,6]
List of topics to be covered	1-2: Introduction: Historical & future trends; CMOS Process 3-4: MOS devices, SPICE models 5-7: Inverters 8-10: Designing combinational logic gates in CMOS 11-13: Designing sequential circuits 14-15: Interconnect and timing issues 16-17: Designing memory and array structures 18-20: Designing arithmetic building blocks 21-23: VLSI testing and verification 24-25: System design issues 26-27: Project Presentations Midterm exams take two lectures
Syllabi approved by	Lauren Christopher
Date of approval	04/09/2019