COURSE SYLLABUS

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YEAR COURSE OFFERED: 2019
SEMESTER COURSE OFFERED: Spring
DEPARTMENT: CENG
COURSE NUMBER: 3312
NAME OF COURSE: Digital Circuits
NAME OF INSTRUCTOR: Vernon Bryant
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The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

Pre-requisites
Calculus II and Physics II

Learning Objectives
Students will convert numbers from/to Decimal to/from Binary and other Radix systems.
Students will derive equivalent switching expressions by applying transformations allowed in Boolean Algebra.
Students will determine the sum of minterms and product of maxterms that are equivalent to a given expression.
Students will design and analyze combinational circuits comprised of logic gates, multiplexers and decoders with both single and multiple outputs.
Students will obtain a minimal sum of products of a given switching function by using K-maps.
Students will design a multi-level gate network using gates from a specified set, and/or using XOR gates, and/or using multiplexers.
Students will determine the state diagram and the minimized state table for a given sequential system.
Students will design and analyze sequential networks comprised of SR flip-flops, and/or T flip-flops, and/or JK flip-flops and/or D flip-flops and logic gates.

Major Assignments/Exams
(Short exams and homework (unannounced) 10%
Exam I 30%
Exam II 30%
Final (comprehensive) 30%
**Required Reading**


**Recommended Reading**

None

**List of discussion/lecture topics**

- Boolean algebra, minterms, maxterms DeMorgan’s theorem
- NAND, NOR, NOT , AND and OR gates
- Karnaugh Maps
- Quine- McClusky method
- VHDL
- Combinational circuit design using SSI and MSI/LSI
- Combinational circuit analysis
- Programmable Logic Devices
- Latches and Flip Flops
- Counter design and analysis
- Mealy and Moore finite state machines
- Synchronous sequential circuit design
- Synchronous sequential circuit analysis