**EECE 3015 Digital Electronics Laboratory**

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| **Class Schedule:** | Two credit course, meeting the equivalent of one 50 minute lecture and one 170 minute lab per week |

**Course Coordinator:** Susan C. Schneider

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| **Course Materials:** |
| **Required:** | EECE Cable Kit, EECE 3015 Kit, Tool Kit |

**Course Description:**

Gain experience in the design, assembly, testing, and trouble-shooting of digital electronic circuits. Experiments encompass a wide range of topics such as: basic logic gates, standard combinational circuits, sequential circuit design, standard sequential circuits, digital interfacing, and microprocessors. 7400 series ICs and microprocessor devices are used.

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| **Prerequisites:** | ELEN 2030 and EECE 2710, which may be taken concurrently; or ELEN 2020 and BIEN 3200, which may be taken concurrently. |

**Required** in Electrical Engineering and Computer Engineering programs and for the Bioelectronics major in the Biomedical Engineering program.

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| **Contribution to Professional Component:** | Engineering Science | 50% |
| Engineering Design | 50% |

**Course Goals:**

* Apply theory learned in EECE 2030) including combinational and sequential circuit design, decoders, multiplexers, and VHDL
* Write programs to use a microprocessor in control applications.

**Course Objectives:**

# By the end of this course, you should be able to…

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| 1) | Design, build, test, troubleshoot, and evaluate digital circuits |
| 2) | Computer software such as Multisim, Cypress PSoC Creator, Designer, and Programmer. |
| 3) | Evaluate and revise designs as actual performance is reviewed. |
| 4) | Prepare a written report that effectively communicates the objective, the design procedure, the experimental results, and the conclusion for any project design. |

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| **Contribution to Program Objectives:** | Partial fulfillment of Criterion 3 objectives A, B, C, E, G, I, and K |

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| **Laboratory**  | **Course Topics:** | **duration** |
| 1 | Introduction to Digital Lab | 2 weeks |
| 2 | Digital Gate Characteristics | 1 week |
| 3 | Introduction to Microcontrollers  | 1 week |
| 4 | Microcontroller General Purpose IO | 1 week |
| 5-7 | Microcontroller Digital and Analog Components (PWM, ADC, OA) | 1 week |
| 6 | Interrupts and the Reaction Timer Project | 1 week |
| 7 | Motor Drive and Control Project | 2 weeks |
| (8) | Microcontroller Design Project | 4 weeks |