

**SYST 101**  
**Introduction to Systems Engineering**  
**Fall 2016**

**Instructor:** Marty Rothwell

**Lecture: Tuesday & Thursday 4:30-5:45 Krug Hall 242**

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**Office Hours:** Before or after class, or by appointment

**Text:** None

**Description:** The intent of this course is to provide a basic understanding of systems engineering (SE) and the systems engineering process. Students will become familiar with common SE terms and procedures as well as terms and procedures of other engineering disciplines. Students will also learn to use CORE, a systems engineering software program.

Students will learn Arduino to use in a hands-on SE design process starting from a Conops paper to a completed system. Students will learn the SE process by building and programming an electronic device of their choice. This course is designed to give an overview of topics that will be covered in more detail in later SE classes.

**SYST101 2016 Fall Syllabus**

| Date |    | Day | Lesson                                      | Activity                    |
|------|----|-----|---|-----------------------------|
| 8/30 | T  | 1   | Introduction<br>Lec 1- What is an engineer? | Introduction                |
| 9/1  | TH | 2   | Common Engineering Terms                    | Mech Universe               |
| 9/6  | T  | 3   | Common Engineering Concepts                 | Equations for Work          |
| 9/8  | TH | 4   | Work in different systems                   | Quiz on Eng Concepts        |
| 9/13 | T  | 5   | Lec 2 – What is Systems Engineering?        | Create Context, Ext system. |
| 9/15 | TH | 6   | Lec 3 Define Needs & Requirements           | Download CORE               |
| 9/20 | T  | 7   | Lec 4 Using CORE                            |                             |
| 9/22 | TH | 8   | Lec 5 System Modeling                       |                             |
| 9/27 | T  | 9   | Lec 6 CORE functional modeling              | EFFBD's & Simulation        |
| 9/29 | TH | 10  | Lec 7 Putting it all together in CORE       |                             |

|       |    |       |   |  |
|-------|----|-------|---|--|
| 10/4  | T  | 11    | Decision Matrix Tables                      | Order Arduino kits   |
| 10/6  | TH | 12    | Final review for CORE Project               | Turn in CORE project   |
| 10/11 | T  | 13    | Columbus Day                                |  |
| 10/13 | TH | 14    | Review for Mid-term exam                    |  |
| 10/18 | T  |       | Mid-Term Exams                              |  |
| 10/20 | TH | 15    | Intro to Arduino Electronics Devices        | Get Arduino boards<br>Setup, loop, Hello World                             |
| 10/25 | T  | 16    | Programming Basics                          | blink, variables, functions,<br>breadboarding, LEDs, resistors             |
| 10/27 | TH | 17    | Intro to Electronic Circuits                | Voltage, Current, Resistance,<br>Ohm's Law, Power                          |
| 11/1  | T  | 18    | Intro to Electronic Circuits                | Sensors, Voltage dividers,<br>potentiometers, thermistor.                  |
| 11/3  | TH | 19    | Programming Basics                          | Control loops  |
| 11/8  | T  | 20    | Arduino Basics                              | Speaker, tone(), servo, arrays   |
| 11/10 | TH | 21    | Project Discussion Rubrics                  | Create Conops Paper  |
| 11/15 | T  | 22    | Project Management                          |  |
| 11/17 | TH | 23    | IR Programming                              | Create SRD   |
| 11/22 | T  | 24    | Senior Design talk                          |  |
| 11/24 | TH | Break | Thanksgiving                                |  |
| 11/29 | T  | 25    | Dr Laskey                                   | Download Conops and SRD into<br>CORE, create requirements &<br>components. |
| 12/1  | TH | 26    | Lec 8 - Verification<br>& Validation        | Write Technical paper using<br>CORE  |
| 12/6  | T  | 27    | Lec 12 Building Quality into<br>your system |  |
| 12/8  | TH | 28    | Presentations                               | Review for Final   |
| 12/13 |    |       | Final Exam                                  | 4:30-7:10 pm   |

### Grade Breakdown

- 20% Mechanics & Electronics
- 20% CORE & Arduino Exercises
- 20% Arduino Project
- 20% Mid-Term
- 20% Final Exam

100 – 95 = A+

94 – 90 = A

89 – 85 = B+

84 – 80 = B

79 – 75 = C+

74 – 70 = C

69 – 65 = D+

< 65 = F

#### Important Points:

- All Submissions will be submitted via Blackboard. No paper copies.
- During the course individuals will work in group exercises. When a group turns in a paper, the paper must have the full names of each person who participated in the exercise. I like the names as part of the paper, but I will also accept names in the notes section of the BB submission.
- If someone in your group was not present and did not participate in the exercise, then do not put their name on the paper. They will have to do the exercise on their own and turn in their own paper to receive their own grade.
- All submissions will have a deadline. The deadline will appear in BB. Any paper turned in late will have 10 points deducted from the total.
- Any submission should have a professional quality to it. It should look like a paper you would turn in if you were an employee with a company. Sentences must be grammatically correct and spelling must be correct.
- It is your responsibility to check Blackboard to verify your grades.