

Revised: 12/5/14

**FALL 2014**  
**SYEN 1210: INTRODUCTION TO SYSTEMS ENGINEERING**  
**COURSE SYLLABUS**

**Instructor:** Dr. Andrew Wright, Email: [abwright@ualr.edu](mailto:abwright@ualr.edu), Phone: (501) 569-8071  
Office: EIT 522, Office hours: see [calliope.ualr.edu](http://calliope.ualr.edu)

**Lecture Room:** EIT 224, **Robotics Lab:** EIT 223

**Class Time:** Section 01: W 11:00-11:50 (lecture), W 12:00-1:50 (lab)

**Teaching Assistants:** Taimoor Azfal

### **Course Description**

Prerequisite(s): MATH 1302 or 1315 or consent of the instructor. Introduction to engineering as a profession, engineering problem solving, engineering design process, engineering ethics, engineering communication, history of engineering developments, and case studies involving leading inventions in the engineering field from a variety of disciplines. Students work in teams to build small engineering projects. Course includes industry visits and invited talks by industry specialists. One hour lecture. Two hours lab. Two credit hours.

### **Readings**

W. C. Oakes, L. L. Leone, C. J. Gunn, **Engineering Your Future: A Comprehensive Introduction to Engineering**, Oxford University Press, 2012, ISBN: (required).

ISBN-10: 0199797560, ISBN-13: 978-0199797561

A variety of short stories and programs to be listed on [calliope.ualr.edu](http://calliope.ualr.edu).

### **Course Objectives**

1. Introduce students to on campus resources to enhance success and introduce students to the University's processes and expectations.
2. Introduce students to the engineering profession and creative engineering problem-solving through class activities, design projects, and presentations.
3. Familiarize students with the various engineering disciplines and their interrelationships.
4. Provide historical perspective on engineering design processes, successes, challenges, failures, and their influence on contemporary society.
5. Inspire and instill an appreciation for the engineering profession, its ethics, and practices.
6. Learn and apply engineering design process in proposing and building working devices or models that meet preset constraints and specifications.
7. Introduce students to communication, teaming, and project management skills necessary to excel in today's engineering workplace.

**Sickness or Emergency** is a legitimate excuse to make up a graded assignment (attendance or exam). However, to guarantee that no late penalties are applied, the student should notify the instructor in advance or provide an independent written excuse (e.g., a doctor's note) after the fact.

### **Late Assignments**

All homework assignments are due one week after the date they are assigned at the end of the class period for that week. Late homework will not be accepted. **No make-up quizzes will be given.**

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## Course Evaluation

Final grades will be computed using the following weights:

**59% In-class quizzes** and Homework assignments

**40%** Future Challenge Performance and Robotics Design Reports

**1%** Final report (learning experience)

**Grades:**  $A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F$

**In-class quizzes and homework:** Class examinations are CLOSED BOOKS and CLOSED NOTES. Students are responsible for ALL topics covered in class, assigned reading, and homework assignments. Quizzes will be given roughly bi-weekly throughout the semester. Homework assignments will be given throughout the semester.

The homework average is computed by  $H = 100 * (\frac{1}{N_h}) (\sum_{i=1}^{N_h} h(i))$ , where  $N_h$  is the number of homework assignments and  $h(i)$  is the sequence of homework grades (1 or 0).

The homework average will count the same as a quiz. The best 5 scores ( $Q_i$ ) will be averaged to determine the In-class quiz and homework grade,  $.59 * \sum_{i=1}^5 Q_i$ .

**Future Challenge Performance:** Each student will prepare an individual treatment from investigating some idea of future significance. The instructor will choose the best few for further development, and groups will be formed to expand the idea. The group will prepare a script and perform a skit related to their topic.

**Robotics Design Reports:** A robotics competition will be held early in the semester and a second challenge later in the semester. Students will design robots out of Vex parts to perform the challenge in a competitive environment. At the end of each challenge, a report documenting the design and performance of the robot will be done. Each group will submit a report.

The best three scores from the skit, the script, the first design report, and the second design report will be averaged to determine the Future Challenge Performance and Robotics Design Reports according to  $.4 * \sum_{i=1}^3 R_i$ .

**Final Report (learning experience):** A report describing what you learned in the semester will be handed in at the end of the class. This report should be a self-assessment.

## Attendance

Regular attendance will be taken by sign in sheet. If a student misses more than 15% of classes his/her final grade will be reduced by one letter grade (i.e., from A to B or B to C). Students who do not attend more than 50% of the classes during the first eleven days of class may be administratively withdrawn from the course at the discretion of the instructor.

A student who misses more than 25% of classes will receive a final course grade of an F and may be administratively withdrawn at the discretion of the instructor.

Tardiness is disruptive, so please be respectful to your peers and instructor and get to class on time. If you are tardy, please come into the room quietly and sit in the nearest available seat to the door.

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### **Cell phones**

Please turn off your cell phone (i.e. Airplane mode) before class. If you forget and receive a call in class, please immediately disable your ringer/buzzer and terminate the call. Do NOT answer the call and have a conversation as this may be classified as "disruptive behavior" and may result in your being administratively dropped from the class.

**Disruptive Behavior** may result in your being administratively dropped from the class, especially if it is persistent.

### **Students with Disabilities:**

Per academic policy 501.2, the following statement must be included in all syllabi (see <http://ualr.edu/policy/index.php/5012/>)

"Students with Disabilities: Your success in this class is important to me, and it is the policy and practice of the University of Arkansas at Little Rock to create inclusive learning environments consistent with federal and state law. If you have a documented disability (or need to have a disability documented), and need an accommodation, please contact me privately as soon as possible, so that we can discuss with the Disability Resource Center (DRC) how to meet your specific needs and the requirements of the course. The DRC offers resources and coordinates reasonable accommodations for students with disabilities. Reasonable accommodations are established through an interactive process among you, your instructor(s) and the DRC. Thus, if you have a disability, please contact me and/or the DRC, at 501-569-3143 (V/TTY) or 501-683-7629 (VP). For more information, please visit the DRC website."

This statement has not been prepared by the instructor of this course, but is an academic policy, so please excuse the colloquial wording (use of first and second person).

### **Student Handbook**

The UALR Student Handbook is available at <http://ualr.edu/deanofstudents/assets/archive/HANDBOOK.pdf>. Most of your disciplinary questions will be answered by that document.

**Electronic delivery of assignments** will NOT be accepted in lieu of a hard-copy of the assignment. However, in extreme circumstances, the student may delivery his/her assignment electronically by the due date to avoid the late penalty. A hard copy must follow up in a reasonable time (for instance, the time it might take the post office to deliver a hard copy) and the hard copy must be identical in content to the electronic copy. The instructor will dispose of the electronic copy once the hard copy has been accepted.

**Modifications to Syllabus** may be made to improve delivery of the course content. The instructor will provide an updated syllabus at least one week prior to any changes taking effect and no modifications will be done within two weeks of the final exam.

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**Course Topic List**

	Dates	Topic	Reading	Lab Activity
Week 1.	Aug. 27	Introduction, syllabus, class format and expectations.		Robotics
	Aug. 29	Succeeding in the classroom, attitude, goals, test-taking, learning styles, time management.	Ch 7	
Week 2.	Spt. 3	<b>Labor Day ... no class</b>		Robotics
	Spt. 5	Introduction to engineering, history of engineering developments and disciplines.	Ch 1	
Week 3.	Spt. 10	Visualization and Graphics	Ch 9	Robotics
	Spt. 12	Visualization and Graphics	Ch 9	
Week 4.	Spt. 17	Engineering Computer Tools	Ch 10	Robotics
	Spt. 19	Units and Conversions; Dimensional Analysis	Ch 16	
Week 5.	Spt. 24	Units and Conversions; Dimensional Analysis	Ch 16	App. B , Introduction to Matlab
	Spt. 26	The Campus Experience Statistical profiles of engineering profession Global engineering workplace	Ch 19 Ch 4 Ch 5	
Week 6.	Oct. 1	Review for Exam		CAD
	Oct. 3	<b>First Exam</b>		
Week 7.	Oct. 8	Future challenges.	Ch 6	CAD
	Oct. 10	Engineering communication, technical reports, and presentations. Teamwork and leadership.	Ch 14 Ch 11	
Week 8.	Oct. 15	Engineering problem solving, analytic and creative problem solving, personal problem solving styles. <b>Mid-term grades viewable by students.</b>	Ch 8	CAD
	Oct. 17	Engineering problem solving, analytic and creative problem solving, personal problem solving styles. <b>Future Challenge Presentation 1</b>	Ch 8	
Week 9.	Oct. 22	Project management. <b>Future Challenge Presentation 2</b>	Ch 12	CAD
	Oct. 24	Project management. <b>Future Challenge Presentation 3</b>	Ch 12	
Week 10.	Oct. 29	Engineering design process. <b>Future Challenge Presentation 4</b>	Ch 13	<b>CAD Exam</b>
	Oct. 31	Engineering design process (Halloween!) <b>Future Challenge Presentation 5</b>	Ch13	
Week 11.	Nov. 5	Engineering design process. <b>Future Challenge Presentation 6</b>	Ch 13	Robotics
	Nov. 7	Engineering Fundamentals. <b>Future Challenge Presentation 7</b>	Ch 18	
Week 12.	Nov. 12	Engineering Fundamentals. <b>Future Challenge Presentation 8</b>	Ch 18	Robotics
	Nov. 14	Engineering Fundamentals. <b>Future Challenge Presentation 9</b>	Ch 18	
Week 13.	Nov. 19	Areas of engineering specialization and emerging fields. Engineering majors, positions and job functions. <b>Future Challenge Presentation 10</b>	Ch 2	<b>No Labs</b>
	Nov. 21	<b>Thanksgiving</b>		
Week 14.	Nov. 26	Review for Exam.		Robotics
	Nov. 28	<b>Exam Two</b>		
Week 15.	Dec. 3	Engineering Fundamentals	Ch 18	Robotics
	Dec. 5	Design Consultation		
Week 16.	Dec. 10 Dec. 11	Last day of classes. Design Consultation <b>Consultation Day</b>		Robotics
Week 17.	Dec. 14	<b>Final Exam Fri. 10:30-12:30: Robotics Competition</b>  Final report due on the overall learning experience in the course due at final exam time.		

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