

# ENGR 1A – Introduction to Engineering

## COURSE SYLLABUS – Spring 2015

Materials not marked with + (including this syllabus) have been provided by Nick Langhoff, Cañada College



**Course:** 1455      ENGR 1A – Introduction to Engineering  
Units: 3.0

Tu/Th 4:00 – 5:50 p.m.      Rm: GA-103

Instructor: Tom Rebold  
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Office Hours: M/W 12-1  
T/Th 9:30-10, 12:30-1  
F 2-3

### **Description:**

The main goal of this course is to enhance your success as an engineering student and to help you decide which major engineering discipline to pursue. The course explains the engineering education pathways and explores effective strategies for you to reach your full academic potential. It also introduces you to the use of computers in the solution of a wide variety of engineering problems, and provides a basic understanding of engineering processes and tools, including experimentation, data analysis, and computer and communication skills. Throughout the course, emphasis will be given to personal and academic development, success strategies, technical communications, engineering design and problem solving, and ethical considerations. A spreadsheet program (Microsoft Excel) and a high-level computer language (MATLAB) are an integral part of the course.

### **Recommended Preparation:**

Eligibility for ENGL1A

### **Text (Required):**

Landis, R.B., *Studying Engineering: A Road Map to a Rewarding Career*, 4<sup>th</sup> ed., ISBN-10: 0979348749

### **Course Webpage:**

All course content is available at: <http://mpconline.mpc.edu/>

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## **STUDENT LEARNING OUTCOMES:**

Upon successful completion of this course, a student will meet the following outcomes:

- A. Apply basic engineering principles and use common computer tools to design and build a product in a team environment.
- B. Identify the main branches of engineering, the education options, and the roles and responsibilities of engineering in society.
- C. (MPC Area E2) Accurately assess knowledge, skills, and abilities in relationship to their educational, career, and/or personal goals.

## **OBJECTIVES:**

Students successfully completing this class will be able to:

- A. Apply basic engineering principles and use common computer tools to design and build a product in a team environment.
- B. Identify the main branches of engineering, the education options, and the roles and responsibilities of engineering in society.
- C. Solve elementary, but real, problems in engineering.

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## **COURSE REQUIREMENTS:**

**Class Participation:** Regular attendance is required and active participation is expected from each student (as you will experience, this will help you in understanding the course material!).

**Homework:** Homework sets will be assigned typically each week. Most of the assignments are writing assignments that lead towards the final academic success project.

**Projects/Presentations:** There will be two group design projects, a group presentation, and an individual education plan project this semester. Details of each project and associated requirements will be given in separate handouts.

**Exams:** There will be four multiple-choice exams over the semester. You need to bring a scantron form 882-E (the green form) with you to each exam date. Exam dates will be announced two weeks prior to the exam.

**Academic Success Project:** As stated above, one of the primary goals of this course is to maximize your personal and academic success. To this end, you will complete a project to design your plan for becoming a “World-Class” Engineering Student. More details to follow in a separate handout.

#### **Grading Policies:**

The final grade will be determined as follows:

Homework .....	20%
Laboratory.....	15%
Projects/Presentations.....	15%
Exams .....	20%
Academic Success Project.....	30%

The corresponding letter grade is given by the following table:

Letter Grade	A	B	C	D	F
Final Grade	90-100	80-89	70-79	60-69	0-59

A student who gets a grade of 60% or less in any of the exams should see the instructor immediately to devise a plan to improve the student’s performance in class.

#### **TENTATIVE SCHEDULE:**

The below schedule is subject to change. Changes will be announced in class and/or on MPCOnline.

Week	Date (Tue)	Tuesday	Thursday	Reading/Video Assignment DUE	Writing/Problem Assignment DUE
1	8/25	<a href="#">Purpose, Philosophy of course</a> <a href="#">What is Engineering?</a> Name Game Activity: Paper Tower Contest+	<a href="#">Engineering Design Process</a> <a href="#">Excel</a>  <a href="#">Lab 1: Excel</a>	Syllabus	None
2	9/1	<a href="#">Keys to success in engineering study, Mindsets, Attitudes, ABET, Education models</a> Activity: Ability vs Effort Mindset of a Champion	<a href="#">History of Engineering</a> <a href="#">Intro to Error Analysis: measurement uncertainty, statistical estimation</a>  <a href="#">Lab 2: Regression Analysis+</a>	Chapter 1, <a href="#">Mindset of a Champion</a>	<a href="#">Mindset of Champion Assignment</a>
3	9/8	Speaker: Bill Kirkwood, MBARI	<a href="#">Rewards and opportunities of an engineering career, greatest engineering achievements</a> Activity: 2015 Achievements+	Chapter 2: 2.1, 2.2, 2.3, 2.4, 2.5	<a href="#">HW #1</a>
4	9/15	<a href="#">Engineering Disciplines, Job Functions, Outlook, Professional Societies, Professional Registration</a> Activity: Disciplines Research+	Introduction to MATLAB  <a href="#">Lab 3: Intro to MATLAB</a>	2.6, 2.7, 2.8, 2.9, 2.10	<a href="#">HW #2</a>

5	9/22	Learning & learning styles, Metacognition, Teaching in College, Learning process, Seeking help	Software Engineering, Matlab: vectors, plotting, matrices <a href="#">Lab 4: MATLAB Scripts, Plotting</a>	Chapter 3	<a href="#">HW #3</a> , Learning styles online survey
6	9/29	Early course preparation, Preparing for lectures, During lectures, Making effective use of your professors, How to email your professor	Materials Engineering: structure, properties, processing, material selection Lab 5: Material Properties Candy	Chapter 4	<a href="#">HW #4</a>
7	10/6	Student/professional organizations Engineering Speaker #2	Civil Engineering: Statics, Trusses, Transportation, Waste-water Bamboo Tower Kickoff+ Computer Aided Design+		Interview Your Professor
8	10/13	Reading for comprehension, The forgetting curve, Organizing your learning process, Making effective use of your peers, Priority management	Mechanical Engineering: Fluids, Dynamics, Thermo Bamboo Tower Construction	Chapter 5	<a href="#">HW #5</a>
9	10/20	Personal Development - receptiveness to change, Making behavior modification work for you Engineers Speaker #3	Bamboo Tower Competition	Chapter 6: 6.1, 6.2, 6.3, 6.4	<a href="#">HW#6</a> , Jung Typology Test
10	10/27	Personal development, Success, Maslow's hierarchy of needs, Self-esteem, MBTI, Oral and Written Communications, Mental and Physical Wellness	Mechanical Engineering: Aeronautical/Aerospace Lab 6: Mars Lander Control System (MATLAB Sim)+	Chapter 6: 6.5, 6.6, 6.7, 6.8	<a href="#">HW #7</a>
11	11/3	Student Presentations I: Career Research Project	Electrical Engineering: Ohm's Law, Passive Electronics, Applications Circuit Construction Kit Lab 7: Lie Detector Test, DMM, Analog Discovery+		
12	11/10	Orientation to Engineering Education, The Engr Education system, Advising, Academic Regulations, Pathways Activity: 4-Year SEP	Electrical Engineering: Diodes, Transistors, Applications, Sensors Lab 8: LED pulse detector, Analog Discovery, Arduino Display+	Chapter 8: 8.3, 8.4, 8.5	<a href="#">HW #8</a>
13	11/17	Student Organizations, Engineering Projects, Internships, Student Competitions Robotics Challenge Kickoff	Computer Engineering: Digital Circuits, Computer Architecture, Microprocessors/controllers Robotics: Tactile Sensors+	Chapter 7: 7.1, 7.2, 7.3	4-yr UC/CSU SEPs <a href="#">HW #9</a>
14	11/24	Engineering Ethics	<b>THANKSGIVING HOLIDAY</b>	Ethics Reading Assignment, Chapter 8: 8.6	<a href="#">HW #10</a>

15	12/1	Student Presentations II: Career Research Project	Mechatronics: sensors/calibration, actuators, control systems:  Robotics: Servomotor control, Wall Following		Career Presentations Due
16	12/8	Robotics Development	Robotics Competition		
17	12/15	<b>Finals Week: Meet for final meeting</b>			<b>Academic Success report is due!</b>

## MISCELLANEOUS:

### Means of Communication:

#### **Getting email:**

To avoid missing important messages from your instructors and from the college/District, please activate your student email account by following the instructions at this [link](#) if you have not already done so. Messages regarding your registration status, as well as other necessary information, will be sent to you through this means of communication.

#### **Sending email:**

When you send an email to your instructor, *you must include in the subject line: “ENGR 1A ...”*.

### **How to Change your Email in MPC’s Database & Forward Your *mpc.edu* Email to Another Email Address:**

Your teacher, and the college, will either use a) your **mpc.edu** email account and/or b) the email you have on file with the MPC Registrar to share information with you. If you don’t check your MPC email, or the email on file with the Registrar, you will miss important news. Here are some steps to make sure you receive important notices from MPC and your instructor:

#### **Update Your Email in the MPC Registrar’s Student Database**

1. Log in to <https://webreg.mpc.edu/>
2. First, make sure your contact email is correct in the registrar’s database.
  - a. In your student account area, click on the link that says "Update Account"
  - b. Under contact information, choose “edit,” then modify your email address. This is your contact information for the registrar and faculty who may need to contact you about class matters.
3. When you are finished, click the “Update Account” button at the bottom of the contact page.

#### **Forward your *mpc.edu* Email to Another Address**

1. Log in to <https://webreg.mpc.edu/>
2. Then, click on “Student Portal Home” in the menu at left.
3. At the bottom of “Quick Links” in the main window click on the link for “Your MPC Student Email.”
4. If you are a New User, you’ll want to follow the instructions in the main window.
5. If you want to forward all email sent to your *mpc.edu* address, click on the “Forward Email” link in the menu at left and follow the instructions on that page.

**Accommodations:** If you have a disability that may affect your academic experience and are seeking accommodations, it is your responsibility to inform the Access Resource Center as soon as possible. The ARC office is in STS115, on the ground floor of the Student Services building. Their phone number and email address are available on their website, at:

<http://www.mpc.edu/student-services/specialized-programs/access-resource-center-arc>

### **Important Dates to Remember:**

8/24                      Classes begin

9/5	Last day to ADD a semester-length course
9/5	Last day to DROP a semester length course w/eligibility for a partial refund
9/7	Last day to DROP a semester length course without a “W” on your transcript
<b>9/7</b>	<b>No classes: Labor Day</b>
11/2	Graduation application deadline
<b>11/11</b>	<b>No classes: Veterans Day</b>
11/18	Last day to withdraw from semester length classes
<b>11/26-11/28</b>	<b>No classes: Thanksgiving</b>
<b>12/14-12/17</b>	<b>Final Exams</b>