Introduction to Engineering

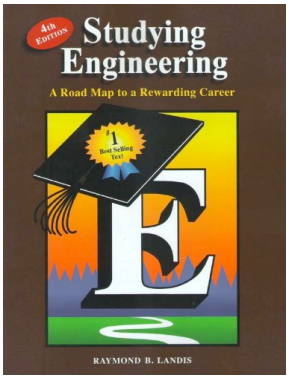
1. COURSE INFORMATION

Course Number & Name:	ENGR 10
Section Number:	53940
Semester & Year:	Spring 2017
Lecture/Lab (days, time):	TTh, 9:20AM – 12:30PM
Location:	N1-301A/B
Final Date and Time:	5/25/17, 9:30-11:30AM, N1-301
Drop Policy:	Withdrawal date with a 'W' – 4/27/17 Without a 'W' on transcript & refund – 2/12/17 Without a 'W' on transcript, no refund – 2/19/17
Last day to request P/NP:	3/3/17
Prerequisites:	None. Advisory: Math 903
	To avoid receiving an erroneous 'W' or 'F', please drop yourself if you cannot complete the course!

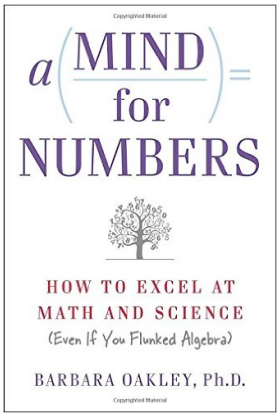
2. INSTRUCTOR INFORMATION

Name:	Kate Disney
Office:	Science #112
Office Hours:	Tuesday 12:30 pm – 2:15 pm in N1-301 or office Tuesday 5:00 – 6:00 pm in office By arrangment
Phones:	408- 822-5264 Cell – 650-906-3688 **Call cell at any time to arrange for help**.
E-mails:	kate.disney@wvm.edu kdisney@sbcglobal.net ← best for quick response

3. COURSE MATERIALS



Studying Engineering – 4th Edition
Author: Raymond B. Landis
Publisher: Discovery Press



A Mind for Numbers – 1st Edition
Author: Barbara Oakley
Publisher: TarcherPerigee

Course information, the schedule, and class handouts are available on Google docs located at:

http://tinyurl.com/Engr10-spring17

4. COURSE DESCRIPTION

This course exposes students to the field of engineering and presents the skills necessary to succeed as engineers. The different branches of engineering and the nature of engineering work are explored. Design engineering and evaluation are addressed through multiple team-based design projects and engineering problem-solving topics. Communication skills for technical presentations and reports are developed through practical engineering scenarios. Guest speakers from local engineering firms and tours to local companies are included.

5. STUDENT LEARNING OUTCOMES

Upon completion of the course the student should be able to:

1. Students will understand the differences between the major disciplines within engineering.
2. Students will design and construct a solution to a problem using the engineering design process.
3. Develop both verbal and written communication skills for presenting technical information.
4. Present technical information in a clear and accurate written format.

6. GRADING

Design Process for becoming a world-class engineering student	-	20%
Final Project	-	20%
Book Report	-	10%
Assignments, Homework, Tours, & all other class activities	-	40%
Class Participation	-	10%

(Note: Grading Percentage breakdown subject to minor revision)
There will be no make-ups unless for some extenuating circumstance. Make-ups must be arranged with me **prior** to the due date.

Late Assignments: 10% per school day that an assignment is late.

Credit/No Credit Grading Option: You may request that your grade be Pass/No Pass instead of a letter grade by completing the form below by approx.. 3/3/17.

A passing grade is a 'C' or better. The form can be found at:

http://www.missioncollege.org/admissions/documents/Pass_NoPass.pdf

7. Class Content

Course Components:

1. Keys to Success as a college student
2. Learning about what engineering is and the various disciplines
    a. The many engineering disciplines

    b. What is Engineering Design
    c. The many roles engineers may have
    d. Engineering accomplishments and the slow/fast evolution of technology
3. Using *assist.org* and drafting an Education Plan
4. Engineering facilities (tours) and speakers!
5. Learning Styles and Teaching Styles, and strategies to use when a teaching style doesn't match your preferred learning style.
6. Engineering concepts and analysis
7. Tools that engineers use:
    a. Excel for data analysis
    b. MS Word
    c. Powerpoint
8. Communications – Oral presentations and written reports
9. Using the Engineering Design Process to solve a design problem
10. Working in teams on hands-on projects or activities.
11. Ethical Case Studies in engineering
12. Education outside of the classroom – enrichment activities

<u>Field Trips</u>

There are three required field trips in the class. These are off-site industry tours require driving and/or car-pooling. Students who need rides or special accommodations need to address these with me 2 weeks prior to the tour. Maps and other essential informational items will be given in class at least one week prior to the tour.

It is the student's responsibility to come to class to receive important hand-outs, or take the initiative to find out what information was given during class time if a class is missed.

Students must wear closed-toed shoes and long pants to tours, for safety reasons.

<u>Class Binder</u>:

Students will be asked to purchase a 2" binder for all work associated with this class. This binder will hold everything you do in this class. Purchase lined binder paper and at least three dividers and put all of this into the binder. All returned/graded assignments should be kept in this binder. Students will be occasionally asked to reflect on their experiences and this journaling will also be kept in the binder. There should be at least three sections to this binder:

1. Lecture and class notes
2. Homework
3. Outside work and projects
4. Journaling and reading notes

Always write with a pencil so that you can erase. It is recommended that you purcahse the following mechanical pencil:

Reports and Assignments:

Some assignments require a formal report. The format will be provided. **All written assignments must be typed, with the exception to calculations that can be hand-written**.

You are strongly encouraged to work in groups, however homework must be your own work. Copied assignments will not be accepted. All sources used in written material must be properly cited.

Software Applications available:

In the classroom, we will be using Microsoft Office. Office includes Word, Excel, and PowerPoint.

Working on campus outside of class time:

The Technology Center is on the second floor of the Campus Center in room #240. It is a drop-in lab for Mission College students.

The Learning Assistance and Tutoring Center located at S2-201 has engineering tutors available.

Cell Phones:

Cell phone use is not permitted during class time. Using computers and watching videos that are unrelated to course lecture or activity are not allowed. Students using the internet to engage in activities unrelated to the class will be asked to leave.

There are seven qualities that are needed to be successful in this class. Those qualities are:

1. Initiative – can you "self start"?
2. A basic K-12 foundation in science and math – understanding some of a problem and describing what you do know about a problem.
3. A positive outlook – Do you have energy and do you believe in yourself; can you work with other people? Do you bring out the best in a team? **Engineering is very much a "Team Sport"**
4. Respect for others – are you a good "follower" and do you reflect well on yourself? *What does this mean on tours and when there are speakers?*
5. The desire and perseverance to pursue a problem until you have "something".
6. Integrity!
7. Focus – no computer or cell phone use when others are talking.
8. Doing assignments and turning them in on time and in a form that shows respect for this class and yourself.

8. CLASS ATTENDANCE

Students are expected to attend all sessions of each class.
Instructors may drop students from class if they fail to attend the first class meeting, or when accumulated unexcused hours of absence exceed ten percent of the total number of hours the class meets during the semester. Moreover, an instructor may drop from the class any student who fails to attend at least one class session during the first three weeks of instruction.

FACULTY ABSENCE

If the instructor is not in attendance after 20 minutes from the scheduled start time of class, the class is cancelled and the students may leave.

9. CHEATING POLICY

Dishonesty includes but is not limited to in-class cheating, out-of-class cheating, plagiarism, knowingly assisting another student in cheating or plagiarism, or knowingly furnishing false information to college staff, faculty, administrators or other officials. Following are definitions of in-class cheating, out-of-class cheating, plagiarism, and furnishing false information. These are not all-inclusive and the list itself is not meant to limit definition of cheating to just those mentioned.
a. In-class cheating: during an examination or on any work for which the student will receive a grade or points, unauthorized looking at or procuring information from any unauthorized sources, or any other student's work.
b. Out-of-class cheating: unauthorized acquisition, reading or knowledge of test questions prior to the testing date and time; changing any portion of a returned graded test or report and resubmitting as original work to be regraded; or presenting the work of another as one's own for a grade or points.

c. Plagiarism: unauthorized use of expression of ideas from either published or unpublished work(s) as a student's own work for a grade in a class. This also includes the violation of copyright laws, including copying of software packages.
d. Furnishing false information: forgery, falsification, alteration or misuse of college documents, records, or identification in class or in laboratory situations.

10. CODE OF STUDENT CONDUCT

It shall be the policy of the District to enforce a student code of conduct the purpose of which is to promote and maintain orderly conduct of a responsible student body in a manner compatible with the District and College function as an educational institution (Education Code 76030).
http://www.missioncollege.org/student_services/student_code.html

11. DISABILITY STATEMENT

Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. Please contact DISC (Disability Instructional Support Center) located in S2-201 (408-855-5085 or 408-727-9243 TTY) to coordinate reasonable accommodations for students with verifiable documentation.
ADA Statement: The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation required that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact DISC (Disability Instructional Support Center) located in S2-201 (408-855-5085 or 408-727-9243 TTY).
http://www.missioncollege.org/depts/disc/index.html

12. SAFETY/EMERGENCY

"Mission College is serious about safety and we urge you to increase your awareness of some basic emergency preparedness procedures while on campus. Here are some key things you should know:
Locate (in every classroom):

- Classroom emergency phone
- All evacuation exits from your classroom and the fastest way out of the building without using ANY elevators - Also know an alternate route in case your first choice is blocked.
- Designated assembly area for your building (map on classroom wall)
- Emergency Procedures for Campus Safety chart (on classroom wall)
- Nearest fire extinguisher and first aid kit

WVM-Alert - Emergency Notification
Free WVM-Alert will text, email and call you to alert you to campus emergency situations. Sign in to www.wvm.edu/emergency and give us your contact information ASAP! If you don't sign up, you won't be notified!

Engineering 10 – Introduction to Engineering

Date	Class Activities	Date	Class Activities	Homework Due
1/31	**Introductions** Overview of the class and Topics covered. Class Schedule "Name games"	2/2	What is Engineering? What do Engineers do? Roles of Engineers Apple Lathe Demo	1) First assignment 2) Field Trip Form 3) How are scientists different from engineers? 4) 882E Scantrons
2/7	**The Engineering Disciplines** Rate the disciplines based on what interests you using rating sheet.	2/9	**The Engineering Disciplines – Cont'd** Rate the disciplines based on what interests you using rating sheet. ***Additive Manufacturing*** ***http://www.stratasys.com/resources/case-studies/medical/nemours***	In class questions to be turned in. Read by 2/9: http://www.economist.com/technology-quarterly/2016-06-09/factory-fresh
2/14	**Guest Speaker:** *Gabriel Alcantar*, **Civil Engineer**, *Langan* - Civil Engieering Firm **The Engineering Disciplines - Cont** Rate the disciplines based on what interests you using rating sheet.	2/16	**Thinking about habits and what is needed to be successful as an engineering student.** **Scholarships and Internships** **11:00 am - class over early**	**Homework #1**

2/21	**Preparing for Success** The core Lower Division and the "Engineering Critical Path". **<u>Guests:</u>** **10:30 am –** *Edrina Rashidi* **– MESA** *Diego Espinosa* **– STEM Pipeline Coordinator** *Chia Green* **– Tutoring Center Coordinator**	2/23	**<u>Guest:</u>** **9:20 am** - *Theresa Lawhead*, Counselor **How to select GE courses for an engineering major**. Finish Ed Plan **Peer review of Ed Plans**	**Homework #2**
2/28	**Introduce Wind Turbine Lab** ***Electrical Engineering*** - *How a generator works?* *How energy is converted from mechanical to electrical energy.* Designing the experiment Introduction to Excel for Engineers (See google folder for Excel problem.)	3/2	**Wind Turbine Lab** Build, Test, and Analyze Wind Turbines **<u>Guest Speaker:</u>** **11:00 am Chemical Engineering –** *Leandra Martin, VP of Instruction at Mission College*	
3/7	**Wind Turbine Data Analysis Using Excel** Use **Excel** to create graphs of class turbine data.	3/9	**SVAWPC TOUR- 10 a.m.** ***Civil and Mechanical Engineering*** Silicon Valley Advanced Water Purification Center - SVAWPC 4190 Zanker Road, San Jose Contact: *Jamie DeSantis* Wear long pants – closed toe shoes *http://purewater4u.org/advanced-water-treatment-facility*	**REQUIRED:** Turn in plots/graphs of wind turbine data on Tuesday.

3/14	***Electrical and Mechanical Engineering*** Audio Speaker Lab Answer questions posed in Speaker Lab	3/16	**The Engineering Design Process** **Introduce Final Project** Group project to build a device that solves a customer's problem. Watch at home: Deep Dive Video http://www.youtube.com/watch?v=JkHOxyafGpE **11:00 am** **EE & Software - Engineering Speakers:** *Robert Burdick*, **Electrical & SW Engineer** ROKU *Andres Marquez*, **Electrical Engineer** Intel *Steven Wildblood*, **Computer Engineer** Intel	**Homework #3**
3/21	***Civil/Structural Engineering*** **Types of Bridges** Building Big – Bridges In-class Project: **Three types of truss towers** **Test Trusses**	3/23	***ELC Meeting*** ***No class***	
3/28	***Spring Break***	3/30	***Spring Break***	

4/4	**Engineering Speaker:** ***Mechanical and Aerospace Engineering*** *Andy Turner* - ***SSL***	4/6	**<u>Tour 10:00 am</u>** **Solaria –** Maker of PV Panels **Fremont**	
4/11	**In class activity** Introduce Oral Presentations to present an aspect of technology or an ethics issue	4/13	**Becoming a World Class Engineering Student**	
4/18	**How Silicon Valley came to be** Working as a Team *"Transistorized"* Intro to Microelectronics *"Silicon Run"*	4/20	**Thinking about thinking**	**Homework #4** <u>Watch this movie at home:</u> *"Triumph of the Nerds*" How Silicon Valley became the center of the PC world https://www.youtube.com/watch?v=sX5g0kidk3Y&index=1&list=PLjSrL4-yAJ1FyBK5Ea4ZO0mD5caqKfY1H

4/25	***Software and Electrical Engineering*** Coding and storing information with tic-tacs and other symbols that are not letters.	4/27	**TOUR – 11:30 a.m.** **(Arrive at 10:00 am)** **Computer History Museum** 1401 N. Shoreline Blvd. Mountain View	
5/2	**Ethics and Engineering** **Video Clips:** *Hyatt Regency- Kansas City, Tacoma Narrows Bridge, Union Carbide –Bhopal, India* **Ford Pinto Debate**	5/4	***Overview of 1982 Antenna Case*** Ethics Role Playing- Round-table discussion about 1982 Antenna Collapse. Present an opinion statement. Future Ethical Issue - Autonomous Vehicles http://cacm.acm.org/news/201683-the-road-to-regulating-self-driving-cars-is-long-winding/fulltext http://www.dailygazette.com/news/2016/feb/17/whos-blame-car-crash-where-nobody-driving/	**Confirm Oral Presentation topic with Kate on Tuesday**
5/9	**Oral Presentations on how something or some technology works (see rubric)**	5/11	**Oral Presentations**	
5/16	**Oral Presentations**	5/18	**Work on Final Project**	
		5/25 Thurs.	**FINAL 9:20 – 11:20** Demo Final Project	

			Turn in Final Report	