VG 100 Introduction to Engineering Syllabus

UM-SJTU Joint Institute, Summer 2017

Course Description:

This course introduces students to the professional technical and communication skills required by engineers and provides them with an overview of engineering at the beginning of their program. An important component of the course is the real-world engineering projects. The course has the following objectives:

a) To provide an experiential introduction to engineering through project-based work in an engineering discipline, appropriate for first-year students and undertaken by student teams.
b) To introduce students to the basics of written, oral, and visual communication.
c) To provide experiences in teambuilding and teamwork.
d) To introduce students to the role of the engineer in society and professional responsibilities/ethics.
e) To introduce environmental and quality concerns in the engineering profession, including the concept of "whole life design" for recycling and environmentally conscious engineering decision making.
f) To introduce students to the acceptance and analysis of risk in engineering design and manufacturing.

After completing this course, students should demonstrate proficiency with

a) Solve engineering problems using project-specific mathematics, engineering, and science concepts.
b) Analyze, interpret and make decisions about quantitative data using basic concepts of descriptive statistics (mean, Median, standard deviation, normal distributions, and mode) and measurement.
c) Solve open-ended design problems.
d) Using skills in the context of a team-based design project.
e) Engage in an ethical decision-making process given some engineering situations.
f) Indentify the ethical, environmental and other global and societal impacts of engineering practice.
g) Design technical/professional communications.
h) Deliver well-structured, technically sound communication.
i) Evaluate and effectively construct arguments, using technical content at the first-year level.

Prerequisites: None

Instructors:

Technical Instructor:
Prof. Yu Zheng
Email: yuuzheng@umich.edu
Office room: Room 217, N Law School Building
Office hours: During weekly labs or by appointment

Communication Instructor:
Dr. Cynthia Vagnetti
Email: cvagnetti@sjtu.edu.cn
Office: Room 410, N Law School Building
Office hours:

Technical TAs:

Communication TA:

TA1: Chang Liu
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Lectures:
Tuesday & Thursday, 10:00-11:40 (weekly); Monday, 10:00-11:40 (week 5-10)
东中院 E4-502

Labs:
Wednesday, 16:00-17:40 (Session 1); Tuesday, 12:10-13:50 (Session 2)
JI General Engr. Lab 1 (4F)

Textbook:

No textbook is required. The following reference books are recommended:

1. *Foundations of Engineering*, Mark Holtzapple (Author), W. Reece (Author)[Texas A&M University] ISBN-13: 978-0072480825 ISBN-10: 0072480823 Edition: 2nd McGraw-Hill Higher Education (Chapter 1 The Engineer, Chapter 5 Introduction to Design, Chapter 7 Numbers, Chapter 9 Statistics, Chapter 2 Engineering Ethics, Appendix A Unit Conversions, Appendix B NSPE Code of Ethics, Appendix C z table)
2. *Introduction to Engineering and the Environment*, Edward Rubin, 1st Ed., Nov. 30, 2000, McGraw-Hill Higher Education, ISBN-13: 9780072354676, ISBN-10: 0072354674. - Chapter 1 Engineering and the Environment
3. *The Everyday Writer with Exercises*, Andrea A. Lunsford, 5th Ed., Bedford/St. Martin's, 2012. (ISBN 978-1457612671)

Grading Policy:

Category	Item	Max. Percent %	Distribution
Individual Work	Homework	10	Varies with Instructors
	Midterm Exam	10	60% Tech., 40% TC
	Peer Evaluation	Team Multiplier	N/A
Team Work	Skill development session	5	100% TC
	Project 1 Competition	10	100% Tech.
	Project 1 Report and Manual	10	60% Tech., 40% TC
	Project 2 Proposal Writing	10	60% Tech., 40% TC
	Project 2 Poster	10	100% TC
	Oral Presentation • Pitch • Progress Report • Symposium	15 2.5 5 7.5	 50% Tech., 50% TC 50% Tech., 50% TC 50% Tech., 50% TC

	Prototype Demonstration • Symposium • Expo	10 5 5	 100% Tech. 100% Tech.
	Project 2 Final Report	10	60% Tech., 40% TC

Total VG100 Grade = Team Work × Team Multiplier + Individual Work

The skill development session is compulsory. The purpose of these sessions is to help students realize the Technical Communication teamwork skills they will need to successfully accomplish each project. The peer evaluation will be conducted by your teammates and TAs. The peer evaluation score will be calculated based on

a) Attendance of lab sessions.
b) Completion of deliverables by assigned time.
c) Contribution to the assigned deliverables.

The instructors reserve the right to change the percentages and calculation of the above grading system.

Attendance Policy:

- A student is expected to attend every class. The instructor makes the final decision to excuse or not to excuse an absence.
- The instructor is entitled to give a failing grade for excessive absences.
- No food is allowed in class.

Homework Policy:

- Homework may consist of writing and/or coding parts.
- Students are required to accomplish homework independently. However, it is acceptable for students to collaborate in discussing and helping each other solve the problems.
- Homework is due as specified. No late homework will be accepted after the due dates.

Project Policy:

- Students will be divided into groups to conduct the projects.
- At the end of each project, every group need finish a report with a clear statement of what he/she has contributed to the project.
- Reports are due in one week after each project. No late report will be accepted after the due dates.

Quiz and Exam Policy:

- Quizzes and exams are closed book.
- Any use of cell phones, pads, tablets, or other electronic devices is prohibited.
- No make-ups will be given unless documented emergency.

Academic Integrity Policy:

Each student has the responsibility to understand, accept, and comply with the honor code as set forth by the UM-SJTU Joint Institute (http://umji.sjtu.edu.cn/academics/academic-integrity/honor-code/). Violations of the honor code will be reported to the honor council. At the instructor's discretion, the

penalty may be a grade of zero on the assignment up to and including a grade of failure on the course. It is the sole responsibility of the student to understand and follow the honor code.

Disability Policy:

If you have any disability that might interfere with your ability to turn in assignments on time or in the form required, please contact the instructors and the Academic & Student Affairs Office at the start of the term so that arrangements can be made to accommodate you.

Safety Policy:

Details will be provided in the first lecture.

Tentative Schedule:

WK	DAY	Date	Professor/TA	Tentative Lecture Topics (T = Technical; C = Communication; D&P = Discussion and Presentation)	HW	Due
1	TUE	May 16	Zheng	T1: Course introduction		
	THU	May 18	Vagnetti	C1: Technical communication for the global engineer (citation and plagiarism)	Summary	
	TUE	May 16		No Lab		
	WED	May 17				
2	TUE	May 23	Zheng	T2: Project 1 description: Maze Robot		8:00am Summary
	THU	May 25	Vagnetti	TC2: Manual writing: Integrating words and Images, expectations in minutes, paraphrasing.	Instruction Manual for Project 1	
	TUE	May 23	TAs	Lab 1: Lab orientation; Lecture and practice on the use of Arduino TC input: Lab journal/log upload on Canvas every week		
	WED	May 24				
3	TUE	May 30		Holiday for Dragon Boat Festival: No Class and Lab		Minutes
	THU	Jun 1	Vagnetti	C3: Introduction to Project Proposals, How to sell your	Ideas and Pitch	

				idea: Logo, Identity, and Audience	presentation for Project 2	
	WED	May 31	TAs	Lab 2: Sensors and feedback; Motors; Project 1: prototype (ALL TEAMS)		
4	TUE	Jun 6	Zheng	T3: Introduction to Mechatronics		
	THU	Jun 8	Zheng	T4: Actuators and Sensors		
	TUE	Jun 6	TAs	Lab 3: Project 1: prototype (Mechanical & Electrical)		
	WED	Jun 7				
5	MON	Jun 12	Vagnetti	C4: The Good Writing: Review of everything you learned in Vy100/Vy200		
	TUE	Jun 13	Zheng	T5: Numbers and Statistics	HW	Minutes
	THU	Jun 15	Vagnetti	C5: Technical Presentations and Effective Slides: Visual and Spoken Rhetorics		
	TUE	Jun 13	TAs	Lab 4: Project 1: Test (ALL TEAMS)		
	WED	Jun 14	TAs	Lab 5: Game Day (ALL TEAMS)		
6	MON	Jun 19	Zheng	T6: Introduction to Design		
	TUE	Jun 20	Zheng + Vagnetti	D&P 1: Pitch Day for Project 2: Oral presentations: 5 min. each group, max 5 slides + 1 title slide		Minutes
	THU	Jun 22	Zheng + Vagnetti	D&P 2: Pitch Day for Project 2: Oral presentations: 5 min. each group, max 5 slides + 1 title slide		Project 1: Instruction manual
	TUE	Jun 20	TAs	Lab 6: Scheduling and assessment of Project 2: [TA verify sketch design and give suggestion], start purchasing		
	WED	Jun 21				
7	MON	Jun 26	Vagnetti	C6: Time Management: Gantt Chart	Progress report and presentation	HW
	TUE	Jun 27	Zheng	T7: Ethics		Minutes

	THU	Jun 29	Zheng + Vagnetti	T8+C7: Mid Term Exam Review		
	TUE	Jun 27	TAs	Lab 7: TA gives guidelines in purchasing materials, finish purchasing		
	WED	Jun 28				
8	MON	July 3		Midterm Exam		
	TUE	July 4	Vagnetti	C8: Poster Presentation	Symposium practice talk: Poster Presentation: Final Report	Minutes
	THU	July 6	Zheng	T9: Robots		
	TUE	July 4	TAs	Lab 8: TC Lab: giving guidance and suggestions for progressive presentation (rehearsal)		
	WED	July 5				
9	MON	July 10	Zheng + Vagnetti	D&P 3: Progress Report and Prototypes		Project 2 progress presentation
	TUE	July 11	Zheng + Vagnetti	D&P 4: Progress Report and Prototypes		Minutes
	THU	July 13	Vagnetti	C9: Final report		
	TUE	July 11	TAs	Lab 9: TC Lab: TAs guide them to prepare for the symposium talk (rehearsal) and poster		
	WED	July 12				
10	MON	July 17	Zheng + Vagnetti	D&P 5: Symposium practice talk (15 minutes)		
	TUE	July 18	Zheng + Vagnetti	D&P 6: Symposium practice talk (15 minutes)		Minutes
	THU	July 20	Zheng + Vagnetti	D&P 7: Symposium practice talk (15 minutes)		**Poster due on Thursday night 07-20**
	TUE	July 18	TAs	Lab 10: TC Lab for final report		
	WED	July 19				
11	TUE	July 25	Zheng + Vagnetti	D&P 8: Peer Review: How to		Minutes

				Give Comments		
	THU	July 27	Zheng + Vagnetti	D&P 9: Peer Review: How to Address Reviewers' Concerns		**Slides for the Symposium due on Thursday night 07-27**
	TUE	July 25	TAs	Lab 11: Finalizing product		
	WED	July 26				
	SAT	July 29	All	Symposium Day 9:30am-4:00pm		
12	TUE	Aug 1	Zheng + Vagnetti	D&P 10: Peer Review of final report draft		Minutes
	THU	Aug 3	Zheng + Vagnetti	D&P 11: Poster Competition + Wrap up		
	TUE	Aug 1	TAs	Lab 12: Get Ready for Expo (Technical and TC TAs all attend)		
	WED	Aug 2				**One Slide for the Expo due on Friday night 08-04**
13	WED	Aug 9		Design Expo		**Final Report due on Sunday night 08-06**