VM495: Mechanical Engineering Laboratory II

2017 Summer Semester

Objective

While this second Mechanical Engineering Laboratory course builds upon the hands-on experience students gained in VM395, the underlying philosophies of these two classes are different. In VM495, students will gain additional experience by designing, constructing, and operating experimental projects related to mechanical systems. The engineering portion of VM495 involves key areas of experimentation such as performing literature search, writing & planning technical proposal, validating physical models, designing & setting up experiments, developing experimental techniques, analyzing test results, and writing high-quality technical report. The technical communication portion of this course will train students to become more proficient in communicating ideas through enhancing their oral presentation skills, ability to write technical/research report, and team-building skills in a professional manner. In addition, effective team-building skills will allow students to work more effectively as a team member to accomplish a common team goal.

Instructors

Prof. Chen, C. P. (Engineering)
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Thursday 13:00 to 14:00
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Co-Instructor
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Course / Laboratory Teaching Assistants

Mr. Tianyi Shen
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(@ e-reading room)

Course Pre/Co-requisites:

Prerequisite: VM360, VM395, preceded or accompanied by VM350; it is recommended that VM450 should not to be elected concurrently with VM495.

Textbook:

A. J. Wheeler and A. R. Ganji, ***Introduction to Engineering Experimentation***, 2nd edition (international edition), Pearson Prentice Hall, NJ (USA), 2004.

Additional Reference:

R.S. Figliola and D.E. Beasley, ***Theory and Design for Mechanical Measurements***, 5th edition (International student version), John Wiley & Sons, Inc. (2011).

Course Schedule:

Lectures:

Tuesday (weekly):	14:00 to 15:40	E. Middle Hall E1-304
Thursday (weekly):	14:00 to 15:40	E. Middle Hall E1-304
Friday (only during ODD week):	16:00 to 17:40	E. Middle Hall E1-304

Laboratory Sessions (Location**:** Mechanical Engineering Laboratory, 4th floor, JI building)

Session 1**:	Monday	18:20 to 21:20
Session 2**:	Thursday	18:20 to 21:20

** Refer to the laboratory session list for your assigned session and group**.**

Grading Criteria:

Assignments	Percentage
Lab #1 Group Report	10 %
Lab #1 Presentation (Group / Individual)	10% (2.5% / 7.5%)
Lab #2 Group Proposal	5 %
Lab #2 Group Progress Report	7.5 %
Lab #2 Group Poster	7.5 %
Lab #2 Group Final Report	15 %
Lab #2 Final Presentation (Group / Individual)	10% (2.5% / 7.5%)
Homework, In-class Assignments & Lab Participation	7.5 %
Technical Communication Assignments	7.5 %
Exam 1	10 %
Exam 2	10 %
TOTAL	**100 %**

Important Information about Lab Assignments:

1. **Lab participation in each lab session is MANDATORY for each student**. Lab attendance will be taken at the beginning of each lab session. If your request of absence is approved by Professor Chen, then it is your own responsibility to arrange the duties with your team members and inform the Lab TA. Failure to do so may receive a reduced

grade for that lab assignment. Under normal circumstance, a student may not request for absence more than twice during the entire semester.

2. Scores for the lab assignments will include the lab participation and safety aspects of the grade. Only through (1) lack of participation (such as late arrival to, early departure from, absence from their appointed laboratory section, or incomplete participation in team work) or (2) inattention to safety rules, will a student's grade be reduced. Any conduct in contradiction to the lab safety rules or deemed "unsafe" by the laboratory supervisor will reduce a student's participation and safety grade, and may also result in expulsion from the class.
3. Each team must select a team leader for that lab assignment. The same student cannot be team leader again for second lab assignment. Role and responsibility of each team member must be rotated from lab 1 to lab 2.
4. Two hard-copies of each lab report must be submitted at the same time. An electronic version of the lab report will be submitted to Canvas or emailed to TA. In addition, presentation file (one hardcopy and one electronic version) must also be submitted with the lab report. All students whose names appear on the same lab report earn the same grade for that report.
5. All group work and assignments must be completed only within your own group. Data cannot be shared among different groups.
6. "**Plan your work and work your plan**." Use your lab time wisely – this is the only time for you to do your building and experimentation. Especially for lab assignment #2, plan what you are going to do in lab before you come. Do any research, writing, or planning in your other meetings when possible. It is important to remember "***Proper Prior Planning Prevents Poor Performance***" (the 6 P's).
7. **You are required to bring a laboratory notebook for the lab sessions.** All students must bring a laboratory notebook to every lab class to write down raw data, notes on the experiments, and calculations. The notebook must be bound (no loose papers) and used only for this class. Instructors may inspect your lab notebooks at any time and reduce your Participation and Safety grade if your notebook is missing or incomplete.

Lab Conduct and Safety Rules:

1. Each lab assignment is designed for students to complete within the three-hour lab period. If students finish the experiment early, they are free to leave. However, it is strongly advised that they stay for the remainder of the lab period to work on the lab report. All analyses that are not completed in lab must be completed outside of lab period.
2. Data files generated in the lab should be copied onto the computer's desktop for backup. Students may backup the test data on their portable storage devices for further analysis outside of class.
3. Use of mobile phone in the lab for making phone calls is strictly prohibited.
4. No eating or drinking is permitted in the laboratory. Students are free to leave at any time to take short breaks (go to restroom, get a drink, etc).

5. No phone call is allowed in the lab while the lab session is underway. If you must answer a phone call on your mobile phone, please proceed to the outside of the lab and do so with courtesy accordingly (Remember, the lab session is going on).
6. The laboratory workspace must be cleaned and restored to the same conditions as when the laboratory session began.
7. Students must always be careful when operating a piece of equipment. They should ask the instructor or TA for assistance if unsure about the equipment or operating procedure.
8. Excessive force should never be applied to any piece of equipment. Please check with the instructor or TA for assistance. This will avoid equipment damage as well as possible personal injury.
9. Basic lab safety rules:
    a. Eye protection must be worn at all times around any moving machinery. Safety goggles are available for use in the lab. Please check with your lab instructor for assistance.
    b. Care must be exercised when plugging in and using electrical equipment.

Internet Resources:

This course uses the JI Canvas intranet website (https://umji.famousedu.com/login/canvas). Canvas provides a place for the instructors and TA to give electronic versions of all course handouts, extra reading material, lecture notes, etc. In addition, the Discussion and Chat Room functions can be used for discussion between students and between students and the instructors or TA. The course instructors will also use the Announcements on Canvas to convey urgent messages to the entire course. For this reason you should remember to check Canvas (or your email, if set up for this in Canvas) on a regular basis.

Academic Integrity and Honor Policy:

Student surveys show that the overwhelming majority of JI students is proud of the Honor Code and supports it fully. It is seen as an asset of the JI, a real positive feature distinguishing the JI both from other institutions within SJTU and at other Chinese universities. The introduction of the Honor Code has enhanced the reputation of the JI while also teaching JI students about academic integrity.

All students in the class are presumed to be decent and honorable, and all students in the class are bound by the Honor Code of the Joint Institute. The JI Honor Code is included in the undergraduate student handbook and also available at:

http://umji.sjtu.edu.cn/academics/academic-integrity/honor-code/

In short, the Honor Code prohibits students from representing work that is not the fruit of their own labors as their own. The specifics and application to concrete situations as well as the details of enforcement involving the student-comprised Honor Council and the Faculty of Discipline (FCD) make up the bulk of the Honor Code.

You may not seek to gain an unfair advantage over your fellow students; you may not consult, look at, or possess the unpublished work of another without their permission; and you must appropriately acknowledge your use of another's work. Any violation of the above honor policies appropriate to each piece of course work will be reported to the Academic & Student Affairs Office, and if guilt is established, penalties may be imposed. If violations are found and proven, there will be an automatic reduction of the final course grade by **ONE** full letter grade. More severe penalties may include, but are not limited to, expulsion from the University. If you have any questions about this course policy, please consult the course instructors.

In-class Assignments and Participation:

In-class assignments on both engineering and technical communication aspects of the course will be given at lectures periodically throughout the semester. These assignments are designed to reinforce the student's knowledge of the materials covered in class and promote class attendance, discussion, and participation. Under normal circumstance, if you're absent in the class when the assignments are given, you will NOT be able to make up for them.

VM495- Course Lecture and Lab Assignment (updated on 17 May 2017)

Week	***Lab Assignment***	***Engineering Lectures Tu.& Friday (odd week)***	***Technical Comm. (T/C) Lectures Thursday***	***Lab Assignment Due***
1 (May 15- 19)	No lab this week Lab team formed before the end of Lecture 3	Course introduction, overview; Sensor applications, intro to Lab 1	*Introduction, avoiding plagiarism*	
2 (May 22 - 26)	**Start of Lab1**	Design of Experiments/ Discussion of Lab 2	*Writing mathematics*	
3 (May 29 – June 2)	Progress of Lab 1	No Tuesday class/ Individual group discussion on Lab 2 topics	*Discussion of Lab 2*	
4 (June 5-9)	Wrap up of Lab 1	Individual group discussion on Lab 2 topics	*Graphical information design*	
5 (June 12- 16)	Start of Lab 2	Lab 1 Group Presentations (PPT1 and PPT2)	*Proposal, progress report*	
6 (June 19 - 23)	Progress of Lab 2	EXAM 1	*Lab 2 Proposal Presentations by Group Leaders*	Lab 1 Final Report and PPT due on 6/22
7 (June 26 – June 31)	Progress of Lab 2	Statistical Analysis/ uncertainty Data Acquisition/signal process I	*Case study: Engineering by PowerPoint?*	Lab 2 Formal Proposal Due
8 (July 3 – July 7)	Progress of Lab 2			
9 (July 10 - 14)	Progress of Lab2	Individual group discussion on Lab 2 progress	*Illustrated abstract*	Lab 2 progress report due: 7/14

10 (July 18 - 21)	Progress of Lab 2	Data Acquisition and signal process II Advanced Measurement Techniques	*Technical poster*	Illustrated abstract and draft technical poster due
11 (July 24 - 28)	Wrap up of Lab 2	Advanced Measurement Techniques II Course Review/ Exam 2	*In-class review of draft posters*	
12 July 31 – Aug 4)		Final Presentations		Final technical poster for Design Expo due
13 (Aug 7 - 11)				Lab 2 Final Report and PPT file due