

VM360
Modeling, Analysis, and Control of Dynamics Systems
(Summer 2017)

Website: sjtu-umich.instructure.com

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Lecture:

Monday and Tuesday 8:00-9:40 AM (Weekly)
Wednesday 8:00-9:40 AM (Bi-weekly, odd week)

Course Materials

- Course notes, and associated documents (available by downloading from Canvas)
- Text book: System Dynamics, Ogata, 4th Ed.
- Reference: Modeling and Analysis of Dynamic Systems, Close, Frederick, Newell.

Grading Criteria

5 Homeworks + in-class Quizzes	20%
Midterm Exam	20%
Project Report	20%
Final Exam	40%

The letter grade associated with the median score is expected to be in the range of 'A-' to 'B+'.

Homework:

Assigned homework will be due at the beginning of class. No late homework will be accepted. Do not disturb the lecture by turning in homework after the lecture starts. Lowest homework grade will be dropped. You are not permitted to look at, use, or copy any solutions manual or solutions that are not your own. You may work together with your fellow students on the homework but you must turn in your own work that reflects your understanding of the material. It is your responsibility to check the homework solutions. Students must abide by JI Honor code.

Project:

- Done in group of 4 students. Names for each group should be conveyed to TA by May 23, 2017.
- A semi-open ended problem is assigned to each group in fourth teaching week.
- Requires MATLAB programming + other programming language (optional)
- Brief report (maximum 10 pages) due on July 25, 2017
- Must abide by UM-SJTU JI Honor Code

Exam:

Midterm Exam will be held on Monday, June 26, 2017- Closed book, one page handwritten notes allowed*, no solved problems.

Final Exam, Date: Tuesday, August 7, 2017 - 40% - Closed book, one page handwritten notes allowed*, no solved problems.

* You will be required to turn in your handwritten notes with the exam and it will be returned to you after the exam is graded.

* No make- up quizzes or exams will be allowed (unless note provided by Dean).

* Students must abide by UM- SJTU JI Honor Code.

Lecture Topics

Week		Lecture Topic
1 (05/15)	Monday Tuesday Wednesday	Introduction Laplace Transforms Mathematical Modeling
2 (05/22)	Monday Tuesday	Mechanical Systems Electrical/Electro-mech. Systems
3 (05/29)	Monday (No class) Tuesday (Dragon Boat Festival) Wednesday	Linearization
4 (06/05)	Monday Tuesday	System Response Routh's Stability Criterion
5 (06/12)	Monday Tuesday Wednesday	1 st and 2 nd order systems 1 st and 2 nd order systems Control Actions
6 (06/19)	Monday Tuesday	Steady state errors in unity Feedback systems
7 (06/26)	Monday Tuesday Wednesday	Mid-Term Exam Root Locus Sketching Root Locus Sketching
8 (07/03)	Monday Tuesday	Design of controllers using RL Method Design of controllers using RL Method
9 (07/10)	Monday Tuesday Wednesday	Bode Plots Bode Plots Bode Plots
10 (07/17)	Monday Tuesday	Stability Margins Stability Margins
11 (07/24)	Monday Tuesday Wednesday	Stability Margins Project Due Design of controllers in frequency domain
12 (07/31)	Monday Tuesday	Design of controllers in frequency domain Design of controllers in frequency domain & Review
13 (08/07)	Monday	Final Exam

Canvas course website

Refer to the Canvas course website (Vm360 Summer17) for all course information. Lecture slides, syllabus, and reading material will be uploaded to Canvas Files. Course updates will be posted on the Announcements.

I will go through the syllabus in the first lecture. If you have any questions regarding the syllabus, just ask me in the lecture.