TEXAS A&M UNIVERSITY
DEPARTMENT OF MECHANICAL ENGINEERING

MEEN 364 Dynamic Systems and Controls
Sections 501 – 516,   Spring 2019

GENERAL INFORMATION - REV.7

General Description (3 credits):
Mathematical modeling, analysis, measurement and control of dynamic systems; extensions of
modeling techniques of MEEN 363 to other types of dynamic systems; introduction to feedback
control, time and frequency domain analysis of control systems, stability, PID control, root locus;
design and implementation of computer-based controllers in the lab.

Prerequisites:
ECEN 215, MEEN 260, MEEN 363

Course Content:
Engineering Science – 2/3 or 2 hr
Engineering Design – 1/3 or 1 hr

INSTRUCTORS:

<table>
<thead>
<tr>
<th>(501 - 504)</th>
<th>(505 - 508)</th>
<th>(509 - 512)</th>
<th>(513 - 516)</th>
</tr>
</thead>
</table>
| Dr. Won-jong Kim  
Associate Professor  
223 Mechanical  
Engr. Office Bldg.  
Ph. 845-3645  
E-mail: wjkim@tamu.edu | Dr. Zohaib Hasnain  
Research Assistant Professor  
Ph. 458-5823  
E-mail: zhasnain@tamu.edu | Dr. Alan Palazzolo  
Professor  
123 Mechanical Engr. Office Bldg.  
Ph. 845-5280  
E-mail: a-palazzolo@tamu.edu | Dr. Swaminathan Gopalswamy  
Professor of Practice  
216 Mechanical Engr. Office Bldg.  
Ph. 845-7270  
E-mail: sgopalswamy@tamu.edu |
Course Teaching Assistants:

<table>
<thead>
<tr>
<th>TA</th>
<th>Lab Section</th>
<th>Day</th>
<th>Time</th>
<th>Lab Section</th>
<th>Day</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>1 Burak Ayyildiz</td>
<td>505</td>
<td>Th</td>
<td>11:10 – 2:00</td>
<td>510</td>
<td>Tu</td>
<td>11:10 – 2:00</td>
</tr>
<tr>
<td>2 Angel Gomez</td>
<td>501</td>
<td>M</td>
<td>2:20-5:10</td>
<td>507</td>
<td>M</td>
<td>11:10 – 2:00</td>
</tr>
<tr>
<td>3 Riya Khurana</td>
<td>512</td>
<td>F</td>
<td>11:10 – 2:00</td>
<td>509</td>
<td>F</td>
<td>8:00 – 10:50</td>
</tr>
<tr>
<td>4 Tianqi Li</td>
<td>504</td>
<td>W</td>
<td>2:20 – 5:10</td>
<td>506</td>
<td>W</td>
<td>8:00 – 10:50</td>
</tr>
<tr>
<td>5 Kaustubh Tangsali</td>
<td>515</td>
<td>Th</td>
<td>5:30 – 8:20</td>
<td>516</td>
<td>Tu</td>
<td>5:30 – 8:20</td>
</tr>
<tr>
<td>6 Rangeesh Venkatesan</td>
<td>503</td>
<td>Tu</td>
<td>2:20-5:10</td>
<td>508</td>
<td>Th</td>
<td>2:20-5:10</td>
</tr>
<tr>
<td>7 Grayson Woods</td>
<td>502</td>
<td>Tu</td>
<td>8:00 – 10:50</td>
<td>511</td>
<td>Th</td>
<td>8:00 – 10:50</td>
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TA email

<table>
<thead>
<tr>
<th>TA</th>
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<tbody>
<tr>
<td>1 Burak Ayyildiz</td>
<td><a href="mailto:burakcelal@tamu.edu">burakcelal@tamu.edu</a></td>
</tr>
<tr>
<td>2 Angel Gomez</td>
<td><a href="mailto:kornldu1981@tamu.edu">kornldu1981@tamu.edu</a></td>
</tr>
<tr>
<td>3 Riya Khurana</td>
<td><a href="mailto:riyakhurana@tamu.edu">riyakhurana@tamu.edu</a></td>
</tr>
<tr>
<td>4 Tianqi Li</td>
<td><a href="mailto:xmcx731@email.tamu.edu">xmcx731@email.tamu.edu</a></td>
</tr>
<tr>
<td>5 Kaustubh Tangsali</td>
<td><a href="mailto:kmtangsali@tamu.edu">kmtangsali@tamu.edu</a></td>
</tr>
<tr>
<td>6 Rangeesh Venkatesan</td>
<td><a href="mailto:rangeesh@tamu.edu">rangeesh@tamu.edu</a></td>
</tr>
<tr>
<td>7 Grayson Woods</td>
<td><a href="mailto:graysonwoods@tamu.edu">graysonwoods@tamu.edu</a></td>
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Time and Place:

Lectures

Sections 501 – 504, Dr. Kim
Monday & Wednesday 10:20 AM - 11:10 AM
MEEN (JCAIN) 202

Sections 505 – 508 Dr. Hasnain
Tuesday & Thursday 8:25 AM - 9:15 AM
Richardson (RICH) 101

Sections 509-512 Dr. Palazzolo
Monday & Wednesday 11:30 AM - 12:20 PM
Heldenfels (HELD) 105

Sections 513-516 Dr. Gopalswamy
Monday & Wednesday 10:20 AM - 11:10 AM
Richardson (RICH) 106
LABS: ALL LABS WILL BE HELD IN THE COMMON CONTROL LAB ZACH 230

Office Hours:

Dr. Palazzolo – Tu, Th, Fr: 1:30 – 2:30 pm (MEOB 123)

Dr. Kim - M and W 12:20 – 1:50 pm (MEOB 223)

Dr. Gopalswamy - M and W 12:20 – 1:50 pm (MEOB 216)

Dr. Hasnain: W 7:00 – 9:00 am and Th 10:00 am – 11:00 am (MEOB 415)

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<thead>
<tr>
<th>TA Office Hrs.</th>
<th>Held In Common Lab</th>
<th>Zach 230</th>
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<tbody>
<tr>
<td>TA 1, Angel</td>
<td>Tu</td>
<td>2 - 3 pm</td>
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<tr>
<td>TA 2, Tianqi</td>
<td>M</td>
<td>9 – 10 am</td>
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<tr>
<td>TA 3, Grayson</td>
<td>M</td>
<td>2 – 3 pm</td>
</tr>
<tr>
<td>TA 4, Rangeesh</td>
<td>W</td>
<td>2 – 3 pm</td>
</tr>
<tr>
<td>TA 5, Kaustubh</td>
<td>F</td>
<td>10 – 11 am</td>
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<tr>
<td>TA 6, Riya</td>
<td>W</td>
<td>9 – 10 am</td>
</tr>
<tr>
<td>TA 7, Burak</td>
<td>Th</td>
<td>2 – 3 pm</td>
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Additional help is available by scheduling an appointment with your instructor or with any of the lab and lecture TAs. The easiest way to reach us is via e-mail.

Textbook:
Course notes are available on eCampus for MEEN 364. The book by Franklin is an excellent supplement to the course notes and is highly recommended, especially for the latter 2/3 of the course on feedback control.

The course textbook is


Additionally, some material regarding modeling of dynamic systems may be presented from *(On reserve at Evans Annex and available Online through library.tamu.edu)*

On-line Course Material:
All course material (notes, lab manuals, homework, ....) will be available through eCampus at http://ecampus.tamu.edu/. Please, check the site frequently, e.g. at least weekly. NOTE: THIS INCLUDES THE DAILY COURSE NOTES AND OLD (PRIOR SEMESTERS) EXAMS 1, 2 AND THE FINAL EXAM.

Use of Computer Software:
This course will introduce you to and make extensive use of two software tools: (1) MATLAB/SIMULINK and (2) LabVIEW. The former will be used for solving homework problems, and for performing all of the control-related labs. The latter will be used in all of the measurement-related labs.

The software tools you will be introduced to in this course are intended to help you solve the various numerical problems you encounter in this course. Such problems would otherwise require extensive number crunching. Even though one could perform symbolic calculations with some of these tools, we highly recommend against it. You could use the symbolic calculators of MATLAB to check some of the mathematics you perform by hand. However, we expect you to know how to do mathematics by hand and you may have to show your skills in the tests. Review notes on various aspects of mathematics needed in this course will be made available on the course web page. It is also OK to use Python if that is what you are accustomed to.

Student Evaluation:
Student grades will be computed as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Homework</td>
<td>10 %</td>
</tr>
<tr>
<td>Common Exam I</td>
<td>20 %</td>
</tr>
<tr>
<td>Common Exam II</td>
<td>20 %</td>
</tr>
<tr>
<td>Final Exam - Comprehensive</td>
<td>25 %</td>
</tr>
<tr>
<td>Laboratory Reports - Group</td>
<td>15 %</td>
</tr>
<tr>
<td>Pre-Lab Reports (3%), Lab Quizzes (5%), &amp; Lab Safety (2%)</td>
<td>10 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100 %</strong></td>
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Common Exams:

There will be two common exams on Weds., February 13, 2019 and Weds., March 27, 2019. Both exams will take place in the 7 PM - 9 PM time period. The exams will include problems and perhaps short answer or multiple choice questions. Exams will be based on individual work and they will be closed book and closed notes. Information you might need from certain tables in the textbook will be made available to you. **NO CALCULATORS WILL BE ALLOWED IN THE COMMON EXAMS AND THE FINAL, UNLESS OTHERWISE SPECIFIED.**

**COMMON EXAM LOCATIONS**

- Dr. Kim’s Sections (501 – 504): CHEM 100
- Dr. Hasnain’s Sections (505 – 508): RICH 106
- Dr. Palazzolo’s Sections (509 – 512): HELD 100
- Dr. Gopalswamy’s Section (513 – 516): CHEM 2102

**There is No Lab, 2nd day Lecture, or Homework Collection the Weeks of the Common Exams**

Absences:

Work missed due to absences will only be excused for University-approved activities in accordance with TEXAS A&M UNIVERSITY STUDENT RULES (see http://student-rules.tamu.edu/rule07). Specific arrangements for make-up work in such instances will be handled on a case-by-case basis. In accordance with recent changes to Rule 7, please be aware that in this class any “injury or illness that is too severe or contagious for the student to attend class” will require “a medical confirmation note from his or her medical provider” even if the absence is for less than 3 days (see 7.1.6.2 injury or illness less than three days).

Policy on Make-up Exams:

Make-up exams will be given only for those with University-excused absences from the regular exams. Contact the instructor as soon as you are aware of the absence so that a make-up exam can be scheduled. Contact the instructor BEFORE the actual exam takes place. Make-up exams will be scheduled by the instructor.

Final Exam:

The final exam will be given as scheduled in the Spring 2019 schedule of classes as follows:

- Sections 501 – 504, Dr. Kim: Monday May 6, 8:00 – 10:00 am
- Sections 505 – 508, 510 Dr. Hasnain: Friday May 3, 1:00 – 3:00
- Sections 509-512 Dr. Palazzolo: Tuesday, May 7, 10:30 am – 12:30 pm
- Sections 513-516 Dr. Gopalswamy: Monday May 6, 8:00 – 10:00 am

The final will be a comprehensive exam. The final exam will be in your lecture classroom.
Homework Assignments:

Homework will be usually e-mailed to you or posted on the course web page on Thursday, and it will be due at 4:00 PM on the following Thursday. Drop off your homework at your instructor’s office. No late homework will be accepted. All written work must be clear and professionally done with the necessary steps leading to the solution clearly marked. Homework solutions will be made available on the course web site. One of the homework problems will be selected for grading randomly and it will carry 80% of the grade for that homework set. The remaining problems will receive a checkmark, if a convincing solution is present they will receive 20% of the grade for that homework set.

Homework is intended to show your individual work. Each student is required to turn-in his or her solutions to the homework assignments. However, you are allowed to form groups or join each other on discussions regarding the problems. Please, read the section on plagiarism below.

Pre-lab Assignments, Lab Quizzes and Laboratory Reports:

Pre-lab assignments will be due at the beginning of the lab sessions. These are not group assignments; each of you must turn in a pre-lab assignment for grading.

Attendance in the labs is mandatory. All students repeating MEEN 364 must repeat the laboratory component. You are strongly advised to come to the labs fully prepared, by reading the relevant material given to you in the lab description and by reviewing the relevant material from the lectures. Lab reports will be the results of your group's effort. They should not be copied from other group’s efforts, which may be treated as cheating. One lab report should be turned in per group. More details regarding pre-labs, lab quizzes and lab reports will be given to you by your lab instructor.

Use of e-mail:

You are required to check your e-mail regularly (at least daily) and stay in touch with the announcements that appear on the class web site. You must make available to the instructor the most reliable e-mail address you have, and/or any changes to it, as soon as possible.

Peer Evaluations:

You might be asked to provide peer evaluation of each lab group member at the end of the semester. Each group member might be asked to evaluate the contribution of every other group member. These evaluations might be considered in determining the numerical score each group member will receive for the lab reports, and whether such score should deviate from the score given to the group. Non-contributing “slackers” may receive significantly lower lab grades than their more productive team members.

Policy on Grading Complaints:
If you feel a mistake was made in grading any material involving (1) points not added or not recorded properly, (2) points taken-off for an answer that is not 100% correct, or (3) for giving partial credit, please write a description of your complaint on the respective page of the assignment within one week after the graded paper was distributed. Turn in the annotated document to your lecture instructor. They will route it to the appropriate grader for re-checking. Please, be very clear and specific about your complaints.

Americans with Disabilities Act (ADA) Policy Statement:

The Americans 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 requires 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 Disability Services, or call 845-1637. For additional information visit http://disability.tamu.edu.

Academic Integrity Statement:

Plagiarism consists of passing off as yours the work that belongs to someone else. As such, you will be committing plagiarism if you present someone else's work as your own, even with the other person's consent. Be aware that such conduct is against University rules and could have serious consequences. If you have questions about this subject, please consult the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

Aggie Honor Code: "An Aggie does not lie, cheat, or steal, or tolerate those who do."

It is the responsibility of students and instructors to help maintain scholastic integrity at the university by refusing to participate in or tolerate scholastic dishonesty (Student Rule 20. Scholastic Dishonesty, http://student-rules.tamu.edu). New procedures and policies have been adopted effective September 1, 2004. Details are available through the Office of the Aggie Honor System (http://www.tamu.edu/aggiehonors). An excerpt from the Philosophy & Rationale section states:

"Apathy or acquiescence in the presence of academic dishonesty is not a neutral act -- failure to confront and deter it will reinforce, perpetuate, and enlarge the scope of such misconduct. Academic dishonesty is the most corrosive force in the academic life of a university."

Aggie Honor Code: "An Aggie does not lie, cheat, or steal, or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the
philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: aggiehonor.tamu.edu

On all course work, assignments, and examinations at Texas A&M University, the following Honor Pledge will apply either implicitly or explicitly by the student:

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

Signature of Student