CEG 770-01: Computer Engineering Mathematics

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Department of Computer Science and Engineering
Wright State University

CEG770 Computer Engineering Mathematics

SYLLABUS
Fall 2010
Drop dates: 9/27 no grade; 10/25 with a W

Time/Place
Section 1: 6:05-7:20pm, M, W Russ 406

Instructor
Dr. Bin Wang, Professor, 491 Joshi Research Center
Tel: (937) 775-5115, E-mail: send email via WebCT by selecting Bin Wang in the send to list
Office hours: 3:00-4:00pm M, W; Other time: open door policy.
I would like the course to run smoothly and enjoyably. Feel free to let me know what you find just, good, and interesting about the course. Let me know sooner about the reverse. See me, leave me a note, or send me email.

TA
None

Prerequisites
CEG 616 (Matrix Computations) and CS 600 (Data Structures and Software Design)

Textbooks

References
Webpage  
News Group  
Software  
Course Objectives  
Students' Responsibilities  
Course Evaluation  
Late Submission of Assignments

http://wisdom.wright.edu
Check daily WebCT for announcements, assignment, homework, questions and answers

We may use Matlab as our primary programming environment. It would be useful for you to have the Student Edition with several of the relevant toolboxes such as Optimization and Signal Processing. You may use RC152C lab. It has Matlab and all the toolboxes needed for this course.

Computer engineering and science students need proficiency in relevant applied mathematics to be able to discover and model difficult real-world computer engineering and science problems. The relationship of these problems to mathematical theory will be discussed. This course provides an introduction to linear and nonlinear programming, probability and stochastic process, and queueing theory. In addition to mathematical theory, appropriate applications will be presented.

You are expected to:
1) read assigned materials prior to class and come up with questions. Reading materials will be assigned in advance.
2) attend classes on a regular and timely basis. Regular class attendance is mandatory and is essential to success in the course. You are responsible for all contents, handouts, and announcements distributed/made in class.
3) complete and turn in your assignments timely. You are expected to write your own programs. Do not copy from or give your work to others, and do not make it possible for others to copy any portions of your work. Violators will receive a zero credit on the assignment.
4) be present for exams at the scheduled times. If there is a catastrophic event that prevents you form taking an exam, please contact the instructor as soon as possible.
5) visit during office hours if you have questions regarding course contents, lectures, handouts, and other problems.

You will receive a final course grade comprised of the weighted score earned on all required course assignments and exams.

Methods:  

<table>
<thead>
<tr>
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<th>% of final grade</th>
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<tbody>
<tr>
<td>1. Mid-term exam</td>
<td>40% (5th week, Oct/11 Monday)</td>
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<tr>
<td>2. Projects/Homework</td>
<td>20%</td>
</tr>
<tr>
<td>3. Final exam:</td>
<td>40% (11/17, Wed, 8:00-10:00pm)</td>
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Total 100%

You may discuss assignments with classmates but all solutions must be original and individually prepared.

You will lose 10% of the total points for an assignment for each 24-hour period (or fraction of a 24 hour period) the assignment is late. Late assignments will be accepted up to 4 days after the due date as specified in the assignment handout. Late penalty is accrued on weekends just as during the week. Partial
Credits will be given to students who turn in partially completed assignments. Special considerations will be given for students who have a medical excuse for late submission (written proof of illness is required). These considerations may extend to medical emergencies involving children or other family members. Such consideration is at the discretion of the instructor, and will be as reasonable and fair as possible. Special consideration may also be given for employment conflicts (e.g. military duty, travel) if brought to the attention of the instructor prior to the due date for an assignment. Course requirements for other courses are NOT a valid reason for special consideration.

Requirements and Policy

Students are expected to have graduate student status. A solid background in matrix algebra is expected. Homework is due at the start of class on date specified. Exceptions may be made in special circumstances: documentation required. No late exams unless verifiable emergency. Sharing ideas and general computer skills with others outside of class is encouraged. Reading assignments will be given for the Textbooks and References above. Unless specific questions are asked, it is assumed that students are studying and understand the material which parallels the lecture. Questions concerning reading assignments are encouraged.

Missed and Exam

Missed exams can be made up only under extenuating circumstances such as medical emergencies and work conflicts as mentioned above. Please see the instructor as soon as possible if you know you will be unable to attend a quiz or exam. You are expected to schedule your departure for any end of quarter travel after your final exam.

Plagiarism

Students are members of a learning community committed to the search for knowledge and truth. Essential to that search is the faithful adherence by all students to the highest standards of honesty and integrity. A grade of “O” or “F” will be assigned to examinations or assignments on which cheating, plagiarism or any other form of academic dishonesty is committed or determined to have occurred. For the detail, see Wright State University Student Handbook under “Academic Dishonesty”.

Lecture Outline

The following is the tentative lecture schedule. Topics may vary.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Contents</th>
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<tbody>
<tr>
<td>Weeks 1-3</td>
<td>Basic concepts in probability and stochastic process; exponential</td>
</tr>
<tr>
<td></td>
<td>distribution, poisson process, Little’s theorem, Markov chain,</td>
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<tr>
<td></td>
<td>balance equations, birth-death process. Selected topics from</td>
</tr>
<tr>
<td></td>
<td>Chapters 1,2,3 of Kleinrock and handouts.</td>
</tr>
<tr>
<td>Weeks 4-5</td>
<td>Queueing Theory Fundamentals; M/M/1, M/M/* . Selected topics from</td>
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<tr>
<td></td>
<td>Chapters 3,4,5 of Kleinrock and handouts.</td>
</tr>
<tr>
<td>Weeks 6-8</td>
<td>Basic concepts of linear programming; the simplex method. Selected</td>
</tr>
<tr>
<td></td>
<td>topics from Chapters 1,2,3,5 of Bronson.</td>
</tr>
<tr>
<td>Weeks 9-10</td>
<td>Nonlinear Programming – KKT conditions. Selected topics from Chapters</td>
</tr>
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<td></td>
<td>10-12 of Bronson.</td>
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