Computer Science & Engineering Syllabi   College of Engineering & Computer Science

Fall 2010

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
1. Queueing Systems, Volume I: Theory, L. Kleinrock, John Wiley & Sons,
   1975.

2. Operations Research, Second Edition, Richard Bronson and Govindasami
   Naadimuthu, Schaum's Outlines, McGraw-Hill, 1997.

References
1. Advanced Mathematics for Engineers and Scientists, Murray R.
   Spiegel, Schaum's Outlines, McGraw-Hill, 1971.

2. Linear and Nonlinear Programming, Stephen G. Nash and Ariela Sofer,
   McGraw-Hill, 1996.

3. Advanced Engineering Mathematics with Matlab, Second Edition,
   Dean G. Duffy, Chapman & Hall/CRC, 2003.

4. Signals and Systems, Hwei P. Hsu, Schaum's Outlines, McGraw-Hill,
   1995.

5. Digital Signal Processing: A Practical Approach, Second Edition,
   Emmanuel Ifeachor and Barrie Jervis, Prentice-Hall, 2002.

6. Matrix Theory: A Second Course, James M. Ortega, Plenum Press,
   1987.

7. An Introduction to Difference Equations, Second Edition, Saber Elaydi,
   Springer-Verlag, 1999.

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

Software

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.

Course Objectives

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.

Students' Responsibilities

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.

Course Evaluation

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

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

Late Submission of Assignments

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 "0" 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.

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