Fall 2004

CEG 770: Computer Engineering Mathematics

Yong Pei
Wright State University - Main Campus, yong.pei@wright.edu

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CEG 770 Computer Engineering Mathematics
4 Credits, Fall Quarter 2004
Syllabus

Time/Place: Lecture: 4:10 – 5:25 PM, M. & W., 144 Rike Hall
Instructor: Dr. Yong Pei, 340 Russ Engineering Center
             Tel. 937-775-5111, Email: ypei@cs.wright.edu
             Office Hours: 2:30-4:30pm, Tu.

Description: 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, queueing theory, mathematics of signal
processing, difference equations, and related differential and matrix equations. In addition to
mathematical theory, appropriate applications will be presented.

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

Textbooks:
4. Advanced Mathematics for Engineers and Scientists, Murray R. Spiegel, Schaum's Outlines,

References:

Software: We will 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 Website: Through WebCT
Grading:

- Mid-term exam 30%
- Final exam 40%
- Projects and Homework assignments 30%

(including textbook problems/programming)

Requirements and Policy:

Students are expected to have graduate student status. A solid background in matrix algebra is expected. HW 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.

All work must be your own. However, 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.

Schedule: Topics may vary Exam dates are firm.

**Week**  **Topic/Tests etc.**

1-3  Basic concepts of linear programming; the simplex method. Selected topics from Chapters 1,2,3,5 of Bronson.

3-4  Nonlinear Programming – basic descent methods, conjugate directions and Newton methods. Selected topics from Chapters 10-12 of Bronson.

5-8  Queueing Theory.

(Mid-term exam in the 5th week)

9-10 Mathematical Foundations of Systems and Signals with Applications. Selected topics from Chapters 4, 7, 8, and 13 of Spiegel and Chapters 1-4 of Hsu.

10  Advanced Topics in Digital Signal Processing (as time permits). Chapter 3 of Ifeachor and Jervis.

Final Exam.