

The University of Kansas
Electrical Engineering and Computer Science
EECS-863 Analysis of Communication Networks
Spring Semester 2008

1. *General Information*

- Place, Times, Credits:** 1131 Learned, 2:30 - 3:50 TR, 3 credit hours
Prerequisites: EECS 861 (Random Signal Theory), Recommended: EECS 562 and EECS 663
Text: *Modeling and Analysis of Telecommunications Networks*,
J. F. Hayes and T. V. J. Babu, Wiley, 2004.
References: *Random Signals: Detection, Estimation and Data Analysis*,
Shanmugan and Breipohl, Wiley, 1988.
Computer Networks and Systems, 3E, Robertazzi, Springer, 2000.
Queueing Systems, Vol I and II, Kleinrock, Wiley, 1975.
Data Networks, Bertsekas and Gallager, Prentice Hall, 1992.
Performance Analysis of Local Computer Networks,
Hammond and O'Reilly, Addison Wesley, 1986.
Professor: David W. Petr
Office Hours: 2001C Eaton: 4:00-5:00 pm TR, 3:00-4:00 pm W, or by appointment
206 Nichols Hall: by appointment
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2. *Course Description (Catalog)*

Modeling and analysis for performance prediction of communication networks. Topics include: an introduction to queueing theory; analysis of TDM systems; modeling and analysis of networks of queues; analysis of congestion and flow control algorithms; analysis of routing algorithms; analysis of bus and ring networks.

3. *Tentative Course Schedule (subject to change)*

<u>Topic</u>	<u>Meetings (75 min)</u>
Course introduction	1
Discrete-time Markov chains	3
Continuous-time Markov chains	1.5
Queueing and blocking systems	4.5
Simulation	1.5
Delay and departure analysis	2
Systems with arbitrary service processes	5
Networks of queues	6
Polling networks	1
Other Topics, Student Presentations, etc.	4.5
Midterm Exam	1
Final Exam	Wednesday 14 February 1:30-4:00 pm

4. Policies

4.1 Prerequisites

The material in the prerequisite courses (especially EECS 861) is important background for this course. See me if you have questions about the prerequisites.

4.2 Grade Composition and Letter Grades

The following course components and weights are subject to change pending class discussions about projects, student presentations, etc.

Homework	20%
Midterm Exam	20%
Projects	20%
Student Presentations	20%
Final Exam	20%
<hr/> Total	<hr/> 100.0%

The mapping from your final course score to your grade for the course will be based *to a first approximation* on the standard thresholds of 90% for an A, 80% for a B, 70% for a C, etc. However, I reserve the right to adjust these thresholds based on the final distribution of final course scores. As an example of what I mean by this, if there are several students with scores between 94% and 99%, several more with scores between 86% and 91%, and none in between, the entire second group of students would likely get the same grade, which would likely be a B. The thresholds could also be moved down, e.g., under other circumstances I may assign a student with a score of 89% an A. I will expect the quality of work (and hence the grades) to be consistent with the fact that this is a graduate-level course.

4.3 Exams

All exams are closed book. I will provide any reference information (tables, etc.) I think you may need. You will also be allowed one 8 1/2 by 11 sheet of notes (one side) for each exam. All exams (including the final exam) should be considered to be cumulative (since course material tends to build on previous material), but each exam (including the final exam) will concentrate on material not yet tested. The final exam (if there is to be one) is not optional.

4.4 Make-Ups

Make-up exams given only if: 1) I am informed in **ADVANCE** of the exam (in person or by phone conversation, email, voice mail, message left with secretary, or some other means), and 2) I deem the reason to be sufficiently meritorious (job interviews are not). If the reason is illness, I **REQUIRE** documentation of the illness from a health-care professional. This documentation can be provided after the exam.

4.5 Homework

There will be approximately one homework assignment each week, usually given on Tuesday and due the following Tuesday. Homework will be turned in during class. Late homework will NOT be accepted except for rare extenuating circumstances. Problems must be stapled together and include student name, KUID, course number and date due. Generally only a subset of the problems will be graded, but you are responsible for all problems assigned. Problem solutions (for all problems) will be made available on the course website.

4.6 Projects

I expect to assign two or three projects during the semester in addition to regular homework. At least one of these will involve computer simulation of networks.

4.7 Reading

You will be held responsible for all reading material assigned, even if it is not explicitly covered in lecture. Material

from reference texts that is essential to the course will be provided to you.

4.8 Academic Misconduct

Although I encourage students to *study* together, *cheating* will be dealt with severely, with penalties up to and including a grade of F in the class and referral to the Dean. Cheating is essentially representing someone else's work as your own. Cheating includes, but is not limited to copying solutions/answers from another student or from a solution manual, having another student do your work for you, using a simulation model that another student has developed/debugged, etc. If you are ever in doubt about what level of collaboration is acceptable, contact me.

4.9 Course Website

The course website will contain supplemental information and resources for this course, as well as electronic copies of all assignments and solutions. It will be updated from time to time as the course progresses. The site can be found by following links from <http://www.eecs.ku.edu>. Notify me if you have difficulty accessing this site.

5. Dates of Interest

16 January	Wednesday	Last day to drop with full refund
24 January	Thursday	Last day to add a class on-line
24 January	Thursday	Last day to drop with 90% refund
7 February	Thursday	Last day to drop on-line (no transcript record)
14 February	Thursday	Last day to drop with 50% refund
13 March	Thursday	Midterm Exam (tentative date)
15-23 March	Sat-Sun	Spring Break
17 April	Thursday	Last day to withdraw (WP or WF on transcript)
8 May	Thursday	Last day of classes
14 May	Wednesday	Final exam: 1:30 - 4:00 pm

NOTICES

Disabilities: The KU Office of Disability Resources (DR) coordinates accommodations and services for all eligible students with disabilities. If you have a disability and wish to request accommodations and have not contacted DR, please do so as soon as possible. Their office is located in 22 Strong Hall; their phone number is 785-864-2620 (V/TTY). Information about their services can be found at <http://www.disability.ku.edu/>. Please also contact me privately in regard to your needs in this course.

Course Materials: Course materials prepared by the instructor, together with the content of all lectures and review sessions presented by the instructor, are the property of the instructor. Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited. On request, the instructor will usually grant permission for students to audio tape lectures, on the condition that these audio tapes are only used as a study aid by the individual making the recording. Unless explicit permission is obtained from the instructor, recordings of lectures and review sessions may not be modified and must not be transferred or transmitted to any other person, whether or not that individual is enrolled in the course.

Dropping/Withdrawing from Class: An engineering course can be dropped between the start of classes and [the date shown above] with no record of the enrollment appearing on the student's transcript. After that date, a student may withdraw from a class (receive a "WP" or "WF" on the transcript, assigned by the instructor) until [the date shown above]. This is the last opportunity to withdraw from a class.

Also, any student on probation will violate the probation agreement if he or she drops or withdraws from a course without obtaining prior permission from the associate dean.