IE 334 Operations Research III – Stochastic Problems (3 2 4) (ECTS: 7)
2019-2020 Fall – Tentative Syllabus

Instructors:

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Catalog Description:

Introduction; review of basic concepts of probability and properties of random variables; basics of decision making under uncertainty; discrete-time Markov chains; exponential distribution and Poisson process; queuing theory; probabilistic inventory models; probabilistic dynamic programming.

Text Book:

Operations Research - Applications and Algorithms, Wayne L. Winston, 4th Edition, Cengage Learning, 2004.

Supplementary Texts:

- Frederick S. Hillier and Gerald J. Lieberman, Introduction to Operations Research, 10th Edition, McGraw Hill, 2015.
- Taha, H.A., Operations Research, Prentice Hall, 8th ed., 2007.
- Sheldon M. Ross, Introduction to Probability Models, 10th Edition, Elsevier, 2010.

Tentative Course Schedule:

Week	Topic
1	Review of Probability, Random Variables, Sample Space, Conditional Probability, Distributions and Expectations.
2	Basic Principles of Decision Making Under Uncertainty, Decision Criteria
3	Utility Theory, Decision Trees
4	Markov Chains: *n-Step Transition Probabilities, Classification of States*
5	Markov Chains: *Mean First Passage Times, Steady State Probabilities*
6	Markov Chains: *Absorbing Chains, Applications of Markov Chains*
7	Properties of Exponential Distribution, Counting Process, Poisson Process
8	Queuing Models: *Terminology, Arrival and Service Processes, Birth-and Death Processes*
9	Queuing Models: *M/M/1, M/M/s queues*
10	Queuing Models: *M/G/∞, GI/G/∞, M/G/1 queues, Finite Source Models*
11	Probabilistic Inventory Models: *The Newsvendor Problem*
12	Probabilistic Inventory Models: *The EOQ with uncertain Demand* ((*r, q*) *and* (*s, S*) *models*)
13	Probabilistic Inventory Models: *Service Level Measures*
14	Review

Class Meeting Hours:

	Lecture	Recitation
Section 1	Mon. 09:20-12:10 (LA14)	Thu. 09:20-11:10 (LA14)
Section 2	Tue. 09:20-12:10 (LA14)	Fri. 09:20-11:10 (LA14)

- There will be no lectures on 21.10.2019 Monday (Section 1), and 29.10.2019 Tuesday (Section 2). Make-up lectures will be announced later.

Tentative Grading:

% 30 Homework Assignments (3 assignments, each is 10%)

% 33 Midterm Exam

% 37 Final Exam

Letter grades will be mainly based on the catalogue grading system described in Çankaya University regulations.

Note that the instructor reserves the right to modify these percentages in case he finds it necessary.

Academic Integrity: All students admitted to Çankaya University are expected to act honestly and ethically. Therefore, any form of dishonesty will not be tolerated. Every student should declare his/her understanding and belief in the Honor Code stated by the department for the examinations and assignments.

Make-up Exams: Make-up exam will be given based on Çankaya University Regulations for unanticipated absences and with valid excuse ONLY (e.g., illness with a doctor's report). If a student misses midterm exam and/or final exam with a valid excuse, then she/he will get one make-up exam for each. ***A make-up exam may have a different format and may contain different type of questions than the regular exam***.

Attendance: Attendance will be taken every lecture hour. It is strongly recommended to attend all the lecture hours to understand the course material.

Conditions that lead to the letter grade "NA":

Any of the following will lead to letter grade NA.

- If you fail to take the midterm exam (or its makeup), you will NOT be able to take the final exam and you will receive the letter grade NA.
- If you are eligible to take the final exam but fail to take it (or its makeup), you will receive the letter grade NA.

Course Website:

- Communication will be made through course page at http://webonline.cankaya.edu.tr
- Announcements, lecture notes, grades, and other information will be uploaded to course page.
- Every student should check the course page regularly. Students are also responsible for printing the course material (lecture notes, exercises, etc.) from the course web page.

Exams and Homework Assignments:

- There will be one midterm exam, final exam, and three homework assignments in this course.
- In exams the students may need a calculator, so they should bring their calculators to all exams. (Use of cellular phones instead of calculators will not be allowed.)
- In *homework assignments*, students should work in teams of *maximum three students*.
  - It is the student's responsibility to find his/her team members.
  - Each team should submit a single written document including their work for each homework assignment.

NOTE THAT EVERYTHING ON THIS SYLLABUS IS SUBJECT TO CHANGE. STUDENTS WILL BE NOTED ABOUT ANY CHANGE.