COURSE SYLLABUS

Course Code: IENG312                  Course Title: Operations Research II      Semester: Fall 2009-10
Credit Hours: (3,1)3                    Prerequisites: IENG312           ECTS VALUE 8

Lecturer: Assoc.Prof. Haluk S. Balkan

Group 1 Class Hours Mon. & Wed. 8:30-10:20  ☎: +90 392 630 1441
Office Hours: Mon, Tue 10:30-12:30

Office: IE Building, 1st Floor,
Room IE B-103
E-Mail: haluk.balkan@emu.edu.tr

Catalogue Data: This course introduces uncertainty, risk and probabilistic approaches. Basic mathematical models will be covered for stochastic processes, queues, inventory systems, and decision analysis. Basic models, such as discrete and continuous time Markov chains, Markov Processes, M/M/c queuing systems, decision trees, and elementary solution techniques related to these models are discussed.

Course Goals: The main goal of this course is to:

- Develop skills for modeling and decision making under uncertainty,
- Emphasize on the analytic approach to probabilistic modeling,
- Formulate models for real-life situations involving uncertainty,
- Use computer software for solving real-life problems, and interpret the results.

General Learning Outcomes: On successful completion of the course, a student should have sufficient knowledge and understanding of:

- Probabilistic modeling of simple inventory models,
- Decision making under uncertainty,
- Utility theory approach to decision making,
- Use of decision tree as an optimization tool,
- Game theory models and their analysis,
- Markov chain models as a powerful tool,
- Poisson process models,
- Queuing models.

Competencies: On successful completion of the course, all students will have developed their skills in:

- Formulation of probabilistic and stochastic models arising in diverse real-life problems,
- Solving queuing theory, game theory, and Markov chain models,
• Optimal decision making under uncertainty,
• Using related computer software effectively,
• Using Poisson process as a powerful tool.

On successful completion of the course, all students will have developed their appreciation of and respect for **values and attitudes** regarding the issue of:

• Impact of uncertainty in decision making,
• Role of stochastic modeling in real-life situations,
• The role of Poisson process & Markov chains,
• Impact of computer software in obtaining solutions.

**Relationship with Other Courses:**
This is a first course on probabilistic operations research models and the techniques for their analysis. Most of the following courses use extensive knowledge of concepts and techniques developed in this course.

**Textbook:**

**References**

**Computer Usage:**
Assignments will be given which should be solved using statistical and other program packages available in IE the Computer and Optimization Laboratory.

**Grading Policy:**
The lecturer will base the final course grade on the general assessment of students. The following scale is supplied to give the student an approximate idea about the relative importance of various assessment tools:

Assignments & Quizes: 20%  
Midterms: 2 x 25%  
Quiz: 15%  
Final Examination 30%.

**Attendance:**
Attendance and contributions made by students will be taken every lecture hour. Note that university regulations allow the instructor to give a grade of NG to a student whose absenteeism is more than 25% of the total lecture hours or who do not complete sufficient work. In this course any student who has an absenteeism of 14 or more class hours and deserves a failing grade (D- or F) will get a grade of NG instead. If a student has excuse backed by valid documentation which should be submitted within 3 days of final examination (or end of excuse whichever is later) a make-up examination will be given at a suitable time for the final examination. A student will get a zero grade from all examinations and quizzes if no valid excuse is given as explained above. No make-up examination will be given for any Midterm or quizzes missed with a valid excuse and their percentage contributions will be added to the percentage contribution of the final examination. Assignments not handed in on due dates will not be collected and zero grade will be awarded.

**Academic Dishonesty:**
Any act not suitable for a university student will not be tolerated and may lead to formal disciplinary action.
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<thead>
<tr>
<th>Date Range</th>
<th>Topic</th>
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<tbody>
<tr>
<td>5-7 Oct. 2009</td>
<td>Decision Making under Uncertainty</td>
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<tr>
<td>12-14 Oct. 2009</td>
<td>Utility Theory</td>
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<td>16 Oct. 2009</td>
<td>Quiz 1 at 16:30 Place: IE-D101</td>
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<td>19-21 Oct. 2009</td>
<td>Decision Making under Probabilistic conditions and Decision trees</td>
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<td>26-28 Oct. 2009</td>
<td>Game Theory</td>
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<td>2-4 Nov. 2009</td>
<td>Game Theory (a 20 min. quiz #2 on Wed.)</td>
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<td>9-11 Nov. 2009</td>
<td>Markov Chains</td>
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<td>13-25 Nov. 2009</td>
<td><strong>First Midterm Examinations Period</strong></td>
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<td>2 Dec. 2009</td>
<td>Markov Chains</td>
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<td>7-9 Dec. 2009</td>
<td>Markov Chains</td>
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<td>14-16 Dec. 2009</td>
<td>Poisson Process</td>
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<td>21-23 Dec. 2009</td>
<td>Queuing Models (a 40 min. quiz #3 on Mon.)</td>
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<td>25 Dec. 2009</td>
<td><strong>Second Midterm Examination, Time 16:30</strong></td>
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<td>28-30 Dec. 2009</td>
<td>Queuing Models</td>
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<tr>
<td>4-6 Jan 2010</td>
<td>Queuing Models (a 40 min. quiz #4 on Wed.)</td>
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This schedule may be further revised due to force major condition.