1. This mission of the College is to serve business and society in the global economy through developing professionally qualified and socially responsible business leaders as well as through advancing the frontiers of knowledge in business management.

2. The strategic objective of Department of Industrial and Information Management-Graduate Program /Institute of Information Management is to Cultivate industrial and information management professionals who possess TIP (Technological knowledge, Innovative foundation, and Perceptive learning).

Graduate Program Learning Goals (goals covered by this course are indicated by checks):

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>✓</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>✓</td>
<td>5</td>
</tr>
</tbody>
</table>

Instructor:

Shine-Der Lee, Ph.D., Professor  
Phone: #53146  
Email: sdlee@mail.ncku.edu.tw  
Class hours/Location: Monday 14:10-16:00PM, Wednesday 15:10-16:00PM, IIM 61202  
Office hours: Monday 16:00-17:30PM, Wednesday 16:00-17:30PM, or by appointment, to be announced

Course Description:

The knowledge of simulation is useful, if not essential, to anyone pursuing graduate work in any of the engineering, management, or science fields. This is an advanced course of simulation modeling at the graduate level. The purposes are to introduce students with formal notions and theories of simulation, and to illustrate, explore the rich diversity of simulation modeling and analysis techniques for real applications to appropriate problems.

Course Objectives:

The objective of this course is to provide students with the formal concepts and underlying theories for the modeling and analysis of simulation. The course is methodology oriented and applications of the probability/statistics theories are observed. The interplay of data/input
analysis, modeling, validation and verification, and output analysis are also stressed to show the iterative nature of simulation modeling. Topics include: concepts of system simulation, review of probabilities and statistics, verification and validation, input distributions, random number generators and random variates, output analysis, ranking and selection, and variance reduction techniques. The primary goals of this course are:

- To demonstrate the interplay of iterative simulation process, including problem formulation, model building, design and analysis, and implementation, using well-established simulation modeling and analysis techniques.
- To introduce various simulation modeling and analysis techniques for solving a variety of industrial engineering and management science problems.
- To establish a solid foundation for advanced study in simulation field.

**Content Summary:**

Topics included but not limited to:

- Administration and introduction (1 week)
- Concepts of system simulation (2 weeks)
- File manipulation (1 week)
- Review of probabilities and statistics (1 week)
- Verification and validation (1 week)
- Input distributions (2 weeks)
- Random number generators (2 weeks)
- Random variates (2 weeks)
- Output analysis (2 weeks)
- Ranking and selection (1 week)
- Variance reduction techniques (1 week)

**Textbook:**


**Recommended references:**

- Rossetti, Simulation modeling and ARENA, 2010, John-Wiley
- Fisherman, Principles of discrete event simulation, 1978, John-Wiley
- Bratley, Fox & Schrage, A guide to simulation, 1987, Springer-Verlag

**Course Requirement:**

- Class rules will be strictly enforced, turn off your electronic devices. Audio-video recording is allowed only with explicit permission from the instructor.
- Homework will be assigned every week. It is due in the first meeting of the coming week.
Submit your homework with letter or A4 size papers. No late or sloppy homework will be accepted.

• No make up exams

**Grading policy:**

✧ Homework 30%
✧ Mid-term Exam 30%
✧ Final Exam 30%
✧ Class participation, Q&A ±10%

**Grading Policy for AACSB Multiple Assessment:**

<table>
<thead>
<tr>
<th>Category</th>
<th>Midterm</th>
<th>Attitude</th>
<th>Homework, participation</th>
<th>Essay</th>
<th>Final exam (report)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☑ Speaking</td>
<td>30%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☑ Writing</td>
<td>30%</td>
<td>40%</td>
<td></td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>☑ Inter-disciplinary Competence / Problem Solving</td>
<td>30%</td>
<td>30%</td>
<td>20%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>☑ Critical Thinking/ Innovation</td>
<td>30%</td>
<td>30%</td>
<td>20%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>LEAD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Leadership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Ethical Reasoning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GLOB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☑ Global Vision</td>
<td>10%</td>
<td>10%</td>
<td></td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>VSP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☑ Teamwork</td>
<td>30%</td>
<td></td>
<td></td>
<td></td>
<td>20%</td>
</tr>
</tbody>
</table>