Description: Simulation A

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cat-Nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
<th>Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC</td>
<td>4406</td>
<td>20372</td>
<td>1, 2003</td>
<td>ONC</td>
<td>1.00</td>
<td>TWMBA</td>
</tr>
</tbody>
</table>

Academic Group: FOSCI
Academic Org: FOS003
HECS Band: 2
ASCED Code: 020307

STAFFING
Examiner: Mike McFarlane
Moderator: David Mason

PRE-REQUISITES
Pre-requisite: CSC3409

RATIONALE
Systems simulation is commonly regarded as an essential component of the development, modification, and understanding of significant complex industrial and commercial processes and practices, as well as in the design and analysis of complex information systems. Consequently, there is a need for Honours graduates to have highly developed skills in the design, development, and analysis of models of complex systems and be able to do so in ways which support both exploratory approaches and statistical experiments.

SYNOPSIS
This course enables students to explore advanced systems modelling strategies commonly used in the development, modification, and understanding of complex industrial and business processes and practices. Emphasis is placed upon the representation and modelling of stochastic processes using discrete event, continuous, and dynamic methodologies. The major focus of the course will be placed upon validation, and interpretation of the outputs of systems simulation models. Students may use high level languages such as ARENA and SIMSCRIPT in their investigations.

OBJECTIVES
On successful completion of this course students will be able to:

- apply advanced knowledge and skills to the specification, design, development, and interpretation of simulation models of complex systems;
• demonstrate familiarity with current developments and literature in systems simulation;
• identify and fit appropriate distributions to empirical data
• apply principles of precision control to the estimation of parameters;
• utilise Markov methods in systems simulation;
• design, develop, and interpret simulation models of large complex systems using high level software.

TOPOICS

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stochastic processes: Queuing Theory, Distributions Parameter estimation</td>
<td>10.00</td>
</tr>
<tr>
<td>2. Markov methods in simulation</td>
<td>5.00</td>
</tr>
<tr>
<td>3. Precision control: general principles</td>
<td>5.00</td>
</tr>
<tr>
<td>4. Variance reduction techniques</td>
<td>5.00</td>
</tr>
<tr>
<td>5. Sensitivity Analysis and Importance sampling</td>
<td>5.00</td>
</tr>
<tr>
<td>6. Pitfalls in systems modelling</td>
<td>10.00</td>
</tr>
<tr>
<td>7. Contemporary developments in systems simulation</td>
<td>5.00</td>
</tr>
<tr>
<td>8. Development and interpretation of simulation models</td>
<td>55.00</td>
</tr>
</tbody>
</table>

TEXT and MATERIALS required to be PURCHASED or ACCESSED:

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.


REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.


**STUDENT WORKLOAD REQUIREMENTS**

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>28</td>
</tr>
<tr>
<td>Private Study</td>
<td>40</td>
</tr>
<tr>
<td>Project Work</td>
<td>100</td>
</tr>
<tr>
<td>Seminars</td>
<td>3</td>
</tr>
</tbody>
</table>

**ASSESSMENT DETAILS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSIGNMENT 1</td>
<td>10.00</td>
<td>10.00</td>
<td>Y</td>
<td>21 Mar 2003</td>
</tr>
<tr>
<td>PROJECT PROPOSAL</td>
<td>10.00</td>
<td>10.00</td>
<td>Y</td>
<td>04 Apr 2003</td>
</tr>
<tr>
<td>ASSIGNMENT 2</td>
<td>15.00</td>
<td>15.00</td>
<td>Y</td>
<td>18 Apr 2003</td>
</tr>
<tr>
<td>PROJECT</td>
<td>65.00</td>
<td>65.00</td>
<td>Y</td>
<td>13 Jun 2003</td>
</tr>
</tbody>
</table>

**IMPORTANT ASSESSMENT INFORMATION**

1. Attendance requirements:
   It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.

2. Requirements for students to complete each assessment item satisfactorily:
   To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available for each assessment item.

3. Penalties for late submission of required work:
   If students submit assignments after the due date without adequate reason then a penalty of 10% of the total marks available for the assignment may apply for each working day late.

4. Requirements for student to be awarded a passing grade in the course:
   To be assured of a passing grade, students must demonstrate, via the summative assessment items, that they have achieved the required minimum standards in relation to the objectives of the course by satisfactorily completing all summative assessment items (like assignments).

5. Method used to combine assessment results to attain final grade:
   The final grades for students will be assigned on the basis of the weighted aggregate of the marks obtained for each of the summative assessment items in the course.

6. Examination information:
There is no examination in this course.

7 Examination period when Deferred/Supplementary examinations will be held:
   There will be no Deferred or Supplementary examinations in this course.

8 University Regulations:
   Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10
   Academic Misconduct for further information and to avoid actions which might
   contravene University Regulations. These regulations can be found at the URL
   http://www.usq.edu.au/SECARIAT/calendar/Part5/ or in the printed version of the
   current USQ Handbook.

ASSESSMENT NOTES

9 The due date for an assignment is the date by which a student must despatch the
    assignment to the USQ. The onus is on the student to provide proof of the despatch
    date, if requested by the Examiner.

10 Students must retain a copy of each item submitted for assessment. This must be
    produced within five days if required by the Examiner.

11 In accordance with University policy, the examiner may grant an extension of the
    due date of an assignment in extenuating circumstances.

12 The Faculty will NOT accept submission of assignments by facsimile.

OTHER REQUIREMENTS

1 Students will be required to have access to ARENA software - supplied with Text.