**Course Specification**

**Description: Discrete Mathematics for Computing**

<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>MAT</td>
<td>1101</td>
<td>28131</td>
<td>3, 2003</td>
<td>EXT</td>
<td>1.00</td>
<td>TWMBA</td>
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</table>

**Academic Group:** FOSCI  
**Academic Org:** FOS003  
**HECS Band:** 2  
**ASCED Code:** 010101

**STAFFING**

Examiner: Walter Spunde  
Moderator: Sam Farrell

**RATIONALE**

Discrete methods underlie the areas of data structures, computational complexity and the analysis of algorithms. Recent advances in technology - particularly in applications of computing - have enhanced the importance of discrete (or finite) mathematics as a basis for understanding the foundations of computing and for further studies in computer analysis and applications.

**SYNOPSIS**

This course introduces the basic elements of discrete mathematics which provide a foundation for an understanding of algorithms and data structures used in computing. Topics covered include number systems, logic, relations, functions, induction, recursion, Boolean algebra and graph theory.

**OBJECTIVES**

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

- demonstrate an understanding of a wide range of discrete methods;
- demonstrate proficiency at an introductory level in a wide range of discrete techniques;
- demonstrate understanding and proficiency in basic algorithmic techniques;
- demonstrate proficiency in mathematical reasoning and construction of proofs.
**TOPICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Base Changes, Real Numbers and Computer Representation</td>
<td>15.00</td>
</tr>
<tr>
<td>2. Sets, Functions, Relations and Algorithms</td>
<td>20.00</td>
</tr>
<tr>
<td>3. Logic</td>
<td>15.00</td>
</tr>
<tr>
<td>4. Proof</td>
<td>15.00</td>
</tr>
<tr>
<td>5. Recursion</td>
<td>10.00</td>
</tr>
<tr>
<td>6. Boolean Algebra</td>
<td>10.00</td>
</tr>
<tr>
<td>7. Graphs and Trees</td>
<td>15.00</td>
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</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.


Study Book 2003, *Course MAT1101 Discrete Mathematics for Computing*, USQ Distance Education Centre, Toowoomba.

**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>Assessment</td>
<td>30</td>
</tr>
<tr>
<td>Examinations</td>
<td>3</td>
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<tr>
<td>Private Study</td>
<td>140</td>
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ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>ASSIGNMENT 1</td>
<td>30.00</td>
<td>15.00</td>
<td>Y</td>
<td>12 Dec 2003</td>
</tr>
<tr>
<td>ASSIGNMENT 2</td>
<td>30.00</td>
<td>15.00</td>
<td>Y</td>
<td>09 Jan 2004</td>
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<tr>
<td>3 HOUR RESTRICTED EXAMINATION</td>
<td>100.00</td>
<td>70.00</td>
<td>Y</td>
<td>END S3</td>
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</table>

IMPORTANT ASSESSMENT INFORMATION

1. Attendance requirements:
   There are no attendance requirements for this course. However, it is the students' responsibility 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 prior approval then a penalty of 10% of the total marks available for the assignment will apply for each working day late.

4. Requirements for student to be awarded a passing grade in the course:
   To be assured of receiving a passing grade a student must submitting all summative assessment items and gaining at least 50% of the marks available for each summative assessment item.

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

6. Examination information:
   In a Restricted Examination, candidates are allowed access to specific materials during the examination. The only materials that candidates may use in the restricted examination for this course are: writing materials (non-electronic and free from material which could give the student an unfair advantage in the examination); calculators; One A4 sheet, written or typed on one or both sides with any material the student wishes to have. Translation dictionary. Students whose first language...
is not English, may, with the Examiner's approval, take an appropriate non-
electronic translation dictionary into the examination. Students who wish to use a
translation dictionary MUST request and receive written approval from the
Examiner at least one week before the examination date. Translation dictionaries
will be subject to perusal and may be removed from the candidate's possession
until appropriate disciplinary action is completed if found to contain material that
could give the candidate an unfair advantage.

7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during
the examination period at the end of the semester of the next offering of 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 Students must retain a copy of each assignment submitted for assessment. If
requested, students will be required to provide a copy of assignments submitted
for assessment purposes. Such copies should be despatched to USQ within 24 hours
of receipt of a request being made.

10 Students who, for medical, family/personal, or employment-related reasons, are
unable to complete the examination at the scheduled time may apply to defer an
assessment in this course. Such a request must be accompanied by appropriate
supporting documentation. One of the following temporary grades may be awarded
IDS (Incomplete - Deferred Examination; IDM (Incomplete Deferred Make-up);
IDB (Incomplete - Both Deferred Examination and Deferred Make-up).

11 It is desirable for students to have access to e-mail and internet access to
USQConnect for this course.