Description: Educational Use of Computers in the Mathematics Classroom

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cat-nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
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<tr>
<td>EDU</td>
<td>4222</td>
<td>35069</td>
<td>2, 2004</td>
<td>ONC</td>
<td>1.00</td>
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Academic group: FOEDU
Academic org: FOE002
Student contribution band: 1
ASCED code: 070100

STAFFING
Examiner: John Green
Moderator: Leo Crameri

RATIONALE
Just as graphing calculators had a major impact on the teaching and learning of mathematics in schools, computers are revolutionising the way mathematical reasoning is conveyed to the typical school learner. Such changes are occurring at a time when pre-service teachers generally reflect on their own mathematics education experiences and question their ability to teach the subject meaningfully. Recent years have seen a growing prominence of software that is specially developed for the use of teachers of school mathematics. When used in appropriate teaching contexts this software has the potential to illuminate a child's conception of mathematical principles in ways previously deemed unimaginable. This elective course serves to strengthen the use of computers as a pedagogical tool and to prepare teachers for the time when all students will have access to computers.

SYNOPSIS
The course serves to advance the pedagogy, theory and quality of teaching and learning in Primary and Middle School mathematics using computing technologies. This will heighten a teacher’s appreciation of the pedagogical implications associated with the introduction of computers into the mathematics curriculum. The course is practical in nature involving considerable first hand experiences at assessing, using and evaluating a large variety of mathematics education software. At the same time, it will assist pre-service teachers to grow in their personal, practical theories about teaching mathematics. Throughout the course, links between key mathematical concepts important in the Primary and Middle School mathematics curriculum will be established.
OBJECTIVES
Upon the successful completion of this course students will be able to:

1. describe currently researched and recommended strategies for teaching certain mathematical concepts with the aid of computers
2. evaluate new mathematics education software packages as they become available
3. utilise computers in the teaching and learning of mathematics
4. navigate their way through novel software packages without the need for formal training
5. establish links between key mathematical concepts that are important in the P-10 mathematics curriculum
6. construct appropriate strategies and responses for addressing certain classroom scenarios
7. modify such strategies to suit particular needs and situations
8. demonstrate an ability to test such responses that have been, in the context of group meetings, exposed to adaptation and refinement
9. demonstrate frameworks for thinking about and articulating their own approaches to teaching mathematics with the aid of computers.

TOPICS

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>1. Research and evaluation on teaching mathematics with computers</td>
<td>25.00</td>
</tr>
<tr>
<td>2. Teaching &quot;space&quot; with computers</td>
<td>15.00</td>
</tr>
<tr>
<td>3. Teaching &quot;number&quot; with computers</td>
<td>15.00</td>
</tr>
<tr>
<td>4. Teaching &quot;measurement&quot; with computers</td>
<td>15.00</td>
</tr>
<tr>
<td>5. Teaching &quot;chance and data&quot; with computers</td>
<td>15.00</td>
</tr>
<tr>
<td>6. Teaching &quot;algebra&quot; with computers</td>
<td>15.00</td>
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TEXT and MATERIALS required to be PURCHASED or ACCESSED:
ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility.
at http://bookshop.usq.edu.au click 'Semester', then enter your 'Course Code' (no spaces).

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.


Hazzan, O 2000, , *Attitudes of prospective school mathematics teachers towards integrating information technologies into their future teaching*, San Diego, California, Vol 1-3. no. . (Society for Information Technology and Teacher Education proceedings of the 11th international conference.)


STUDENT WORKLOAD REQUIREMENTS:

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Directed Study</td>
<td>70.00</td>
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<tr>
<td>Private Study</td>
<td>71.00</td>
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<tr>
<td>Workshops</td>
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ASSSESSMENT DETAILS

<table>
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<tr>
<th>Description</th>
<th>Marks out of</th>
<th>Wtg(%)</th>
<th>Due date</th>
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<tr>
<td>SEMINAR PRESENTATION &amp; DISCUSS</td>
<td>999.00</td>
<td>60.00</td>
<td>20 Jul 2004</td>
</tr>
<tr>
<td>(see note 1)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>PORTFOLIO</td>
<td>999.00</td>
<td>40.00</td>
<td>20 Jul 2004</td>
</tr>
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NOTES:
1. Examiner will advise assessment due dates. Letter grades will be used in this course and will be displayed in the Notes Section.

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 (or at least a grade of C-) 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 20% 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 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.

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 (or grades) 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

ASSESSMENT NOTES

1. 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.

2. Students must retain a copy of each item submitted for assessment. This must be produced within twenty-four (24) hours of receipt of request being made by the Examiner. The student must retain this copy until the grade for this course has been finalised.

3. The Examiner may grant an extension of the due date of an assignment in extenuating circumstances.

4. In the event that a due date for an assignment falls on a local public holiday in their area, such as a Show holiday, the due date for the assignment will be the next working day. Students are to note on the assignment cover the date of the public holiday for the Examiner's convenience.

5. Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded the temporary grade: IM (Incomplete - Make up). An IM grade will only be awarded when, in the opinion of the Examiner, a student will be able to achieve the remaining objectives of the course after a period of non-directed personal study.

6. Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time may apply to defer an assessment in a 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).

7. When there is more than one marker for a single item of assessment, the distributed patterns and means for the different markers will be compared and marks adjusted if necessary.

8. The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media. The Faculty will NOT accept submission of assignments by facsimile. Students who do not have regular access to postal services or who are otherwise disadvantaged by these regulations may be given special consideration. They should contact the Examiner of the course to negotiate such special arrangements.

9. Marking criteria are provided in course material as mark sheets/guides or as part of assignment specifications.

10. All assessment items must be submitted and passed.

OTHER REQUIREMENTS

1. Students will require access to e-mail and Internet access to USQConnect for this course.

2. Students are to use a recognised referencing system a specified by the course examiner.