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>
<th>Campus</th>
</tr>
</thead>
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<tr>
<td>EDU</td>
<td>4222</td>
<td>66731</td>
<td>2, 2007</td>
<td>ONC</td>
<td>1.00</td>
<td>Toowoomba</td>
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Academic group: FOEDU
Academic org: FOE002
Student contribution band: National Priority Teaching
ASCED code: 070100

STAFFING
Examiner: Karen Spence
Moderator: Bruce Waldrip

OTHER REQUISITES
State law in Queensland (Australia) requires that all adults working/undertaking professional experience/researching with children under the age of 18, in the state of Queensland are required to possess a current suitability card (Blue Card). (See "Other Requirements" for further information.)

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. 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

The course objectives define the student learning outcomes for a course. The assessment item(s) that may be used to assess student achievement of an objective are shown in parenthesis. 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 and the Internet (All assessment items)
2. evaluate new mathematics teaching websites as they become available (All assessment items)
3. utilise computers and the Internet in the teaching and learning of mathematics (All assessment items)
4. navigate their way through novel websites and software packages without the need for formal training (All assessment items)
5. establish links between key mathematical concepts that are important in the P-10 mathematics curriculum (All assessment items)
6. construct appropriate strategies and responses for addressing certain classroom scenarios (All assessment items)
7. modify such strategies to suit particular needs and situations (All assessment items)
8. demonstrate frameworks for thinking about and articulating their own approaches to teaching mathematics with the aid of computers and the Internet (All assessment items)
9. demonstrate frameworks for thinking about and articulating their own approaches to teaching mathematics with the aid of computers (All assessment items).

TOPICS

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>Research and evaluation on teaching mathematics with computers and the Internet</td>
<td>25.00</td>
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<tr>
<td>Teaching &quot;space&quot; with computers</td>
<td>15.00</td>
</tr>
<tr>
<td>Teaching &quot;number&quot; with computers</td>
<td>15.00</td>
</tr>
<tr>
<td>Teaching &quot;measurement&quot; with computers</td>
<td>15.00</td>
</tr>
<tr>
<td>Teaching &quot;chance and data&quot; with computers</td>
<td>15.00</td>
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<tr>
<td>Teaching &quot;algebra&quot; with computers</td>
<td>15.00</td>
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</table>

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.


Masalski, J 1999, How to use the spreadsheet as a tool in the secondary school mathematics classroom, 2nd edn, NCTM, Reston, VA.

(for Windows and Macintosh Operating Systems)


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>
</tr>
<tr>
<td>Private Study</td>
<td>71.00</td>
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<tr>
<td>Workshops</td>
<td>24.00</td>
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ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks out of</th>
<th>Wtg(%)</th>
<th>Due date</th>
</tr>
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<tbody>
<tr>
<td>ASSIGNMENT 1</td>
<td>999.00</td>
<td>70.00</td>
<td>23 Jul 2007</td>
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<tr>
<td>EXAMINATION</td>
<td>999.00</td>
<td>30.00</td>
<td>END S2</td>
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NOTES

1. The examiner will advise the due date for this assessment item. Letter grades will be used in this course and will be displayed in the Notes Section.

2. Students will be advised of the examination date for this course when the official examination timetable for semester 2 2007 has been finalised.
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 satisfactorily complete an individual assessment item a student must achieve a grade
   of at least C-. (Depending upon the requirements in Statement 4 below, students may not
   have to satisfactorily complete each assessment item to receive a passing grade in this
   course.)

3 Penalties for late submission of required work:
   If students submit assignments after the due date without prior approval of the examiner
   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 complete and submit all of the
   summative assessment items and achieve at least 50% of the total weighted marks available
   for the course.

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
   grades obtained for each of the summative assessment items in the course.

6 Examination information:
   Candidates may have access to any material during the Open examination except the
   following: electronic communication devices, bulky materials, devices requiring mains
   power and material likely to disturb other students. Closed Examination Candidates are
   allowed to bring only writing and drawing instruments into the Closed examination.
   Restricted Examination Candidates are allowed access only to specific materials during
   a Restricted 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 which
   cannot hold textual information (students must indicate on their examination paper the
   make and model of any calculator(s) they use during the examination);

7 Examination period when Deferred/Supplementary examinations will be held:
   Any Deferred or Supplementary examinations for this course will be held during the next
   examination period.

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 In accordance with the University’s assignment extension policy (Regulation 5.6.1), the examiner may grant an extension of the due date of an assignment in extenuating circumstances.

4 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.

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


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 examiner.

3 IMPORTANT NOTE: Working with Children: State law in Queensland requires that all adults (including university students, pre-service educators, trainers, vocational teachers, industry educators) working with children under the age of 18, in the State of Queensland*, obtain approval before commencing such work. Many education courses include a practical component (professional experience, project work, research, assessment etc.) that may require engagement with children under the age of 18. It is your responsibility to ensure that you possess a current suitability card (Blue Card) before commencing any practical components of this course. DO NOT PARTICIPATE IN ANY PRACTICAL EXPERIENCE WITH CHILDREN UNDER 18 UNLESS YOU POSSESS A CURRENT ‘BLUE CARD’. For further information: http://www.childcomm.qld.gov.au/employment/bluecard/informationSheets.html *If you are undertaking practical experience outside the State of Queensland, Australia you should check local requirements.