Description: Compiler Design and Construction

<table>
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<tr>
<th>Subject</th>
<th>Cat-nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
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<td>2, 2004</td>
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**Academic group:** FOSCI  
**Academic org:** FOS003  
**Student contribution band:** 2  
**ASCED code:** 020107

**STAFFING**
Examiner: Ron House  
Moderator: Richard Watson

**REQUISITES**
Pre-requisite: CSC3403

**RATIONALE**
Programming languages provide high-level virtual machines which allow human users to efficiently write portable programs. The technology to build compilers which translate high-level programming languages has made the proliferation of computer use possible. The knowledge and skills in compiler construction are essential for computing professionals, and are useful not only for design and implementation of compilers but also for programs that manage any kind of high-level language based input including database, system control and document-processing languages.

**SYNOPSIS**
This course addresses compiler design and construction for high-level programming languages. It covers the techniques needed to translate programs in high-level languages to machine codes to be executed by the hardware of Central Processing Units (CPU) of computers. The topics addressed include: Lexical Analysis, Syntactic Analysis, Intermediate Code Generation, Compiler Optimization, Object Code Generation.

**OBJECTIVES**
On successful completion of this course students will:

1. have a good knowledge of the entire process of programming language translation and optimisation;
2. understand theories and principles for compiler construction;
3. have skills to design and implement compilers for high-level programming languages.

**TOPICS**

<table>
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<th>Description</th>
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<tr>
<td>1. Lexical Analysis</td>
<td>20.00</td>
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<td>2. Syntactic Analysis</td>
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</tr>
<tr>
<td>3. Intermediate Code and Semantic Analysis</td>
<td>20.00</td>
</tr>
<tr>
<td>4. Compiler Optimization</td>
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<tr>
<td>5. Object Code Generation</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).

Department of Mathematics and Computing CDROM SET 1, 2004 (available from the USQ Bookshop). This CD set contains course material, Windows and Linux Software relevant to this course offering only. Department of Mathematics and Computing CDROM SET 2, 2004 (available from the USQ Bookshop). This set contains a complete Redhat Linux distribution which is required for this course. For more information about the CD sets and their use, please refer to http://www.sci.usq.edu.au/cdrom and the course web site.


**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>
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<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Directed Study</td>
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<td>Examinations</td>
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<td>Private Study</td>
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ASSESSMENT DETAILS

<table>
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<tr>
<th>Description</th>
<th>Marks out of</th>
<th>Wtg(%)</th>
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<td>10 Sep 2004</td>
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NOTES:

1. Examination dates will be available during the Semester. Please refer to the examination timetable when published.

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 that 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 awarded marks gained by the student or 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 gain at least 50% for the examination and 50% for the total of the five non-exam assessment items. There is no requirement that students must pass every non-exam assessment.

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

6 Examination information:
In a Closed Examination, candidates are allowed to bring only writing and drawing instruments into 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 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/corporateservices/calendar/part5.htm or in 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 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.

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.

13 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).

OTHER REQUIREMENTS

1 Students will require access to an appropriate computer either via the student's own arrangements or a USQ study centre. Ideally, students should have access to email and the Internet.