308794
Embedded Software Engineering 401

Mr Clive Maynard

UNIT OUTLINE

Semester 2 2009
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INTRODUCTION

Welcome to Curtin Engineering. The School of Engineering at Curtin aspires to be nationally and internationally recognised as a leader in Engineering education and research. We are dedicated to the enhancement of teaching and research and the pursuit of excellence and innovative applications of engineering technology as a contribution to the advancement of scientific knowledge, understanding and community relevance.

ESSENTIAL ADMINISTRATIVE INFORMATION

Unit Title: Embedded Software Engineering 401
Unit Study Package Number: 308794
Unit Coordinator: Mr Clive Maynard
Teaching Area: Department of Electrical and Computing Engineering
Credit Value: 25
Mode(s) of study: Essential
Pre-requisites: None.
Co-Requisites: None.
Anti-requisites: None.
Additional requirements: None.
Core Unit: Bachelor of Engineering (Computer Systems Engineering)
Core Unit status: If you are taking this unit as a required (core) unit in your course of study, you may be terminated from your course of study if you fail this unit twice.
Result Type: This is a grade/mark unit.
Ancillary Fees and Charges: All fee information can be obtained through the Fees Centre. Visit http://www.fees.curtin.edu.au/index.cfm for details.
Unit Website:
Faculty or School Website: http://www.fac.eng.curtin.edu.au/home/index.cfm
Tuition Pattern:
Lecture 2 hours, 1 time weekly.
Practical 3 hours, 1 time alternate weeks.
Tutorial 1 hour, 1 time alternate weeks.
TEACHING STAFF

The lecturer or tutor for this unit and their contact details are below:

<table>
<thead>
<tr>
<th>Your lecturer or tutor:</th>
<th>Mr Clive Maynard</th>
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<tbody>
<tr>
<td>Email:</td>
<td>Through Blackboard</td>
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<tr>
<td>Phone:</td>
<td>9266 7905</td>
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<td>Building:</td>
<td>204</td>
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<td>Room:</td>
<td>215</td>
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<td>Contact Hours:</td>
<td>See Schedule on Office Door</td>
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provide feedback in relation to your progress in this unit.

UNIT COORDINATOR

Every unit also has a person who is responsible for the overall administration of that unit. This person is the Unit Coordinator. If you cannot contact the person who is teaching you (named above) or if you have further queries about this unit, you may wish to contact the Unit Coordinator for this unit. Their contact details are below:

<table>
<thead>
<tr>
<th>Unit Coordinator:</th>
<th>Mr Clive Maynard</th>
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UNIT SYLLABUS

- Hardware-software co-design, space-time issues.
- Software engineering for embedded systems, project management, advanced device handling.
- Tool support. Constraint, memory, real-time, integrity, reliability, fault-tolerance.
- Scheduling and dispatch issues. Mapping software into hardware. Memory management issues.
- Operating system issues. Multi-processor structures and concurrent programming.
- Some particular systems. SCADA, diagnostic, hard real-time.
LEARNING OUTCOMES

On successful completion of this unit you will be able to:

1. Understand the principles of Hardware-software co-design.
2. Describe the basic techniques of project management including quality assurance issues.
3. Evaluate the requirements for a real-time system;
4. Interpret the requirements in terms of the microcontrollers, interface subsystems, operating systems and scheduling algorithms which can be used to implement the system;
5. Structure real-time system software for efficient implementation;
6. Understand the issues of integrity, reliability and fault-tolerance in real time systems;
7. Distinguish between the needs of small embedded real-time systems and of large distributed real-time systems;
8. Understand the differences between uniprocessor and multiprocessor concurrent configurations;
9. Describe solutions to several case studies.

LEARNING ACTIVITIES

Lecture 2 hours, 1 time weekly.
Practical 3 hours, 1 time alternate weeks.
Tutorial 1 hour, 1 time alternate weeks.

STUDENT FEEDBACK

For Semester 1 and Semester 2 eVALUate is open for student feedback:
11 May - 21 June Semester 1
12 October - 22 November in Semester 2

We welcome your feedback as one way to keep improving this unit. Later this semester, you will be encouraged to give unit feedback through eVALUate, Curtin’s online student feedback system (see http://evaluate.curtin.edu.au).

LEARNING RESOURCES

Reference will be made to additional technical papers and books available through the Curtin University library and on the web.

Many of the trade journals present design information and background material which can be very useful in helping you become acquainted with the field of realtime systems. These include:

Electronic Design
EDN
Australian Electronic Engineering
Embedded Systems Programming
What's New in Computing
What's New in Electronic Engineering

Considerable information is also available on the web and references will be given where applicable. An archive of all articles published in Embedded Systems Programming up to December 2001 is available for access from the library.
TEXT BOOK

You will need to purchase the following textbook in order to complete this unit:

- Douglass BP (2004) Real Time UML Addison-Wesley

Recommended Texts:

You do not have to purchase the following textbooks but you may like to refer to them.

- Douglass BP (1999) Doing hard Time Addison-Wesley
- Maynard C A (1994) Forthright Curtin
- Ripps, D L (1989) An implementation guide to real-time programming Yourdon Press (also serialised in EDN magazine)

ASSESSMENT DETAILS

Assessment Summary

The assessment for this unit consists of the following items.

<table>
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<tr>
<th>Assessment Tasks</th>
<th>Week Due</th>
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<tr>
<td>Laboratory Projects</td>
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<td>Design Assignment</td>
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<td>Final Examination</td>
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<td><strong>TOTAL</strong></td>
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Assessment Task Details
You are required to complete the laboratory and the assignment and to sit a two hour examination at the end of the study period. The allocation of marks is as follows:

The examination is Open Textbook.

25% of the examination marks may be allocated to questions based on technical references given during the semester within the unit.

Supplementary and Deferred Assessments
Students granted a Supplementary or Deferred assessment will be notified via OCC. Supplementary and Deferred assessments will be held on Wednesday 17th, Thursday 18th and Friday 19th February 2010. Please also note that the failure to attend the examination/assessment on the day and time set will result in a fail for the unit. Under no circumstances will alternative arrangements be made to suit individuals.

Referencing Style
Curtin Engineering advises students that Curtin University supports the "Chicago Referencing Style" for written work and oral presentations. For a guide to this style please see http://library.curtin.edu.au/referencing/index.html

However, students are permitted to use other recognised styles that appear in the Engineering literature. Note also that individual lecturers can stipulate that a particular style is used when it best matches the type of work in the assessment of the particular unit.

Awarding of Grades
To pass this unit you must:

• Achieve a grade/mark greater than or equal to 5/50.
• Submit all assessments.
• Please note that all components of assessment must be attempted. A minimum of 40% of the possible marks is required in the examination and it is not sufficient to just reach an aggregate of 50% of the total.

STUDENTS’ RIGHTS AND RESPONSIBILITIES

It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

• the Student Charter,
• the University’s Guiding Ethical Principles,
• the University’s policy and statements on plagiarism and academic integrity,
• copyright principles and responsibilities,
• the University’s policies on appropriate use of software and computer facilities,
• students’ responsibility to check enrolment,
• deadlines, appeals, and grievance resolution,
• student feedback,
• other policies and procedures
• electronic communication with students
See [www.students.curtin.edu.au/administration/responsibilities.cfm](http://www.students.curtin.edu.au/administration/responsibilities.cfm) for comprehensive information on all of the above.

## ADDITIONAL INFORMATION

### Telephone Contacts:
If you have a query relating to administrative matters such as:-

- requests for deferment of study
- difficulties with accessing online study materials
- obtaining assessment results

please contact your Unit Coordinator:

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**UNIT STUDY CALENDAR**

If you have a printed copy of this document, you may like to tear off this final page and keep the Study Calendar handy as you work through the unit.

**Semester 2 2009**

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**END OF UNIT OUTLINE**