

# **Wireless and Embedded Systems PG – 7200**

## **Unit Outline 2009**

**Faculty of Information Sciences and Engineering**

**University of Canberra**

*Australian Government Higher Education (CRICOS)  
Registered Provider number: #00212K*

# Wireless and Embedded Systems PG - 7200

## Unit Outline 2009

### School of Information Sciences and Engineering

### Division of Business, Law and Information Sciences

### University of Canberra

*Australian Government Higher Education (CRICOS)  
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This Unit Outline must be read in conjunction with:

- a) *Studying at the University of Canberra: A Guide to Policies and Procedures*, which sets out University-wide policies and procedures, including information on matters such as plagiarism, grade descriptors, moderation, feedback and deferred exams, and is available at <http://www.canberra.edu.au/secretariat/uo-guidepol.html>
- b) Any additional information specified in section 6f.
- c) *Guide to Student Services at the University of Canberra*, and is available at <http://www.canberra.edu.au/secretariat/uo-guideserv.html>

## 1: General Information

- 1a Unit title**  
Wireless and Embedded Systems
- 1b Unit number**  
7200
- 1c Semester and year offered**  
S2, 2009
- 1d Credit point value**  
3CP
- 1e Unit level**  
Post Graduate (PG)
- 1f Name of Unit Convener and contact details (including telephone and email)**  
Dipl.-Ing. C. Chlap, 6201 2391, Chris.Chlap@canberra.edu.au, Office 11B16  
**Name of Unit Moderator and contact details (including telephone and email)**  
Dr. Dharmendra Sharma, 6201 2153, Dharmendra.Sharma@canberra.edu.au, Office 11B13.
- 1g Administrative contact details (including name, location, telephone and email)**  
The School Office 11B14, Ph: 6201-2417/6201-2153, email: [ise@canberra.edu.au](mailto:ise@canberra.edu.au)

## **2: Academic Content**

### **2a Unit description and learning outcomes**

Unit description: The unit begins with an overview of the characteristics and features of several common wireless technologies. A number of common mobile devices will be studied as well as how applications for such devices are implemented and transferred to the device for execution. Non-mobile embedded systems will then be covered, including residential gateways, firewalls and VPN servers. Two common operating systems for such systems will be introduced, and programming techniques for embedded system applications will be reviewed.

Learning outcomes: On completion of this unit, students will be able to design and implement small Java applications for mobile devices. In addition, students will be able to configure and boot an embedded Operating System with a specified set of features for specific target hardware types.

### **2b Prerequisites and/or co-requisites**

Computer Structures and Networks (G)

## **3: Delivery of Unit and Timetable**

### **3a Delivery mode**

This subject is delivered on campus with weekly lectures and tutorials/labs, as per UC timetable for the semester.

### **3b Schedule of topics/lectures/tutorials/practicals/field classes by week**

<b>Week</b>	<b>Activity</b>
1	Introduction to Wireless and Embedded Systems
2	Wireless Application Programming
3	Java2 Mobile Edition
4	Sample Java Code (Assignment 1)
5	Wireless Technology Overview
6	Wireless Services Overview
7	Embedded Systems Hardware Overview
8	<i>class free period</i>
9	<i>class free period</i>
10	Operating Systems for Embedded Systems
11	Platform Builder (Assignment 2)
12	Application Programming (Windows CE)
13	Application Programming (Embedded Linux)
14	Revision and Examination Topics.
15	Foundation Day (no lectures).

## 4: Unit Resources

### 4a Lists of required texts/readings

#### Text books:

*Beginning J2ME - From Novice to Professional, 3rd Edition*  
Sing Li and Jonathan Knudsen,  
Apress 2005.

*Programming Microsoft Windows CE .NET, Third Edition*  
Douglas Boling,  
Microsoft Press 2003,

#### Supplementary readings:

*Multimedia Wireless Networks - Technologies, Standards and QoS*  
Zvi Ganz, Aura Ganz, Kitti Wongthavarawat,  
Prentice-Hall, 2004.

#### Online materials:

Lecture materials, tutorial questions and answers, assignment specifications, and other details are available on the subject web site.

### 4b Materials and equipment

Computers and software in the Building 11 networking laboratory are used in this unit. The use of private personal computers and relevant software is highly recommended.

### 4c Unit website

<http://www.ise.canberra.edu.au/un7200>

## 5: Assessment

### 5a Assessment overview

Assessment Item (including exams held in the exam period)	Due Date of Assignments	Weighting (total to equal 100%)
Assignment 1	5:00pm, Friday of Week 7	20%
Assignment 2	5:00pm, Friday of Week 15	20%
Examination	University examination period	60%

### 5b Details of each assessment item

Assignment 1: Java Midlet.  
Assignment 2: Building an Embedded OS.

Full details are available on the unit web site (see **4c**).

Final Examination: open book, no electronic materials are permitted.

All assessment items are compulsory.

### 5c Special assessment requirements

The final assessment in the subject will result in one of the following grades: HD, DI, CR, P or Fail. Please note that PX grades are no longer available at UC.

$$\text{total\_mark} = \text{assignment\_1\_mark (out of 20)} + \text{assignment\_2\_mark (out of 20)} + \text{examination\_mark (out of 60)}$$

The grade for the subject is then determined according to the following rules:

Total mark (out of 100)	Exam mark (out of 60)	Final Grade
$\geq 85$	<i>and</i> $\geq 51$	HD
$\geq 75$	<i>and</i> $\geq 45$	DI
$\geq 65$	<i>and</i> $\geq 39$	CR
$\geq 50$	<i>and</i> $\geq 30$	P
$< 50$	<i>or</i> $< 30$	(NX, NS, NC or NN)

### 5d Supplementary assessment

There will be no supplementary test or exam.

Students who miss the final exam due to illness will be able to sit for a deferred examination. A doctor's certificate stating that the student was not able to sit for the exam should be given to the lecturer in charge as soon as possible - generally within 3 days of the examination

### 5e Text-matching software

No text-matching software will be used in this Unit. You are encouraged to use Google and Wikipedia for researching the covered topics.

## 6: Student Responsibility

### 6a Workload

The amount of time you will need to spend on study in this Unit will depend on a number of factors including your prior knowledge, learning skill level and learning style. Nevertheless, in planning your time commitments you should note that for a 3cp Unit the total notional workload over the fifteen-week semester is assumed to be 150 hours or an average of 10 hours per week. These hours include time spent in classes. The total workload for Units of different credit point value should vary proportionally. For example, for a 6cp Unit the total notional workload over a fifteen-week semester is assumed to be 300 hours or an average of 20 hours per week.

### 6b Special needs

Students who need assistance in undertaking the unit because of disability or other circumstances should inform their Unit Convener or the Disabilities Office as soon as possible so the necessary arrangements can be made.

### 6c Attendance requirements

Attendance records will be kept. Students who do not attend regularly will almost certainly fail the final exam.

**6d Required IT skills**

See Section 2b

**6e Costs**

Textbooks, software and consumables. Information about the DETYA guidelines on student charges for HECS students can be found on OSIS.

**6f Additional information**

All assignments will require background reading, intelligent criticism, keen observation and the development of a line of argument to support an adopted stance. It is also a requirement that each assignment is solely the work of the individual submitting it (unless explicitly stated otherwise) and that it is produced specifically for the subject in question. The reproduction, paraphrasing, summarizing or otherwise presenting in altered form, another person's ideas or arguments without acknowledgment is plagiarism. Plagiarism includes submitting work prepared by another author, including another student, as one's own. Any form of plagiarism will be reported to the Head of School for investigation.

Special Needs: Please notify your lecturer or tutors of any special needs you have, for example, special arrangement for people with disabilities etc.

<b>7: Authority of this Unit Outline</b>
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Any change to the information contained in Section 2 (Academic content), Section 3 (Delivery of Unit and timetable) and Section 5 (Assessment) of this document, will only be made by the Unit Convener if the written agreement of staff and a majority of students has been obtained; and if written advice of the change is then forwarded to each student enrolled in the Unit at their registered term address. Any individual student who believes him/herself to be disadvantaged by a change is encouraged to discuss the matter with the Unit Convener.