ITEC851
System and Network Technologies
S2 Evening 2014
Computing

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General Information

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Credit points
4

Prerequisites
COMP342

Corequisites

Co-badged status

Unit description
This unit will look in detail at the following commercial operating systems: Microsoft Windows 2000, Microsoft Windows 2003, HP/UX Ili, Solaris 10, Red Hat Linux, IBM MVS, IBM OS400 and OpenVMS and explore how secure they are in a commercial environment. This unit will include hands-on tutorials on most of the operating systems and will also include threat and vulnerability analysis of common configurations. As operating systems provide the environment upon which all application processing is based, knowing their strengths and weaknesses will help in understanding how to make commercial environments more secure.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-dates

Learning Outcomes
1. Demonstrate in-depth knowledge and understanding of mobile technologies and apply
them to solve practical real world problems in a professionally responsible manner.

2. Demonstrate an understanding of the fundamental principles required to design mobile networks.

3. Analyse the protocol architecture of mobile data and cellular networks.

4. Exemplify a wide range of problems and research issues in the field of mobile networking.

5. Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience

6. Evaluate critically a wide range of current trends and technologies in the field of mobile networking

7. Engage in independent professional work with a high level of autonomy and accountability.

General Assessment Information

The three Quizzes constitute 30% of the total mark and serve as a feedback mechanism to monitor your progress in the unit.

Assignment must be submitted on time. Late submission of the assignment will be accepted, but penalized at the rate of 10% per working day late.

Assignment work must be written clearly, with good grammar, correct word usage, correct punctuation, and lack of spelling errors. Poor or bad expression will be penalized. Wherever required, all written work must be properly referenced and conform to standard stylistic conventions.

General notes on assignment

For all submitable assignment work you are encouraged to:

- set your personal deadline earlier than the actual one;
- keep backup of all important files;
- make sure that no one else picks up your printouts.

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz 1</td>
<td>10%</td>
<td>Week 4 (in class)</td>
</tr>
<tr>
<td>Quiz 2</td>
<td>10%</td>
<td>week 8 (In class)</td>
</tr>
<tr>
<td>Quiz 3</td>
<td>10%</td>
<td>Week 12 (In class)</td>
</tr>
<tr>
<td>Name</td>
<td>Weighting</td>
<td>Due</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Assignment</td>
<td>20%</td>
<td>Week 12 (Thursday 6pm)</td>
</tr>
<tr>
<td>Final Exam</td>
<td>50%</td>
<td>TBA</td>
</tr>
</tbody>
</table>

**Quiz 1**

**Due:** *Week 4 (in class)*

**Weighting:** 10%

Quiz 1 is a short test (close book) that will be based on your previously covered lecture material for weeks 1-3. The quiz questions will be handed over to you at the beginning of your Lecture class. Quiz 1 contributes 10% of the total mark.

This Assessment Task relates to the following Learning Outcomes:

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- Demonstrate an understanding of the fundamental principles required to design mobile networks.
- Exemplify a wide range of problems and research issues in the field of mobile networking.
- Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience.
- Engage in independent professional work with a high level of autonomy and accountability.

**Quiz 2**

**Due:** *week 8 (in class)*

**Weighting:** 10%

Quiz 2 is a short test (close book) that will be based on your previously covered lecture material for Weeks 4-7. The quiz questions will be handed over to you at the beginning of your Lecture class. Quiz 2 contributes 10% of the total mark.

This Assessment Task relates to the following Learning Outcomes:

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- Demonstrate an understanding of the fundamental principles required to design mobile networks.
Exemplify a wide range of problems and research issues in the field of mobile networking.

Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience.

Engage in independent professional work with a high level of autonomy and accountability.

Quiz 3
Due: Week 12 (In class)
Weighting: 10%

Quiz 3 is a short test (close book) that will be based on your previously covered lecture material for Weeks 8-11. Quiz 3 contributes 10% of the total mark.

This Assessment Task relates to the following Learning Outcomes:

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- Demonstrate an understanding of the fundamental principles required to design mobile networks.
- Exemplify a wide range of problems and research issues in the field of mobile networking.
- Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience.
- Engage in independent professional work with a high level of autonomy and accountability.

Assignment
Due: Week 12 (Thursday 6pm)
Weighting: 20%

Problem Solving

This Assessment Task relates to the following Learning Outcomes:

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
Demonstrate an understanding of the fundamental principles required to design mobile networks.

Analyse the protocol architecture of mobile data and cellular networks.

Exemplify a wide range of problems and research issues in the field of mobile networking.

Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience

Evaluate critically a wide range of current trends and technologies in the field of mobile networking

Engage in independent professional work with a high level of autonomy and accountability.

Final Exam

Due: TBA

Weighting: 50%

An examination allows us to individually and securely assess student's mastery of the coursework material. The examination material will be covered by learning outcomes #1 to #7. The examination will be closed book and three (3) hours in length

Regarding the examination process, note that

§ you must attend all required classes and submit all required assessment, otherwise the Executive Dean of the Faculty or delegated authority has the power to refuse permission to attend the final examination

§ the University Examination period for Second Half Year 2014 is from Monday 17th November to Sunday 7th December 2014.

§ you are expected to present yourself for examination at the time and place designated in the University Examination Timetable

§ the timetable will be available in Draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of examinations

§ no early examinations for individuals or groups of students will be set. All students are expected to ensure that they are available until the end of the teaching semester, that is the final day of the official examination period

§ the only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for Special Consideration.

This Assessment Task relates to the following Learning Outcomes:
• Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
• Demonstrate an understanding of the fundamental principles required to design mobile networks.
• Analyse the protocol architecture of mobile data and cellular networks.
• Exemplify a wide range of problems and research issues in the field of mobile networking.
• Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience
• Evaluate critically a wide range of current trends and technologies in the field of mobile networking
• Engage in independent professional work with a high level of autonomy and accountability.

Delivery and Resources
ITEC851 is taught via lectures and informal tutorial sessions.

Classes
Classes are held from 6-10pm Thursday evenings. Lectures/Tutorials and other discussion are in E6A-109 in the lecture slot.

Lectures
Lectures are used to introduce mobile network technologies, protocols and design and put them in a wider context. You are encouraged to ask questions of the lecturer, both during and outside the lecture, to clarify anything you might not be sure of.

It should be noted that no single text book completely covers the content of this unit. A large portion of the lecture material is drawn from research papers, white papers and standard documents. Students are encouraged to read the weekly recommended reading list to gain a solid understanding of the topics that are covered.

Quizzes
There will be three quizzes in the following weeks: 4, 8, and 12. A quiz is a short test that will be based on your previously covered lecture material. For example, week 4 quiz will be based on lectures done in weeks 1-3. The quiz questions will be handed over to you at the beginning of your Lecture class. These quizzes contribute 30% of the total mark and serve as a feedback
mechanism to monitor your progress in the unit.

**Tutorial**
The tutorial gives you the opportunity to interact with your peers and with the lecturer. The tutorial sessions involve informal discussions with your peers and the lecturer. Each week you will be given problems to solve prior to the tutorial; preparing solutions is important because it will allow you to discuss the problems effectively with your lecturer and maximise the feedback you get on your work.

**Assignments**
Your assignment is to be submitted in the assignment box labelled ITEC851 on the first floor of Building E6A. Late submission of the assignment will be accepted, but penalised at the rate of 10% per working day late. If you cannot submit assignments on time because of illness or other circumstances, please contact the convenor at the earliest possible time.

**General Notes**
In this unit, you should do the following:

- Attend lectures, take notes, ask questions.
- Attend your tutorial, seek feedback from your lecturer on your work.
- Prepare for and strive to do well in the three quizzes.
- Read appropriate sections of the text, add to your notes and prepare questions for your lecturer/tutor.
- Prepare answers to tutorial questions.
- Work on any assignments that have been released.

Lecture notes will be made available each week but these notes are intended as an outline of the lecture only and are not a substitute for your own notes or the recommended reading list.

**Required and Recommended Texts**
There is no single text book containing material that could address all topics of unit. All necessary reading material will be provided by the lecturers.

**Other Useful Books (You need not buy unless you believe you need to own one)**

- A. Jamalipour, The Wireless Mobile Internet: Protocols, Architectures, and Services,
### Lecture Schedule (Tentative)

<table>
<thead>
<tr>
<th>Week-Thursday</th>
<th>Lecture</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/08/2014 (Week 1)</td>
<td>Introduction</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td>14/08/2014 (Week 2)</td>
<td>Wireless Transmission</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td>21/08/2014 (Week 3)</td>
<td>Medium Access Protocols</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td>28/08/2014 (Week 4)</td>
<td>Quiz 1</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td></td>
<td>Wireless LAN</td>
<td></td>
</tr>
<tr>
<td>04/09.2014 (Week 5)</td>
<td>Mobile IP-Cellular IP</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td>11/09/2014 (Week 6)</td>
<td>Transport Layer Design</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td>18/09/2014 (Week 7)</td>
<td>Introduction to Cellular Networks</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td><strong>Mid-Semester Break</strong> (Two Weeks)</td>
<td>20/09/2014-06/10/2014</td>
<td></td>
</tr>
<tr>
<td>09/10/2014 (Week 8)</td>
<td>Quiz 2</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td></td>
<td>Cellular-IP Integration: LTE</td>
<td></td>
</tr>
<tr>
<td>15/10/2014 (Week 9)</td>
<td>QoS for Mobile Data Networks</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td>23/10/2014 (Week 10)</td>
<td>Mobile Ad Hoc Network (MANET)</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td>30/10/2014 (Week 11)</td>
<td>Bluetooth-Sensor Networks-IEEE 802.15</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td>06/11/2014 (Week 12)</td>
<td>Assignment Due</td>
<td>Recommended Reading List/Notes</td>
</tr>
<tr>
<td></td>
<td>Quiz 3</td>
<td></td>
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<tr>
<td></td>
<td>IEEE 802.15 (Contd)</td>
<td></td>
</tr>
<tr>
<td>13/11/2014 (Week 13)</td>
<td>Guest Lecture</td>
<td></td>
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<tr>
<td></td>
<td>Revision</td>
<td></td>
</tr>
</tbody>
</table>
Learning and Teaching Activities

Lecture
Lectures are used to introduce mobile network technologies, protocols and design and put them in a wider context.

Tutorial
Problem solving session. Tutorials are posted every Friday on ilearn. Even though these tutorial exercises are not formally assessed, it is important that students solve them on a weekly basis as these questions are often previous exam questions or structured like test/exam questions. The more practice you have at such questions, the more likely you are to do yourself justice in quizzes/exams. Solutions to these exercises will be regularly posted on ilearn unit site. If need be, this will also allow you to discuss the problems effectively with your lecturer/peers and maximise the feedback you get on your work. In case of any difficulty, seek help from the teaching staff.

Policies and Procedures
Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:


In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Code of Conduct
Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student_conduct/](https://students.mq.edu.au/support/student_conduct/)

Special Consideration
Special Consideration is intended for a student who is prevented by serious and unavoidable disruption from completing any unit requirements in accordance with their ability. This application
form needs to be filled and submitted to the Science Centre along with some evidence to support
your case. Depending on the circumstances presented, the convenor may choose to give you an
alternate assessment, additional time for an assessment, make-up exam, etc. If a
Supplementary Examination is granted as a result of the Special Consideration process the
examination will be scheduled after the conclusion of the official examination period. For details
of the Special Consideration policy specific to the Department of Computing, see the
Department's policy page.

**Late Submission**

There will be a deduction of 10% of the total available marks made from the total awarded mark
for each 24 hour period or part thereof that the submission is late. This penalty does not apply for
cases in which an application for special consideration is made and approved.

**Grade Appeal**

In case of problems arising with your final grade, the first step is to organise a review. The
Department recommends that you request an appointment with the convenor of the unit in order
to review your grade. If the review does not solve the problem, a formal Grade Appeal can be
lodged. For more information please refer to the grade appeal policy page at:


**Academic Honesty**

Plagiarism involves using the work of another person and presenting it as one's own. The
Department, in line with University policy, treats all cases seriously. In particular, the Department,
keeps a record of all plagiarism cases. This record is referred to so that an appropriate penalty
can be applied to each case.

For concrete examples, refer to Academic Honesty Policy at: http://www.mq.edu.au/policy/docs/
academic_honesty/policy.html

**Student Support**

Macquarie University provides a range of support services for students. For details, visit http://stu
dents.mq.edu.au/support/

**Learning Skills**

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study
strategies to improve your marks and take control of your study.

- **Workshops**
- **StudyWise**
- **Academic Integrity Module for Students**
- **Ask a Learning Adviser**

**Staff-Student Liaison Committee**

The Department has established a Staff-Student Liaison Committee (800 level) to provide all
students studying a Computing unit the opportunity to discuss related issues or problems with
Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

**Learning outcomes**

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- Demonstrate an understanding of the fundamental principles required to design mobile networks.
- Analyse the protocol architecture of mobile data and cellular networks.
- Exemplify a wide range of problems and research issues in the field of mobile
networking.
• Demonstrate an understanding of the concepts, techniques, algorithms, and protocols employed in mobile data and cellular networks and be able to communicate these ideas to wider audience
• Evaluate critically a wide range of current trends and technologies in the field of mobile networking

Assessment tasks

• Quiz 1
• Quiz 2
• Quiz 3
• Assignment
• Final Exam

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

• Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
• Demonstrate an understanding of the fundamental principles required to design mobile networks.
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• Evaluate critically a wide range of current trends and technologies in the field of mobile networking

Assessment tasks

• Quiz 1
**PG - Research and Problem Solving Capability**

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

**Learning outcomes**

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
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- Evaluate critically a wide range of current trends and technologies in the field of mobile networking

**Assessment tasks**

- Quiz 1
- Quiz 2
- Quiz 3
- Assignment
- Final Exam

**PG - Effective Communication**

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.
This graduate capability is supported by:

**Assessment tasks**

- Assignment
- Final Exam

**PG - Engaged and Responsible, Active and Ethical Citizens**

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues.

This graduate capability is supported by:

**Learning outcomes**

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- Engage in independent professional work with a high level of autonomy and accountability.

**Assessment task**

- Final Exam

**PG - Capable of Professional and Personal Judgment and Initiative**

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

**Learning outcomes**

- Demonstrate in-depth knowledge and understanding of mobile technologies and apply them to solve practical real world problems in a professionally responsible manner.
- Engage in independent professional work with a high level of autonomy and accountability.

**Assessment task**

- Final Exam

**Changes from Previous Offering**

This unit previously covered topics in network systems technologies and mobile networks The
Unit content was changed to reflect that the Unit now deals solely with mobile networks.

**Standards**

Four standards, namely HD, D, CR, P summarize as many different levels of achievement. Each standard is precisely defined to help students know what kind of performance is expected to deserve a certain mark. The standards corresponding to the sample learning outcomes of this unit are given below:

<table>
<thead>
<tr>
<th>LO</th>
<th>P</th>
<th>Cr</th>
<th>D</th>
<th>HD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LO#1</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>In-depth knowledge and understanding of mobile technologies.</td>
<td>Provide basic description and definitions of mobile networking and protocol architecture</td>
<td>Describe across most of the topics in mobile networking and protocol architecture</td>
<td>Discuss with breadth across most of the topics in mobile networking and protocol architecture</td>
<td>Discuss with breadth and depth across most of the topics in mobile networking and protocol architecture</td>
</tr>
</tbody>
</table>

| **LO#2** |   |    |    |    |
| Demonstrate an understanding of design of mobile networks | Demonstrate limited understanding of mobile technologies and protocols | Demonstrate detailed understanding of mobile technologies and protocols | Demonstrate an advanced understanding of mobile technologies and protocols | Demonstrate an in-depth understanding of mobile technologies and protocols |

| **LO#3** |   |    |    |    |
| Competence in analysis of mobile network protocols. | Perform basic analysis of mobile technologies and protocols | Perform detailed analysis of mobile technologies and protocols | Perform advanced analysis of mobile technologies and protocols | Perform advanced analysis of mobile technologies and protocols |

| **LO#4** |   |    |    |    |
| Exemplify a wide range of problems and research issues | Describe limited set of key issues related to Mobile networking | Explain some of the key issues related to mobile networking | Explain most of the key issues related to mobile networking | Discuss in depth all of the key issues related to mobile networking |

| **LO#5** |   |    |    |    |
| Demonstrate an understanding of concepts, algorithms and protocols in mobile networking | Demonstrate limited understanding of mobile networking concepts, algorithms and protocols | Demonstrate detailed understanding of mobile networking concepts, algorithms and protocols | Demonstrate an advanced understanding of mobile networking concepts, algorithms and protocols | Demonstrate an in-depth understanding of mobile networking concepts, algorithms and protocols |

| **LO#6** |   |    |    |    |
Competence in analysis and evaluation of current mobile technologies.

Grading

At the end of the semester, you will receive a grade that reflects your achievement in the unit

- **Fail (F)**: does not provide evidence of attainment of all learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; and incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.

- **Pass (P)**: provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; and communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.

- **Credit (Cr)**: provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; plus communication of ideas fluently and clearly in terms of the conventions of the discipline.

- **Distinction (D)**: provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.

- **High Distinction (HD)**: provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application.

In this unit, your final grade depends on your performance in each part of the assessment. For each task, you receive a mark that combines your standard of performance regarding each
learning outcome assessed by this task. Then the different component marks are added up to
determine your total mark out of 100. Your grade then depends on this total mark and your
overall standards of performance.

Concretely, in order to pass the unit, you must

- obtain a total mark of 50% or higher and a mark of 40% or higher in the final
  examination;
- make a reasonable attempt at the exercises in the assessment tasks;
- demonstrate that you can perform at a Functional level or higher for each criterion
  assessed in the two assignments;
- reach a Functional level or higher for each criterion assessed in the final examination.

Students obtaining a higher grade than a pass in this unit will (in addition to the above)

- have a total mark of 85% or higher and perform at distinction level or higher in
  the final examination to obtain High Distinction;
- have a total mark of 75% or higher and perform at credit level or higher in the
  final examination to obtain Distinction;
- have a total mark of 65% or higher and perform at pass level but with 50% or
  higher in the final examination to obtain Credit.

You are encouraged to:

- set your personal deadline earlier than the actual one;
- keep backups of all important assessed tasks;
- make sure no one else picks up your printouts.

All work submitted should be readable and well presented.

You should never commit plagiarism in any of your submitted work, including tutorial and
practical answers.