Subject Information

Subject Code	CSCI204
Subject Name	Object and Generic Programming in C++
Credit Points	6
Pre-Requisites	CSCI124 or CSCI192
Co-Requisites	None.
Restrictions	None.
Equivalence	None.
Assessment	Assignments 20% Tutorial 5% Lab exercises 25% Exam 50%
General Subject	Yes.

Subject Description

CSCI204 develops a thorough understanding of the object-oriented approach and introduces such object concepts as encapsulation, inheritance, polymorphism and runtime binding. This is complemented by an introduction to object-oriented design, with UML representations at the program level. Templates are introduced as a method of achieving generalisation. Container classes and the Standard Template Library are presented as examples of generic programming.

Extra Information

Generic Extra Information:
Excellent results in this subject may result in an award. For further information please go to the following web page http://www.uow.edu.au/informatics/scsse/current/UOW024521.html

Subject Objectives:
On successful completion of this subject, students will be able to: 1.Design and implement objects providing encapsulation, inheritance and polymorphism. 2.Devise solutions to problems through the use of generic programming. 3.Interpret and develop basic UML diagrams. 4.Design object-oriented solutions to problems, including identifying appropriate objects and object relationships.

Subject Information

Subject Code	**CSCI205**
Subject Name	**Software Development Methods & Tools**
Credit Points	6
Pre-Requisites	CSCI124 or CSCI192
Co-Requisites	None.
Restrictions	None.
Equivalence	None.
Assessment	1. Assignments 30% 2. Mid term examination 20% 3. Final examination 50%
General Subject	Yes.

Subject Description

This subject provides an introduction to the process of design and analysis of software. Students will receive a formal introduction to the software design process and techniques, pattern design and reuse, as well as general approaches of interface design. A UML supporting tool will be used for practice of object oriented development approach.

Extra Information

Generic Extra Information:
Excellent results in this subject may result in an award. For further information please go to the following web page http://www.uow.edu.au/informatics/scsse/current/UOW024521.html

Subject Objectives:
On successful completion of this subject, students will be able to: 1.Explain the techniques and stages of a selected modern analysis and design method. 2.Describe the range of application domains to which a method can properly be applied. 3.Demonstrate proficiency in the correct use of the techniques learnt. 4.Properly apply the method to a particular analysis and design problem within the method's application domain. 5.Correctly use UML notation to document the analysis and design.

Subject Information

Subject Code	**CSCI213**
Subject Name	**Java Programming and Applications**
Credit Points	6
Pre-Requisites	CSCI124 or CSCI192
Co-Requisites	None.
Restrictions	None.
Equivalence	ITCS213
Assessment	assignments 50%; exams 50%
General Subject	Yes.

Subject Description

This subject provides: 1. an introduction to the Java language and some of its standard class libraries; and 2. experience with object oriented design and implementation techniques. Topics covered will include: use of a Java Integrated Development Environment, Java language, subset of the standard Java class packages (Standard Edition: windowing, graphics, TCP/IP networking, threads, database access, applet, media), security issues with portable code, Java "Micro Edition" (ME) and its associated packages and applications. Development of applications for different environments.

Extra Information

Generic Extra Information:
Excellent results in this subject may result in an award. For further information please go to the following web page http://www.uow.edu.au/informatics/scsse/current/UOW024521.html

Subject Objectives:
On successful completion of this subject, students will be able to: 1.Develop programs that utilize the Java programming language 2.Develop programs that exploit graphical user interfaces; 3.Implement programs using threads, networking, and Java database access libraries; 4.Implement programs with Java ME, graphics, and "games" packages

Subject Code	CSCI235
Subject Name	Databases
Credit Points	6
Pre-Requisites	CSCI124
Co-Requisites	None.
Restrictions	None.
Equivalence	None.
Assessment	1.Assignments- 25% 2. Class tests - 15% 3. Final examination- 60%
General Subject	Yes.

Subject Description

This subject investigates three major areas of modern database systems: 1. design of relational databases 2. programming of relational databases 3. concurrency control and data recovery in database systems Topics will include: Introduction to conceptual database modelling; Principles of relational database model; Structured Query Language (SQL) and its procedural extensions (PL/SQL, Embedded SQL, JDBC); Database server programming; Normalisation of relational databases; and Transaction management and recovery in database systems

Extra Information

Generic Extra Information:
Excellent results in this subject may result in an award. For further information please go to the following web page http://www.uow.edu.au/informatics/scsse/current/UOW024521.html

Subject Objectives:
A student who successfully completes this subject should be able to:
(i) explain the principles of relational database model,
(ii) design and implement a simple relational database,
(iii) use a number of software tools to implement database applications,
(iv) program a relational database server,
(v) normalise a relational database,
(vi) explain the principles of distributed databases and design a distributed database,
(v) explain the principles of transaction management and database recovery mechanisms

Subject Information

Subject Code	ISIT100
Subject Name	Systems Analysis
Credit Points	6
Pre-Requisites	None.
Co-Requisites	None.
Restrictions	None.
Equivalence	BUSS211
Assessment	Tutorial worksheets; major assignment; mid-session test, final examination.
General Subject	Yes.

Subject Description

This subject aims to introduce the student to the techniques and technologies of structured systems analysis. It examines the complementary roles of systems analysts, clients and users in life cycle development methods. Data flow analysis and process descriptions are introduced and the relation to object orientation examined. The student will make use of a Computer Aided Software Engineering (CASE) tool to document solutions to typical problems.

Extra Information

Subject Objectives:
On successful completion of this subject, students should be able to: demonstrate an understanding of the origin and development of formal systems analysis methods; demonstrate an ability to analyse the key elements of a narrative and interview; demonstrate an appreciation of the relationship between information strategy and organisational structure; information systems requirements and organisational objectives; complementary roles of clients, users and analysts in the development of computer based information systems and demonstrate an ability to analyse a system and present a system description, demonstrate an appreciation of CASE tools as an aid to systems modelling.

Diploma of Business and Diploma of Information Technology

(CRICOS course codes: 057231C, 057232B)
(CRICOS course codes: 057233A, 057234M)

Subject Outline Summer 2011

WUCB121

Quantitative Methods

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Australia

Wollongong

Quantitative Methods

Subject Description

The aim of the subject is to introduce students to quantitative techniques and their application to business economics. The main focus of the subject is inferential statistics and topics will include descriptive statistics, probability, sampling, confidence intervals, hypothesis testing, elementary correlation, and regression analysis. Students are introduced to the use of computer programs for estimation and analysis.

Students who are enrolled in the Diploma in IT and achieve a clear pass in this subject will be awarded advanced standing for STAT131 once they articulate into the Faculty of Informatics. Students enrolled in the Diploma of Business and achieve a clear pass in this subject will be awarded advanced standing for COMM121 once they articulate into the Faculty of Commerce.

Subject Structure

Quantitative Methods is delivered in a face-to-face format of five (5) hours per week. The subject consists of 3 hours of lecture and 1 × 2 hour tutorial each week. The session is of 14 weeks' duration with face-to-face classes scheduled for the first 12 weeks and a study/examination period in Weeks 13 and 14.

In addition to scheduled class sessions, students are expected to spend additional time in individual study and research. As a general guideline students will need to spend at least 1 hour in private study (including completing homework and revision) for every two hours of scheduled class time.

Teachers will be available for a consultation time each week. Students will be notified of the time and location of the consultation session during Week 1 of the Session. It is recommended that students experiencing difficulty with this subject arrange to consult with the teacher as difficulties are encountered.

Some students may require tutorial support to improve language/literacy skills. Where this is recommended, students will be advised to use the College's self-access facilities in the Multimedia Centre in their own time. These facilities are located upstairs in building 30.

Learning Resources

Compulsory Textbook

Berenson et al. (2010) *Basic Business Statistics: Concepts and Applications*, 2e, Pearson. ISBN 9781442500334

Additional Readings

Black, K et al. (2007). *Australasian Business Statistics*. Wiley.
ISBN 978 0 47080 944 0.

Excel and PHStat2

In many practical applications of statistics, the statistician must deal with large amounts of data. As a part of statistical analysis, the statistician would have to perform various calculations using data; and the sheer number of computations involved makes this aspect of statistical method time-consuming and tedious. Fortunately, numerous commercially prepared computer packages are available to perform some or all of the calculations involved. In both lectures and tutorials, Excel and an add on for Excel called PHStat2 (available with the textbook) will be used to demonstrate the application of statistical techniques to problems in actual business and economic settings.

Calculators

Students will be required to bring a scientific calculator to all classes.

Only approved scientific calculators will be permitted in exams. The list of approved calculators is located on the college website (www.uowcollege.edu.au). Students should refer to this list to confirm their calculator has been approved for use in exams. Programmable calculators are not permitted. Programmable calculators usually have a RUN, EXE, CALC or SOLVE button.

Subject Outcomes

Successful completion of this subject should enable students to:

1. Explain and demonstrate the basic concepts of probability and statistics.

2. Demonstrate in substantial depth the statistical techniques that are commonly used in the modern commercial world.

3. Apply statistical techniques to improve analysis and planning of the business decision-making process.

4. Interpret and explain solutions in non-technical way for a range of situations including business and commerce.

5. Use and interpret appropriate output from statistical computer packages, particularly Excel and PHStat2.

6. Evaluate the role played by statistics in empirical research and business practices in the workplace.

Subject Content

This subject will cover the following content areas:

1. Descriptive statistics.

2. Probability concepts and rules.

3. Binomial probability distribution and normal probability distribution.

4. Sampling distributions.

5. Confidence intervals.

6. Hypothesis testing on one population and two populations.

7. Analysis of variance.

8. Simple regression analysis and multiple regression analysis.

Graduate Qualities

The Diploma of Business and Diploma of Information Technology courses are designed to assist students in developing the UOW College Graduate Qualities. It helps students become:

1. **Informed**: have a sound knowledge of an area of study or profession and understand its issues locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas

2. **Independent Learners**: engage with new ideas and ways of thinking and critically analyse issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.

3. **Problem Solvers**: take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative, and aim for high standards.

4. **Effective Communicators**: articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognise how culture can shape communication.

5. **Responsible**: understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.

Subject Outline in Weeks

The following guide to lessons and activities may be adjusted to suit the needs of the group as long as subject outcomes and assessment criteria are met.

The chapters referred to below are in the compulsory textbook, *Basic Business Statistics: Concepts and Applications*.

Week 1   Introduction to Descriptive Statistics

Emergency evacuation procedure.

Introduction to Quantitative Methods, including PASS Program.

CHAPTER 1:

- ➢ Understand how statistics are used in business.
- ➢ Understand the difference between descriptive and inferential statistics.
- ➢ Understand the types of data used in statistics.

Week 2   Descriptive Statistics (continued)

CHAPTER 2:

- ➢ Understand principle methods that fall under the heading of descriptive statistics. This includes frequency distributions tables, charts and diagrams.

CHAPTER 3:

- ➢ Understand summary measures of centre, variation and association.

Week 3   Probability Rules & Probability Distributions

CHAPTER 4:

- ➢ Understand the theory and concepts of probability, the topic that serves as a link between describing and presenting information obtained from samples and be able to make inferences to larger population.

CHAPTER 5:

- ➢ Understand the concept of a random variable, which allows us to summarise the results of an experiment in terms of numerical-valued outcomes.
- ➢ Understand the properties of probability distribution.
- ➢ Compute the expected value and variance of the probability distribution.

Week 4   Binomial Distribution & Normal Distribution

During first hour of lecture:

Class Test 1

During last two hours of lecture:

CHAPTER 5:

> ➢ Understand how to compute probabilities from binomial distributions.

CHAPTER 6:

> ➢ Understand normal distribution which is the most important specific continuous distribution.

Tutorials: Computer lab (See subject website for location)

Week 5   Sampling Distribution

CHAPTER 7:

> ➢ Understand sampling techniques.
>
> ➢ Understand the concept of sampling distribution.
>
> ➢ Compute probabilities related to the sample mean and sample proportion.
>
> ➢ Understand the importance of central limit theorem.

Week 6   Confidence Intervals

CHAPTER 8:

> ➢ The objective of estimation is to determine the approximate value of the population on the basis of the sample statistic**.**
>
> ➢ Develop confidence interval estimates for the population mean and proportion.
>
> ➢ Determine the sample size necessary to obtain a confidence interval.

Week 7   Hypothesis Testing: 1 population

CHAPTER 9:

> ➢ Understand the basic principles of hypothesis testing.
>
> ➢ Understand the errors and assumptions of hypothesis testing.
>
> ➢ Use hypothesis testing to test a mean or proportion.

Week 8   Mid Session Test

Mid Session Test

Week 9   Hypothesis Testing: 2 populations (continued)

CHAPTER 10:

> ➤ Introduction to hypothesis testing for two-sample tests involving numerical values.

> ➤ Hypothesis testing for two-sample tests involving numerical values (cont.).

> ➤ Use hypothesis testing for related samples.

Tutorials: Computer lab (See subject website for location)

Week 10   1 factor ANOVA (Analysis of Variance)

CHAPTER 10:

> ➤ Understand one-way analysis of variance, a technique that allows statisticians to determine whether differences exist among population means.

> ➤ Understand the concept of the Tukey-Kramer procedure and it's basic applications.

Tutorials: Computer lab (See subject website for location)

Week 11   Simple and Multiple Linear Regression

CHAPTERS 12 & 13:

> ➤ Introduce the **c**oncept of simple linear regression.

> ➤ Understand the techniques and assumptions involved in simple and multiple linear regression.

> ➤ Be able to develop a multiple regression model.

> ➤ Interpret the regression coefficients.

> ➤ Test and interpret the significance of the regression model.

Week 12   Multiple Regression Analysis and Revision

During first 2 hours of lecture:

Revision for Final Exam

During third hour of lecture:

Class Test 2 – based on Excel and PHStat2 output

Weeks 13 & 14   Final Examination Period

Examination and study period. Please refer to examination timetable for the exact date, time and location of the final exam.

Assessment

Assessment and Plagiarism Policy

All written assessment tasks, with the exception of examinations and in-class tasks, must be word-processed unless students are otherwise advised.

Students must keep copies of all assessment tasks submitted for marking with the exception of class tests and examinations.

Plagiarism is a form of cheating or stealing that happens when a student uses someone else's work and presents it as his/her own without showing where it comes from. To avoid this, students are expected to submit their own original work for assessment and to accurately acknowledge all references and sources used in essays and assignments.

For information regarding assessment, plagiarism, acknowledging sources and examination rules, please refer to the UOW College Student Handbook

Assessment and Learning Schedule

Assessment Task	Weight %	Week No.	Length Time	Contents Assessed	Outcomes Assessed	Graduate Qualities Assessed
Class test 1	15%	4	45 minutes	1	1, 2	1, 3
Mid-session test	25%	8	1 hour 30 minutes	2 – 5	1 – 3	1, 3
Class test 2	10%	12	30 minutes	1 – 8	2 – 5	1, 3
Final exam	50%	13 / 14	3 hours	6 – 8	3 – 6	1, 3

Note: A final mark of 50% or higher is required to pass ALL Diploma subjects. A mark between 45% and 49% is **NOT** a pass.

Marking Guidelines

UOW College best practice is that students can normally expect to have results and feedback to assessment tasks within two weeks and before the next assessment task is due. On occasion there may be exceptions to this time frame due to, for example, the size of the task, the size of the class, teacher illness or teacher leave.

Where there are several teachers marking a major assessment task, tasks will be handed back by all the teachers within the same week

Assessment Criteria and Explanation of Components

All assessment components are marked according to set marking criteria.

Class Test 1	**45 minutes**	**15%**

Class Test 1 will be held in week 4 during the first hour of lectures.

This test contains the following material covered in the lectures during weeks 1 & 2 (chapters 1 – 3):

- Introduction to Descriptive Statistics
- Descriptive Statistics

Mid-session Test	**1 hour 30 minutes**	**25%**

The mid-session test is one hour and 30 minutes in length. It will be held in week 8 during the first two hours of lectures.

This test contains the following materials covered in the lectures during weeks 3 – 6 (chapters 4 – 8):

- Probability Rules
- Probability Distribution
- Binomial Distribution
- Normal Distribution
- Sampling Distributions
- Confidence Intervals

Class Test 2	**30 minutes**	**10%**

Class Test 2 will be held in week 12 during the first hour of lectures.

Class Test 2 is a test based on Excel and PHStat2 printouts. You will be required to complete several Excel and PHStat2 exercises prior to the test and are required to bring this output to the exam to help you answer the questions. Exercises will be completed during Computer Lab tutorials in Week 10.

Final Examination   3 hours   50%

The final exam is a 3-hour exam held during the college official exam period in weeks 13 & 14. It is a combination of multiple-choice questions and short answer questions.

The final examination contains the following material covered in the lectures during weeks 7-12 (chapters 9 – 13):

- Hypothesis Testing: 1 Population

- Hypothesis Testing: 2 Populations

- 1 factor ANOVA (Analysis of Variance)

- Simple Linear Regression

- Multiple Linear Regression

Non-English speaking background students in the Diploma Programs may use foreign language dictionaries for their final exams. Diploma students who wish to use a dictionary must complete the Dictionary Use Application Form available at reception. This form and the dictionary must be submitted to reception **no later than 5pm Friday week 11** for approval.

Please note the following regulations regarding dictionary use:

- The only dictionaries permitted are language dictionaries, with word to word translations only.

- English-English dictionaries, Electronic dictionaries, Terminology dictionaries, or other are not permitted. The dictionary **must not** include English translations or explanations. Any dictionary that includes English explanations or phrases is not acceptable and will not be approved.

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Diploma of Business and Diploma of Information Technology

(CRICOS course codes: 057231C, 057232B)
(CRICOS course codes: 057233A, 057234M)

Subject Outline Summer 2011

WUCB130

Introduction to Management

Introduction to Management

Subject Description

This subject will introduce students to key management theories and concepts including organisational culture, social responsibility, ethics, managing groups, motivating employees, planning, managing human resources and employment relations, strategic management, decision-making, managing operations, leadership and foundations of management control. The course is designed to provide an opportunity for students to acquire understanding through a series of lectures supported by student participation in simulation activities. The subject is presented from the point of view of managers, but students will learn how the different interests between organisational stakeholders affect various management processes.

Subject Structure

Introduction to Management is delivered in a face-to-face format of five (5) hours per week. The subject consists of 1 × 3 hour lecture and 1 × 2 hour tutorial each week. The session is of 14 weeks' duration with face-to-face classes scheduled for the first 12 weeks and a study/examination period in Weeks 13 and 14.

In addition to scheduled class sessions, students are expected to spend additional time in individual study and research. As a general guideline students will need to spend at least 1 hour in private study (including completing homework and revision) for every two hours of scheduled class time.

Teachers will be available for a consultation time each week. Students will be notified of the time and location of the consultation session during Week 1 of the Session. It is recommended that students experiencing difficulty with this subject arrange to consult with the teacher as difficulties are encountered.

Some students may require tutorial support to improve language/literacy skills. Where this is recommended, students will be advised to use the College's self-access facilities in the Multimedia Centre in their own time. These facilities are located upstairs in building 30.

Learning Resources

Textbook

Schermerhorn J R, Davidson P, Poole A, Simon A, Woods P and Chau S I 2011
Management, 4th Edn, , John Wiley & Sons, Milton Qld.

Texts and Video/DVD

1. Achbar, M., Abbott, J., and Bakan, J., 2004, *The Corporation* [videorecording], Madman Cinema.

2. Branson, R., 1998, *Losing my virginity: How I survived, had fun, and made a fortune doing business my way*, New York, Three Rivers.

3. Crainer, S., and Dearlove, D., 2003, *The ultimate business library: The greatest books that made management*, Capstone, Oxford.

4. Drucker, P., 2002, *Managing in the next society*, Butterworth-Hinemann, Oxford.

5. Modern times [videorecording], 2003, Burbank, Warner Home Video.

6. Slater, R., 2004, *Jack Welch on leadership,* abridged from Jack Welch and the GE way, New York, McGraw-Hill.

7. Spurlock, M., 2004, *Super size me* [videorecording], Civic Square, Ronin Films.

8. Zanko, M. (ed.), 2002, *The handbook of human resource management policies and practices in Asia-Pacific economies*, Volumes 1 and 2, Edward Elgar, Northampton.

9. *Pirates of Silicon Valley* [videorecording], 1999, Published Burbank, CA : Warner Home Video.

Additional Readings

1. Drucker, P., 2002, *Managing in the next society*, Butterworth-Hinemann, Oxford, Will the Corporation Survive? The Future of Top Management and The Way Ahead, pp. 271-299.

2. Koch, R. and Godden, I., 1997, *Managing without management: A post-management manifesto for business simplicity*, Nicholas Brealey, London, Chapter 1, Has Management Outlived its Usefulness?

3. Klein, N., 2000, *No logo, no space, no choice, no jobs: Taking aim at the brand bullies*, Flamingo, The Discarded Factory, pp. 195-229.

Journals and Newspapers

As management and employment relations are real world phenomena, students should take advantage of the availability of information about these subjects available in local, national and international newspapers and magazines.

Subject Outcomes

Successful completion of this subject should enable students to:

1. apply a broad range of theoretical concepts in practical contexts in a management context;

2. analyse the workplace from the perspective of a variety of stakeholders (management, employees, unions, government);

3. analyse management theory through reflection on simulations and case studies;

4. analyse and plan approaches to self-management as a student;

5. develop skills in logical analysis and synthesis of theoretical and empirical material; and

6. explain the historical and social context of Western management theory and practice.

Subject Content

This subject will cover the following content areas:

1. Managing and the Managers Job.

2. Management - Past and Present, Managing groups and teams.

3. The internal environment – culture, diversity and ethics.

4. The external and international environment.

5. Managing strategy and planning.

6. Planning & Decision Making.

7. Organising and Controlling.

8. Leading & Influencing.

9. Managing and motivating individual behaviour and Human Resources.

10. Communication.

11. Managing change and innovation.

Graduate Qualities

The Diploma of Business and Diploma of Information Technology courses are designed to assist students in developing the UOW College Graduate Qualities. It helps students become:

1. **Informed**: have a sound knowledge of an area of study or profession and understand its issues locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas

2. **Independent Learners**: engage with new ideas and ways of thinking and critically analyse issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.

3. **Problem Solvers**: take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative, and aim for high standards.

4. **Effective Communicators**: articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognise how culture can shape communication.

5. **Responsible**: understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.

Subject Outline in Weeks

The following guide to lessons and activities may be adjusted to suit the needs of the group as long as subject outcomes and assessment criteria are met.

Week 1 - Subject Orientation and Introductory Tasks

The Contemporary Workplace

Text: Chapter 1

Week 2

Information and Decision Making

Historical Foundations of Management

Text: Chapters 3 & 4

Week 3

Environment and Diversity

Teams and Teamwork

Text: Chapters 2 & 16

Week 4

The International Environment

Ethical Behaviour and Social Responsibility

Text: Chapters 5 & 6

Week 5

Planning

Strategic Management

Essay Due

Text: Chapter 7 & 9

Week 6

Leading

Text: Chapter 13

Week 7

Mid session test

Week 8

Organising

Operations and Services Management

Text: Chapters 11 & 19

Week 9

Controlling

Group Presentation Due. Students to be advised in tutorials

Text: Chapter 8

Week 10

Communication and Interpersonal skills

Individuals, job design and stress

Group Presentation Due. Students to be advised in tutorials

Text: Chapters 17 & 15

Week 11

Managing Human Resources

Motivation and rewards

Group Presentation Due. Students to be advised in tutorials

Text: Chapter 12 & 14

Week 12

Leading and managing change

Subject revision and exam advice

Text: Chapter 18

Weeks 13 & 14   Final Examination Period

Examination and study period. Please refer to examination timetable for the exact date, time and location of the final exam.

Assessment

Assessment and Plagiarism Policy

All written assessment tasks, with the exception of examinations and in-class tasks, must be word-processed unless students are otherwise advised.

Students must keep copies of all assessment tasks submitted for marking with the exception of class tests and examinations.

Plagiarism is a form of cheating or stealing that happens when a student uses someone else's work and presents it as his/her own without showing where it comes from. To avoid this, students are expected to submit their own original work for assessment and to accurately acknowledge all references and sources used in essays and assignments.

For information regarding assessment, plagiarism, acknowledging sources and examination rules, please refer to the UOW College Student Handbook

Assessment and Learning Schedule

Assessment Task	Weight %	Week No.	Length Time	Contents Assessed	Outcomes Assessed	Graduate Qualities Assessed
Essay	25%	5	1200 – 1500 Words	1 – 4	1, 2, 5, 6	1, 3, 4
Mid-session Test	20%	7	2 hours	1 – 6	1, 2, 3, 6	1, 2, 3, 4
Group Presentation	15%	9 – 11	20 – 30 minutes	Various	1, 2, 4, 5,6	1, 3, 4, 5
Final Exam	30%	13 / 14	3 hours	1 – 12	1, 2, 5, 6	1, 3, 4
Participation	10%	Ongoing	Weeks 1 – 12	1 – 12	1, 2, 3, 4, 5, 6	1 – 5

Note: A final mark of 50% or higher is required to pass ALL Diploma subjects. A mark between 45% and 49% is **NOT** a pass.

Marking Guidelines

UOW College best practice is that students can normally expect to have results and feedback to assessment tasks within two weeks and before the next assessment task is due. On occasion there may be exceptions to this time frame due to, for example, the size of the task, the size of the class, teacher illness or teacher leave.

Where there are several teachers marking a major assessment task, tasks will be handed back by all the teachers within the same week

Assessment Criteria and Explanation of Components

All assessment components are marked according to set marking criteria.

Essay	1200 – 1500 words	25%

Students evaluate a range of information and develop skills in reading and writing critically about theories in management.

Details of the essay will be given out in week 1.

Group Presentation	20 – 30 minutes	15%

Details of the group presentation will be handed out in week 1.

Mid-session Test	2 hours	20%

This assessment tests students' ability to recall and apply a range of disciplinary knowledge as covered in weeks 1 – 6. The test will consist of a variety of questions. Further details will be given out in week 6.

Final Examination	3 hours	30%

The final examination tests students' ability to recall and apply a broad range of disciplinary knowledge as covered in weeks 1 – 12. This examination will consist of a variety of questions. Further details regarding the examination will be provided in week 12.

Non-English speaking background students in the Diploma Programs may use foreign language dictionaries for their final exams. Diploma students who wish to use a dictionary must complete the Dictionary Use Application Form available at reception. This form and the dictionary must be submitted to reception **no later than 5pm Friday week 11** for approval.

Please note the following regulations regarding dictionary use:

- The only dictionaries permitted are language dictionaries, with word to word translations only.

- English-English dictionaries, Electronic dictionaries, Terminology dictionaries, or other are not permitted. The dictionary **must not** include English translations or explanations. Any dictionary that includes English explanations or phrases is not acceptable and will not be approved.

Participation	Ongoing	10%

Active participation in tutorials is expected of all students in all classes. Participation in class discussions will help develop the student's confidence in questioning and commenting on material presented, encourage critical thinking and allow the tutor to evaluate the student's progress.

Participation marks may be allocated according to the following criteria:

- Constructive contribution to general class discussion

- Constructive feedback and contribution to discussions following presentations

- Active participation in tutorial support classes where recommended

- Proactive consultation with class teacher and/or tutorial support where relevant

- Completion of non-assessable tasks including homework and other tasks

- Preparedness for class sessions

- Active participation in group work

Diploma of Information Technology

UOW College

A College of the University of Wollongong

Subject Outline Summer 2011

Australia

Wollongong

WUCT103

Algorithms and Problem Solving

Algorithms and Problem Solving

Subject Description

This subject introduces the basic concepts of algorithms and their relationship to data structures and problem solving. It emphasises problem solving techniques leading to the development of algorithms rather than their implementation or a formal mathematical treatment of algorithms.

It is a precursor to formal algorithm analysis and to the learning of any specific computer programming language. The subject structure reflects an awareness of the need for students to comprehend „what' will be written in a computer program, prior to learning „how' to write it. Thus, students gain an appreciation of the principles of general problem solving and algorithm construction before their conceptions of such matters can be pre-loaded and restricted by the assumptions inherent in any specific computer programming language.

Topics include sorting, searching and counting problems and the principal algorithms used in their solution. Common approaches to algorithm development and analysis will be examined.

Subject Structure

Algorithms & Problem Solving is delivered in a face-to-face format of 7 (seven) hours per week. The subject consists of 2 × 2 hour lectures and 3 hours of tutorial/ practical classes each week. The session is of 14 weeks' duration with face-to-face classes scheduled for the first 12 weeks and a study/examination period in Weeks 13 and 14.

Students may be required to access computer laboratories outside normal laboratory class time in order to complete assignments. Furthermore, students will be required to undertake supplementary reading from relevant textbooks.

The subject uses a number of teaching and learning strategies to allow students to fulfil the objectives and be able to transfer the skills to their future work and study most effectively.

The teaching strategies will include lectures, tutorials, small group discussions and class exercises.

Students would be expected and encouraged to use learning strategies that encourage deep understanding of topics and concepts. These include reflective readings, class discussion, mind mapping, explorations of new ideas and discussion with content experts.

The abstract nature of the material requires a discursive delivery designed to transfer a conceptual rather than a specific skill set. Classes use lecture time to carefully explain a given concept, with heavy use of multiple worked examples and metaphors.

Students are taught techniques for simple „on-paper' processes which implement the concept at hand and provide a general understanding of how a given strategy or algorithm works. Students are set a number of practice problems to complete in class and/or at home.

In addition to scheduled class sessions, students are expected to spend additional time in individual study and research. As a general guideline students will need to spend at least 1

hour in private study (including completing homework and revision) for every two hours of scheduled class time.

Teachers will be available for a consultation time each week. Students will be notified of the time and location of the consultation session during Week 1 of the Session. It is recommended that students experiencing difficulty with this subject arrange to consult with the teacher as difficulties are encountered.

Some students may require tutorial support to improve language/literacy skills. Where this is recommended, students will be advised to use the College's self-access facilities in the Multimedia Centre in their own time. These facilities are located upstairs in building 30.

Learning Resources

Students are not required to purchase a specific text but should use the following as a guide to reading:

Cormen, T.H., et al "*Introduction to Algorithms*" MIT Press.

Berman, K.A. and Paul, J.L., 2005, *Algorithms: Sequential, Parallel, and Distributed*, Thomson Course Technology, Boston.

Brassard, G. and Bratley, P., 1996, *Fundamentals of Algorithmics*, Prentice Hall, Englewood.

Forouzan, B.A., 2004, *Foundations of Computer Science From Data Manipulation to Theory of Computation*, Brooks/Cole, Belmont, California.

Gilberg, R. and Forouzan, B.A., 2001, *Data Structures: A Pseudocode Approach with C++*, Brooks/Cole, Belmont, California.

Levitin, A., 2003, *Introduction to the Design and Analysis of Algorithms*, Addison Wesley, Boston.

Subject Outcomes

Successful completion of this subject will enable students to:

1. Create algorithms and apply them to solve simple problems;
2. Evaluate the concept of recursion and analyse its use;
3. Compare and evaluate the base case and the general case of a recursively defined problem;
4. Determine the appropriate solution technique for a given problem;
5. Demonstrate an understanding of the concepts of time and space complexity as applied to simple algorithms;
6. Analyse and evaluate the computational efficiency of the principal algorithms for sorting and searching;
7. Demonstrate an understanding of the relationship of trees to data structures, algorithms and counting;
8. Analyse issues logically, evaluate different options and viewpoints and implement decisions.

Subject Content

This subject will cover the following content areas:

1. Introduction to algorithms and problem solving; Pseudocode and Flowcharts Invariants; identifying the invariant as a means to solving problems.

2. Elementary algorithms; Brute Force vs. Finesse.

3. Records, arrays, lists; Games: Winning Strategies.

4. Sorting and searching algorithms; Exploiting symmetry in problem Solving.

5. Linked list; Calculational Logic.

6. Queue and stack Induction.

7. Recursion; Use induction to prove a hypothesis.

8. Trees Towers of Hanoi: examining recursive solutions.

9. Graphs Backtracking; Game Trees.

10. Algorithm analysis: empirical measurement, Performance comparison; Knight's tour and Kings tour.

11. Algorithmic strategies: Brute force, greedy, divide and conquer; More on Knight's tour and Kings tour.

12. Algorithmic strategies: Backtracking, heuristics; A sensible way to discuss the complexity of a problem.

Graduate Qualities

The Diploma of Business and Diploma of Information Technology courses are designed to assist students in developing the UOW College Graduate Qualities. It helps students become:

1. **Informed**: have a sound knowledge of an area of study or profession and understand its issues locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas

2. **Independent Learners**: engage with new ideas and ways of thinking and critically analyse issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.

3. **Problem Solvers**: take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative, and aim for high standards.

4. **Effective Communicators**: articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognise how culture can shape communication.

5. **Responsible**: understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.

Subject Outline in Weeks

The following guide to lessons and activities may be adjusted to suit the needs of the group as long as subject outcomes and assessment criteria are met.

	Lecture Series A Algorithms	Lecture Series B Problem Solving
Week 1		
	Introduction to algorithms and problem solving Pseudocode and Flowcharts	Invariants; identifying the invariant as a means to solving problems
Week 2		
	Elementary algorithms	Brute Force vs. Finesse
Week 3		
	Records, arrays, lists	Games: Winning Strategies
Week 4		
	Sorting and searching algorithms	Exploiting symmetry in problem Solving
Week 5		
	Linked list	Calculational Logic
Week 6		
	Queue and stack	Induction
Week 7		
	Recursion	Use induction to prove a hypothesis
Week 8		
	Trees	Towers of Hanoi: examining recursive solutions
Week 9		
	Graphs	Backtracking, Game Trees
Week 10		
	Algorithm analysis: empirical measurement, performance comparison	Knight's tour, Kings tour
Week 11		
	Algorithmic strategies: Brute force, greedy, divide and conquer	More on Knight's tour, Kings tour
Week 12		
	Algorithmic strategies: Backtracking, heuristics	A sensible way to discuss the complexity of a problem
Week 13 & 14	**Final Examination Period**	

Examination and study period. Please refer to examination timetable for the exact date, time and location of the final exam.

Assessment

Assessment and Plagiarism Policy

All written assessment tasks, with the exception of examinations and in-class tasks, must be word-processed unless students are otherwise advised.

Students must keep copies of all assessment tasks submitted for marking with the exception of class tests and examinations.

Plagiarism is a form of cheating or stealing that happens when a student uses someone else's work and presents it as his/her own without showing where it comes from. To avoid this, students are expected to submit their own original work for assessment and to accurately acknowledge all references and sources used in essays and assignments.

For information regarding assessment, plagiarism, acknowledging sources and examination rules, please refer to the UOW College Student Handbook

Assessment and Learning Schedule

Assessment Task	Weight %	Week No.	Due week	Contents Assessed	Outcomes Assessed	Graduate Qualities Assessed
Assignment 1	8%	1	3	1 & 2	1, 2	1, 3
Assignment 2	8%	3	5	2, 3, & 4	1, 3	1
Assignment 3	8%	5	7	3, 4 & 5	2, 4, 5 & 8	1, 2, 3 & 5
Assignment 4	8%	7	9	6, 7, 8	6 to 8	1 – 4
Assignment 5	8%	9	12	9 to 12	4 & 8	1 – 3
Participation	10%	1 – 12		All	All	All
Final exam	50%	13 / 14	3 hours	All	All	All

Note: A final mark of 50% or higher is required to pass ALL Diploma subjects. A mark between 45% and 49% is **NOT** a pass.

Marking Guidelines

UOW College best practice is that students can normally expect to have results and feedback to assessment tasks within two weeks and before the next assessment task is due. On occasion there may be exceptions to this time frame due to, for example, the size of the task, the size of the class, teacher illness or teacher leave.

Where there are several teachers marking a major assessment task, tasks will be handed back by all the teachers within the same week

Assessment Criteria and Explanation of Components

All assessment components are marked according to set marking criteria.

Assignments	40%

There will be a total of 5 assignments released on **e-learning** in weeks 1, 3, 5, 7, 9. Each assignment is due at **23:59** on **Wednesday** in weeks 3, 5, 7, 9, and 12.

The assignments are equally weighted. Refer to the Assessment Schedule for details of assignment weightings.

All assignments must be **submitted via e-learning** (no exceptions).

The following penalties will apply to late assignments (in accordance with the Student Handbook):

- 1 day late: - 10%

- 2 days late: - 20%

- 3 days late: - 30%

- Work submitted more than three days late will be graded as 0 marks

For each assignment, no submission will be possible beyond 23:59 Saturday of the week due.

Final Examination	3 hours	50%

The final exam is of 3 hours duration plus reading time. You will be given more information on the format of the final exam during the session.

Non-English speaking background students in the Diploma Programs may use foreign language dictionaries for their final exams. Diploma students who wish to use a dictionary must complete the Dictionary Use Application Form available at reception. This form and the dictionary must be submitted to reception **no later than 5pm Friday week 11** for approval.

Please note the following regulations regarding dictionary use:

- The only dictionaries permitted are language dictionaries, with word to word translations only.

- English-English dictionaries, Electronic dictionaries, Terminology dictionaries, or other are not permitted. The dictionary **must not** include English translations or explanations. Any dictionary that includes English explanations or phrases is not acceptable and will not be approved.

Participation   10%

Active participation in tutorials is expected of all students. Participation in class discussions will help develop the student's confidence in questioning and commenting on material presented, encourage critical thinking and allow the tutor to evaluate the student's progress.

Participation marks may be allocated according to the following criteria:

- Proactive consultation with class teacher

- Completion of non-assessable tasks including homework and practice tasks

- Preparation for teacher-student consultation sessions

- Active participation in group work and class discussions

Diploma of Information Technology

UOW College

A College of the University of Wollongong

Subject Outline Summer 2011

Australia

Wollongong

WUCT114

Procedural

Programming

Procedural Programming

Subject Description

This subject is designed as an introductory course in computer programming and is suitable for students who have no prior knowledge of programming languages or who have little (or no) experience in designing, developing and implementing programs in the C++ programming language.

The lectures introduce students to computer programming by explaining the fundamental concepts involved in programming computers. Programming is treated as total creative process by which programs are written for the purpose of instructing computers to carry out a variety of tasks.

To develop skills in the design, development and implementation of programs, students will be given a number of assignments and will be shown how to develop a programming solution to each specified problem by performing a number of logical steps. These assignments will provide practical experience in writing, debugging and testing programs on the C++ Integrated Development Environment.

The subject content includes computer algorithms, program design, implementation and documentation. Elements of "good programming style" will be treated as a significant part of the course.

Subject Structure

Procedural Programming is delivered in a face-to-face format of 7 (seven) hours per week. The subject consists of 1 x 3 hour lecture, 1 × 1 hour tutorial and one 3-hour practical session each week. The session is of 14 weeks' duration with face-to-face classes scheduled for the first 12 weeks and a study/examination period in Weeks 13 and 14.

Students may be required to access computer laboratories outside normal laboratory class time in order to complete assignments. Furthermore, students will be required to undertake supplementary reading from relevant textbooks. Students will need to bring their own storage device (such as a USB drive) for use in the laboratory classes. Alternatively you may choose to email a copy of your work to yourself if you do not have such a device. Students are responsible for their own storage of work. Ensure regular backups are made, as no exceptions will be given for loss of files

Principal material covered in this subject will be available from the subject's web site. Students are free to print their own copies of these slides. These slides may then be combined with notes written during lectures to form the principal introductory programming reference for this subject. For course revision, students should review each lecture and complete any homework tasks.

In addition to scheduled class sessions, students are expected to spend additional time in individual study and research. As a general guideline students will need to spend at least 1 hour in private study (including completing homework and revision) for every two hours of scheduled class time.

Teachers will be available for a consultation time each week. Students will be notified of the time and location of the consultation session during Week 1 of the Session. It is recommended that students experiencing difficulty with this subject arrange to consult with the teacher as difficulties are encountered.

Some students may require tutorial support to improve language/literacy skills. Where this is recommended, students will be advised to use the College's self-access facilities in the Multimedia Centre in their own time. These facilities are located upstairs in building 30.

Learning Resources

The following reference text(s) are recommended:

D. S. Malik, *C++ Programming: From Problem Analysis to Program Design*, 5th Edition, Course Technology, 2011

Other relevant text(s):

Judy Scholl, *C++ Programming: From Problem Analysis to Program Design*, Lab Manual, 4th Edition 2009

Bjarne Stroustrup, *Programming: Principles and Practice Using C++*, Addison-Wesley, 2009

Subject Outcomes

Successful completion of this subject will enable students to:

1. Analyse and explain the behaviour of simple programs.

2. Apply basic C++ functionality to code simple algorithms.

3. Display a working knowledge of good programming style.

4. Design, implement, test and debug simple programs.

5. Apply features of an integrated development environment to develop programs.

6. Apply the techniques of structured decomposition to break a program into smaller pieces.

7. Further develop C++ practical skills by writing computer programs.

8. Demonstrate effective communication skills with other C++ programmers.

Subject Content

This subject will cover the following content areas:

1. Background of Computing and Programming - History of computers, Algorithms, Programming style.

2. Introduction to C++ Programming - C++ Data types, The Representation of Data, Binary numbers, Operators, Simple C++ programs and Stream I-O.

3. C++ Selection Control Structures - The if and switch statements.

4. C++ Loop Control Structures - The for loop, while loop and do-while, loop. break & continue statements.

5. C++ Libraries and Arrays - C++ Libraries, Array data types.

6. Strings and Formatted I-O - Character Arrays, Strings, I-O streams, Format manipulators.

7. Functional Decomposition I - Intro to Functions and Functional decomposition.

8. Functional Decomposition II - Advanced Functions - pass by reference, pass by value, passing arrays to functions.

9. Storage Structures and User Defined Data Types - Structs, Unions, Enums and User Defined Data Types.

10. File I-O, Debugging Strategies - C++ File streams, Formatted I-O with files, Debugging Strategies.

11. Multi-File Programs, Recursion and Recursive Algorithms - Multi-file programs, Projects and Header Files, Recursion and recursive algorithms.

12. Revision.

Graduate Qualities

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1. **Informed**: have a sound knowledge of an area of study or profession and understand its issues locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas

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3. **Problem Solvers**: take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative, and aim for high standards.

4. **Effective Communicators**: articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognise how culture can shape communication.

5. **Responsible**: understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.

Subject Outline in Weeks

The following guide to lessons and activities may be adjusted to suit the needs of the group as long as subject outcomes and assessment criteria are met.

Generally, the subject will be divided into four modules with each module comprised of lectures, an assignment and a test.

Week 1 – An Overview of Computers and Programming Languages

History of computers, Elements of a Computer System, The Language of a Computer, Programming Methodologies, ANSI/ISO Standard C++.

Week 2 – Basic Elements of C++

The Basic Elements of a C++ Program, Data types, Arithmetic Operators and Operator Precedence, Expressions, Type Conversion, Input, Increment and Decrement Operators, Output, Preprocessor Directives, Creating a C++ Program, Simple Debugging, Programming Style and Form, Assignment Statements

Week 3 – Input / Output

I/O Streams and Standard I/O Devices, Using Predefined Functions in a Program, Input Failure, Output and Formatting Output, Additional Output Formatting Tools, Input/Output and the *string* Type, Debugging: Understanding Logic Errors and Debugging with *cout* Statements, File Input/Output.

Ass1 Due - 5 marks

Week 4 – Control Structures I (Selection)

Relational Operators, Logical (Boolean) Operators and Logical Expressions, Selection *if* and *if…else*, Using Pseudocode to Develop, Test, and Debug a Program, *switch* Structures.

Test 1 - 7.5 marks

Week 5 – Control Structures II (Repetition)

Why is Repetition Needed?, *while* Looping (Repetition) Structure, Designing *while* Loops, *for* Looping (Repetition) Structure, *do…while* Looping (Repetition) Structure, *break* and *continue* Statements, Nested Control Structures, Debugging Loops.

Week 6 – User Defined Functions I

Predefined Functions, User-Defined Functions, Value-Returning Functions.

Ass 2 Due - 5 marks

Week 7 - User Defined Functions II

Void Functions, Value Parameters, Reference Variables as Parameters, Scope of an Identifier, Global Variables, Named Constants, Function Overloading, Functions with Default Parameters.

Test 2 - 7.5 marks

Week 8 – User Defined Simple Data Types, Namespaces, and the string Type

Enumeration Type, Namespaces, *string* Type.

Week 9 – Arrays and Strings

Arrays, *C*-Strings (Character Arrays), Parallel Arrays, Two- and Multi- dimensional Arrays

Ass 3 Due - 5 marks

Week 10 – Records (*structs*), Random Numbers

Records (*struct*s), The PseudoRandom Number Generator (PRNG)

Test 3 - 7.5 marks

Week 11 – Recursion and Multi-File Programs

Recursive Definitions, Problem Solving Using Recursion, Recursion or Iteration?, Introduction to Multi-File Programs (C++ Projects)

Ass 4 Due - 5 marks

Week 12 - Revision

Revision

Test 4 - 7.5 marks

Weeks 13 & 14   Final examination Period

Examination and study period. Please refer to examination timetable for the exact date, time and location of the final exam.

Assessment

Assessment and Plagiarism Policy

All written assessment tasks, with the exception of examinations and in-class tasks, must be word-processed unless students are otherwise advised.

Students must keep copies of all assessment tasks submitted for marking with the exception of class tests and examinations.

Plagiarism is a form of cheating or stealing that happens when a student uses someone else's work and presents it as his/her own without showing where it comes from. To avoid this, students are expected to submit their own original work for assessment and to accurately acknowledge all references and sources used in essays and assignments.

For information regarding assessment, plagiarism, acknowledging sources and examination rules, please refer to the UOW College Student Handbook

Assessment and Learning Schedule

Assessment Task	Weight %	Week No.	Length Time	Contents Assessed	Outcomes Assessed	Graduate Qualities Assessed
Assignments	20%	3, 6, 9, 11	TBA	1 – 11	1 – 8	1 – 5
Module Tests	30%	4, 7, 10, 12	60 minutes	1 – 11	1 – 8	1 – 5
Final exam	50%	13 / 14	3 hours	1 – 11	1 – 8	1 – 5

Note: A final mark of 50% or higher is required to pass ALL Diploma subjects. A mark between 45% and 49% is **NOT** a pass.

Marking Guidelines

UOW College best practice is that students can normally expect to have results and feedback to assessment tasks within two weeks and before the next assessment task is due. On occasion there may be exceptions to this time frame due to, for example, the size of the task, the size of the class, teacher illness or teacher leave.

Where there are several teachers marking a major assessment task, tasks will be handed back by all the teachers within the same week

Assessment Criteria and Explanation of Components

All assessment components are marked according to set marking criteria.

Subject delivery and assessment is based on 4 modules worth 12.5 marks each and a final examination worth 50 marks giving a total out of 100 marks. Each module is comprised of an Assignment (5 marks) and a Test (7.5 marks).

Assignments 1, 2, 3,and 4	20% (4 × 5%)

Students will design and code C++ programs according to provided program specifications.

Assignment 1 (**Week 3**)   – Will be assessing topics from module 1 (weeks 1 – 3).

Assignment 2 (**Week 6**)   – Will be assessing topics from module 2 (weeks 4 – 6).

Assignment 3 (**Week 9**)   – Will be assessing topics from module 3 (weeks 7 – 9).

Assignment 4 (**Week 11**)   – Will be assessing topics from module 4 (weeks 10 – 11).

Please note that each module builds on the knowledge in the previous module(s), hence to complete assignments 2 – 4 concepts from the preceding modules are assumed knowledge.

Assignments will require work to be completed on the computer. For most students the practical classes (3 hours per week) will provide sufficient time to complete these tasks. If additional computer time is required it will be the responsibility of students to make use of University computer laboratories in their own time. The laboratory schedule and availability can be viewed in the laboratory.

All assessable tasks must be the student's own work. Group work on any assessable task is not permitted. Copying another person's code, or allowing someone else to copy your work, is regarded as cheating. Any student involved in cheating will receive no marks for the work. If a student is having difficulty understanding or completing any task, the student should not hesitate to ask for assistance. (This is, of course, AFTER THE STUDENT HAS EARNESTLY TRIED TO COMPLETE THE TASK).

Assignments must be submitted electronically (in full); this procedure will be explained to you by your lecturer. Please ensure you label the assignments with the following information typed clearly on the label and on the top of each file: student name, student number, subject name, assignment number, the due date. Submitted C++ code files should also have a brief statement describing what is contained in the file. The title block should be appropriately commented so as to not effect compilation of the file. To receive full marks assignments must be demonstrated during the lab class in the following week. Assignments that are not demonstrated will receive a 1 mark deduction. Late assignments should be submitted via e-learning.

Late assignments should be submitted via the e-learning website to your teacher. Any emailed assignments are sent at the student's own risk. (Return receipts can be enabled on most email applications to receive confirmation.)

Late submission will be penalised in accordance with the student handbook.

- 1 day late: 10% of mark
- 2 days late: 20% of mark
- 3 days late: 30% of mark

(Work submitted later than three days will not be marked)

Extension of the due date (without penalty) will only be granted in exceptional circumstances *e.g.* death in family, medical condition, etc. Appropriate documentary evidence must be provided. A student requiring an extension in these circumstances should submit a Special Consideration Request Form to the Program Manager, as outlined in the Wollongong College Australia student handbook.

Module Tests 1, 2, 3, and 4	60 minutes	30% (4 × 7.5%)

The module tests will consist of multiple-choice and short answer questions. They are closed-book exam conducted in lab class (*i.e.* no reference material or C++ compilers are permitted).

Module Test 1 (Week 4) – Will be assessing topics from module 1 (weeks 1 – 3).

Module Test 2 (Week 7) – Will be assessing topics from module 2 (weeks 4 – 6).

Module Test 3 (Week 10) – Will be assessing topics from module 3 (weeks 7 – 9).

Module Test 4 (Week 12) – Will be assessing topics from module 4 (weeks 10 – 11).

Please note that each module builds on the knowledge in the previous module(s), hence to complete module tests 2 – 4 concepts from the preceding modules are assumed knowledge.
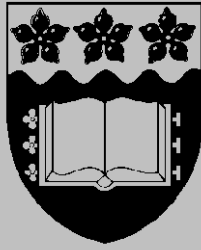
Final Examination	3 hours	50%

The final examination will be held during the formal examination period in weeks 13 and 14, and will examine all topics covered during the session.

Non-English speaking background students in the Diploma Programs may use foreign language dictionaries for their final exams. Diploma students who wish to use a dictionary must complete the Dictionary Use Application Form available at reception. This form and the dictionary must be submitted to reception **no later than 5pm Friday week 11** for approval.

Please note the following regulations regarding dictionary use:
- The only dictionaries permitted are language dictionaries, with word to word translations only.
- English-English dictionaries, Electronic dictionaries, Terminology dictionaries, or other are not permitted. The dictionary **must not** include English translations or explanations. Any dictionary that includes English explanations or phrases is not acceptable and will not be approved.

Wollongong College Australia

A College of the University of Wollongong

Australia

Wollongong

Diploma in Information Technology

(CRICOS course codes: 057233A, 057234M)

Subject Outline Autumn 2011

WUCT121

Discrete Mathematics

Discrete Mathematics

Subject Description

Students will be introduced to the spirit of mathematical inquiry and critical analysis, and encouraged to develop the ability to apply mathematical principles to the formulation and solution of problems. This will be done using non-calculus techniques, especially those of logic and number theory. This subject is well suited to computer science students. Topics include logic, number theory, mathematical induction, set theory, relations and functions, and graph theory.

Subject Structure

Discrete Mathematics is delivered in a face-to-face format of 6 (six) hours per week. The subject consists of 2 × 2 hour lectures and 1 × 2 hour tutorial each week. The session is of 14 weeks' duration with face-to-face classes scheduled for the first 12 weeks and a study/examination period in Weeks 13 and 14.

In addition to scheduled class sessions, students are expected to spend additional time in individual study and research. As a general guideline students will need to spend at least 1 hour in private study (including completing homework and revision) for every two hours of scheduled class time.

Teachers will be available for a consultation time each week. Students will be notified of the time and location of the consultation session during Week 1 of the Session. It is recommended that students experiencing difficulty with this subject arrange to consult with the teacher as difficulties are encountered.

Some students may require tutorial support to improve language/literacy skills. Where this is recommended, students will be advised to use the College's self-access facilities in the Multimedia Centre in their own time. These facilities are located upstairs in building 30.

Assumed Knowledge:

Band 4 or higher in NSW HSC Mathematics, or Band 2 or higher in NSW HSC Mathematics Extension 1, or any band in NSW HSC Mathematics Extension 2.

Learning Resources

Epp, Susanna S, 1993, *Discrete Mathematics with Applications*

Lucas, John F, 1986, *Introduction to Abstract Mathematics*

Grossman, Peter, *Discrete Mathematics*, 2nd ed, 2002, Palgrave Macmillan

Johnsonbaugh, Richard, *Discrete Mathematics*, 5th ed, 2001, Prentice Hall, New Jersey

You are not required to purchase reference books. Several copies of these books are available in the University of Wollongong Library. These readings are not intended to be an exhaustive list. Students are encouraged to use the Library catalogue and databases to locate additional readings with similar titles and contents.

Calculators

Students will be required to bring a scientific calculator to all classes. Students who need to purchase a calculator for this subject are strongly recommended to purchase a Casio FX-82 series (approximately $25 – $40) calculator.

Only approved scientific calculators will be permitted in examinations. The list of approved calculators is located on the college website (www.wca.uow.edu.au). Students should refer to this list to confirm their calculator has been approved for use in examinations. Programmable calculators are not permitted. Programmable calculators usually have a RUN, EXE, CALC or SOLVE button.

Subject Outcomes

Successful completion of this subject will enable students to:

1. apply mathematical principles to the interpretation of data, the formulation and solution of problems and the critical analysis of answers for use in a range of problems in both mathematics and computer science;

2. construct truth tables for logical expressions; test statements for logical equivalence and represent mathematical statements in the language of predicate logic;

3. use appropriate methods of proof to derive results in set theory, number theory and the elementary theory of relations and functions;

4. define the basic elements of graph theory, and apply these in analysing types of graphs.

Subject Content

This subject will cover the following content areas:

1. Overview of subject and introduction to logic.
2. Logic.
3. Predicate logic.
4. Methods of proof.
5. Set theory.
6. Relations and functions.
7. Natural numbers.
8. Mathematical induction.
9. Integers.
10. Elementary number theory.
11. Congruence arithmetic.
12. Graph theory

Graduate Qualities

The Diploma in Business and Diploma in Information Technology courses are designed to assist students in developing the WCA Graduate Qualities. It helps students become:

1. **Informed**: have a sound knowledge of an area of study or profession and understand its issues locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas

2. **Independent Learners**: engage with new ideas and ways of thinking and critically analyse issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.

3. **Problem Solvers**: take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative, and aim for high standards.

4. **Effective Communicators**: articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognise how culture can shape communication.

5. **Responsible**: understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.

Subject Outline in Weeks

The following guide to lessons and activities may be adjusted to suit the needs of the group as long as subject outcomes and assessment criteria are met.

Week 1

Lecture 1: Subject Introduction, Logic
Lecture 2: Natural Numbers

Week 2

Lecture 1: Logic
Lecture 2: Integers & Real Numbers

Week 3

Lecture 1: Logic
Lecture 2: Predicate Logic

Assignment 1 due

Week 4

Lecture 1: Mathematical Induction
Lecture 2: Mathematical Induction

Week 5

Lecture 1: Methods of Proof
Lecture 2: Mathematical Induction

Assignment 2 due

Week 6

Lecture 1: Methods of Proof
Lecture 2: Graph Theory

Mid-Session Test 1

Week 7

Lecture 1: Graph Theory
Lecture 2: GraphTheory

Assignment 3 due

Week 8

Lecture 1: Number Theory
Lecture 2: Congruence Arithmetic

Week 9

Lecture 1: NumberTheory
Lecture 2: Set Theory

Assignment 4 due

Week 10

Lecture 1: Congruence Arithmetic
Lecture 2: Set Theory

Mid-Session Test 2

Week 11

Lecture 1: Set Theory
Lecture 2: Relations and Functions

Assignment 5 due

Week 12

Lecture 1: Relations and Functions
Lecture 2: Relations and Functions

Weeks 13 & 14   Final examination Period

Examination and study period. Please refer to examination timetable for the exact date, time and location of the final examination.

Assessment

Assessment and Plagiarism Policy

All written assessment tasks, with the exception of examinations and in-class tasks, must be word-processed unless students are otherwise advised.

Students must keep copies of all assessment tasks submitted for marking with the exception of class tests and examinations.

Plagiarism is a form of cheating or stealing that happens when a student uses someone else's work and presents it as his/her own without showing where it comes from. To avoid this, students are expected to submit their own original work for assessment and to accurately acknowledge all references and sources used in essays and assignments.

For information regarding assessment, plagiarism, acknowledging sources and examination rules, please refer to the Wollongong College Australia Student Handbook
http://www.wca.uow.edu.au/handbook

Assessment and Learning Schedule

Assessment Task	Weight %	Week No.	Length Time	Contents Assessed	Outcomes Assessed	Graduate Qualities Assessed
Weekly assignments	20%	2, 4, 6, 8, 10	1 – 2 hours each	1 – 12	1 – 3	1, 3
Mid-session test 1	15%	6	1 hour	1 – 3	1, 2	1, 3
Mid-session test 2	15%	10	1 hour	4 – 8	1, 3	1, 3
Final examination	50%	13 / 14	3 hours	1 – 12	1 – 4	1, 3

Note: A final mark of 50% or higher is required to pass ALL Diploma subjects. A mark between 45% and 49% is **NOT** a pass.

Marking Guidelines

WCA best practice is that students can normally expect to have results and feedback to assessment tasks within two weeks and before the next assessment task is due. On occasion there may be exceptions to this time frame due to, for example, the size of the task, the size of the class, teacher illness or teacher leave.

Where there are several teachers marking a major assessment task, tasks will be handed back by all the teachers within the same week

Assessment Criteria and Explanation of Components

All assessment components are marked according to set marking criteria.

Assignments	20%

There will be five assignments which will be handed out in tutorials. Each assignment will be due as indicated in the assessment schedule. They will be marked during the ensuing week and returned in the following tutorial class.

▸ You must show working for each question on the assignment.

▸ Marking criteria includes correctness, presentation and working.

▸ Untidy or illegible work will not be assessed, and will be graded as 0 marks.

▸ Assignments must be submitted with the assignment cover sheet provided and you should make sure your receipt is initialed.

▸ Faxed or emailed assignments will not be accepted. You must submit your assignment in person.

▸ Late assignments must be dated and initialed by an authorized employee of the college and submitted in accordance with the local policy of individual campuses.

▸ The following penalties will apply to late assignments (in accordance with student handbook):

- 1 day late   – 10%

- 2 days late   – 20%

- 3 days late   – 30%

- Work submitted more than three days late will be graded as 0 marks.

▸ Extension of the due date (without penalty) will only be granted if you are successful in applying to the College for special consideration. A student requiring an extension in these circumstances should submit a Special Consideration Request Form to the Program Manager, as outlined in the Wollongong College Australia student handbook.

▸ Assignments are only part of the expected weekly workload.

▸ You should keep a copy of all work submitted.

Every assignment submitted will contribute towards your final assessment. However, the primary purpose of each assignment is to give you feedback on your progress and understanding of the work.

Mid-Session Test 1   60 minutes   15%

Mid-session test 1 will be held in week 6 and will examine materials covered in the lectures and tutorials during weeks 1 – 4.

Mid-Session Test 2   60 minutes   15%

Mid-session test 1 will be held in week 10 and will examine materials covered in the lectures and tutorials during weeks 5 – 8.

Final Examination   3 hours   50%

The final examination will be held during the formal examination period in weeks 13 and 14. The examination will include all topics covered during the session with approximate emphasis as follows: 11.5% on topics studied in weeks 1 – 4, 11.5% on topics studied in weeks 5 – 8, and 27% on topics studied in weeks 9 – 12

Non-English speaking background students in the Diploma Programs may use foreign language dictionaries for their final examinations. Diploma students who wish to use a dictionary must complete the Dictionary Use Application Form available at reception. This form and the dictionary must be submitted to reception **no later than 5pm Friday week 11** for approval.

Please note the following regulations regarding dictionary use:

- The only dictionaries permitted are language dictionaries, with word to word translations only.

- English-English dictionaries, Electronic dictionaries, Terminology dictionaries, or other are not permitted. The dictionary **must not** include English translations or explanations. Any dictionary that includes English explanations or phrases is not acceptable and will not be approved.

Diploma of Information Technology

UOW College

A College of the University of Wollongong

Subject Outline Summer 2011

Australia

Wollongong

WUCT124

Applied

Programming

Applied Programming

Subject Description

This subject develops a thorough understanding of program design using data structures. It extends WUCT114 and presents pointers, dynamic memory management and exception handling. Other topics include implementation of Sorting and Searching algorithms including the use of `typedef`s to generalise algorithms; Implementation of data structures: queues, stacks, linked lists, dequeues, trees, heaps; Hashing; random access files; Testing of programs: black and white box testing, and the use of debuggers; Use of multi-file organisation; These concepts will be treated through formal lectures, tutorials, assignments and laboratory sessions employing an object oriented language.

Subject Structure

Applied Programming is delivered in a face-to-face format of 7 (seven) hours per week. The subject consists of 2 × 2 hour lectures, and 3 hours of practical laboratory work each week. The session is of 14 weeks' duration with face-to-face classes scheduled for the first 12 weeks and a study/examination period in Weeks 13 and 14.

Students may be required to access computer laboratories outside normal laboratory class time in order to complete assignments. Furthermore, students will be required to undertake supplementary reading from relevant textbooks.

Students will need to bring their own storage device (such as a USB drive) for use in the laboratory classes. Alternatively you may choose to email a copy of your work to yourself if you do not have such a device. Students are responsible for their own storage of work. Ensure regular backups are made, as no exceptions will be given for loss of files

The majority of the learning materials used in lectures will be made available from the Applied Programming website. Students are welcome to print copies of the materials provided on this site for their personal use. The learning materials provided to students represent a summary of the topics being discussed; lectures cover each topic in significantly more detail. It is important that students attend all lectures and actively participate in class discussions.

In addition to scheduled class sessions, students are expected to spend additional time in individual study and research. As a general guideline students will need to spend at least 1 hour in private study (including completing homework and revision) for every two hours of scheduled class time.

Teachers will be available for a consultation time each week. Students will be notified of the time and location of the consultation session during Week 1 of the Session. It is recommended that students experiencing difficulty with this subject arrange to consult with the teacher as difficulties are encountered.

Some students may require tutorial support to improve language/literacy skills. Where this is recommended, students will be advised to use the College's self-access facilities in the Multimedia Centre in their own time. These facilities are located upstairs in building 30.

Learning Resources

Malik D.S., C++ Programming: Program Design Including Data Structures, 5th Edition, Course Technology, 2011

Hubbard J. R., *Programming with C++*, (2nd ed.),
Schaum's Outlines Series, McGraw-Hill, 2000

Hortstmann, C, Budd, T, *Big C++,*
Wiley Publishing, 2005

Savitch W., *Problem Solving with C++: The Object of Programming*, (5th ed.),
Addison-Wesley, 2005

Stroustrup B., *The C++ Programming Language*, (3rd ed.),
Addison-Wesley, 2000

Stallings W., *Operating Systems – Internals and Design Principles*, (5th ed.),
Prentice-Hall, 2005

Deitel, H., & Deitel P., *C++, How to Program*, (5th ed.),
Prentice-Hall, 2005

Subject Outcomes

Successful completion of this subject will enable students to:

1. Use memory management and exception handling in software implementation

2. Use dynamic memory allocation to create and maintain dynamic data structures

3. Identify and describe structured data types, their implementation in C++, and use in problem solving

4. Design, implement, test and debug simple programs.

5. Write programs that display a working knowledge of good programming style.

Subject Content

This subject will cover the following content areas:

1. Revision and Introductory Topics

2. Pointers

3. Dynamic memory

4. Object-based programming

5. Exceptions and debugging

6. Sorting

7. Searching

8. Collection classes

Graduate Qualities

The Diploma of Business and Diploma of Information Technology courses are designed to assist students in developing the UOW College Graduate Qualities. It helps students become:

1. **Informed**: have a sound knowledge of an area of study or profession and understand its issues locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas

2. **Independent Learners**: engage with new ideas and ways of thinking and critically analyse issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.

3. **Problem Solvers**: take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative, and aim for high standards.

4. **Effective Communicators**: articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognise how culture can shape communication.

5. **Responsible**: understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.

Subject Outline in Weeks

The following guide to lessons and activities may be adjusted to suit the needs of the group as long as subject outcomes and assessment criteria are met.

Week 1 – Module 1

Introduction / More C++

Week 2 – Module 1

More C++

Week 3 – Module 1

More C++

Week 4 – Module 2

Pointers and Dynamic Memory

Week 5 – Module 2

Pointers and Dynamic Memory

Week 6 – Module 2

Pointers and Dynamic Memory

Week 7 – Module 3

Classes

Week 8 – Module 3

Classes

Week 9 – Module 3

Classes

Week 10 – Module 4

Data Structures

Week 11 – Module 4

Data Structures

Week 12 – Module 4

Data Structures / **Revision**

Weeks 13 & 14   Final Examination Period

Examination and study period. Please refer to examination timetable for the exact date, time and location of the final exam.

Module Content

Module 1: More C++

- WUCT114 Revision
    - `typedef`, type-casting, enumerations
- Multiple Source Programs
    - header/implementation files
    - avoiding redefinition of included files
    - makefiles
- Preprocessor Directives
    - definitions, conditional commands, include
- Understanding runtime errors
    - Segmentation Faults
    - Bus Errors
- Bitwise operators
    - and/or/xor/complement/shift operations
- Binary I/O
    - `seekg`/`seekp`
    - `read`/`write`

Module 2: Pointers and Dynamic Memory

- Pointers
    - `sizeof`
    - address operator (`&`)
    - passing function arguments by reference/value
    - reference operator (`*`)
    - arrays as pointers
    - pointer arithmetic (`p++`, etc)
    - `void*` pointers
    - pointers to structs/classes (`->` operator)
- Dynamic Memory
    - `new` operator
    - memory leaks
    - `delete` operator
    - `delete[]` operator

Module 3: Classes

- Classes
    - classes vs. objects
    - private/public
    - accessor/mutator functions
    - constructors
    - copy constructors
    - destructors
    - `static const` member variables
- Namespaces
- Other classes
    - `string` class
- Exceptions
    - `try`
    - `catch`
    - `badalloc`
    - `catch(...)`
    - Black/White-box testing

Module 4: Data Structures

- Sorting/searching
    - Selection/Bubble/Insertion
    - Binary search
    - Quicksort
- Generic coding using typedef statements
- Linked lists
    - C++ implementation of insert/delete, etc.
- Binary Search Trees
    - C++ implementation of location, traversals, etc.
    - Storing trees in arrays
- Overview of other collections
    - doubly-linked lists, stacks, queues, dequeues, priority queues, heaps
- Hashing
    - Hash functions
    - Collisions
    - Occupancy
    - Insertion/retrieval of data

Assessment

Assessment and Plagiarism Policy

All written assessment tasks, with the exception of examinations and in-class tasks, must be word-processed unless students are otherwise advised.

Students must keep copies of all assessment tasks submitted for marking with the exception of class tests and examinations.

Plagiarism is a form of cheating or stealing that happens when a student uses someone else's work and presents it as his/her own without showing where it comes from. To avoid this, students are expected to submit their own original work for assessment and to accurately acknowledge all references and sources used in essays and assignments.

For information regarding assessment, plagiarism, acknowledging sources and examination rules, please refer to the UOW College Student Handbook

Assessment and Learning Schedule

Assessment Task	Weight %	Week No.	Length Time	Contents Assessed	Outcomes Assessed	Graduate Qualities Assessed
Exercises	5%	1 – 12		1 – 8	1 – 5	1 – 3
Assignment 1	6.25%	2 – 3		1	4, 5	1 – 3
Test 1	5%	3	30 minutes	1	4, 5	1 – 3
Assignment 2	6.25%	4 – 5		2 – 3	1, 2, 4, 5	1 – 3
Test 2	5%	6	30 minutes	2 – 3	1, 2, 4, 5	1 – 3
Assignment 3	6.25%	7 – 8		4 – 5	1, 2, 4, 5	1 – 3
Test 3	5%	9	30 minutes	4 – 5	1, 2, 4, 5	1 – 3
Assignment 4	6.25%	10 – 11		6 – 8	3, 4, 5	1 – 3
Test 4	5%	12	30 minutes	6 – 8	3, 4, 5	1 – 3
Final exam	50%	13 / 14	3 hours	1 – 8	1 – 5	1 – 3

Note: A final mark of 50% or higher is required to pass ALL Diploma subjects. A mark between 45% and 49% is **NOT** a pass.

Marking Guidelines

UOW College best practice is that students can normally expect to have results and feedback to assessment tasks within two weeks and before the next assessment task is due. On occasion there may be exceptions to this time frame due to, for example, the size of the task, the size of the class, teacher illness or teacher leave.

Where there are several teachers marking a major assessment task, tasks will be handed back by all the teachers within the same week

Assessment Criteria and Explanation of Components

All assessment components are marked according to set marking criteria.

Assignments		**25%**

Each course module will include a practical assignment involving the creation of a C++ program which utilises the language features learned within that module.

Assignments are to be submitted on or before the due time. Assignments which are submitted after the due time will be marked as late and will be penalised as outlined in the student handbook. Assignment submissions more than 3 days late will be awarded a mark of zero. Each of the 4 assignments is worth 6.25% of your final mark for this subject.

Class Tests	**30 minutes**	**20%**

Each course module concludes with a written test assessing the student's understanding of the module content in a manner which prepares them for the final examination. Each of the 4 class tests is worth 5% of your final mark for this subject.

Final Examination	**3 hours**	**50%**

The final examination will be held during the formal examination period in weeks 13 and 14, and will examine all topics covered during the session.

Non-English speaking background students in the Diploma Programs may use foreign language dictionaries for their final exams. Diploma students who wish to use a dictionary must complete the Dictionary Use Application Form available at reception. This form and the dictionary must be submitted to reception **no later than 5pm Friday week 11** for approval.

Please note the following regulations regarding dictionary use:

- The only dictionaries permitted are language dictionaries, with word to word translations only.

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Exercises		**5%**

Throughout the session, small coding exercises will be given to help students consolidate their understanding and put the theory learned into practise.

Diploma of Information Technology

(CRICOS course codes: 057233A, 057234M)

UOW College

A College of the University of Wollongong

Subject Outline Summer 2011

Australia

Wollongong

WUCT140

Analytical Thinking

for Technology

Analytical Thinking for Technology

Subject Description

This subject is an introduction to the techniques of critique as used in the area of information and communication technology (ICT). It covers a range of approaches to critique and how they can be expressed in the form of a case study, report, oral presentation and critical essay.   The approaches to critique are applied across the themes of the internet and the web; systems design and development; and computers and education.   A consideration of ethics is incorporated in each of the themes. The subject is specifically designed to address the needs of students who have not developed skills and understanding of the concepts and techniques of critique.

Subject Structure

Analytical Thinking for Technology is delivered in a face-to-face format of five (5) hours per week. Weekly classes consist of a 3-hour lecture and a 2-hour tutorial.

In addition to scheduled class sessions, students are expected to spend additional time in individual study and research. As a general guideline students will need to spend at least 1 hour in private study (including completing homework and revision) for every two hours of scheduled class time.

Teachers will be available for a consultation time each week. Students will be notified of the time and location of the consultation session during Week 1 of the Session. It is recommended that students experiencing difficulty with this subject arrange to consult with the teacher as difficulties are encountered.

Some students may require tutorial support to improve language/literacy skills. Where this is recommended, students will be advised to use the College's self-access facilities in the Multimedia Centre in their own time. These facilities are located upstairs in building 30.

Learning Resources

There are no set texts for this subject.

Required readings:

The following list of required readings can be found on the library website under e-readings or short term loans for this subject.

1. Chaffee J, 2012 *Critical Thinking, Thoughtful Writing,* 5th edition, Wadsworth Cengage Learning, Boston, MA, USA, pp 1 – 25 (Week 1)
2. Shneiderman, B and Plaisant C, 2010, *Designing the User Interface – strategies for effective human-computer interaction,* 5th edition, Addison-Wesley, Upper Saddle River, pp 22 – 59 (Week 2)
3. Shneiderman, B and Plaisant C, 2010, *Designing the User Interface – strategies for effective human-computer interaction,* 5th edition, Addison-Wesley, Upper Saddle River, pp 150 – 185 (Week 3)
4. Benyon, D 2005 *Designing Interactive Systems: a comprehensive guide to HCI interaction and design,* 2nd edition, Addison Wesley, Harlow England, pp 533 – 555 (Week 4)
5. Benyon, D 2005 *Designing Interactive Systems: a comprehensive guide to HCI interaction and design,* 2nd edition, Addison Wesley, Harlow England, pp 601 – 615 and 624 – 643 (Week 5)
6. Bretag T, Crossman J & Bordia S, 2009, *Communication Skills,* McGraw-Hill, Sydney, NSW Australia, pp 145 – 166, or
   Dwyer J, 2009, *Communication in Business: strategies and skills,* 4th edition, Pearson Prentice-Hall, Frenchs Forest, NSW Australia, pp526 – 540 (Week 8)
7. Clabaugh GK & Rozycki EG 1997, *Analyzing Controversy: An Introductory Guide,* Dushkin/McGraw-Hill, Sluice Dock Guilford CT USA, pp 12 – 18, 20 – 27, 28 – 36 (Week 9)
8. Clayton JF 2006 "Online Learning" in Ghaoui C, *Encyclopeadia of Human Computer Interaction,* Idea Group Reference, Hershey PA USA, pp 435 – 440 (Week 10)
9. Bennett S, Maton K & Kervin, L 2008, „The "digital natives" debate: A critical review of the evidence', British Journal of Educational Technology, 39, 5, 775-786, accessed 21 July 2011, Wiley Online Library (Week 11)

Supplementary readings:

A list of supplementary readings which are optional to the above required readings will be made available during Week 1. Supplementary readings may be added to during the session as they become available..

Subject Outcomes

Successful completion of this subject will enable students to:

1. Distinguish between various approaches to critique

2. Analyse basic concepts about theory

3. Analyse issues, including ethics, related to ICT

4. Evaluate empirical evidence and apply it to theories relating to ICT

5. evaluate various methods and techniques of critique as they apply to ICT

6. Evaluate technology in its social and business context

7. Present a coherent discussion both orally and in writing

8. Reflect upon the process of learning with the purpose of developing conceptual and creative skills

9. take limited responsibility for achievement of group outcomes

10. Report on findings

Subject Content

This subject will cover the following content areas:

1. Essay writing: An introduction to essay writing for university.

2. Introduction to Usability Universal usability and design principles

3. Evaluating website design: Methods and techniques

4. Fundamentals of human computer interaction I: Memory, attention, emotion and implications for design.

5. Fundamentals of human computer interaction II: Social interaction, perception and implications for design

6. Editing your essay.

7. What is a report? Reports and their use in information technology.

8. Presentation techniques: Practical techniques for making presentations.

9. Being sceptical: What does being sceptical mean for information technologists?

10. Computers and education – an orthodox view: An orthodox view of computers in education.

11. Computers and education – a sceptical view: A sceptical view of computers in education.

12. Review and reflection; Reflecting upon the processes of learning.

Graduate Qualities

The Diploma of Business and Diploma of Information Technology courses are designed to assist students in developing the UOW College Graduate Qualities. It helps students become:

1. **Informed**: have a sound knowledge of an area of study or profession and understand its issues locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas

2. **Independent Learners**: engage with new ideas and ways of thinking and critically analyse issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.

3. **Problem Solvers**: take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative, and aim for high standards.

4. **Effective Communicators**: articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognise how culture can shape communication.

5. **Responsible**: understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.

Subject Outline in Weeks

The following guide to lessons and activities may be adjusted to suit the needs of the group as long as subject outcomes and assessment criteria are met.

Week 1 Essay writing

An introduction to essay writing for university

Week 2 Introduction to Usability

Universal usability and design principles

Week 3 Evaluating website design

Methods and techniques

Week 4 Fundamentals of human computer interaction I

Memory, attention, emotion and implications for design

Week 5 Fundamentals of human computer interaction II

Social interaction, perception and implications for design

Week 6 Editing your Essay

Editing your essay

Week 7 What is a report?

Reports and their use in information technology

Week 8 Presentation techniques

Practical techniques for making presentations

Week 9 Being sceptical

What does being sceptical mean for information technologists?

Week 10 Computers and education – an orthodox view

An orthodox view of computers in education

Week 11 Computers and education – a sceptical view

A sceptical view of computers in education

Week 12 Review and reflection

Reflecting upon the processes of learning

Weeks 13 & 14   Final examination Period

Please note that there is no final examination for Analytical Thinking for Technology in this study period.

Assessment

Assessment and Plagiarism Policy

All written assessment tasks, with the exception of examinations and in-class tasks, must be word-processed unless students are otherwise advised.

Students must keep copies of all assessment tasks submitted for marking with the exception of class tests and examinations.

Plagiarism is a form of cheating or stealing that happens when a student uses someone else's work and presents it as his/her own without showing where it comes from. To avoid this, students are expected to submit their own original work for assessment and to accurately acknowledge all references and sources used in essays and assignments.

For information regarding assessment, plagiarism, acknowledging sources and examination rules, please refer to the UOW College Student Handbook

Assessment and Learning Schedule

Assessment Task	Weight %	Week No.	Length Time	Contents Assessed	Outcomes Assessed	Graduate Qualities Assessed
Class test 1	15%	4	1 hour	1 – 3	2, 3, 6	1, 4, 5
Essay	30%	7	1300 words	1 – 6	1, 5, 7	1, 2, 4
Group presentation and report*	30%	10	20 minutes	2 – 8	4, 6, 7, 8, 9, 10	1, 2, 3, 4, 5
Class test 2	25%	12	2 hours	1 – 11	1, 3, 5, 7	1, 4

*The report contains an individual component for each student.

Note: A final mark of 50% or higher is required to pass ALL Diploma subjects. A mark between 45% and 49% is **NOT** a pass.

Marking Guidelines

UOW College best practice is that students can normally expect to have results and feedback to assessment tasks within two weeks and before the next assessment task is due. On occasion there may be exceptions to this time frame due to, for example, the size of the task, the size of the class, teacher illness or teacher leave.

Where there are several teachers marking a major assessment task, tasks will be handed back by all the teachers within the same week

Assessment Criteria and Explanation of Components

All assessment components are marked according to set marking criteria.

All assessment components are marked according to set marking criteria. Marking criteria are available in week 1.

Essay	1300 Words	30%

In this assessment, students will prepare a coherent, written discussion of concepts and issues in the field of information technology. Further details will be provided in week 1.

Class Test 1	1 Hour	15%

The class tests will consist of multiple choice and/or short answer questions based on the lectures, tutorials and readings in the preceding weeks.

Group Presentation and Report	20 minutes	30%

In this assessment, students will investigate a topic and present their results to the class. The report contains an individual component for each student. Further details will be provided in week 1.

Class Test 2	2 Hours	25%

The class tests will consist of multiple choice and/or short answer questions based on the lectures, tutorials and readings in the preceding weeks.

UOWC-WUCT140-SO/7