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# SCSSE

**School of Computer Science and Software Engineering  
Faculty of Informatics**

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**CSCI204 Object and Generic Programming in C++  
Subject Outline  
Spring Session 2009**

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Head of School –Professor Willy Susilo, Student Resource Centre, Tel: (02) 4221 3606

## GENERAL INFORMATION

### Subject Coordinator

Telephone Number:

Email:

Location:

Dr Luke McAven

02 4221 4879

lukemc@uow.edu.au

3.109

Dr McAven's consultation times during session:

Day

Monday

Wednesday

Time

10:30-12:30

10:30-12:30

### Lecturer

Telephone Number:

Email:

Location:

Dr Wanqing Li

4221 5410

wanqing@uow.edu.au

3.101

Dr Li's consultation times during session:

Day

Monday

Tuesday

Time

8:30-10:30

10:30-12:30

### Subject Organisation

Session:

Credit Points

Contact hours per week:

Lecture Times & Location:

Spring Session, Wollongong Campus

6 credit points

3 hours lectures, 2 hours Computer lab

Lecture A 13:30– 15:30 Mon, 38-G01

Lecture B 09:30-10:30 Tues, 35-G45

Tutorial Day, Time and Location can be found at: <http://www.uow.edu.au/student/timetables/index.html>

Students should check the subject's web site regularly as important information, including details of unavoidable changes in assessment requirements will be posted from time to time via e-Learning space <http://www.uow.edu.au/student/>. Any information posted to the web site is deemed to have been notified to all students.

### 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

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level. Templates are introduced as a method of achieving generalisation. Container classes and the Standard Template Library are presented as examples of generic programming.

### 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

### Graduate Qualities

This subject will continue to the following graduate qualities:

Informed  
Problem Solvers

Further information can be found at:

<http://www.uow.edu.au/informatics/scsse/current/SubjectInformation/UOW049401.html>

### Attendance Requirements:

It is the responsibility of students to attend all lectures/tutorials/labs/seminars/practical work for subjects for which you are enrolled. It should be noted that the amount of time spent on each 6 credit point subject should be at least 12 hours per week, which includes lectures/tutorials/labs etc.

Satisfactory attendance is deemed by the University, to be attendance at approximately 80% of the allocated contact hours.

Attendance rolls will be kept for lectures and laboratories. If you are present for less than 80% and would have otherwise passed you need to apply for student academic consideration, otherwise a TF (technical fail) grade will be recorded.

Students MUST attend their **allocated** tutorial unless they have the written permission of the subject coordinator.

### Method of Presentation:

In order to maximize learning outcomes, it is strongly recommended that students attend all lectures.

### Lecture Schedule:

A proposed Lecture schedule for the subject is as follows:

Week	Topic
1	Subject introduction, Introduction to Object Oriented Programming, C++ revision
2	C++ Revision: Functions ... An introduction to UML. Classes and objects: Encapsulation.
3	An introduction to UML Diagrams: Class and Object diagrams. Constructors & Destructors. Composition & aggregation. Reusability, naming, coupling & cohesion.
4	Overloading & Friends, Inheritance.
5	Inheritance, virtuality, abstractness and polymorphism. Runtime type identification.
6	Exceptions, namespaces. More on design and diagrams with UML.
7	More on diagrams with design and diagrams with UML.

	Some miscellaneous material.
8	Generic programming: Templates for functions and classes. Containers and iterators. Template compilation models.
9	Advanced C++ I/O, manipulators, strings and string streams.
10	Introduction to the Standard Template Library. STL: Vectors, Deques and Lists.
11	STL: Vectors, Deques and Lists, STL: Stacks, queues and priority queues, STL: Sorted Associated containers.
12	STL: Sorted Associated containers, STL: Function objects & generic algorithms.
13	Summary, revision

Changes to the above schedule will be posted via e-Learning space <http://www.uow.edu.au/student/>. Any information posted to the web site is deemed to have been notified to all students.

### Subject Materials:

Any readings/references are recommended only and are not intended to be an exhaustive list. Students are encouraged to use the library catalogue and databases to locate additional readings

### Textbook(s):

Joyce Farrell, Object Oriented Programming Using C++, Third Edition, Thomson Learning.

### Other Resources:

References:

- Blaha, M. and Rumbaugh, J., Object-Oriented Modeling and Design with UML.2nd edition. Pearson Education, Inc. 2005.
- Horstmann, C. and Budd, T., Big C++, John Wiley & Sons, Inc. 2005
- Johnsonbaugh R. and Kalin M. 2000, Object-oriented Programming in C++. Prentice Hall.
- Main M. and Savitch W. 2001. Data Structures and Other Objects Using C++. Addison Wesley.
- Deitel H. M. and Deitel P. J. 2001. C++: How to Program, 3rd Edition, Prentice Hall.
- Meyers, S. 1992. Effective C++, Addison Wesley.
- Stroustrup, Bjarne, The C++ Programming Language, Addison-Wesley
- Musser, D. R., Derge, G. J. and Saini, A. 2001. STL Tutorial and Reference Guide, 2<sup>nd</sup> ed. Modena Software, Inc.

### Assessment:

This subject has the following assessment components.

ASSESSMENT ITEMS & FORMAT	% OF FINAL MARK		GROUP/ INDIVIDUAL	DUE DATE
Laboratories	10%	60% (6/10)	Individual	During 2-13, not week 6
Four assignments	40%	40% (16/40)	Individual	Approximate due weeks: 4,7,10,13

<b>Final Examination</b>	<b>50%</b>	<b>45%</b> <b>(22.5/50)</b>	<b>Individual</b>	<b>During exam period</b>
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### Notes on Assessment:

All assignments are expected to be completed independently. Plagiarism may result in a FAIL grade being recorded for that assignment.

- (a) There will be 4 assignments, which will be assessed. There is no requirement to carry out this work in the laboratories. You may work at home to develop solutions. Your completed solutions must be submitted electronically via the UNIX/Linux *submit* system.
- (b) **Submissions via email will not be accepted.**
- (c) All assignments are expected to be completed independently. Plagiarism may result in a FAIL grade being recorded for that assignment.
- (d) Assignments are to be submitted electronically by the deadline. It is the student's responsibility to keep a backup of his/her work. Failure of a student's own equipment cannot be expected to be suitable grounds for an extension.
- (e) Programs that do not compile in accordance with the assignment specification may receive **zero marks**.
- (f) **Late assignments will not be accepted without a granted Student Academic Consideration.** The exact time after which the submitted assignment will not be accepted by the system will be indicated in every assignment specification.

### Electronic Submission of Assessment Items:

Unless otherwise notified by the subject coordinator, all written assignments must be submitted electronically.

### Lab sessions

- Students must abide by the laboratory rules posted on the wall of the Laboratory (and included in this document).
- Students may use the computers outside their designated laboratory times provided the laboratory is open and no other laboratory class is scheduled. If another class is scheduled for the laboratory, you may enter no earlier than 20 minutes after the scheduled starting time and ask the supervisor whether any vacant machines may be used.

To prepare for laboratories students should be familiar with the lecture notes and suggested chapters of the text book or other sources. The lecture notes or the textbook may be needed for reference during the labs. It is much easier having a printed copy of the lecture notes.

**To be eligible for a Pass in this subject a student must achieve a mark of at least 60% (6/10) in the Laboratories, 40% (16/40) in the assignments, and 45% (22.5/50) in the exam. Students who fail to achieve one of these minimum marks & would have otherwise have passed may be given a TF (Technical Fail) for this subject.**

### Procedures for the return of assessment items:

We aim to return assignment marks within 2 weeks of the assignment deadline. Marks will be available through SOLS, and comments will be returned at laboratories or via email. Enquiries regarding the marks should be made within **2 weeks of the assignment marks being released**.

### Penalties for late submission of assessment items:

Penalties apply to all late work, except if student academic consideration has been granted. Late

submissions will attract a penalty of 25% of the mark obtained per day, including weekends. Work more than 3 days late will be awarded a mark of zero.

Requests for extensions should be made electronically by logging on to SOLS at <http://www.uow.edu.au/student/index.html>, and following the Student Academic Consideration link. All such requests must be made prior to the due date and supporting documentation (e.g. medical certificates) should be lodged with administration. Please note that such requests are not necessarily granted. In particular, no extension will be allowed after model solutions have been released or discussed in class. The following advice, which forms part of the Student Academic Consideration application process, should also be noted.

“Please be aware that your Subject Coordinator(s) may not be able to consider your application for Student Academic Consideration immediately. If the nature of assistance sought is urgent, or you are seeking a short extension of time to submit your assessment item, please approach your Subject Coordinator directly, soon after submitting the form.”

Thus, you should not assume your application has been granted. You should discuss the situation with your subject coordinator or lecturer as soon as possible after submitting your application and prior to the due date for the assessment item.

### **Tutorial/Lab Closure Policy**

If for any reason, the number of students in a tutorial or lab falls below a sustainable enrolment level, as determined by the Head of School, tutorials/labs offered for that subject may be collapsed or deleted.

You will have to attend the new tutorials/lab if this closure affects the one you are attending.

We will endeavour to make this decision no later than Week 4 of session.

### **Supplementary Exams**

Supplementary Exams will be dealt with in accordance with student academic consideration policy (<http://www.uow.edu.au/about/policy/studentacademicconsiderationpolicy.pdf>) 9.2 Timing of Supplementary Exams.

While the School normally grants supplementary exams when the student does not sit the standard exam for an acceptable reason, each case will be assessed on its own merit and there is no guarantee a supplementary exam will be granted. If a supplementary exam is granted, you will normally be notified via SOLS Mail the time and date of this supplementary exam. You must follow the instructions given in the email message.

**Please note that if this is your last session and you are granted a supplementary exam, be aware that your results will not be processed in time to meet the graduation deadline.**

### **Student Academic Consideration Policy**

The School recognises that it has a responsibility to ensure equity and consistency across its subjects for all students. Sometimes, in exceptional circumstances, students need to apply for student academic consideration in order to complete all assessable work.

The University applies strict criteria to the granting of student academic consideration. Before applying for student academic consideration, students should carefully read the University's policy which can be found at: <http://www.uow.edu.au/about/policy/studentacademicconsiderationpolicy.pdf>.

### **Plagiarism**

**When you submit an assessment task, you are declaring the following**

1. It is your own work and you did not collaborate with or copy from others.
2. You have read and understand your responsibilities under the University of Wollongong's policy on plagiarism.

- You have not plagiarised from published work (including the internet). Where you have used the work from others, you have referenced it in the text and provided a reference list at the end of the assignment.

Students must remember that:

Plagiarism will not be tolerated.

Students are responsible for submitting original work for assessment, without plagiarising or cheating, abiding by the University's policies on Plagiarism as set out in the University Handbook under University Policy Directory and in Faculty handbooks and subject guides. Plagiarism has led to the expulsion from the University.

### Student Academic Grievance Policy

The School aims to provide a fair, equitable and productive learning environment for all its students. The Student Academic Grievance Policy seeks to support the achievement of this goal by providing a transparent and consistent process for resolving student academic grievances.

Any student who has a grievance over a result should obtain a Faculty of Informatics Appeal Against Decision or Action Affecting Academic Experience form from the Informatics Student Enquiry Centre. (<http://www.uow.edu.au/content/groups/public/@web/@inf/@faculty/documents/doc/uow017433.pdf>) The student should firstly take the form to the marker/lecturer to discuss the matter and, if the student is still not satisfied, s/he should take the next step as outlined on the form.

Once the grievance has been considered by the Faculty, if the student still feels the situation has not been fully resolved s/he may consult the Dean of Students. However, the Dean of Students can have no input into the academic judgment of the lecturer and can only review the grievance to ensure proper procedure has been followed.

### Relevant University Policies, procedures and students services:

For more information students must refer to the Faculty handbook, online references or consult the UOW policy in full at <http://www.uow.edu.au/handbook/courserules/studacgrievpol.html> which contains a range of policies on educational issues and student matters.

This outline should be read in conjunction with the following documents:

Code of Practice - Teaching and Assessment <a href="http://www.uow.edu.au/handbook/codesofprac/teaching_code.pdf">http://www.uow.edu.au/handbook/codesofprac/teaching_code.pdf</a>	Code of Practice - Students <a href="http://www.uow.edu.au/handbook/codesofprac/cop_students.html">http://www.uow.edu.au/handbook/codesofprac/cop_students.html</a>
Code of Practice-Honours <a href="http://www.uow.edu.au/handbook/CodeofPractice-Honours.pdf">http://www.uow.edu.au/handbook/CodeofPractice-Honours.pdf</a>	Acknowledgement Practice <b>Plagiarism will not be tolerated:</b> <a href="http://www.uow.edu.au/handbook/courserules/plagiarism.html">http://www.uow.edu.au/handbook/courserules/plagiarism.html</a>
Key Dates <a href="http://www.uow.edu.au/student/dates.html">http://www.uow.edu.au/student/dates.html</a>	Student Academic Consideration Policy: <a href="http://www.uow.edu.au/about/policy/studentacademicconsiderationpolicy.pdf">http://www.uow.edu.au/about/policy/studentacademicconsiderationpolicy.pdf</a>
Course Progress Requirements: <a href="http://www.uow.edu.au/student/mrp/index.html">http://www.uow.edu.au/student/mrp/index.html</a>	Graduate Qualities Policy: <a href="http://www.uow.edu.au/about/teaching/qualities/index.html#_The_new_UOW">http://www.uow.edu.au/about/teaching/qualities/index.html#_The_new_UOW</a>
Academic Grievance Policy (Coursework and honours students) <a href="http://www.uow.edu.au/handbook/courserules/studacgrievpol.html">http://www.uow.edu.au/handbook/courserules/studacgrievpol.html</a>	Non-Discriminatory Language Practice and Presentation <a href="http://staff.uow.edu.au/eed/nondiscrimlanguage.html">http://staff.uow.edu.au/eed/nondiscrimlanguage.html</a>
Occupational Health and Safety <a href="http://staff.uow.edu.au/ohs/commitment/ohspolicy/index.html">http://staff.uow.edu.au/ohs/commitment/ohspolicy/index.html</a>	Ownership of Work & Intellectual Property Policy: <a href="http://www.uow.edu.au/handbook/generalcourserules/UOW028651.html">http://www.uow.edu.au/handbook/generalcourserules/UOW028651.html</a>
Human Research Ethics Committee: <a href="http://www.uow.edu.au/research/rso/ethics/human/">http://www.uow.edu.au/research/rso/ethics/human/</a>	Rules for student conduct: <a href="http://www.uow.edu.au/handbook/generalrules/StudentConductRules.pdf">http://www.uow.edu.au/handbook/generalrules/StudentConductRules.pdf</a>
Independent Learners' Introductory Program <a href="http://www.uow.edu.au/student/attributes/ilip/">http://www.uow.edu.au/student/attributes/ilip/</a>	Informatics Faculty Librarian, Ms Annette Meldrum, phone: 4221 4637, email: <a href="mailto:ameldrum@uow.edu.au">ameldrum@uow.edu.au</a>
Student Support Services:	SCSSE Internet Access & Student Resource Centre

*This subject outline can be found at: <http://www.uow.edu.au/informatics/scsse/current>*

<a href="http://www.uow.edu.au/student/services/">http://www.uow.edu.au/student/services/</a> Informatics Faculty SEDLO ( <b>Student Equity and Diversity Liaison Officers</b> ) Virginie Schmelitschek, phone 4221 3833, <a href="mailto:virginie@uow.edu.au">virginie@uow.edu.au</a>	<a href="http://www.uow.edu.au/informatics/common/uow024466.html">http://www.uow.edu.au/informatics/common/uow024466.html</a>
SCSSE Computer Usage Rules <a href="http://www.uow.edu.au/informatics/common/uow024457.html">http://www.uow.edu.au/informatics/common/uow024457.html</a>	SCSSE Subject Outlines <a href="http://www.uow.edu.au/informatics/scsse/current">http://www.uow.edu.au/informatics/scsse/current</a>