SCSSE

School of Computer Science and Software Engineering
Faculty of Engineering & Information Sciences

Acting Head of School A. Professor Markus Hagenbuchner, Student Resource Centre,

Tel: (02) 4221 3491

CSCI204 Object and Generic Programming in C++

Subject Outline

Autumn Session 2015

Consultation Times:

Subject Coordinator	Dr Igor Kharitonenko	Dr Lei Ye
Telephone Number:	02 4221 4825	02 4221 3793
Email:	igor@uow.edu.au	lei@uow.edu.au
Location:	3.108	3.211

Dr Kharitonenko's consultation times during session:

Day	Time
Thursday	12:30 – 14:30
Friday	13:30 – 15:30

Dr Ye's consultation times during session:

Day	Time
Tuesday	13:30 – 15:30
Thursday	13:30 – 15:30

Subject Organisation:

Session:	Autumn Session 2015, Wollongong Campus
Credit Points	6 credit points
Contact hours per week:	3 hours lecture; 2 hours lab
Lecture Times & Location:	Lecture A: Tuesday 15:30-17:30, 67-104 Lecture B: Thursday 15:30-16:30, 35-G20
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 Moodle 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 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:

"Graduate Qualities" are the aspirational qualities that students will progressively develop through their learning experiences at UOW. These Graduate Qualities are not achieved in a single subject - their development is an ongoing process across an entire program of study. This subject will contribute to the following Graduate Qualities:

- Innovation and design
- Informed
- Problem solvers

Further information can be found at:
http://eis.uow.edu.au/future-students/graduate-qualities/index.html

<u>Graduate Qualities Explained</u>:

Graduate Qualities	Covered in	Assessed in
Innovation and design	Lectures, Laboratories	Assignments, Laboratories, Exam
Informed	Lectures	Assignments, Laboratories, Exam
Problem Solvers	Lectures, Laboratories	Assignments, Laboratories, Exam

Recent Improvements:

SCSSE is committed to ongoing improvements and is constantly monitoring feedback from students and staff.

Attendance Requirements:

In order to maximize learning outcomes, it is strongly recommended that students attend all lectures/tutorials/labs/seminars/ practical work for subjects for which you are enrolled. Satisfactory attendance is deemed by the University, to be attendance at approximately 80% of the allocated contact hours.

Attendance rolls may be kept for laboratories. <u>If you are present for less than 80% and would have otherwise passed, a TF (technical fail) grade may be recorded for this subject.</u> Students MUST attend the lab sessions unless they have a written permission of the subject coordinator, or a granted request for academic consideration.

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/labs and self-directed study.

Lecture Schedule:

Week	Topic
1-3	Subject introduction, introduction to object oriented programming, C++ revision. An introduction to UML. Classes and objects: Encapsulation. Constructors & destructors. Composition & aggregation. Reusability, naming, coupling & cohesion.
4-5	Overloading & friends, inheritance. Inheritance, virtuality, abstraction and polymorphism. Runtime type identification.
6-7	Exception objects, miscellaneous. More on design and diagrams with UML.

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

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):

No textbook is prescribed for this subject. However, the following books may be useful as reference texts:

References:

- Joyce Farrell, Object Oriented Programming Using C++, 4th Edition, Thomson Learning, 2008
- Mailk, D. S., C++ Programming: Program Design Including Data Structures, 7th Edition, Course Technology, Cengage Learning, 2014
- 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++, 2nd Edition, John Wiley & Sons, Inc. 2008
- Johnsonbaugh R. and Kalin M., Object-oriented Programming in C++. 2nd Edition, Prentice Hall, 1999
- Main M. and Savitch W. 2001. Data Structures and Other Objects Using C++, 4th Edition, Addison Wesley, 2010
- Deitel H. M. and Deitel P. J. 2001. C++: How to Program, 8th Edition, Prentice Hall, 2011
- Meyers, S., Effective C++, 3rd Edition, Addison Wesley, 2005
- Stroustrup, Bjarne, The C++ Programming Language, 4th Edition, Addison-Wesley, 2013
- Musser, D. R., Derge, G. J. and Saini, A., STL Tutorial and Reference Guide, 2nd Edition, Addison Wesley, 2001

Assessment:

This subject has the following assessment components.

ASSESSMENT ITEMS & FORMAT	% OF FINAL MARK	GROUP/ INDIVIDUAL	DUE DATE
Laboratory assignments	10%	Individual	During Laboratories weeks 2-12
Three assignments	40%	Individual	Advised by Lecturer
Final Examination	50%	Individual	During exam period

Notes on Assessment:

Assignments

All assignments are expected to be completed <u>individually</u>. Plagiarism may result in a FAIL grade being recorded for that assignment.

- There will be 3 assignments. 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.
- Submissions via email will not be accepted.
- Assignments have to be submitted electronically before the due date and then can be resubmitted (if needed) before the submission is closed. As sufficient time is given for implementation and resubmission (to resolve possible electronic submission difficulties), late assignments will not be accepted without granted student academic considerations. The exact time after which the submitted assignment will not be accepted by the *submit* system will be indicated in every assignment specification. Late submissions will attract a penalty of 100% of the assessment mark.
- It is the student's responsibility to keep a backup of his/her work. Failure of the equipment cannot be expected to be suitable grounds for an extension.
- All submitted assignments must include an information header that shows the student's name, the email address and the group number. Assignments without the properly filled headers will not be marked.
- The submitted files must be named as required. Files submitted with incorrect names are not recognized by the assignment test/report system and will not be tested/marked
- Programs that do not compile, or which are not in accordance with the assignment specification, may receive zero marks.
- Assignment marks will be published on SMP. Enquiries about the marks can only be made to the lecturer within a maximum of 1 week after the assignment marks are published. After 1 week, the marks cannot be changed.

Labs sessions

- The lab sessions will be one week behind the lectures to provide sufficient time for preparation. All lab tasks are available on the subject web site (in the section *Laboratories*) and may be completed at home prior the scheduled lab sessions.
- Students are expected to complete the lab tasks and get their work assessed during supervised 2-hrs lab sessions. All lab exercises should be completed. If more time is required to complete the scheduled lab task, this can also be done after the current session during a week. However, all work must be completed before the next session start.
- At the next lab session (during the first 1 hr of the lab session) your tutor will check your solutions and give you a mark according to the quality of your solution and the level of your understanding.
- Students, who are not able to attend a lab session and would like to get a mark for the task completed, must apply for academic considerations according to the UOW policies.

Technical Fail

To be eligible for a Pass in this subject a student must achieve a mark of at least 40% (4/10) in the Laboratories, 40% (16/40) in the assignments, and 40% (20/50) in the examination. Students who fail to achieve any of these minimum marks and would otherwise have passed may be given a TF (Technical Fail) for this subject. Students may get TF if they attend less than 80% of the lab sessions.

Reasonable Adjustment to Assessment
A student with a disability may be entitled to reasonable adjustment to assessment.
A reasonable adjustment document is a recommendation that needs to be discussed and ratified by subject coordinators. Normal subject assessment requirements can only be adjusted with explicit written permission of the subject coordinator. In particular students cannot assume that a reasonable adjustment document bestows a right to deferred or supplementary exams.

Supplementary Exams

1. A student whose overall performance results in a TF will only be granted a supplementary assessment task (e.g. a supplementary exam or a supplementary assignment) if approved by the school assessment committee.
2. A student who achieves a mark of 48-49% will normally be eligible for a grade of WS and a supplementary exam organised by the University. In this case, the maximum grade attainable is PS (Pass Supplementary) and a mark of 50%.
3. A student who has successfully applied for academic consideration will receive either:
   a. A WD - Withheld Deferred Exam - and be allowed to sit only a supplementary exam, which will be supervised by the University or
   b. A WH – Withheld – and be allowed to sit a supplementary exam not supervised by the University or complete some other supplementary task
4. If a student is being investigated for misconduct and the investigation cannot be completed before the grades are released the student will receive a grade of WH until a mark is declared.

Calculators will not be allowed in the final exam.

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.

Exams
Exams will be run in accordance with UOW Exam rules, please refer to changes to exams and grades at: http://www.uow.edu.au/student/exams/UOW115867.html

Supplementary Exams
The School does not offer a supplementary exam to a student who has sat a scheduled exam. Supplementary Exams will be dealt with in accordance with student academic consideration policy (http://www.uow.edu.au/about/policy/UOW060110.html) 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 recognizes 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/UOW058721.html

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.
3. You have not plagiarized 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 to 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 Academic Integrity and Plagiarism Policy as set out in the University Handbook, the University's online Policy Directory and in Faculty handbooks and subject guides. Re-using any of your own work (either in part or in full) which you have submitted previously for assessment is not permitted without appropriate acknowledgement-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/about/policy/UOW058653.html) 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 http://www.uow.edu.au/about/policy/UOW058680.html at 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 http://www.uow.edu.au/about/policy/UOW058666.html
Code of Practice-Honours: http://www.uow.edu.au/about/policy/UOW058661.html
Key Dates: http://www.uow.edu.au/student/dates/index.html
Course Progress Requirements: http://www.uow.edu.au/student/cp/index.html
Academic Grievance Policy (Coursework and honours students) http://www.uow.edu.au/about/policy/UOW058653.html
Student Charter: www.uow.edu.au/student/charter/
Occupational Health and Safety http://www.uow.edu.au/about/policy/UOW016894.html
Human Research Ethics Committee: http://www.uow.edu.au/research/ethics/human/index.html
General Enquiries; EIS Central Bld 4, Ground Floor, Room 12 Phone; 4221 3491

Faculty of Engineering & Information Sciences current students website: http://eis.uow.edu.au/current-students/
Student Support Services: http://www.uow.edu.au/student/services/index.html Faculty SEDLO (Student Support and Learning Officers) Mitz Perez - Bld 4 Rm 105 phone 4221 3833 Mon-Wed, mitz-perez@uow.edu.au
Information Technology Services and Policies: http://www.uow.edu.au/about/policy/it/index.html
Student Representative Details: http://eis.uow.edu.au/current-students/get-involved/index.html
Academic Integrity and Plagiarism Policy: http://www.uow.edu.au/about/policy/UOW058648.html
Student Academic Consideration Policy: http://www.uow.edu.au/about/policy/UOW058721.html
Non-Discriminatory Language Practice and Presentation http://www.uow.edu.au/about/policy/UOW058706.html
Ownership of Work & Intellectual Property Policy: http://www.uow.edu.au/about/policy/UOW058689.html
Rules for student conduct: http://www.uow.edu.au/about/policy/UOW058723.html
Code of Practice– Student Professional Experience: http://www.uow.edu.au/about/policy/UOW058662
Netiquette Guide: http://www.uow.edu.au/student/moodle/netiquette/index.html