
SCSSE

School of Computer Science & Software Engineering
Faculty of Informatics

MCS9124 Applied Programming Solving
Subject Outline
Spring Session 2007

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

GENERAL INFORMATION

Subject Coordinator

Telephone Number:

Email:

Location:

Dr Aneesh Krishna

4221 4043

aneesh@uow.edu.au

3.209

Dr Krishna's Consultation Times During Session

Day

Tuesday

Thursday

Time

3:00 - 5:00 pm

11:30 am - 1.30 pm

Subject Organisation

Session:

Credit Points

Contact hours per week:

Lecture Times & Location:

Spring Session, Wollongong

6

3 hours lecture; 2 hours laboratory/ 1hr tutorial

Wed 13:30 - 15:30 35.G45

Fri 09:30 - 10:30 35.G45

Tutorial Day, Time and Location can be found at:

<http://www.uow.edu.au/student/sols/timetables/index.html>

Lecture Schedule

Week	Topic	Comments
1	Compilation Process, Debugging tools, Make and Makefiles	No Laboratory
2	More on C++ Programming: Random Access files and Internal I/O, Namespaces, Black and White Box Testing	
3	Searching and Sorting	
4	Program Design Approaches	Assignment 1 Due
5	Concept of Class as a means to decompose problems	
6	Pointers (I)	
7	Pointers (II)	Assignment 2 Due
8	Linked lists	
9	Stacks, Queues, De-queues	
10	Hashing, Heaps and Heapsort	Assignment 3 Due
11	Binary Trees	
12	The design of object based programs	
13	Revision and other topics leading to CSCI204	Assignment 4 Due

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. Any information posted to the web site is deemed to have been notified to all students.

Content

This subject develops a thorough understanding of program design using data structures. It extends CSC114 and presents pointers, dynamic memory management and exception handling. Other topics include implementation of Sorting and Searching Algorithms including the use of typedefs, void pointers and indexes to generalise algorithms; Implementation of data structures: queues, stacks, linked lists, dequeues, trees; Use of arrays as an implementation structure – hashing, radix sort, heaps and Heapsort; Random Access files and internal I/O; Testing of programs: black and white box testing, and the use of debuggers; Use of multi-file organisation in encapsulation and data hiding, with make files; These concepts will be treated through formal lectures, tutorials, assignments and laboratory sessions employing an object oriented language.

Objectives

On successful completion of this subject, students should be able 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.

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.

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

Method of Presentation

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. Any information posted to the web site is deemed to have been notified to all students.

Lectures will be delivered in the sequence specified in the content schedule above. Laboratories will follow the lecture topics. Tutorials will be discussion based where students will present the design of their assignments. Regular attendance at lectures, tutorials and laboratories is a requirement for the successful completion of this course.

Lecture notes and other subject resources will be available from the subject's E-Learning site at <http://www.uow.edu.au/student/lo/>.

Examples and further materials that are covered in lectures and supplemental notes may be found on the subject website. Laboratories start from week two.

Subject Materials

Lecture notes, lab exercises and assignments for this subject will be available on the subject website. Students are encouraged to print their copies. However, the lecture notes may not include all examples and explanations given in lectures.

Reference Books

1. Savitch, Walter, Absolute C++, Addison-Wesley, 2002
2. Malik, D.S., C++ Programming: From Problem Solving to Program Design, Thomson Learning, 2002
3. Main, Michael & Savitch, Walter, Data Structures and Other Objects using C++, 2nd Edition, Addison-Wesley, 2001
4. Hubbard, John R., Data Structures with C++, Schaum's Outlines, McGraw-Hill, 2000
5. Sedgewick, Robert, Algorithms in C++, Addison-Wesley Pub. Co., c1992
6. Bjarne Stroustrup, The C++ Programming Language, 3rd edition, 2000, Addison-Wesley

7. Adams, Joel, Leestma, Sanford & Nyhoff, Larry, C++: An Introduction to Computing
8. Forouzan, Behrouz A. & Gilberg, Richard F., Computer Science: A Structured Programming Approach Using C++, 2000, Brooks/Cole
9. Friedman, Frank L. & Koffman, Elliot B. Problem Solving, Abstraction and Design Using C++, 3rd edition, 2000, Addison-Wesley

Some of these are available from UniCentre Bookshop and Library

These 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

Assessment

This subject has the following assessment components.

Assessment Items & Format	Percentage of Final Mark	Due Date
Laboratory sessions	10%	during week 2-12
Assignments	40%	as scheduled (shown with lecture schedule)
Examination	50%	Formal Examination Period

Notes on Assessment

IMPORTANT: ALL of the assessment items listed in the above table must be completed successfully in order to pass the subject.

Assignments

- (a) There will be 4 programming 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.
- (b) Each assignment submission will include design document, which will consist of: A high-level description of your solution, including design decisions, data structure and an explanation of how it works and/or pseudocode.
- (c) Assignments are to be submitted electronically via Unix/Linux system before the scheduled time. Submission via email/fax/printed form is not acceptable. Some tasks will require the student to demonstrate C++ programs to the tutor in the laboratory. These tasks will be clearly identified on the instructions on the assignments. Receipts for submitted work are e-mailed to the student and should be kept by the student as evidence of submission. The receipt will contain compilation messages. It is the student's responsibility to ensure that any errors reported are corrected.
- (d) It is student's responsibility to keep a backup of his/her work. There will be no extension granted due to any circumstance related to the failure of students' own equipment.
- (e) Students who copy an assignment may receive **zero** for that assignment. This also covers assignments which may be the product of community effort by several students. Working together is acceptable, but the final coding should be the work of the individual student, as assessment is a measure of your ability. **All students involved in plagiarism will have zero marks for that assessment task.**
- (f) Programs submitted which do not produce the required result cannot be awarded more than half marks. Programs which do not compile due to syntax errors will receive no marks, but may still be commented upon. Proper documentation and program style are needed in the assignments to receive full marks.
- (g) An extension of time for the completion of an assignment may be granted in certain circumstances. A request for an extension must be made **before** the due date through SOLS as a special consideration. Submission of the assignment will be opened one week before the due time. **Late assignments will not be accepted without a granted special consideration.** Exact time after which the submitted assignment will not be accepted by the system will be indicated in every assignment specification.
- (h) Marked assignments will be returned in laboratory sessions. Enquiries about the marks can only be made to the tutors during the laboratory class time, within **maximum 1 week after the assignment is handed back.** After 1 week, **no more marks can be changed.**

- (i) Assignments will be available from the subject website. Students should check the website regularly for changes and updates to subject information together with assessment marks.
- (j) Requests for a Special Consideration should be made electronically by logging on to SOLS at <http://www.uow.edu.au/student/index.html>, and following the Special 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 Special Consideration application process, should also be noted.

“Please be aware that your Subject Coordinator(s) may not be able to consider your application for special 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.

Laboratory 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.

The lab sessions will be one week behind the lectures to provide sufficient time for preparation. To get prepared, students need to go through lecture notes, and complete the questions that may be specified in the lecture. Lab exercises for this subject will be available on the subject website. Students are encouraged to print their copies before their lab sessions. Lecture notes and textbook may be needed for reference during the labs.

Students are required to complete the lab tasks within the first 100 minutes of the 2 hour lab session and then demonstrate their program to the tutor. The tutor will give a mark according to the level of participation of the lab.

Students, who are not able to attend a lab session and would like to get 1 mark for the task complete at home, must apply for special considerations through SOLS prior to the session.

Special consideration

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 special consideration in order to complete all assessable work.

The University applies strict criteria to the granting of special consideration. Before applying for special consideration students should carefully read the University's policy. The policy can be found at: <http://www.uow.edu.au/handbook/courserules/specialconsideration.html>

As an example: If a student requires an extension of time for the completion of an assignment this may be granted in certain circumstances. A request for an extension must be made to the Subject Coordinator via SOLs before the due date.

Scaling (School)

Final results in this subject may be scaled. The scaling method that will be used in this subject is as follows.

If E is the student exam mark, and A is the student assignment mark, the student final mark will be determined as follows:

if $E \geq 40\%$ of the maximum exam mark: then student final mark is $E + A$;

if $35\% \leq E < 40\%$ of the maximum exam mark: then student final mark is $\min\{E+A, 47\}$

Additional Information

Students must refer to the Faculty Handbook or online references which contains a range of policies on educational issues and student matters.

Laboratory Procedures

- Students must abide by the laboratory rules posted on the wall of the Laboratory
- 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.
- When there is a queue for computers, students must give up the computer they are using after one hour of use. They may rejoin the end of the queue.
- To complete the assignment component of the subject, students need to design and implement programs in C++. There is no requirement to carry out the work in the laboratories. You may still work at home to develop solutions. However, submissions are via the labs, and assistance in laboratories will be for programs demonstrable in a Linux environment.
- Copying software for another person is in breach of either copyright or the license agreement, as is selling original disks whilst retaining a copy. Exchanging disks also leads to the introduction of software viruses which may corrupt the system

Supplementary Exams

Supplementary Exams will be dealt with in accordance with Special Consideration Policy (<http://www.uow.edu.au/handbook/courserules/specialconsideration.html>) 6.2 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.

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 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.
4. Plagiarism will not be tolerated.
5. 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 Calendar under University Policies, 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 or <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 judgement of the lecturer and can only review the grievance to ensure proper procedure has been followed.

For more information, please consult the UOW policy in full at <http://www.uow.edu.au/handbook/courserules/studacgrievpol.html>

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

Code of Practice - Teaching and Assessment http://www.uow.edu.au/handbook/codesofprac/teaching_code.html	Key Dates http://www.uow.edu.au/student/dates.html
Code of Practice - Students http://www.uow.edu.au/handbook/codesofprac/cop_students.html	Information Literacies Introduction Program http://www.library.uow.edu.au/helptraining/workshops/ilip/
Acknowledgement Practice Plagiarism will not be tolerated http://www.uow.edu.au/handbook/courserules/plagiarism.html	Student Support Services: http://www.uow.edu.au/student/services/ Informatics Faculty SEDLO (Student Equity and Diversity Liaison Officers) Virginie Schmelitschek, phone 4221 3833, virginie@uow.edu.au
Code of Practice-Honours http://www.uow.edu.au/handbook/honourscode.html	Informatics Faculty Librarian, Ms Annette Meldrum, phone: 4221 4637, ameldrum@uow.edu.au
Non-Discriminatory Language Practice and Presentation http://staff.uow.edu.au/eo/nondiscrimlanguage.html	Intellectual Property Policy http://www.uow.edu.au/research/researchmanagement/1998IP.html
Occupational Health and Safety http://staff.uow.edu.au/ohs/commitment/OHS039-ohspolicy.pdf	SCSSE SISAT Internet Access & Student Resource Centre http://www.sitacs.uow.edu.au/info/current/internet_access_and_resource.shtml
SCSSE SISAT Computer Usage Rules http://www.itacs.uow.edu.au/info/current/support/labs/rules.shtml	SCSSE SISAT Style Guide for Footnotes, Documentation, Essay and Report Writing http://www.sitacs.uow.edu.au/info/current/styleguide.pdf
SCSSE SISAT Student Guide http://www.itacs.uow.edu.au/info/current/regulations.shtml	SCSSE SISAT Subject Outlines http://www.itacs.uow.edu.au/info/current/subject_outlines/