

**UNIVERSITY OF CAPE TOWN
DEPARTMENT OF COMPUTER SCIENCE**

**NOTES to STUDENTS
CSC2001F
2016**

Computer Science is an exciting field concerned with the technology that's driving the Information Age and it plays an important role in the development of our country. The goals the Second Year Course are to complete the basic education of a Computer Scientist. By the end of the year you will be able to design new solutions on a range of computer platforms.

CSC2001F is the second year course in Computer Science that, together with CSC2002S, is designed for students who intend majoring in Computer Science. MAM1000W (or equivalent), CSC1015F & CSC1016S are prerequisites. MAM2000W is a recommended co-requisite.

1. COURSE COORDINATOR

A/Prof Patrick Marais, Room 309, Computer Science Bldg

e-mail: patrick@cs.uct.ac.za

All queries about lectures should be addressed to the lecturer concerned. All queries about the running of the course and tutorials should be addressed to the Teaching Assistant in the first instance. The Course Coordinator should be approached regarding missed tests (see Section 15) and if the Teaching Assistant cannot help.

2. TEACHING ASSISTANT

Mr Richard Maliwatu.

e-mail: rmaliwatu@cs.uct.ac.za

Your TA can help on the running of tutorials, marking of assignments and tests and general questions about the course.

3. LECTURES

2nd Period (09h00 – 09h45) in Lecture Theatre CS2A, Second Floor, Computer Science Building. A detailed timetable is appended.

4. BOOKS

Prescribed:

- MA Weiss, Data Structures and Problem Solving Using Java [2010 – 4th Edition], Addison-Wesley, ISBN 9780321541406

Recommended:

- Other notes will be available from the Department or the Department Web pages.

5. SYLLABUS

Unix and Introduction to the Lab [4]:

A/Prof P Marais

Practical work will be done on Unix. In preparation for this, the first week will introduce students to this operating system as installed in the lab. A quick introduction to the version control system Git will also be given; some practical assignments will require its use

Data Structures 1 [12]:**Dr Geoff Nitschke**

Analysis of Algorithms: We will discuss how to express the running times of algorithms in a way that enables us to distinguish an efficient algorithm from an inefficient one. *Trees* (general, binary, AVL): We will study tree data structures, their applications, their algorithms and various techniques for ensuring their efficiency.

Data Structures 2 [16]:**Ms Omowunmi Isafiade**

We will begin by studying Hash Tables in order to learn how to store large amounts of data in ways that are relatively easy to index and search. Searching must sometimes be done in terms of priority. Hash tables, are not as suitable for prioritizing access to information as priority queues are. Priority queues ensure that the information is always ordered so that the information with the highest priority is easily accessible. This is a good thing because retrieval can occur in constant time. On a final note, we will discuss some graph algorithms because indexing and searching operations typically do not occur independently but rather as a sequence. It is therefore important to find ways of doing so optimally. For each of the data structures, we will discuss their pros and cons, as well as application examples for which each one is best suited.

Databases [16]:**Dr Anne Kayem**

This module aims to develop an understanding of what makes a good database and an awareness of the issues in database management. On completion of the module students should be able to design, create, populate and query a database.

6. SENIOR LABORATORY

The Senior Computing Laboratory is situated on Level 2A in the Computer Science Building. There are 80 workstations (shared with CS3 students).

One of the requirements for second year Computer Science is that students achieve a degree of proficiency with the Unix operating system as well as a version control system “Git”.

Practicals must be completed on the designated equipment and the final program will be required to compile & execute on this UNIX system.

The equipment will always be adequate for students to perform the work of the course. Any additional facilities such as Internet access, telnet, ftp etc are given to help comprehension of what is available in the outside world. Should these facilities be abused they can be withdrawn from any individual or the class as a whole without warning. In particular, any student found playing games, either locally on internationally, on departmental equipment, without permission, will have these privileges revoked.

Each student is expected to spend at least four hours per week in the laboratory.

Each student will be issued with a user name and password during the first week of the academic term. This is for their personal use. Permitting another user to use your personal login, using another person's login or attempting to crack any UCT computer system or any other computer system connected on the Internet is a punishable offence and action against such offenders will be initiated with the University court.

The Senior Laboratory is provided for the use of Computer Science students only. A card control system & a siren have been introduced for security. The admission of non-Computer Science students to this laboratory after hours, or loaning them a card for access to the laboratory, will result in the offending Computer Science student having their privileges revoked.

The laboratory will be available 24 hours per day. Staff are not on duty during the weekend. Should the service go down during that period we do not guarantee that it will be up until Monday morning. *Do not rely on the service during the weekend* (for example, to complete a practical) although we will do our best to prevent outages.

The department accepts NO responsibility for delays arising from students using equipment outside the department. NO extensions will be granted for such failures.

7. TUTORIALS (FRIDAY 2ND PERIOD)

A tutorial/learning activity is run in the Friday lecture period. This will be coordinated by the lecturer of the course in question. It will (generally) comprise one of the following:

A short discussion of the practical set for the following week

An in-class learning activity, led by the lecturer. The precise form of this activity, such as whether it is group-based or individual, will depend on the course material. This activity is intended to help students understand the course material and *it will be assumed that students attended these sessions when setting test and exam questions*. Note that in some instances, the lecturer may choose to have assessments conducted in the period form part of your class record for the course.

8. PRACTICAL WORK (MON - FRI AFTERNOONS)

Practicals are worked on by students in their own time. Penalties for late hand-ins are: **10% per day. Work which is more than 5 days late will NOT be accepted.** Tutors are available during tutorial sessions to assist with the current open practical (see Section 9).

Marks and comments will usually be returned within 2 weeks.

9. TUTORIALS AND ASSIGNMENTS

Tutorials are held Mondays to Thursdays 14h00 – 15h00 in Senior Lab. You may attend one session each week, where you may work on the current practical assignment. You will sign up on Vula for a particular day. Tutors will be present in the lab to assist with any problems of a general nature relating to the current assignment. Attending a tutorial session is not mandatory but is strongly encouraged.

It is your responsibility to sign up for a tutorial that fits in with your timetable. If you do not sign up for a session as soon as possible and find that all your preferred slots are filled, it is your responsibility to find a student with whom you can arrange a swap.

You will be expected to use the Git version control system to manage your assignment code and to use unit testing (through Junit) to ensure that your code is well tested and robust. Failure to do this will result in a substantial penalty on your assignments. Further information on these requirements will be released with your practical specifications.

10. ATTENDANCE, EXEMPTIONS, EXTENSIONS

Exemption and extensions of deadlines for practicals, tutorials and weekly problem solving exercises will only be considered on medical or compassionate grounds. Medical grounds have to be supported by a Valid Medical Certificate signed by a qualified Medical Doctor, *which clearly explains why the student is unable to complete their assignment*. The department will **not** accept medicals without this assurance. Compassionate grounds will normally require a letter of support from a parent/guardian or counsellor.

Please submit your Medical Certificate to Ms S Valley (Admin Assistant, room 317), and alert the Course Convener that you have done so via email. See your course coordinator regarding compassionate grounds: do this *before* the deadline in question, or if that is not possible, immediately on your return to UCT. It is vital to do this immediately as late applications after the deadlines have passed will not be considered. The TA and tutors cannot grant extensions and exemptions, do not ask them.

11. DP REQUIREMENTS

Duly Performed (DP) Certification constitutes permission to sit the final examination for the course. This will only be granted to students who fulfil the following requirements:

Minimum of 45% (weighted) aggregate on practical work; note this is not simply the “average” of your pracs;

A pass on the UNIX test.

12. EXAMINATION REQUIREMENTS

The final course mark is made up as follows:

All Programming Exercises (weighted average)	33.3%
Class Tests	16.7%
June Exam	50%

Subminima: 45% for practicals, 45% tests and exams (this is a weighted average of your tests/exams: 25%/75%). In order to pass the course you have to obtain at least 50% overall and not less than the subminima.

Supplementary Examination: This is a re-examination for those that qualify, and will comprise 1 paper of 3 hours in Jan/Feb of next year.

13. CLASS TESTS

There will be two class tests for CSC2001F:

Test 1	Thursday	17 th March	Jameson Hall
Test 2	Tuesday	10 th May	Jameson Hall

All class tests will be held during the scheduled lecture time, i.e. 9h00—9h45.

Marks will usually be returned within 48 hours.

14. UNIX TEST

The first 4 lectures in CSC2001F will be on the UNIX operating system. There is a practical test associated with the UNIX course.

The practical test will be administered by a tutor or the Teaching Assistant. All the tasks set need to be successfully completed. Any unsuccessful task can be specifically redone. This test will be conducted from 22nd February – 8th April. Any tutor can assist you in completing any task – they need to sign off that task when it is successfully completed. Once all tasks have been done, the form must be handed in at the CS reception. PLEASE CHECK VULA TO ENSURE THAT YOUR UNIX TEST GRADE HAS BEEN UPDATED TO “PASS” WITHIN 1 WEEK OF HANDING IN YOUR COMPLETED SHEET.

Failure to complete this test successfully will result in the student being denied a DP for the course.

15. MISSED CLASS TESTS

Any student who misses a class test for Medical or Compassionate reasons will be required either to rewrite the test or to do an oral – exemption from class tests will not be granted. The procedure to follow is:

1. It is the student's responsibility to inform the Departmental Secretary as soon as possible & *no later than 3 days* after the test that you have missed the test and provide the following:

either

 - A Medical certificate, signed by a Medical doctor must be provided to the Departmental Secretary; *this must clearly indicate that the student is medically unable to write the test. Medicals which do not adhere to this requirement will be rejected – please explain this to your doctor.*

or

 - In the case of Compassionate reasons please discuss this with the Course Coordinator *no later than 3 days* after the test.
2. The re-test must be done within 10 days of the test (or by the end of the week following the test) whichever date comes first. It is usually arranged for 1 week after the original test.
3. In the case of an extended Medical situation contact the Course Coordinator.

16. COMMUNICATIONS

Information regarding the course, announcements, course assessment and feedback will be provided by means of Vula: **vula.uct.ac.za**. Information may also be supplied by email. You are expected to refer to both these resources on a daily basis. The department will assume that you have read every email or Vula communication.

17. PLAGIARISM AND ACADEMIC DISHONESTY

All forms of academic dishonesty (including plagiarism of programs, essays, tutorials etc) are illegal and will be punished according to the University's rules. These rules are severe and can lead to rustication. The Computer Science Department checks all program submissions to ensure that the work submitted has not been copied. Work by other authors must be acknowledged as such under all circumstances.

Of course we do encourage you to share and debate ideas and discuss your work but we draw a careful line between that and plagiarism. A copy of the Department's plagiarism policy will be placed under Vula resources, and you are expected to read this. Please pay close attention: we take it very seriously.

18. TUTORIALS

Tut	Wks	Tutorial	Start	End Handin (by 9h00)	Marked by	Guaranteed Marked by
1	1	Trees I	24-Feb	03-Mar	10-Mar	17-Mar
2	2	Trees II	03-Mar	22-Mar	04-Apr	11-Apr
3	2	Hashing	22-Mar	12-Apr	19-Apr	26-Apr
4	1	Graphs	13-Mar	20-Apr	27-Apr	05-May
5	1	DB I	20-Apr	28-Apr	05-May	12-May
7	2	DB II	28-Apr	12-May	18-May	19-May

19. HOW TO SUCCEED IN CS 2

Second year is not hard but it is different from first year and some people struggle to adapt. *You have to take responsibility for your study yourself.* There is much more to the course than the lectures: there are the practicals and tutorials, but you also have to study on average at least 2 hours on your own for every lecture.

Work through the Text Book

Try to read ahead of the lectures in an organized way. For many lectures you can download lecture material beforehand from the CS2 web page. You cannot study the textbook and notes at the last minute and the lectures won't make much sense if you don't read by yourself.

Lectures add to the textbook

The lecturers' role is not to dictate notes or to spoon-feed students. Lecturers will assume you are familiar with the basics from the textbook and other notes. They will stimulate and expand your understanding of the area but they won't cover everything in the book – that is your responsibility. You can ask questions of lecturers or tutors about the material.

Practicals are very important

You will only really understand a topic once you can solve problems in the area yourself, by yourself. This is the purpose of practical work: this is where learning really happens. The emphasis in our Department is on practical and applicable problem-solving knowledge – the only kind there is.

Tutorials

Prepare your tutorial work carefully – we make participation in the problem solving assessments count towards your DP to add to the motivation to work consistently. Use the outcomes of these assessments to help gauge your progress. Your tutor will be your personal assistant who will look at your work, see how you are doing and generally get to know you well. Consult him or her and talk about the work you are doing and get valuable advice.

A/Prof Patrick Marais, Course Coordinator

20. TIMETABLE**CSC2001F - 2016**

Week	Date	Monday	Tuesday	Wednesday	Thursday	Friday
1	15-Feb	UNIX (4)				TUT/ACT
2	22-Feb	DS1 (12)				TUT/ACT
3	29-Feb					TUT/ACT
4	07-Mar					TUT/ACT
5	14-Mar	DS2 (16)			TEST1	TUT/ACT
6	21-Mar	Public Holiday				Public Holiday
7	28-Mar	VACATION				
8	04-Apr					TUT/ACT
9	11-Apr					TUT/ACT
10	18-Apr		DB (16)			TUT/ACT
11	25-Apr			Public Holiday		TUT/ACT
12	02-May	Public Holiday				TUT/ACT
13	09-May		TEST1			TUT/ACT
14	16-May					Consolidation
15	23-May	Consolidation/Exams				

UNIX	Patrick Marais
DS1	Geoff Nitschke
DS2	Omowunmi Isafiade
DB	Anne Kayem