UNIVERSITY OF CAPE TOWN
Department of Computer Science

General Notes to Students — Computer Science CSC3003S — 2022

Welcome to the last semester of CS3. CSC3002F and CSC3003S together constitute a major in Computer Science. You need to have passed INF2009F, CSC2001F and CSC2002S to do this course. as well as (MAM1004F+MAM1008S) or MAM1000W. CSC2004Z is required if CSC2002S was passed after 2017. It is recommended that you also have completed a second year course in Mathematics, Applied Mathematics or Statistics, but this is not a requirement.

1. **Course Convenor**: A/Prof Patrick Marais, Room 309, Computer Science Building; Email: patrick@cs.uct.ac.za

All queries about lectures and the content of exercises 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 convenor should be approached regarding missed tests (see Item 7) and practicals (Item 14) or if the teaching assistant cannot help. See also *Dealing with Difficulties* in Item 12 below.

2. **Teaching Assistant**: *Mr Leonard Chuang*. ***Email****: CHNLEO008@myuct.ac.za*

Your teaching assistant (TA) can provide help with administrative issues on the running of tutorials, marking of assignments and tests. Please note that this is the only valid email for the TA; emails to other email addresses will not be answered. Please allow at least 24 hours for an email response.

3. **Lectures**: Mon-Fri, 2nd period (9h00-9h45), 1st semester. **Venue**: HUM LT1A (in Neville Alexander Building on upper campus).

You skip lectures at your own risk. Attendance is expected at all lectures. Lecturers may also run unannounced tests and quizzes during lectures. These will not count very much to the final mark but if you miss them, you will not be able to make them up.

To help your structure your time, and to highlight test dates and the like, a provisional lecture timetable is presented at the end of these Notes. It is expected that each module will have a weekly study plan (accessible through the "Lessons" tab on the left of the Vula site page) which you should follow to ensure you remain on track.

4. **Syllabus:** The course consists of four parts (for practical work see Item 13 below).

- **Advanced Software Design 1 and 2** (A/Prof . M. Densmore/ Mr Bernard Akhigbe)

This part of the course is about software design, that is, how to turn ideas into quality effective and efficient code in a systematic and controlled manner. We start by reviewing O-O & UML, project management and software development methodologies. We investigate software development with SCRUM. Software architecture is an important topic together with design patterns.

Prescribed Book: "Software Engineering, Ian Sommerville", Addison-Wesley, 9th/10th Edition, ISBN: 9781292096131

Recommended Book: "Introduction to Systems Analysis and Design in a Changing World", 7th Edition by John W. Satzinger, Robert B. Jackson, Stephen D. Burd

- **Theory of Algorithms** (A/Prof. P. Marais)

Algorithms are central to computing. This course describes how algorithms are categorised. We learn interesting algorithms in each category and analyse their complexity.

Prescribed Book: "Introduction to the Design and Analysis of Algorithms", Anany Levitin, Addison-Wesley, ISBN 0-201-74395-7.

- **Theory of Computation** (A/Prof. S. Berman)

This part of the course focuses on the question: What are the fundamental capabilities and limitations of computers? We study this question by considering the central areas of the theory of computation: Turing machines, computability, and complexity.

Prescribed Book: "Automata theory, languages, and computation", by John Hopcroft, Rajeev Motwani, and Jeffrey Ullman, 3rd Edition, 2007, Pearson, ISBN: 0-321-47617-4.

5. **Class Tests and Examinations**:

Two class tests of 45 minutes will be held **on campus** as follows:

Test 1: 29th August @ 17:00PM

Test 2: 14th October @ 9:00AM

An additional single *concession test* (***date***: 21st October @ 9:00 AM is available to students who qualify – see Note 7 below. All tests will take place in ***Leslie Social Sciences 2A (LS2A).***

A final three-hour invigilated examination will take place **on campus** in the end of year exam block.

In addition each module may require extra short **tests and quizzes** which may contribute up to 15% of the class test record in total.

6. **Course Requirements**

Relative weightings: Practical work, Class tests and Examination are weighted as follows:

Practical work	35% (weighted average of all practicals and assignments)
Class Tests	15%
Examination	50%

Duly Performed Certificates (DP): In order to be permitted to sit the final exam a minimum mark of 45% for a weighted average of the practical work is required. The weighting is usually (but not necessarily) related to the duration and difficulty of the practical exercise.

Sub-minimums: To pass the course students need at least 45% for practical and theory marks separately and 50% overall[1]. Specifically:

>= 50% aggregate in the course as a whole; and

>= 45% weighted average[2] for the Class tests/Examination; and

>= 45% weighted average of Practical Work (this is the mark used to determine DP).

>= 35% average across ToA and ToC component in final examinations (equal weighting)

Note the requirement for the Algorithms module (ToA + ToC).

[1] For entry into honours higher marks are required. Entrance is competitive and places are limited; however experience shows that with marks of 65% for CSC3002F and CSC3003S you should have a place in honours.
[2] Weighted as 15/65 (tests, and quizzes if any) and 50/65 (for the exam).

Re-examination: Students who achieve a final course mark between 45% and 49% qualify for a supplementary examination, which may be an oral. Such students must make themselves available for re-examination after the end of the examination period. Please consult the Department about times.

7. Missed Class Tests

Any student who misses a class test for medical or compassionate reasons will be required to write the end of term written ***concession test*** (date: 21st October) – exemption from class tests will not be granted. *Students may only write the concession test if they have permission from the course convenor*. **The concession test will contain material from the entire semester.**

It is the student's responsibility to inform the course convener as soon as possible and *no later than 3 days* after the test, that they have missed the test. The student must also provide a medical certificate, signed by a Medical doctor. See *Note 15* for details. If the medical satisfies the requirements listed there, the course convener will add them to the list of students eligible to write the concession test.

Compassionate grounds for missing a test should be discussed with the course convenor *no later than 3 days* after the test. In the case of an extended Medical situation contact the course convenor by email - see note 16 below.

NOTE: Students who miss a test or any other formal assessment will only be allowed admission to an alternate assessment, where this is possible and scheduled, if the circumstances warrant this as per the rules for Deferred Examinations in the UCT General Rules and Policies Handbook.

8. Plagiarism and academic dishonesty

We encourage group discussion and support and such support can be very useful for the course; but it is important that each student works with and understands every aspect of the course. You are expected to read and be familiar with the Department's academic dishonesty policy, which includes a detailed explanation of what is or is not acceptable in submitted practical work:

https://www.cs.uct.ac.za/teaching/forms/UCTCS_2016_AcademicDishonestyPolicy.pdf

A copy of this policy will be placed on the course Vula site.

All work submitted must contain a statement by the student attesting that the work submitted is solely their work (even if such a statement is not submitted it will be assumed that the work is solely that of the student concerned). The work of others must be clearly identified and suitably referenced**. A student can only receive credit for work that <u>they</u> have completed**. You may not collaborate on assignments unless they are group assignments.

In 2020, 20 students were found guilty of academic dishonesty in CS3, receiving 0 for the relevant assessment. Furthermore, their University transcripts were endorsed to indicate that they had been found guilty of academic dishonesty. This is not something you want on your transcript – so please take this seriously.

One way in which plagiarism occurs is when students give their UCT/other login credentials (e.g., to cloud storage) to others who then later use these to access practical work. If you give your login details to another person who then copies your work *you will also be given zero* and there may be further penalties.

9. Senior Laboratory

Students will generally use the Senior Computing Laboratory on the mezzanine level 2A and the Ishango Computing Laboratory on level 1 (ground level) in the Computer Science Building. There are 81 workstations and 34 workstations respectively, which are shared by second and third year students.

The equipment will always be adequate for students to perform the work of the course. Should the lab computing facilities be abused, access privileges can be withdrawn completely.

Each student is issued with a logon and password for their personal use only. Do not share your credentials with anyone else for any reason. Allowing another user to use your personal login, using another person's login or attempting to hack/crack/subvert 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.

Tampering with laboratory equipment and/or unplugging equipment is not allowed.

The Senior Laboratory and the Ishango Laboratory are provided for the exclusive use of Computer Science students only. An access card control system is in place for security – please do not prop the doors open! The admission of non-Computer Science students to the laboratories is not allowed.

Both the Senior Laboratory and the Ishango Laboratory are open 24 hours a day. Staff are not on duty in the evenings nor over the weekend. Should the service go down during these periods we do not guarantee that that it will be up until the morning of the next working day. Whilst we will do our best to bring the system up as soon as possible, please do not rely on it during the evenings or over the weekend. The Department accepts no responsibility for delays arising from students using equipment outside the Department and no extensions will be granted in such cases.

10. **Colloquium**

The CS Department holds regular lunchtime colloquia where outside speakers and members of staff give presentations on various topics of interest. You are encouraged to attend in order to broaden and deepen your knowledge of the field of computing.

11. **Communications:** Vula

Vula (http://vula.uct.ac.za) is the university-wide online learning management system that gives you access to resources to assist in the learning process. The class website is located on the Vula system. All lecture handouts will be posted on the course's Vula site. Please use the Vula course website to check regularly for notices and discussions relating to practicals, tests and exams.

Notices posted here are regarded as an alternative to making an announcement in lectures. **All students will be expected to check the Vula website on a daily basis (Monday-Friday) for updates on assignments, marks, hints, deadlines, etc. No bulk email announcements will be sent unless there is urgent course-related news that needs to be communicated immediately.**

The chat room is for casual, polite, discussion; mainly amongst students. Note: If you have questions that need answers then ask the person concerned directly. You cannot depend on responses to ephemera in the chat room. There will also be a Q&A for module specific questions, and the ability to post anonymously.

Please refrain from inappropriate postings anywhere on the website, as it may violate the university's Appropriate Use of Computer Facilities policy (see ICTS website for more details), necessitating disciplinary and/or legal proceedings. Prohibited postings include:

- sexist, racist or otherwise discriminatory comments;
- segments of program code (not provided by an instructor);
- (partial) solutions to graded work before the deadline for submission;
- disrespect, defaming or attacking others and flame wars;
- illegal material.

12. **Dealing with Difficulties**

Speak to the people listed below **early** if you are having problems. Don't go to them at the last minute when it is too late to remedy the situation. Please alert the course convener immediately should you be struggling with the course or assignments.

- Queries relating to administrative issues to do with test marking and practicals should be referred to the Teaching Assistant;
- For assistance with technical queries (e.g., lab services or equipment issues) please use the "GetHelp@CS" tab on the left of the Vula course page; this will direct you to resources, technical forums and other information to help you with technical difficulties related to the course;
- Issues relating to a specific module should, in the first instance, be taken up with the lecturer concerned, by posting a message on the appropriate forum conversation, then if necessary with the Course Convener vie email;
- All other queries should be addressed to the Course Convenor. Specifically, **the lecturers, TA and tutors cannot grant extensions and exemptions - do not ask them**;
- Class representatives are elected by student vote. Class representatives meet formally with the Head of Department, and can also be asked to raise issues of concern to the class with the TA, Lecturer or Course Convenor via email. Class representatives are expected to represent the consensus view of the class; for individual issues, students are asked to contact the TA or course convener directly via email.

13. **Practical Work**

Start working on your assignments as soon as you receive them. Remember that **there are no extensions except for medical and compassionate reasons** (see Item 14/15 below). Plan ahead in cases where you have more than one deadline on the same day or in close proximity.

A schedule is given in Table 1. The average total load is about **ten hours** of practical work per week. Tutors are expected to return all assignment marks and comments within 2 weeks of submission. All marking will be completed in time for DP calculations at the end of the semester. **NOTE: Queries around marking of an assignment will only be accepted within 1 week of the assignment mark being returned on Vula. Furthermore, *no mark related queries will be considered after the final day of term*.**

- **Advanced Software Development:** The practical for this part of the course is the capstone project. Quizzes may be set by the ASD lecturers.
- **Capstone Project**: Students will work in groups of three. A register will be taken at the first three meetings (and possibly thereafter). Meetings will be held in person where possible. A student who does not attend a meeting - without a valid reason, communicated their client - will not be given a mark for the assignment that depends on that meeting. Apart from this case, a single mark will be given to all members of the group unless motivated by the tutor, client or students and agreed to by the course convenor. **Alert the client (lecturer) of any group issues as soon as they occur – DO NOT WAIT UNTIL THE END OF THE PROJECT**. A tutor will be assigned to each project and meetings will be arranged regularly between the group and the tutor. A separate hand-out will be provided with the list of available projects.

  NOTE: you must use the CS Gitlab server – NOT GitHub or any other remote server - to manage your project. Instructions on CS Gitlab set up will be circulated when the term starts.
- **Theory of Algorithms**: Students will need to complete **three** separate ToA practicals, which test understanding of different algorithmic techniques. These problems are received and solved under test/exam conditions within a specified time up to a maximum of 3 hours. They are provisionally

scheduled to take placed in the Senior Laboratory, between the 3rd and 21st October – exact dates will be announced once term starts. Multiple alternate afternoons will be made available each week and students will then be asked to sign up for one of these slots. Quizzes may also be set by the ToA lecturer.

- **Theory of Computation:** There are no practicals for this part of the course, but there will be some tutorials, which may be held in class as well as exercises to practice with. Quizzes may also be held by the lecturer. More details will be provided closer to the time.

Once the deadline for an assignment has passed no re-submissions will be allowed. If no prior submission was made, a single submission of late work will be accepted after the due date. ***Late work will incur an automatic and non-negotiable 10% penalty per day***. Work that is more than **3** days late will not be accepted. If you were ill a medical certificate is required - see the next item.

Table 1. Practical Work Schedule (NB: weightings are approximate and may change)

	Course	**Assignment**	**Start**	**Handin 09:00**	**Length (hours)**		**~% Final Mark**
	ASD	Stage 0: choice					67% (see project handout)
1		Stage 1: start up		Aug 5th	10		
2		Stage 2: planning		Aug 12th	10		
3		Stage 3: prototype+demo		Aug 18th	10		
4		Stage 4: implement & test		Sep 23rd	27		
		Project Demos	26th to 28th Sep				
5	ToA	ToA 1	Week of 3rd Oct				33%
6		ToA 2	Week of 10th Oct				
7		ToA 3	Week of 17th Oct				

14. Attendance, Exemptions, Extensions for Practical Work

Exemption and extensions of deadlines for practicals and tutorials will only be considered on medical or compassionate grounds. You must send an email to the course convenor explaining the circumstances around the request. Make sure that your full name, student number, course code and the reason for your request are clearly indicated in the email. Medical grounds must be supported by a valid *medical certificate* - see Note 15 below.

Compassionate grounds will normally require a letter of support. Email the course convenor 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 lecturers, TA and tutors cannot grant extensions and exemptions - do not ask them.

15. Medical Notes and Short Leave

All students are expected to do all assigned work. If a student falls ill, they must submit a medical certificate to the course convenor as soon as possible.

A valid medical certificate must be signed by a qualified *medical doctor* (or medical practitioner who is authorized to issue medical certificates) and clearly state the days on which **you were medically unfit to work**. Make sure that your full name, student number, course code and what you are applying for are clearly indicated on the document. As soon as you are physically able, please submit the **original** medical certificate to Ms J. Christians (Room 317) and email the course convenor noting that you have submitted a medical certificate. You must also email a scanned version to **sick-csc3003s@cs.uct.ac.za**. The email **Subject** must be "**A**" (for assignment) or "**T**" (for test) and the assignment/test number, followed by your student number e.g. A3 BNDJAM007.

NOTE: while the nature of the illness/ailment may be kept confidential, we do not accept medicals in which the doctor has not included the line "according to my findings" or similar – this indicates that they have examined you and made a clinical finding that you are not able to work, rather than simply being told you are unwell, and writing out a certificate. Medicals which contain a line such as "the patient informed me" will thus not be accepted.

In other/exceptional circumstances, where a student would like to be away from their studies for a short and defined period of time, the Short Leave Application form (under Vula resources) must be filled out and submitted to the course convenor for recommendation and HoD for approval

16. **Appeals Procedure**

If a student feels that their marks are incorrect for any piece of marked work, they must first approach the tutor or TA responsible for that test or assignment. Then, if need be, they may appeal to the course convenor. Finally, they may appeal to the HoD. The appeal to the HOD must be in writing (via email). More generally, the following steps should be followed if you wish to lodge an appeal:

1. for marking related issues, first contact the tutor or TA; if they cannot resolve the issue, then contact the course convener (via email); for general course related issues, email the course convener;
2. if you are unsatisfied with the solution proposed by the course convener, then you should contact the HOD (head of department) via email; The HOD will consult with the course convener and they will agree on some alternate remedial action (where appropriate).
3. if you are not satisfied with their proposed solution, you may appeal to the Deputy Dean (DD), Prof Muthama Muasya (again via email). The DD will consult with the Department around a solution, and may agree or suggest some alternate course.
4. if you are not satisfied with the DD's decision, you may then contact the Dean of the Faculty via email. Note that the Dean is likely to refer this back to the DD for further scrutiny. The Dean's decision is final.

17. **Lecture Timetable**

(next page)

Week	Date	Monday	Tuesday	Wednesday	Thursday	Friday
1	25-Jul	**ASD1**				Client meeting
2	01-Aug					Client meeting
3	08-Aug		holiday			Client meeting
4	15-Aug			**ASD2**		
5	22-Aug					
6	29-Aug	TEST1				
7	05-Sep	Vacation				
8	12-Sep	**ToA**				
9	19-Sep					
10	26-Sep					**ToC**
11	03-Oct					
12	10-Oct					TEST2
13	17-Oct					Conc Test
14	24-Oct	Revision	Revision	Revision	Revision	Exams

ASD1	Melissa Densmore	13
ASD2	Bernard Akhigbe	13
ToA	Patrick Marais	14
ToC	Sonia Berman	14