Tutorial Letter 101/0/2022

Introduction to Programming II

COS1512

Year module

School of Computing

IMPORTANT INFORMATION

Please register on myUnisa, activate your myLife e-mail account and make sure that you have regular access to the myUnisa module website, COS1512-2022-Y1, as well as your e-tutor group website.

Note: This is a fully online module. It is, therefore, only available on myUnisa.

BARCODE

Open Rubric

CONTENTS

Page

1 INTRODUCTION

Dear Student

Welcome to Introduction to Programming II (COS1512). This is a fully online module and you will receive no printed study material.

Because this is a fully online module, you will need to use myUnisa to study and complete the learning activities for this module. Visit the website for COS1512 on myUnisa frequently.

1.1 Getting started

Owing to the nature of this module, you can read about the module and find your study material online. Go to the website at https://my.unisa.ac.za and log in using your student number and password.

We wish you every success with your studies!

2 OVERVIEW OF COS1512

2.1 Purpose

This module introduces students to the design, implementation and evaluation of algorithms-based, structured object-oriented computer programs, with the fundamentals of simple data structures, (including object-orientation). Students are equipped to think logically, creatively, and conceptually and to recognize the design rules, techniques, and components in order to compose and present a functional working program solution to a perceived computing problem of a client, for the application of these programs in the industry's process systems and organizational information systems, to specific standards (such as user-friendly, robust, solution specific, and to the satisfaction of the client). This module provides core compulsory and introductory knowledge, skills and values that will support further studies and applications in the sector of object-oriented programming computing, in the field of computer science, as part of the B-degree.

COS1512 focuses on providing an introduction to objects and the object-oriented programming environment using C++ as programming language. The following topics are included:

- file I/O streams as an introduction to objects and classes;
- using pre-defined classes such as string and vector; C-strings, pointers and dynamic arrays;
- ADTs (i.e. user-defined classes including the functions and operators for these classes as well as separate compilation);
- recursion;
- single inheritance,
- and function and class templates.

2.2 Outcomes

For this module, you will have to master several outcomes:

	Specific outcomes	Assessment criteria
1	The learner can design a logical solution to a simple programming problem, making appropriate assumptions.	• interpret a problem description which specifies the requirements of a program; • identify all steps necessary to solve a problem and order the steps in the correct logical sequence; • write down the logical sequence of operations that a computer should perform to solve a particular problem; • apply object-oriented principles during problem solving.
2	The learner can write C++ program code, demonstrating the principles of good programming style.	• use the different C++ programming constructs appropriately and correctly, in order to implement a solution to a programming problem; • write functions and use them in a program; • define classes and use object-oriented principles to implement programming problems; • recognise/locate errors in a program and correct them.
3	The learner can demonstrate an understanding of the theory underlying the basic programming concepts.	• Explain the purpose of a particular C++ programming construct and identify problem descriptions where they are applicable. • Define relevant programming concepts.

The specific learning *objectives* for each chapter in the prescribed book for COS1512 in order to reach the above learning outcomes are given in more detail in the study guide included in Tutorial Letter 102, available under Additional Resources on the COS1512 course website.

3 CURRICULUM TRANSFORMATION

Unisa has implemented a transformation charter based on five pillars and eight dimensions. In response to this charter, we have placed curriculum transformation high on the teaching and learning agenda. Curriculum transformation includes the following pillars: student-centred scholarship, the pedagogical renewal of teaching and assessment practices, the scholarship of

teaching and learning, and the infusion of African epistemologies and philosophies. These pillars and their principles will be integrated at both programme and module levels as a phased-in approach. You will notice a marked change in the teaching and learning strategy implemented by Unisa, together with how the content is conceptualised in your modules. We encourage you to embrace these changes during your studies at Unisa in a responsive way within the framework of transformation.

4 LECTURER(S) AND CONTACT DETAILS

4.1 Lecturer(s)

The primary lecturer for this module is Dr MA Schoeman:

Department: Computer Science (School of Computing)
Telephone: 011 670 9178
E-mail: schoema@unisa.ac.za

4.2 Department

You can contact the Department of Computer Science as follows:

E-mail: computing@unisa.ac.za

4.3 University

To contact the University, follow the instructions on the Contact us page on the Unisa website. Remember to have your student number available whenever you contact the University.

Whenever you contact a lecturer via e-mail, please include your **module code and student number** in the subject line to enable the lecturer to help you more effectively. Please your **myLife e-mail** in all communication with Unisa. We have been instructed to answer only myLife e-mails from students.

5 RESOURCES

5.1 Joining myUnisa

The myUnisa learning management system is the University's online campus which will help you communicate with your lecturers, other students and the administrative departments within Unisa. To claim your myUnisa account, please follow the steps below:

1. Visit the myUnisa website at https://my.unisa.ac.za/portal
2. Click on the **"Claim Unisa login"** link on the top of the screen under the orange user ID box.
3. A new screen will load, prompting you to **enter your student number**. Please enter your student number and click **"continue"**.
4. Enter your surname, your full name, your date of birth and, finally, your South African ID number (for South African citizens) OR your passport number (for foreign students). Then click "continue". **Remember to enter either an ID number or a passport number, NOT both.**

5. Please read through the guidelines and **click all the check boxes** to acknowledge that you have read all the information provided. Once you are done, click the **"Acknowledge"** button to redirect you to the final page in the process.
6. The final page will display your myLife e-mail address, and your **myLife AND myUnisa password**. This password will also be sent to the cellphone number displayed on the page for safekeeping.
7. Please note that it can take up to 24 hours for your myLife e-mail account to be created.

Remember, the password provided is your myUnisa **AND** myLife password.

5.2 Prescribed book(s)

The prescribed book for this module is:

Walter Savitch. Problem Solving with C++, 10th edition. Pearson International Edition: Addison-Wesley, 2018.

You may also use the 7th, 8th or 9th edition of the prescribed book.

You are expected to purchase your own copy of the prescribed book. For contact details of official booksellers, please consult the list of official booksellers and their addresses in *Study @ Unisa*.

You can also buy an e-book version of Savitch at www.coursesmart.com.

We will refer to the prescribed book as Savitch.

In this module, we cover the following chapters of Savitch:

Chapter	**Topic**	**Sections covered**
Chapter 1	Introduction to computers and C++ programming	1.1 and 1.2
Chapter 4	Overloading functions	**Only** 4.6
Chapter 5	Assert macro	**Only** 5.5
Chapter 6	I/O streams as an introduction to objects and classes	All sections
Chapter 8	C-strings and vectors	8.1 and 8.3, **plus** the subsection *Converting Between string Objects and C Strings*, thus **excluding** 8.2 with the **exception** of the subsection ***Converting Between string Objects and C Strings***
Chapter 9	Pointers and dynamic arrays	All sections **excluding** the optional subsections in 9.2
Chapter 10	Defining classes	All sections

Chapter 11	Friends, overloaded operators and arrays in classes	All sections, **plus** Appendixes 7 and 8
Chapter 12	Separate compilation (ADTs)	12.1 and **only** the first two pages of 12.2
Chapter 14	Recursion	14.1 and 14.2, thus **excluding** 14.3
Chapter 15	Inheritance	**Only** 15.1, thus **excluding** 15.2 and 15.3
Chapter 17	Templates	All sections

Note that some of the sections (in Chapters 1, 4 and 5) are omitted, because they are covered in COS1511. The other sections that are omitted fall outside the scope of this module.

5.3 Recommended book(s)

You do not have to consult any other textbooks apart from Savitch. However, some of you may want to read more widely, and consult alternative references. The following is a useful book available in the Unisa library. Please note that the library does not have multiple copies of this book and that only limited waiting lists are kept.

DS Malik. C++ Programming from problem analysis to program design. Cengage, UK, 2013.

Recommended books can be requested online, via the Library catalogue.

5.4 Prescribed software

The prescribed software for this module is Code::Blocks 20.03. We will refer to the software as Code::Blocks. Code::Blocks includes the MinGW C++ compiler and an Integrated Development Environment (IDE), which we use to create program files. A link to download the software will be provided on the COS1512 site on myUnisa.

5.5 Electronic reserves (e-reserves)

There is no e-reserves for COS1512.

5.6 Library services and resources

The Unisa Library offers a range of information services and resources:

- For a general Library overview, go to https://www.unisa.ac.za/sites/corporate/default/Library/About-the-Library Library @ a glance
- For detailed Library information, go to https://www.unisa.ac.za/sites/corporate/default/Library
- For research support and services (eg personal librarians and literature search services) go to https://www.unisa.ac.za/sites/corporate/default/Library/Library-services/Research-support

The Library has created numerous **Library guides** to assist you: http://libguides.unisa.ac.za

Recommended guides:

- Request recommended books and access e-reserve material: https://libguides.unisa.ac.za/request
- Requesting and finding library material: Postgraduate services: https://libguides.unisa.ac.za/request/postgrad
- Finding and using library resources and tools (Research Support): https://libguides.unisa.ac.za/research-support
- Frequently asked questions about the Library: https://libguides.unisa.ac.za/ask
- Services to students living with disabilities: https://libguides.unisa.ac.za/disability
- A-Z databases: https://libguides.unisa.ac.za/az.php
- Subject-specific guides: https://libguides.unisa.ac.za/?b=s
- Information on fines & payments: https://libguides.unisa.ac.za/request/fines

Assistance with **technical problems** accessing the Unisa Library or resources: https://libguides.unisa.ac.za/techsupport

Lib-help@unisa.ac.za (insert your student number in the subject line please)

General library enquiries can be directed to Library-enquiries@unisa.ac.za

6 STUDENT SUPPORT SERVICES

The *Study @ Unisa* website is available on myUnisa: www.unisa.ac.za/brochures/studies

This website has all the tips and information you need to succeed at Unisa.

6.1 First-Year Experience Programme @ Unisa

For many students, the transition from school education to tertiary education is beset with anxiety. This is also true for first-time students to Unisa. Unisa is a dedicated open distance and e-learning institution. Unlike face-to-face/contact institutions, Unisa is somewhat different. It is a mega university and all our programmes are offered through a blended learning mode or fully online learning mode. It is for this reason that we thought it necessary to offer first-time students additional/extended support so that you can seamlessly navigate the Unisa teaching and learning journey with little difficulty and few barriers. In this regard we offer a specialised student support programme to students entering Unisa for the first time. We refer to this programme as Unisa's First-Year Experience (FYE) Programme. The FYE is designed to provide you with prompt and helpful information about services that the institution offers and how you can access information. The following FYE programmes are currently offered:

- FYE website: All the guides and resources you need to navigate through your first year at Unisa can be accessed using the following link: www.unisa.ac.za/FYE
- FYE e-mails: You will receive regular e-mails to help you stay focused and motivated.
- FYE broadcasts: You will receive e-mails with links to broadcasts on various topics related to your first-year studies (eg videos on how to submit assignments online).
- FYE mailbox: For assistance with queries related to your first year of study, send an e-mail to fye@unisa.ac.za

7. HOW TO STUDY ONLINE

7.1 What does it mean to study fully online?

Studying fully online modules differs completely from studying some of your other modules at Unisa.

- **All your study material and learning activities for online modules are designed to be delivered online on myUnisa.**
- **All your assignments must be submitted online.** This means that you will do all your activities and submit all your assignments on myUnisa. In other words, you may **NOT** post your assignments to Unisa using the South African Post Office.
- **All communication between you and the University happens online.** Lecturers will communicate with you via e-mail and SMS, and use the **Announcements,** the **Discussion Forums** and the **Questions and Answers** tools. You can also use all of these platforms to ask questions and contact your lecturers.

7.2 myUnisa tools

The main tool that we will use is the **Lessons tool**. This tool will provide the content of and the assessments for your module. At times, you will be directed to join discussions with fellow students and complete activities and assessments before you can continue with the module.

It is very important that you log in to myUnisa regularly. We recommend that you log in at least once a week to do the following:

- **Check for new announcements.** You can also set your myLife e-mail account so that you receive the announcement e-mails on your cellphone.
- **Do the Discussion Forum activities.** When you do the activities for each learning unit, we want you to share your answers with the other students in your group. You can read the instructions and even prepare your answers offline, but you will need to go online to post your messages.
- **Do other online activities.** For some of the learning unit activities you might need to post something on the **Blog tool**, take a quiz or complete a survey under the **Self-Assessment** tool. Do not skip these activities because they will help you complete the assignments and the activities for the module.

We hope that by giving you extra ways to study the material and practise all the activities, this will help you succeed in the online module. To get the most out of the online module, you **MUST** go online regularly to complete the activities and assignments on time.

8. ASSESSMENT

8.1 Assessment plan

- To complete this module, you will be required to submit four assignments.
- All information on when and where to submit your assignments will be made available to you via the myUnisa site for your module.
- Due dates for assignments, as well as the actual assignments will be made available on the myUnisa site for this module.
- To gain admission to the examination, you will be required to **submit at least two assignment/s**.
- Your assignments will comprise a combination of online assessments (multiple choice questions) and practical projects.
- You need to obtain **a year mark average of 50% for the assignment/s** to gain admission to the examination.
- The assignment weighting for the module is 20%.
- The examination will be a timed exam (MCQ, true/false and short answer questions).
- The examination will count 80% towards the final module mark.

8.2 Assignment numbers

- There are no assignment due dates included in this tutorial letter.
- Assignment due dates will be made available to you on the landing page of myUnisa for this module. We envisage that the due dates will be available to you upon registration.
- Please start working on your assignments as soon as you register for the module.
- Log on to the myUnisa site for this module to obtain more information on the due dates for the submission of the assignments

8.3 Assignment due dates

- Modules offered by Unisa are either *blended* (meaning that we use a *combination* of printed and online material to engage with you) or *online* (all information is available via the *internet*). In all cases of online engagement, we use myUnisa as our virtual campus.
- From 2022, the myUnisa virtual campus will be offered via a new learning management system. This is an online system that is used to administer, document and deliver educational material to you and support engagement with you.

- Look out for information from your lecturer as well as other Unisa platforms to determine how to access the virtual myUnisa module site.
- Information on the tools that will be available to engage with the lecturer and fellow students to support your learning will also be communicated via various platforms.
- The University undertakes to communicate as clearly and as frequently as is necessary to ensure optimum advantage in the use of the new learning management system.
- Additional information on the use of the myUnisa site for the module, as well as features to engage and communicate with your lecturer and other students will also be made available via the online site for the module.
- Therefore, log on to the myUnisa site for your module to gain more information on where to complete and/or upload your assignments and how to communicate with your lecturer.

8.4 Submission of assignments

As indicated in section 8.1, you need to complete four (4) assignments for this module.

Because this is an online module, the assignments are not provided in this tutorial letter. Instead, the assignments are provided online as they become due. Details on the assignments will be provided on the COS1512 course website on myUnisa.

8.5 The examination

Examination information and details on the format of the examination will be made available to you online via the myUnisa site. Look out for information that will be shared with you by your lecturer and e-tutors (where relevant) and for communication from the University.

9. ACADEMIC DISHONESTY

9.1 Plagiarism

Plagiarism is the act of taking the words, ideas and thoughts of others and presenting them as your own. It is a form of theft which involves several dishonest academic activities, such as the following:

- Cutting and pasting from any source without acknowledging the source.
- Not including or using incorrect references.
- Paraphrasing without acknowledging the original source of the information.

9.2 Cheating

Cheating includes, but is not limited to, the following:

- Completing assessments on behalf of another student, copying from another student during an assessment or allowing a student to copy from you.
- Using social media (eg WhatsApp, Telegram) or other platforms to disseminate assessment information.
- Submitting corrupt or irrelevant files.

- Buying completed answers from “tutors” or internet sites (contract cheating).

9.3 More information about plagiarism can be downloaded on the link below

https://www.unisa.ac.za/sites/myunisa/default/Study-@-Unisa/Student-values-and-rules

10. STUDENTS WITH DISABILITIES

The Advocacy and Resource Centre for Student with Disability ARCSWiD) provides an opportunity for staff to interact with new and returning students with disabilities.

- If you are a student with a disability and would like additional support or need additional time for assessments, you are invited to the module leader Dr MA Schoeman at schoema@unisa.ac.za so that you can be assisted

11. IN CLOSING

Do not hesitate to contact us by e-mail if you are experiencing problems with the content of this tutorial letter or with any academic aspect of the module.

We wish you a fascinating and satisfying journey through the learning material, and trust that you will complete the module successfully.

Enjoy the journey!

Dr MA Schoeman – lecturer for COS1512

DEPARTMENT OF COMPUTER SCIENCE

SCHOOL OF COMPUTING

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