Tutorial Letter 101/0/2024

Advanced Programming
COS3711

Year Module

Computer Science Department

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, COS3711-24-Y, as well as your group website.

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

BARCODE

Define tomorrow.

UNISA | university of south africa

CONTENTS

INTRODUCTION

Dear Student

Unisa is a comprehensive open distance e-learning (CODeL) higher education institution. The comprehensiveness of our curricula encapsulates a range of offerings, from strictly vocational to strictly academic certificates, diplomas and degrees. Unisa's "openness" and its distance eLearning character result in many students registering at Unisa who may not have had an opportunity to enrol in higher education. Our CODeL character implies that our programmes are carefully planned and structured to ensure success for students ranging from the under-prepared but with potential to the sufficiently prepared.

Teaching and learning in a CODeL context involves multiple modes of delivery ranging from blended learning to fully online. As a default position, all post graduate programmes are offered fully online with no printed study materials, while undergraduate programmes are offered in a blended mode of delivery where printed study materials are augmented with online teaching and learning via the learner management system – myUnisa. In some instances, undergraduate programmes are offered fully online as well.

Furthermore, our programmes are aligned with the vision, mission and values of the University. Unisa's commitment to serve humanity and shape futures combined with a clear appreciation of our location on the African continent, Unisa's graduates have distinctive graduate qualities which include

•   independent, resilient, responsible and caring citizens who are able to fulfil and serve in multiple roles in their immediate and future local, national and global communities

•   having a critical understanding of their location on the African continent with its histories, challenges and potential in relation to globally diverse contexts

•   the ability to critically analyse and evaluate the credibility and usefulness of information and data from multiple sources in a globalised world with its ever-increasing information and data flows and competing worldviews

•   how to apply their discipline-specific knowledges competently, ethically and creatively to solve real-life problems

•   an awareness of their own learning and developmental needs and future potential

Whether a module is offered either as 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), we use myUnisa as our virtual campus. 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.

Because COS3711 is a fully online module, you will need to use myUnisa to study and complete the learning activities for this module. You are encouraged to log into the module site on myUnisa regularly (that is, at least twice per week): Advanced Programming [COS3711-24-Y]. Please also activate your myLife email account. Remember that the University will use your myLife email account to contact you, and we will also use it to send you important updates to material in COS3711. It may be a good idea to set up forwarding of emails sent to your myLife account to your primary email account or some other account that you access regularly.

Do not hesitate to contact your lecturer (by email or telephone; the details are on the home page of the COS3711 myUnisa site) if you are experiencing problems with the content of this tutorial letter or any aspect of the module. We sincerely hope that you find this module, as well as your online learning experience, interesting and rewarding and trust that you will complete the module successfully.

Welcome to the Advanced Programming module (COS3711). We trust that you will find this module stimulating and interesting and wish you a successful year. The focus of this module is on advanced object-oriented programming aspects using C++ as the implementation language and the Qt 6 framework for developing object-oriented applications.

We wish you every success with your studies!

2 MODULE OVERVIEW

2.1 Purpose

COS3711 is a final year undergraduate module. We are obliged to offer a course that is comparable in standard to what other universities in the world offer in advanced programming concepts at this level. In the School of Computing, we opted for an advanced programming course using the public domain framework Qt 6.

This module teaches a selection of design patterns to improve your existing object-oriented programming knowledge, new programming aspects such as concurrency, XML handling, and regular expressions as well as the reuse of open-source libraries and tools, using the Qt 6 framework. In addition, some network programming and cloud computing concepts will be included.

The topics covered in this module require a good working knowledge of C++ as well as object-oriented programming knowledge as covered in the first- and second-level programming modules. A more detailed list of what you are expected to know can be found on the home page for this module. After completing this module, you should have a deeper understanding of both

the C++ language and the Qt libraries, as well as of the design patterns used in developing applications with them.

2.2 Outcomes

After completing this module, you should be able to:

- **Specific outcome 1:**
  Understand, recognise and implement a number of design patterns

- **Specific outcome 2:**
  Understand and reuse libraries.

- **Specific outcome 3:**
  Understand and implement concurrent programming techniques.

- **Specific outcome 4:**
  Use regular expressions in an application environment.

- **Specific outcome 5:**
  Generate and parse XML files.

- **Specific outcome 7:**
  Understand and implement reflective programming.

- **Specific outcome 8:**
  Write programs that connect to a network.

- **Specific outcome 9:**
  Describe cloud computing concepts and tools.

3 CURRICULUM TRANSFORMATION

Unisa has implemented a transformation charter, in terms of which the university has placed curriculum transformation high on the teaching and learning agenda. Curriculum transformation includes 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. All of these will be phased in at both programme and module levels, and as a result of this you will notice a marked change in the teaching and learning strategy implemented by Unisa, together with the way in which 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 name and telephone number of the lecturers will be supplied in a COSALL tutorial letter and can also be found on the module site on myUnisa. You should also check the home page of

the COS3711 site on myUnisa to see if there have been any changes to the lecturing staff for this module.

When you contact the lecturers, please do not forget to include your student number and module code. This will help the lecturers to assist you.

4.2 Department

Should you have difficulty in contacting your lecturer, you may phone the general number of the School of Computing. Your message will then be conveyed to the relevant lecturer. Remember to provide your student number together with the relevant module code. You can contact the Department of Computer Science as follows:

Telephone number: 011 670 9200

E-mail: computing@unisa.ac.za

4.3 University

Contact addresses of the various administrative departments appear on the Unisa website: http://www.unisa.ac.za/sites/corporate/default/Contact-us/Student-enquiries.

Please include the student number in all correspondence

5 RESOURCES

5.1 Prescribed book(s)

There is no prescribed book for COS3711 in 2024.

You can find more information about the learning material used on the *Module orientation* pages on myUnisa. Here you will also find information on recommended books, as well as how to access some of these, and other Qt books, online.

5.2 Prescribed Software

Details of the software prescribed can also be found on the Module orientation pages on myUnisa. The software for this module is open source. In other words, you are free to download, install, copy, and distribute it under the relevant open-source license.

5.3 Library services and resources

The Unisa Library offers a range of information services and resources. The library has created numerous library guides, available at http://libguides.unisa.ac.za

Recommended guides:

- For brief information on the library, go to https://www.unisa.ac.za/library/libatglance

- For more detailed library information, go to
   http://www.unisa.ac.za/sites/corporate/default/Library
- Frequently Asked Questions,
   visit https://www.unisa.ac.za/sites/corporate/default/Library/Frequently-Asked-Questions
- For research support and services such as the Personal Librarian service and the Information Search Librarian's Literature
   Search Request (on your research topic) service,
   visit http://www.unisa.ac.za/sites/corporate/default/Library/Library-services/Research-support.
- For library training for undergraduate
   students, visit https://www.unisa.ac.za/sites/corporate/default/Library/Library-services/Training
- Lending Services https://www.unisa.ac.za/sites/corporate/default/Library/Library-services/Lending-services
- Services for Postgraduate students -
   https://www.unisa.ac.za/sites/corporate/default/Library/Services-for-Postgraduates
- Support and Services for students with disabilities -
   https://www.unisa.ac.za/sites/corporate/default/Library/Services-for-students-with-special-needs
- Library Technology Support -https://libguides.unisa.ac.za/techsupport
- Finding and using library resources and tools -
   http://libguides.unisa.ac.za/Research_skills
- A–Z list of library databases – https://libguides.unisa.ac.za/az.php

   Important contact information:
- Technical problems encountered in accessing library online services: Lib-help@unisa.ac.za
- General library-related queries: Library-enquiries@unisa.ac.za
- Queries related to library fines and payments: Library-fines@unisa.ac.za
- Interlibrary loan service for postgraduate students: libr-ill@unisa.ac.za
- Literature Search Service: Lib-search@unisa.ac.za
- Social media channels: Facebook: UnisaLibrary and Twitter: @UnisaLibrary

6 STUDENT SUPPORT SERVICES

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

This brochure contains important information and guidelines for successful studies through Unisa.

If you need assistance with regard to the myModules system, you are welcome to use the following contact details:

- Toll-free landline: 0800 00 1870 (Select option 07 for myModules)
- E-mail: mymodule22@unisa.ac.za or myUnisaHelp@unisa.ac.za

You can access and view short videos on topics such as how to view your calendar, how to access module content, how to view announcements for modules, how to submit assessment and how to participate in forum activities via the following link: https://dtls-qa.unisa.ac.za/course/view.php?id=32130

Registered Unisa students get a free myLife e-mail account. Important information, notices and updates are sent exclusively to this account. Please note that it can take up to 24 hours for your account to be activated after you have claimed it. Please do this immediately after registering at Unisa, by following this link: myLifeHelp@unisa.ac.za

Your myLife account is the **only** e-mail account recognised by Unisa for official correspondence with the university and will remain the official primary e-mail address on record at Unisa. You remain responsible for the management of this e-mail account.

6.1   First-Year Experience Programme

Many students find the transition from school education to tertiary education stressful. This is also true in the case of students enrolling at Unisa for the first time. Unisa is a dedicated open distance and e-learning institution, and it is very different from face-to-face/contact institutions. It is a mega university, and all our programmes are offered through either blended learning or fully online learning. It is for this reason that we thought it necessary to offer first-time students additional/extended support to help them seamlessly navigate the Unisa teaching and learning journey with little difficulty and few barriers. We therefore offer a specialised student support programme to students enrolling at Unisa for the first time – this is Unisa's First-Year Experience (FYE) Programme, designed to provide you with prompt and helpful information about services that the institution offers and how you can access information. The following FYE services are currently offered:
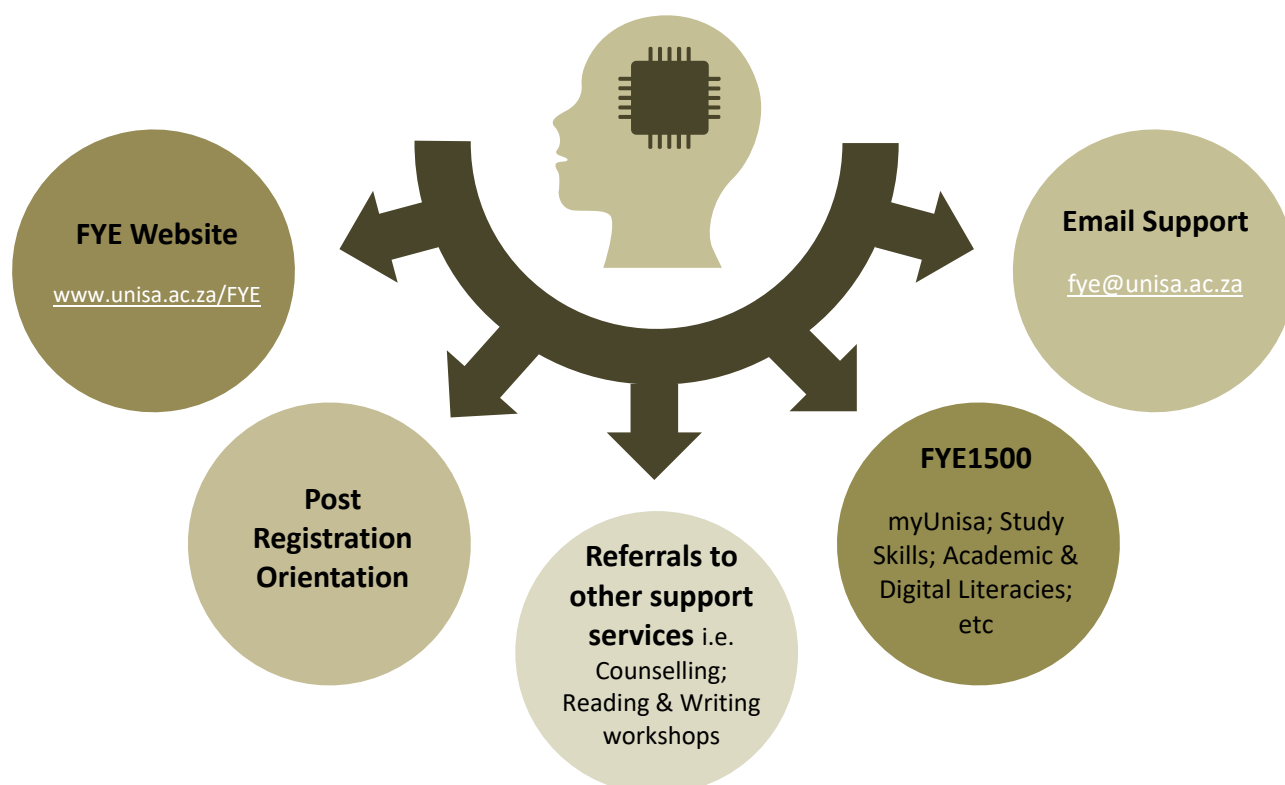
To ensure that you do not miss out on important academic and support communication from the SRU, please check your myLife inbox regularly.

7. STUDY PLAN

A study plan will be provided in the Module orientation pages on myUnisa, which you can use to guide you through year and ensure that you get all assessments in by the due dates.

8 HOW TO STUDY ONLINE

8.1 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 assessments must be submitted online. This means that you will do all your activities and submit all your assessments on myUnisa. In other words, you may NOT post your assessments 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.

8.2 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 cell phone.

- **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 assessments 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 assessments on time.

9. ASSESSMENT

9.1 Assessment plan

- Assignments are known as assessments on the myUnisa platform.
- To complete this module, you will be required to submit **3** assessments and complete **1** exam.
- Due dates for assessments, as well as the actual assessments, are available on the myModules site for this module.
- To gain admission to the examination, you will be required to submit at least **1** assessment before the exam admission is done. The best is to ensure that you submit at least assessment **1**.
- You will receive examination information via the myModules sites. Please watch out for announcements on how examinations for the modules for which you are registered will be conducted.

The following is a breakdown of the formal assessment activities for the year:
- There will be 3 programming assessments during the course of the year.
- There will be 1 exam at the end of the year.

The assessment questions are not provided in this tutorial letter; they will be provided online as they become due.

9.2 Year mark and final examination weights

Assessment	Year mark	Final mark
Assessment 1	30%	
Assessment 2	30%	30%
Assessment 3	40%	
Examination		70%

9.3 Assessment due dates

- There are no assessments **due dates** included in this tutorial letter.

- Assessments due dates will be made available to you on the myUnisa landing page for this module. We envisage that the due dates will be available to you upon registration.

- Please start working on your assessments 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 assessments.

9.4   Submission of assessments

- For each assessment, please see the assessment notes page on myUnisa on how to submit the assessment

- Unisa, as a comprehensive open distance e-learning institution (CODeL), is moving towards becoming an online institution. You will therefore see that all your study material, assessments and engagements with your lecturer and fellow students will take place online. We use myUnisa as our virtual campus.

- The myUnisa virtual campus will offer students access to the myModules site, where learning material will be available online and where assessments should be completed. This is an online system that is used to administer, document, and deliver educational material to students and support engagement between academics and students.

- The myUnisa platform can be accessed via https://my.unisa.ac.za. Click on the myModules 2024 button to access the online sites for the modules that you are registered for.

- The university undertakes to communicate clearly and as frequently as is necessary to ensure that you obtain the greatest benefit from the use of the myModules learning management system. Please access the announcements on your myModules site regularly, as this is where your lecturer will post important information to be shared with you.

- When you access your myModules site for the module/s you are registered for, you will see a welcome message posted by your lecturer. Below the welcome message you will see the assessment shells for the assessments that you need to complete. Some assessments may be multiple choice, some tests, others written assessments, some forum discussions, and so on. All assessments must be completed on the assessment shells available on the respective module platforms.

- To complete quiz assessments, please log on to the module site where you need to complete the assessment. Click on the relevant assessment shell (Assessment 1, Assessment 2, etc.). There will be a date on which the assessment will open for you. When the assessment is open, access the quiz online and complete it within the time available to you. Quiz assessment questions are not included in this tutorial letter (Tutorial Letter 101) and are only made available online. You must therefore access the quiz online and complete it online where the quiz has been created.

- It is not advisable to use a cell phone to complete the quiz. Please use a desktop computer, tablet or laptop when completing the quiz. Students who use a cell phone find it difficult to navigate the **Online Assessment** tool on the small screen and often struggle to navigate between questions and successfully complete the quizzes. In addition, cell phones are more vulnerable to dropped internet connections than other devices. **If at all possible, please do not use a cell phone for this assessment type**.

- For written assessments, please note the due date by which the assessment must be submitted. Ensure that you follow the guidelines given by your lecturer to complete the assessment. Click on the submission button on the relevant assessment shell on myModules. You will then be able to upload your written assessment on the myModules site of the modules that you are registered for. Before you finalise the upload, double check that you have selected the correct file for upload. Remember, no marks can be allocated for incorrectly submitted assessments.

9.4.1 Types of assignments and descriptions

All assignments are defined as either optional, mandatory, compulsory, or elective.

- **Elective assignments**
  - If not submitted, the student gets no mark for this item.
  - The best of the required submissions will count.
- **Mandatory assignments**
  - If not submitted, the student gets no mark for this item.
- **Compulsory assignments**
  - If not submitted, the result on the student's academic record will be *absent.*
- **Optional assignments** – You are encouraged as a student to do optional assignment so that it may benefit your learning.

I. **Elective assignments**
   a. the student is given a choice of which assignments within an identified group to submit, only the best result(-s), the number of which is specified in advance, will contribute towards the year mark.
   b. elective assignments must also be grouped into an elective group.
   c. for the student to select which assignment to submit, the elective assignments must be grouped together. For such an elective group, relevant information must be provided to the student, such as how many of the assignments must be submitted and how many of the assignment marks should be combined into the year mark.
   d. The selection criteria define how marks received for assignments in an elective group are to be combined into the year mark. Three different criteria may be used for calculating the year mark:
   - The best mark should be used, or
   - If the student submits fewer than the required number of assignments per group or no assignment in a group, a mark of 0% will be used.
   - 0% is awarded to all non-submitted or unmarked assessments. A best mark is then calculated from all items.

II. **Mandatory assignments**
   a. contribute to the year mark.
   b. If a student fails to submit a mandatory assignment, no mark is awarded and the year mark is calculated accordingly. The student will therefore forfeit the marks attached to this assignment when the final mark for the module is calculated.

III. **Compulsory Assessment**
   a. when not submitted, the student will fail a Continuous Assessment module but will be shown as absent from the examination in the case of other modules.

IV. **Optional assignments** – You are encouraged as a student to do optional assignment so that it may benefit your learning.

9.5   The assessments

As indicated in section 9.1, you need to complete **3** assessments for this module. **There are no assignments included in this tutorial letter.** Assignments and due dates will be made available to you on myModules for this module. We envisage that the due dates will be available to you upon registration.

9.7   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.

9.7.1   Invigilation/proctoring

Since 2020 Unisa conducts all its assessments online. Given stringent requirements from professional bodies and increased solicitations of Unisa's students by third parties to unlawfully assist them with the completion of assignments and examinations, the University is obliged to assure its assessment integrity through the utilisation of various proctoring tools: Turnitin, Moodle Proctoring, the Invigilator App and IRIS. These tools will authenticate the student's identity and flag suspicious behaviour to assure credibility of students' responses during assessments. The description below is for your benefit as you may encounter any or all of these in your registered modules:

Turnitin is a plagiarism software that facilitates checks for originality in students' submissions against internal and external sources. Turnitin assists in identifying academic fraud and ghost writing. Students are expected to submit **typed** responses for utilisation of the Turnitin software.

The **Moodle Proctoring tool** is a facial recognition software that authenticates students' identity during their Quiz assessments. This tool requires access to a student's **mobile or laptop camera**. Students must ensure their camera is activated in their browser settings prior to their assessments.

The Invigilator "mobile application-based service does verification" of the identity of an assessment participant. The Invigilator Mobile Application detects student dishonesty-by-proxy and ensures that the assessment participant is the registered student. This invigilation tool requires students to download the app from their Play Store (Google, Huawei and Apple) on their **mobile devices** (camera enabled) prior to their assessment.

IRIS Invigilation software verifies the identity of a student during assessment and provides for both manual and automated facial verification. It has the ability to record and review a student's assessment session. It flags suspicious behaviour by the students for review by an academic administrator. IRIS software requires installation on students' **laptop devices** that are enabled with a webcam.

Students who are identified and flagged for suspicious dishonest behaviour arising from the invigilation and proctoring reports are referred to the disciplinary office for formal proceeding.

Please note:

Students must refer to their module assessment information on their myModule sites to determine which proctoring or invigilation tool will be utilised for their formative and summative assessments.

9.8 Supplementary and aegrotat examinations

The supplementary and aegrotat examinations will be held in January/February 2025. Ensure that you check the student assessment policy to see who qualifies for these examinations (https://www.unisa.ac.za/sites/myunisa/default/Assignments-&-Examination/Examinations).

10. ACADEMIC DISHONESTY

10.1 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. Plagiarism includes the following forms of academic dishonesty:

- Copying and pasting from any source without acknowledging the source.
- Not including references or deliberately inserting incorrect bibliographic information.
- Paraphrasing without acknowledging the original source of the information.

10.2 Cheating

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

- Completing assessments on behalf of another student, copying the work of another student during an assessment, or allowing another student to copy your work.
- Using social media (e.g. WhatsApp, Telegram) or other platforms to disseminate assessment information.
- Submitting corrupt or irrelevant files, this forms part of examination guidelines
- Buying completed answers from so-called "tutors" or internet sites (contract cheating).

10.3 For more information about plagiarism, follow the link below:

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

11. STUDENTS LIVING WITH DISABILITIES

The Advocacy and Resource Centre for Students with Disabilities (ARCSWiD) provides an opportunity for staff to interact with first-time 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 contact (name and e-mail address of the lecturer must be inserted) to discuss the assistance that you need.

12.   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!

COS3711 lecturer

DEPARTMENT OF COMPUTER SCIENCE