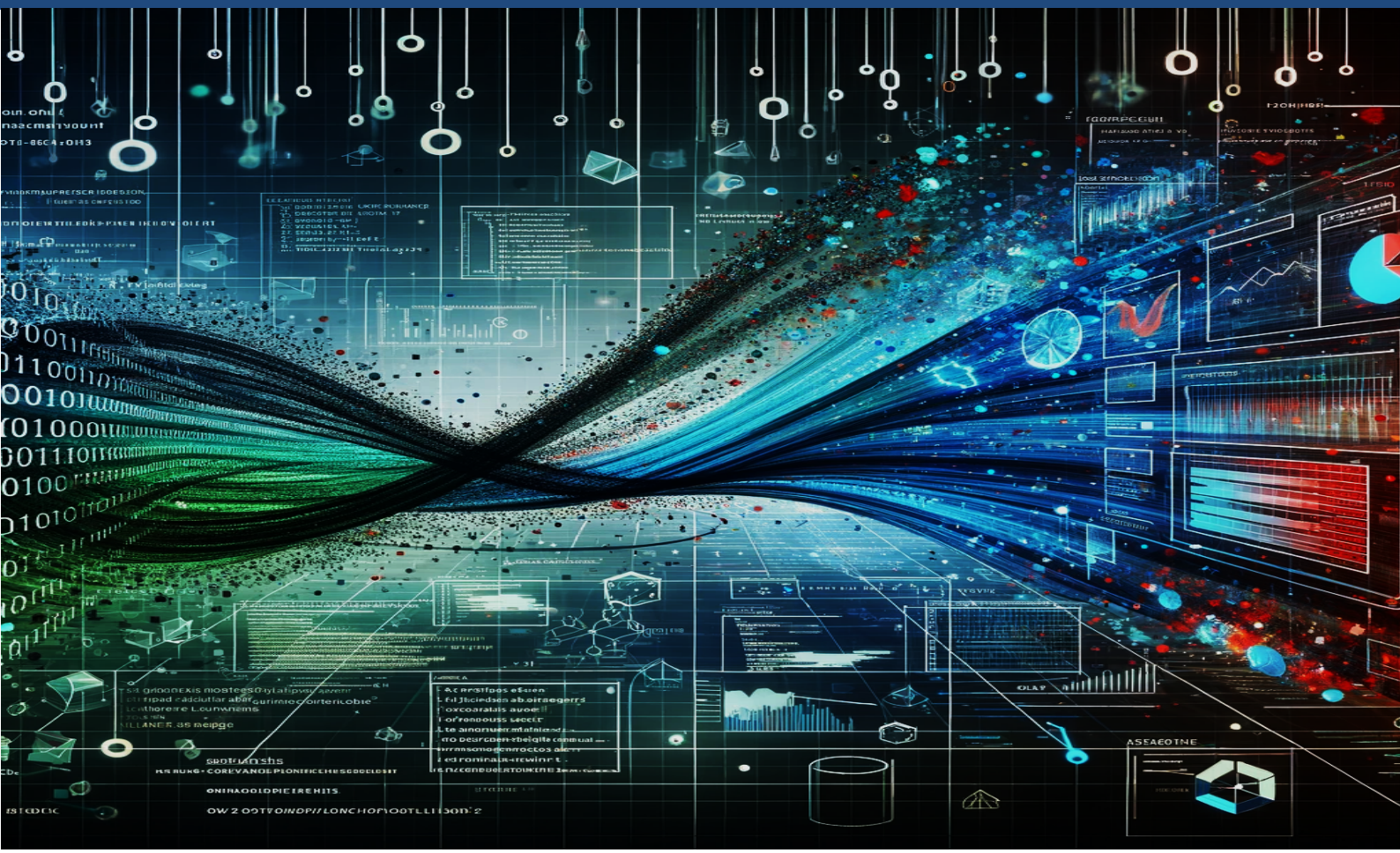

Department of Informatics

Advanced Programming

INF272

- This study guide provides a guideline and may be updated if and when required. When changes to this guide is made, all changes will be clearly indicated and announced.
- All versioning will be clearly indicated so that students can see what has been changed and updated as we progress during the year.

Lecturers: Prof Olawande Daramola and Mr Ridewaan Hanslow

Last updated: 13 February 2024

Table of Contents

1 Introduction

1.1 Welcome

Welcome to the Department of Informatics. We hope you are going to enjoy your studies this year. Informatics studies the application and use of computer and information systems within the organisation.

Our students' strengths lie in their broad background of the economic and management sciences, as well asthe different dimensions of Information Technology. This implies that the world of business and theapplication of technology towards the enhancement of business endeavours is nothing new to them. The useof Information Technology in organisations is growing exponentially and new, more complex and challengingapplications are explored and developed on a daily basis. The work of an informatics specialist is extremely interesting, but studying Informatics has an added benefit in that there is a very small chance that the qualified informatician will ever be without work. The additional opportunity exists to become an entrepreneur in which an informatician runs their own business endeavours within the context of a rapidly expanding technology-driven business environment.

South Africa aims to be an advanced user of Information Technology, and work opportunities for IT graduateshave soared. The working world and environment that we prepare you for through our degrees in Informatics, is international relevant and recognised so a substantial number of our students are successful when they, in the process of expanding their professional skills, seek employment and business opportunities overseas.

We also take great care to ensure that our curriculum is in line with the curricula of overseas universities and we take part in and participate in overseas conferences where educational approaches and curricula are presented and discussed. As an academic department, we also regularly engage with our industry partners to ensure that our students are aligned to the needs of the industry they are moving towards as a professional Information System specialist.

Finally, our BCom (Informatics) degree is one of only a handful of qualifications outside the USA that is internationally accredited by the Accreditation Board for Engineering and Technology (see www.abet.org). As a federation of 35 professional and technical member societies representing the fields of applied science,computing, engineering and engineering technology, ABET is an International Standards Organisation (ISO) recognised accreditor of numerous technical and professional areas of interest.

May you find pleasure and success in gaining this sought-after knowledge!

1.2 Educational approach

The general objective with this module is to emphasise understanding rather than merely focusing on memorizing the content. This is done to stimulate creative thinking and the development of innovative skillsamongst students. Student-centred and co-operative learning and teaching methods are applied during lectures as well as practical sessions, in order to optimally develop the aforementioned skills.

You are expected to participate in discussions during all sessions as your fellow students are dependent on the inputs you provide. Your participation is crucial as you are also dependent on their contributions.

reasonable to assume that this is not always possible, however, no content will be repeated and students will be required to catch up with the given content that was missed. Also, note that there will be no remedy for in-class (impromptu) exercises that are missed.

It is also essential that students work constantly and consistently on this module as history has shown that this leads to greater success. The amount of work required per week is considered to be reasonable within the scope and context of the given credits and related notional hours. Care has been taken to ensure that lectures, activities and tasks remain within the given timeframes as far as humanly possible. However, if students do not work consistently, then it will become impossible to catch up with all the work after approximately four weeks and then a student will start to struggle significantly. When we get to the more advanced concepts within the module, catching up will subsequently be impossible.

As we follow an incremental approach in terms of difficulty level, the first lectures are relatively easy and then we systematically increase difficulty level as we progress. If students constantly and consistently work,even as little as two to three hours extra per week above and beyond the individual theory and practical classes, sufficient skills will be accrued to be able to keep up with the more and more advanced programmingconcepts as we progress.

We focus on logic, programmatic reasoning, problem solving and pattern identification within a problem driven environment applying a given syntax. By following along, working with us and working a little by yourself you will move towards greater and greater success. This does not mean that all students will progressat the same rate, but by participating, working with us and working a little on your own, you will incrementallyimprove.

Even if you struggle, history has shown that if a student works diligently, they will incrementally and systematically improve and succeed in this module. History has also show, that if a student does not do so, then they will not succeed.

The consequences of not following the aforementioned approach and advice are clear. This module is a prerequisite for most of the third-year informatics modules. If a student fails this subject, then they will not be allowed to progress to the third-year. No exceptions will be made in this regard as INF272 is a prerequisite.An exception in this regard has never been made within the history of this subject.

Please note that the level of complexity of the practical work, semester tests and exam align with the expected outcomes for a student on the second-year level. However, the projects and homework assignments push the limits so that students can apply their knowledge by means of a problem-driven approach. Following a problem-driven approach with the projects and homework assignments mean that the project and homework assignments will be more difficult than the practical work, semester tests and exams. By implementing the aforementioned approach, student remember more when it

comes to other critical assessments such as test and exams.

Do not neglect your projects and homework assignments. Work on these projects and homework assignments systematically and diligently. Trying to complete the projects and homework assignments a few days or on the day of submission will lead to failure with regards to projects and homework assignments. Also note that we do not reuse projects and assignments as completed in previous years. Submitting old project and assignments from previous years is a fruitless endeavour that would also lead to failing the assignment.

Please read our Departmental Brochure on ClickUP. The departmental brochure contains frequently asked questions and the answers to the frequently asked questions, so it is important that you read it and know what is in the brochure. The brochure is a simplified description of what is defined by university regulations.If uncertain, please feel free to refer to the official regulations as well. It is our hope that you will find your studies informative, formative, and enjoyable.

2. Administrative Information

Here follows important administrative information, including lecturer contact details, consultation hours, the module timetable, and more. Announcements and other information will be posted on ClickUP on a regularbasis to ensure that you are up to date with the latest developments or changes as far as INF272 is concerned.

2.1 Contact Details

	Name	Building	Tel: (012)420-	E-mail address
Coordinator	Prof. JO Daramola	IT 5- 71	2591	wande.daramola@up.ac.za
Lecturer	Mr. R Hanslo	IT 5-101	3367	ridewaan.hanslo@up.ac.za
Lecturer	-- Semester 2	----	----	----
Assistant Lecturer	Carl Ndlovu	5-70	4177	carl.ndlovu@up.ac.za
Assistant Lecturer	Ismaeel Rahaman	5-70	4177	ismaeel.rahaman@up.ac.za
Teaching assistants **	Luis Miguel	----	----	----
Teaching assistants **	Deandré Vanmali	----	----	----
Departmental admin **	Mrs. CL Pieterse-Mahlangu	5-78	3798	cathy.pieterse@up.ac.za

**** No consultation hours**

Consultation hours will be published on ClickUP. Lecturers do not consult outside their stipulated hours. Please make a note of the consultation hours when published on ClickUP.

2.2 Email Rules and Netiquette

Please take note of the following rules that relate to emails in INF 272:

2.2.1.1 Email is not instant messaging or internet relay chat. Reading and replying to emails consumes

2.2.1.2 a large amount of lecturers' time. Some of the emails are **unnecessary as the answers to questions posed in emails are, in most instances, either in assignments, guidelines or on ClickUP.**

2.2.1.3 We will keep up to date with emails as much as possible. However, we implore you not to spam us with unnecessary requests. Most of the answers are on ClickUP or in the study guides. It is therefore important that you read this study guide!

2.2.1.4 When sending an email, please do not expect an immediate reply. We will endeavour to respond to emails **within 24 hours on weekdays**. However, because we have numerous activities and tasks to complete related to multiple subjects, roles, and responsibilities, the time we can spend on email is limited and it may take **up to 3 working days to respond to your email**. We have to prioritise!

2.2.1.5 When sending an email, please address the lecturer or assistant lecturer politely, ask your questions and sign off your email, so we know how to address you. If you do not follow this simple email etiquette, we will not respond to your email.

2.2.1.6 When sending an email, please state your Name, Surname, Student Number, and Subject in the email quite clearly. We have numerous undergraduate and postgraduate students, and we cannot guess who a student is. We have to look it up using multiple different techniques that are unnecessary.

2.2.1.7 Sometimes when we are swamped with several activities at a time, we might provide very simple straightforward replies. Please do not take it personally. It just means we are juggling too many activities are once.

2.2.1.8 We will not review, consider, and reply to emails **after hours or over weekends.**

2.3 Timetable and lectures

For this module, the following general approach will be followed:

- There are no lecture or practical session recordings. When such recordings are available students skip class and focus only on the recordings by reviewing it in most cases at double the normal speed. This does not work and a student does not learn anything relevant from such an approach.
- There are no quizzes in this subject. Marks are obtained from practical work, semester tests, projects and homework assignments, and in-class exercises. No alternative will be made available.
- The lecturers and assistant lecturers will only be available for consultation during their respective consultation hours.
- Lecturers have multiple subjects, roles, responsibilities, activities and tasks and very rarely can accommodate consultation by appointment or walk-in consultations. Additionally, it may happen that a lecturer would be sporadically unavailable for consultation due to general responsibilities. In such a case,report to the Informatics helpdesk and leave a message with the helpdesk.
- Assistant lecturers are still studying and need the appropriate amount of time to attend to their studies. Assistant lecturers can subsequently not accommodate walk-in consultations.
- Under most circumstances, one lecturer will be available in a theory session. Additional

- lecturers and assistants may be present during theory sessions if and when required.
- At least one assistant lecturer and one teaching assistant will be available during scheduled practical times. However, this depends on the number of students who need to be accommodated during a practical session. There may be extremely rare circumstance that only one person would be available. This would be sporadic and depends solely on uncontrollable circumstances.
- Marking of all practical work will be done in the practical sessions. No work will be marked outside of these sessions. If one or two practical sessions are missed throughout the year, then that is not a concern. However, if a minimum of four consecutive sessions is missed, then consult with your lecturers. In such a case, go through the sample applications, notes and details and consult with explicitly noted questions so that the consultation would be productive and reasonably useful. If no written questions can be presented that is informed by questions noted from the available resources, then we cannot consult on unknow items or areas of interest. Both students and lecturers need to focus on productive work and not busy work. Productive work has clear objectives while busy work is work simply for the sake of being busy and does not work towards a singular success driven objective.
- The aforementioned stipulations may be altered at any time due to general circumstances that arise.

Always confirm dates, times, venues for groups and lecture session on the university module lookup as available on the student portal. No date, time venue may contradict the officially schedule details as found on the student portal and module lookup. The details are followed explicitly as stated on the portal.

In case of an emergency and associated changes, an announcement will be sent to students. Above and beyond this, there shall be no alternative communication from ClickUP in this regard. The module dates, sessions and details are fixed by the central scheduling office and is followed exclusively. If there are changes required in exceptional circumstances, then the scheduling office will be consulted before such change maybe implemented. The scheduling office is the exclusive authority on dates, times and timetable matters.

In this instance, as a matter of convenience, the timetable details are posted below. As a disclaimer to this, ensure that you confirm the details as stipulated on the module lookup page as found on your student portal.

2.4 Grievance Procedures

All grievances must be submitted in writing with specifics of the incident or the nature of the complaint. It is imperative that you follow the procedure outlined below in order to resolve your issues:

1. Consult the lecturer concerned about your grievances/concerns

If the matter has not been resolved,

2. Consult the class representative

The primary function of the Class Representative is to serve as a two-way communication channel between the class and the lecturer. If the matter has not been resolved,

3. Consult the module co-ordinator (large modules with multiple lecturers)

If the matter has not been resolved,

4. Consult the Head of Department

If the matter has still not been resolved,

5. Consult with the Dean of the Faculty

2.5 Theory and practical preparation sessions

A student will be required to attend and participate in ONE theory session a week. In the listed sessions students will be introduced to concept, programming syntax, examples etc. as well as the brief, discussion and description of the week's subsequent practical sessions. The details in these sessions will not be repeated in the practical sessions. There will be regular impromptu in-class exercises during the theory sessions that will count towards the final marks. Hence, all students are advised to take participation in the theory sessions seriously. There will be no remedy for marks missed due to non-participation in theory sessions.

Students will be working in the practical sessions. Students will be supplied with practical descriptions that can be used in the practical sessions, however the additional descriptions, explanations and examples presented in the theory classes will not be repeated in the practical session. There simply isn't sufficient time to do so.

This approach has been implemented as students tend to not prepare for practical sessions. As such, the theory session has been implemented to prepare students for the practical sessions with appropriate guidelines, stipulations and relevant examples appropriate to the week's practical work.

Day	Time	Venue - Chancellors Building
Monday	11:30 - 12:20	Te Water Hall
Monday	12:30 - 13:20	Te Water Hall

2.5.1 Practical sessions

Students will be required to register for ONE practical session. In these sessions students will be working ontheir practical tasks and all practical tasks will be marked in these sessions. Only practical work from the previous week that was uploaded to GitHub will be marked. If the practical files are not on GitHub, and not downloaded for marking in the session, then the assignment will not be marked. GitHub indicates the creation date of files as well as when files were last edited.

The first half of a practical session will focus on working on required practical tasks, while the second half of the session will involve marking the previous weeks work and GitHub submissions while students are still working on their practical activity. This sequence will not be deviated from or changed. This is to prevent students from simply coming to a session to get marked and then subsequently leave. Work on your practical activities in your practical session. It is in your timetable and your schedule. If you do not use the time then you will have to use your own personal time later during the week to manage your practical work. This is unreasonable. It will however be required to work a little outside of practical classes, however most of the work would have been completed in a session and the little work outside of a session is hope to be only rounding off and finalising a small number of details.

Students who attend sessions that they aren't registered for will not be marked, and if a student neglect to attend and work in two consecutive sessions, then the student will be deregistered from their chosen practical group. In such a case, the student in question will have to consult directly in person with the coursecoordinator to be re-allocated to a group.

Day	Time	Venue - Informatorium
Tuesday	12:30 - 14:20	Brown Lab
Tuesday	14:30 - 16:20	Brown Lab
Wednesday	09:30 - 11:20	Brown Lab
Wednesday	11:30 - 13:20	Brown Lab
Friday	09:30 - 10:20	SIT 1 lab

Important note: By tracking student success and failure ratios from 2018 up to now (2024), a clear correlation between working and participating in practical sessions and success versus failure has been found. Simply stated, the more a student works in the practical session, the higher the probability of succeeding in INF272was found. Conversely, it was also found that students who fail at INF272 did not participate and worked in the practical session.

2.6. Rules related to activities and assignments

1. There shall be no extensions to the deadline of assignments or activities unless ClickUP goes down. If ClickUP on rare occasions become available, staff are informed of such by the university IT Services. If a student states that it was down, and there was no confirmation from IT Services, then ClickUP inherentlywas not down and still available. The set due date and time is the cut-off time. So if the assignment or activity is not uploaded before the cut-off time, then your upload will fail. Do not leave this to the last minute as it will fail.
2. Start working on the assignment as soon as it is posted. Even if it means doing a little reading, research,and review – Do not leave this to the day of the deadline. Doing so will have you fail the assignment.
3. Verify the completeness of your upload. We do not verify uploads for students. You are provided with multiple upload opportunities per assignment or activity, so if the upload failed, you WILL have additional upload opportunities until the cut-off time.
4. Incomplete uploads will be considered unsubmitted work.
5. E-mail submissions WILL NOT be accepted. It becomes extremely difficult to manage with so many students and then such submissions become "misplaced". Subsequently students lose marks. Start early, plan ahead and submit on ClickUP on time.
6. Late submissions WILL NOT be accepted. Start early, plan ahead and submit on ClickUP on time. This is good practice for the real world.
7. NO EXCEPTIONS WILL BE MADE FOR ANYONE UNDER ANY CIRCUMSTANCE. Do not assume that some sort of exception will be made for you. This is a fixed rule and does not change for anyone under any circumstance.

3 Study material and purchases

There is no prescribed book for the module. All study material will be provided during class and additional material will be available through ClickUP. Students will be guided towards a variety of online

sources that would assist them in problem solving.

Additional sources are available on the Resource Library page on ClickUP. If a student needs to identify something small that they might not remember from class, or a student is working alone at home, then the resources library on ClickUP would be useful.

If a student identifies a useful resource that helps them, then please feel free to share it with the course coordinator so that the useful resource can be shared with all the other students.

Additional resources are available on the internet. Unfortunately, there are simply too much in and around the knowledge required for software development so lecturers will not be able to teach students everything. Lecturers will teach students the core concepts leveraging what was taught in INF154 and INF164 and then expanding from there throughout the year. Students will have to engage in a small amount of self-study in terms of online resources to expand their knowledge on the core details of INF272.

4 Programme/Departmental/Module Rules, Requirements and Guidelines

Please refer to the Departmental Brochure for general rules, requirements and guidelines.

5 Support Services

Please download a QR code reader on your mobile phone. To download a QR code reader open your mobile app store (App Store, Google Play or Windows Marketplace) and search for QR code readers.

5.1 Safety in the Evening and Emergencies

5.1.1.1 For any safety or emergency-related matters, e.g., if you need a security officer to accompany you from your residence to campus, phone the Operational Management Centre (details at the back of your student card).

5.1.1.2 The 24-hour, multi-disciplinary UP Crisis Line offers professional and confidential support to victims of crime in times of trauma. For assistance and immediate action, phone the UP-Crisis Line on: 0800 00 64 28.

5.1.1.3 Hatfield residence students: From 18:00 till 06:00 security officers are available to escort you (on foot) to and from your residence or campus anywhere east of the Hatfield Campus through to the Hillcrest Campus.

5.2 For E-learning Support

- Report a problem you experience to the Student Help Desk.
- Approach the assistants at the help desks (adjacent to the Student Computer Laboratories in the IT Building, NW2, CBT, etc.).
- Visit the open labs in the Informatorium Building to report problems at the offices of the Student Help Desk.
- Call 012 420 3837.

- Email studenthelp@up.ac.za

5.3 Other Support Services

University of other Pretoria support services			
Faculty student advisors	Academic support Goal setting & motivation Adjustment to university life Test/Exam preparation Stress management Career exploration	Individual consultations and workshops about - time management - study methods	
FLY@UP: The Finish Line is Yours	• Think carefully before dropping modules (after the closing date for amendments or cancellation of modules). • Make responsible choices with your time and work consistently. Aim for a good semester mark. Don't rely on the examination to pass.	www.up.ac.za/fly@up email: fly@up.ac.za	
Disability Unit	Academic support for students with learning disabilities: • Assistive technological services • Facilitation of test and examination accommodations • Test and exam concession applications • Accessible study venues and a computer lab • Referrals for recommended textbooks in electronic format	https://www.up.ac.za/disability-unit 012 420 2064 email: du@up.ac.za	
Student Counselling Unit	Provides counselling and therapeutic support to students	012 420 2333	
Student Health Services	Promotes and assists students with health and wellness	012 420 5233 012 420 3423	
The Careers Office	Provides support for UP students and graduates as they prepare for their careers	careerservices@up.ac.za 012 420 2315	
Department of Security Services	24-hour Operational Management Centre 24-hour Operational Manager Crisis Line	012 420-2310 012 420-2760 083 654 0476 0800 006 428	
Department of Student Affairs	Enquiries concerning studies, accommodation, food, funds, social activities and personal problems	012 420 2371/4001 Roosmaryn Building, Hatfield campus	

University of other Pretoria support services			
Centre for Sexualities, AIDS and Gender	Provides counselling and therapeutic support to students	012 420 4391	
Fees and funding	http://www.up.ac.za/enquiry www.up.ac.za/fees-and-funding	012 420 3111	
IT Helpdesk	For student IT-related queries https://www.up.ac.za/it-services/article/2891993/student-computing-services	012 420 3051 012 420 3837 studenthelp@up.ac.za	
ClickUP Ultra Student Help Site	https://rb.gy/zboqcd	N/A	

6 Module information

6.1 Purpose of the Module

INF272 continues where INF164 left off. The purpose is to teach students how to approach and solve programming problems using HTML, CSS, JavaScript, Bootstrap, Responsive web design, jQuery OOP (C#), LINQ, List and Lambdas (C#), AJAX, synchronous and asynchronous processing as well as Database SQL WITHIN an MVC project (C#). The primary aim of this module is to teach students how to develop information systems in the form of dynamic web applications that would function as distributive computing systems. The systems developed by students relate to how real-world systems function within the distributive computing context (see https://www.techtarget.com/whatis/definition/distributed-computing).

We start simple but then there is an exponential increase in complexity to make sure you master all the skills required of the module.

6.2 Module Outcomes

After completion of this module, a student should be able to:

- **MO1:** Develop web-based applications using the Model-View-Control design pattern to meet a given

  set of systems requirements.
- **MO2:** Make use of object-oriented programming techniques and concepts to model a given

  scenario.
- **MO3:** Integrate database techniques and concepts in a software solution.

- **MO4:** Implement standardised data exchange tools to integrate web services in a softwaresolution.
- **MO5:** Use best practices and debugging to improve the quality of a software solution.

6.3 Articulation with other Modules in the Programme

See Departmental Brochure for a full explanation of all Informatics modules.

6.4 Modules Structure

In this module we will focus or classes, discussions, activities and tasks around the following main themes.

3.3.1 **Preliminaries, point of departure, roadmap and destination**.

o Context and overview.

o Getting started with Visual Studio and GitHub.

3.3.2 Roadmap toward working with the ASP.NET Model-View-Controller (MVC) Pattern.

o Semester 1: Front-end development for distributed computing.

o HTML and CSS within MVC.

o Responsive web design (RDW), HTML and Bootstrap in MVC.

o JavaScript and RDW in MVC (Part 1).

o JavaScript and RDW in MVC (Part 2).

o Manipulating the MVC HTML Document Object Model (DOM) with jQuery.

o Processing data with lists in MVC moving towards data manipulation and processing.

o The application of on add-ons and third-party applications in MVC.

o Semester 1: Transferring data from the front-end to the backend.

o Data Models in MVC with object-oriented programming (Part 1).

o Data Models in MVC with object-oriented programming (Part 2).

o Semester 1: Middle of the year milestone.

3.3.3 Front-end, data transfer (Semester 1) to backend data and storage (Semester 2).

o Semester 2: Backend development.

o Working within the controller contextualised with Lists and LINQ.

o Processing data with database coding and C# within MVC (Part 1).

o Processing data with database coding and C# within MVC (Part 2).

o Processing data with database coding and C# within MVC (Part 3).

- Data and Lazy Loading with Language-Integrated Query (LINQ).
- From data Lazy Loading with LINQ to Eager Loading with Lambda Expressions.
- Synchronous processing with Entity Framework (EF).
- Asynchronous processing with jQuery, AJAX, JavaScript Object Notation (JSON) and EF.
- Asynchronous processing as extended with EF.
- Data protection with importing, exporting and C# triggered backup events.
- Generating reports from processed data in MVC with C#, add-ins and modules.
- Protecting your system and data with MVC security integration.

3.3.4 Semester 2: End of the year milestone.

3.4 Articulation with other modules in the programme

See Departmental Brochure for a full explanation of all Informatics modules.

6.5 Learning Presumed to be in Place

Students should have passed INF164 in order to continue with INF272. There is an extremely rare exception for a very small group of Computer Science (CS) students who should consult with the CS department. This exception does not apply to any other student under any circumstance.

6.6 Credit Map and Notional Hours

The number of credits allocated to a module gives an indication of the volume of learning required for the completion of that module. This is based on the concept of notional hours. Given that this module carries a weighting of 14 credits, it follows that you should spend an average of 140 hours of study in total on the module (1 credit = 10 notional hours). This includes time for lectures, assignments, projects, tests, and exams. This means that you should spend approximately 5-6 hours per week across the 26 weeks on INF272. If you encounter difficulties with this module, you should allocate more hours per week towards INF272 as the objectives of this module emphasises the practical application of programming techniques, which will demand practice. Without coding practice, it is an unfortunate truth that a student will fail this module and would not be allowed to continue with INF354 or INF370. INF272 is a prerequisite for the indicated third- year modules. Keep practicing.

The following is an example of notional hour time allocations for a typical student:

- Notional hours required to master INF272: 14 credits x 10 notional hours = 140 hours.
- Total number of active weeks due to the active UP calendar teaching year = 26 weeks
- Notional hours divided by active weeks: 140 / 26 = 5.38 hours (or 323 minutes) per week.

Please note that the active UP calendar teaching year is calculated to exclude public holidays, special events, recess and exam periods. There are in total 26 weeks that exclude public holidays, special events, recess and exam periods.

A typical week from the perspective of a student would be:

DETAILS	CONTRIBUTION - WEEKLY NOTIONAL Hours
A theory preparation lecture	50 minutes
A practical session	120 minutes
TOTAL HOURS IN CLASS	170 minutes

- **The notional hours are carefully considered in terms of a student's workload. We intend to not overload a student. We do however borrow time from one week and add it onto critical assessment weeks so that the total notional hours add up to 140 hours. But please take care to note that the aforementioned implies that a typical student should work at a minimum 2.55 hours per week on their own outside of normal class times and scheduled events.**

7 Assessments

This section of the study guide provides an overview of mark allocation as per the general module structure. The module is being reconstructed and realigned, so an in-detail module assessment plans cannot be presented in the guide. The module is being revamped in total. Due dates and assessment details will be posted and made available on ClickUP as we progress during the year. This is and unfortunately reality when a module is being changed, updated and upgraded.

7.1 Assessment Plan

Module Average [as calculated at the end of the year]	
• Practical activities and tasks; in-class exercises	30%
• Projects and homework contribution	30%
• Semester Test 1 (S1) and Semester Test 2 (S2) contribution	40%
Final year average [40% required to write exam]	**100%**

There will be one Sick Test (Test 3) at the end of the year for either S1 or S2. Test 3 is not a test that is open to all students. Test 3 is not a "mark improvement" test. There are no such things as a "mark improvement" test for INF272 and requesting one shall not be accommodated.

Test 3 is a sick test that has been officially schedule in the timetable so that students know far in advance when the one and only sick test is scheduled in the rare instance when a student missed one of the ordinary semester tests.

Please do not compare INF272 with the practice of other modules as INF272 is not the same as other modules. Each module has their own requirements and the requirements for INF272 can therefore not the compared with another module.

To be eligible for the sick test, students would have to apply for the sick test within 3 working days if they missed an ordinary test. If there is clash between modules, then a student has to apply for the sick test at least 7 days before a test is scheduled. Relevant documentation and evidence should accommodate the application. All documentation will be validated by contacting the party who supplied the associated documentation.

Please note the following regarding semester test:

- If you are sick, you need to apply for the Sick Test by means of contacting the coordinator and providingthe relevant proof [Sick Note]. You have 3 working days to do this.
- If there is a strange and uncontrollable happenstance, then obtain an affidavit explaining the details, andthen forward it to the coordinator. You have 3 working days to do this.
- If you have a clash [Other test written at the given time], the hierarchy works a follow:
    - Third-year subjects take preference over Second-year subject and Second-year subjects takepreference over first year subject.
    - Practical subjects take preference over theory subjects as defined in the aforementioned order.
    - High credit subjects take preference over low credit subjects in the aforementioned order.
    - Sick tests take preference over another test. So, if you have to write a sick test in one subject, itdoes not matter what the hierarchy is, you can write the sick test in the other subject later. Sicktests have the highest priority of all.

Contact the lecturer with the higher level of importance to obtain a letter of confirmation that you qualify for the test being written, and then forward it to the coordinator of the subject whosetest you will be missing. You have to do so 7 days before the test is written and not afterwards.

7.2 Final year mark contributions and notes

Final Module Average [as calculated at the end of the exam]	
• Year mark	50%
• Exam mark	50%
Final module average [need 50% to pass module]	**100%**

Please refer to the **Departmental Brochure** for general rules and requirements related to supplementary exam qualification. Supplementary exams are not awarded automatically in any circumstance. Never assume that a supplementary exam will be awarded automatically. There are requirements and stipulations based inuniversity regulations that define this.

Please note the following regarding exams*:*

- The hierarchy as stipulated for semester tests is similar to the hierarchy for exams, however the channel of communication and interaction to make all the relevant exam arrangements is a student's faculty andnot the department or the course coordinator.
- During exams a student's faculty administration manages all documentation related to sick exams and

  exam clashes.
- The line of communication during exams regarding the aforementioned is the student portal where allapplications and relevant documentation should be uploaded.
- If there is any level of uncertainty, contact your faculty administrator directly my means of the e-mails

  listed on your faculty's "Contact us" page.

Superficial notes on pass requirements*:*

- Pass requirements are summarised here, however there is a level of complexity not noted here.
- Refer to the departmental brochure as well as your faculty regulations for the complete details.
- A sub-minimum (absolute minimum) of 40% as a year module mark is needed to gain access to

the exam.

- According to faculty regulations you have to obtain a final mark of 50% or more to pass this module.
- **Please note** – If a student does not obtain a sub-minimum in the exam (40%), then regardless of whetheror not a final average is in the supplementary exam range, a student WILL NOT be awarded a supplementary exam. Supplementary exams are NOT awarded automatically. An exam mark less than 40% with a final mark anywhere below 50% constitutes a failure.

7.3 Assessment criteria

In written assessments, such as class tests, quizzes and semester tests, memorandums will be used to assessstudents' answers, while rubrics will be used to assess homework assignments, project deliverables and other forms of practical assessment.

1. In all instances students will receive generic class-based feedback
2. In some instances students will receive individual feedback.
3. This is up to the discretion of the course coordinator and the nature of the assessment.

The following high-level assessment criteria will be applied throughout the course of this module to evaluateyour understanding and proficiency with the content. Students should learn to:

1. Plan a programming solution and implement it using all the programming constructs learnt in INF154 andINF164 as well as INF272. The modules build on each other and as such, content from the listed modulesis used in concert.
2. Create functional and usable web interfaces using HTML and CSS.
3. Implement web-based program functionality using JavaScript.
4. Understand and use the jQuery library to produce simplified and more efficient JavaScript code.
5. Apply responsive web design principles to develop applications that smoothly transform for use onmobile devices.
6. Work in teams and use GIT to create repositories, pull and push to repositories and debug problemsassociated with GIT, such as merge conflicts and removing code segments from repositories
7. Understand and explain the MVC software architectural pattern and apply the architecture to aprogramming project created in Visual Studio.
8. Understand and use MS Razor View Engine.
9. Understand and apply the following object-oriented programming (OOP) concepts: classes, data members, properties, parameterized constructors, encapsulation, access modifiers, inheritance, polymorphism.
10. Apply OOP using the MVC architecture.
11. Understand and apply the following data base programming concepts: read, insert, update, delete, dataadapters, data sets, command builders, stored procedures, entity framework, LINQ queries.
12. Integrate all of the above programming concepts/constructs using Create, Read, Update and Delete(CRUD) functions.
13. Understand and apply JavaScript Object Notation (JSON).
14. Access external web services from within an application using JSON.
15. Understand reporting principles and create reports using Chart.js and suitable PDF producing

JavaScriptlibraries.

16. Implement programming techniques to import and export data from/to an information system's data sources.
17. Apply security principles to manage user access to the different components of a complex webapplication.
18. Deploy a dynamic web application and its database(s) to a suitable hosting environment.

Please note – Assignment, activity, or task requirements ARE NOT OPTIONAL. Assignment, activity, or task requirements ARE MANDATORY. If a student does not comply with assignment requirements and specifications, a zero will be awarded.

7.4 Meaning of Grade Codes on the Student Portal

In some instances, a student's mark is not displayed on the student portal. Please refer to the table below for the meaning of grade codes when they are displayed instead of marks.

Code	Meaning
992	Subminimum not obtained
987	Absent from exam
988	Student not admitted to exam
989	Results not available

7.5 Assessment Policy

Please refer to the **Departmental Brochure** for general rules related to assessment. Make sure to review thedepartmental brochure for all departmental rules and requirements as listed and related to University regulations and requirements. Test and assignment information and dates are available on ClickUP. Please make a note of these dates. In class contact session **Class Tests/Class Activities are done during class time only. No special arrangements will be made in this regard. Please submit assignments and practical exercises on time. No late submissions will be accepted.**

There is no option for promotion in this module. A sub-minimum of 40% as a module mark is needed to gainaccess to the exam. According to faculty regulations you have to obtain a final mark of 50% or more to pass this module. A student's semester mark will be taken into consideration when calculating the final mark. Allassignments due will be posted onto ClickUP. Completed practical/assignments should be uploaded onto ClickUP. **All tests, assignments and activities that are marked will contribute towards your final mark.**

7.6 Plagiarism

Plagiarism (intellectual "theft" or "fraud") is a serious form of academic dishonesty and academic misconduct. It involves both appropriating someone else's work and passing it off as one's own work afterwards. Thus, you commit plagiarism when you present someone else's written or creative work (words, images, ideas, opinions, discoveries, artwork, music, recordings, computer-generated work, etc.) as your own. Only hand in your own original work. Indicate precisely and accurately when you have used information provided by someone else. Referencing must be done in accordance with a recognised system. Indicate whether you have downloaded information from the Internet. For more details, visit

the library's Plagiarism Prevention webpage