FACULTY OF SCIENCE

LEARNING GUIDE

MODULE: Informatics 3B: Advanced Software Engineering
CODE: IFM03B3

THIS <u>MODULE SPECIFIC</u> LEARNING GUIDE
IS INTENDED TO BE USED IN CONJUNCTION WITH
THE <u>UNDERGRADUATE GENERAL</u> LEARNING GUIDE

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COMPILER OF LEARNING GUIDE: Prof D Du Plessis & Prof N Mpekoa

2025

Please note

The most up-to-date and correct version of this
Informatics 3B Learning Guide
is available electronically on Eve.

In the event of any differences between this copy and the
copy currently on Eve, the student is to default to the version
available on Eve.

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Contents

1. WELCOME

Congratulations! You are halfway there. Did you ever think you will make it this far?

This semester will push your skills (new and old), your interpersonal skills as well as your tolerance to sleep deprivation to its limits. Three practical deliverables and, of course, the prestigious Projects Day is what you can look forward to.

We're not going to waste any more of your time (as if you actually read this) and allow you to go back to designing and programming! Oh, and don't forget to study the theory as well ;)

All the best,

Prof DP du Plessis and Prof N Mpekoa

2. ABOUT THIS LEARNING GUIDE

This learning guide contains details specific to the Informatics 3B module and should be used **in conjunction** with the Academy of Computer Science & Software Engineering's Undergraduate General learning guide. Students are to defer to this module specific learning guide in the event that information published herein conflicts with instructions published in the general guide.

3. THE MODULE

Module name:	Informatics 3B: Advanced Software Engineering
Prerequisites for module:	Informatics 3A
Module NQF level:	6
NQF Credits: (calculated according to notional hours)	30
Duration of Module: (Weeks/Semester)	13 weeks
Type of Module:	Semester 2 Module
Language of Delivery:	English

3.1. PURPOSE OF MODULE

The Software Engineering module specifically aims to facilitate the development of competent software developers and engineers for the ever-growing IT industry. The purpose of this module in Software Engineering is to enable students to develop professional skills, knowledge and attitudes that are necessary to become highly competent as software developers and engineers. Specifically, students develop and implement computer systems for the solution of business problems and obtain, on a practical level, experience in a team relationship; to identify, analyse and implement a prototype of a business system.

3.2. MODULE OUTCOMES & MODULE ASSESSMENT CRITERIA

MODULE OUTCOMES	MODULE ASSESSMENT CRITERIA
At the end of this module the student should be able to do the following:	*The student will be assessed as competent if:*
1. Discuss and implement Management concepts.	o The importance of Managing people, Software Cost Estimation, Quality Management, Process Improvement, Configuration Management, Risk Management and Ethical aspects of IT is accurately identified o The benefits of Managing people, Software Cost Estimation, Quality Management, Process Improvement, Configuration Management, Risk Management and Ethical aspects of IT are discussed sufficiently
2. Discuss and use Development concepts.	o The importance of Component based software engineering, Critical systems development, Software Evolution, Decentralised development is accurately identified. o The benefits of Component based software engineering, Critical systems development, Software Evolution, Decentralised development are discussed sufficiently. o Development concepts are correctly deployed.
3. Discuss and use Emerging Technologies.	o The importance of service-oriented engineering is accurately identified. o The benefits of Service oriented engineering are discussed sufficiently. o Applicable emerging technologies and international trends are correctly used in the project.
4. Identify and discuss legal aspects of IT.	o Legal aspects pertaining to software development are accurately identified. o Legal aspects pertaining to software development are discussed in detail.
5. Discuss and implement Verification and Validation concepts	o The importance of Software Testing Strategies that test for Reliability, Durability, Quality and Conformance. o The benefits of Software Testing Strategies that test for Reliability, Durability, Quality and Conformance.

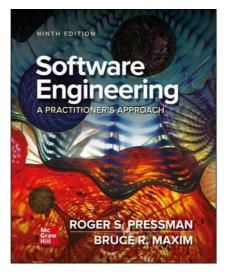| MODULE OUTCOMES	MODULE ASSESSMENT CRITERIA
At the end of this module the student should be able to do the following:	*The student will be assessed as competent if:*
6. Completion of a practical IT business system in a group project.	o An alpha deliverable demonstrating basic interface and system functionalities is successfully implemented and presented effectively. o A beta deliverable demonstrating the bulk of system functionalities as an integrated and comprehensive system is successfully implemented and presented effectively. o A final deliverable constituting the entire system's functionalities as outlined in the system's requirements documentation produced is successfully implemented and presented in a team relationship effectively.

3.3.   MODULE RESOURCES

A blended learning approach that makes use of the following teaching/learning methodology opportunities and experiences is used:
- Lectures.
- Tutorial classes.
- Module website (http://eve.uj.ac.za).
- Microsoft DreamSpark Premium Software (http://eve.uj.ac.za/ds).
- Using books and subject-related periodicals.
- Consultations with module lecturer.
- Consultations with module tutors.
- Practical assignments
- Year project

Students are encouraged to make use of the available resources for the module. Such sources include:
- Module website (http://eve.uj.ac.za)
- Lecture notes

3.3.1. Prescribed Textbook

Title:	Software Engineering
Edition:	International 9th Edition
Author:	Roger Pressman, Bruce Maxim
Publisher:	McGraw Hill Education
ISBN-13:	9781259872976

3.3.2. Development Tools

Informatics 3 allows you to use any development tool you wish. Please ensure that the tools and any plugins and/or extensions that you use are **legal**!

4. LECTURES, TUTORIALS & PRACTICALS

The Informatics 3B module consists of three lectures and one continuous practical session. **The attendance of the lectures, tutorials and practical sessions is <u>compulsory</u> for ALL students.**

The weekly Informatics 3B schedule is as follows:

Activity		Venue
Lectures *(attend all lectures every week)*		
Monday (13:50 -15:25)	*MO 8, MO 9*	C Les 201
Wednesdays (09:40 – 10:25)	*WE 3*	D1 Lab K10
Practical Session *(attend the entire duration of the practical session)*		
Wednesday (08:00 – 09:35)	*WE 1, WE 2*	D1 Lab K11

4.1. LECTURES

Lectures take place every **<u>Monday</u>** (13:50 -15:25) and **<u>Wednesdays</u>** (09:40 – 10:25). Students are to ensure that they arrive timeously as attendance is taken in class.

4.2. PRACTICAL SESSIONS

The practical session take place every **Wednesday** from **08:00 – 09:35**.

5. LECTURERS

Lecturer

Name:	Prof DP Du Plessis
Telephone:	011 559 3816
E-Mail:	danieldp@uj.ac.za
Office:	E-Ring 218
Consultation:	Fridays 10h00-11h30

Lecturer

Name:	Prof N Mpekoa
Telephone:	011 559 2839
E-Mail:	noluntum@uj.ac.za
Office:	E-Ring 210
Consultation:	Monday 11h00 – 12h30

Project Coordinator

Name:	Dr HJC Van Der Westhuizen
Telephone:	011-559-2840
E-Mail:	cvanderwesthuizen@uj.ac.za
Office:	E-Ring 223
Consultation:	By appointment only

6. SCHEDULED PROGRAMME

Students are requested to review the work schedule below, paying particular attention to the dates of the assessment opportunities. The schedule pertaining to the material covered is tentative and subject to change. **Any valid clashes with other subjects must be brought to the attention of the lecturer within the first week of the semester to be considered for possible rescheduling – PLEASE NOTE THAT ASSESSMENTS SCHEDULED FOR OTHER MODULES THAT WILL CLASH WITH ANY INFORMATICS LECTURES MUST BE BROUGHT TO THE ATTENTION OF THE LECTURER.**

W	Date	Theory	Practical
1	14-Jul	Introduction to Informatics 3B	
	16-Jul	Chapter 15	Chapter 15
2	21-Jul	Chapter 16	
	23-Jul	Chapter 17	Industry Public Lecture
3	28-Jul	Chapter 18	
	30-Jul	Chapter 19	Industry Public Lecture
4	04-Aug	Chapter 20	
	06-Aug	Chapter 21	Industry Public Lecture
5	11-Aug	Chapter 22	
	13-Aug	Chapter 23	Industry Public Lecture
6	18-Aug	Chapter 23	
	20-Aug		SEMESTER TEST 1
7	25-Aug	Sick Test	
	27-Aug	Chapter 24	Industry Public Lecture
	Mid Term Break 30 Aug – 07 Sep		
9	8-Sep	Chapter 25	
	10-Sep	Chapter 26	Industry Public Lecture

8	15-Sep	Chapter 27	
	17-Sep	Chapter 28	Industry Public Lecture
9	22-Sep	Chapter 29	
	24-Sep	Heritage Day	
10	29-Sep	Chapter 30	
	01-Oct	Introduction to UML	
11	06-Oct	Data science for software engineering	
	08-Oct		SEMESTER TEST 2
12	13-Oct	Data science for software engineering	
	15-Oct	**Projects Day**	
13	20-Oct	Sick Test	
	22-Oct	Revision	Industry Public Lecture

7. ASSESSMENTS

An integrated approach to assessment whereby assessment forms an integral part of teaching and learning is followed:

- **Formative Assessment** – Students are assessed continuously throughout the whole semester in the form of 2 written tests which comprise 35% of the semester mark. Class tests will comprise 5% of the semester mark. There are also individual practical assignments as well as a series of four group deliverables with a weighting of 60% of the semester mark.
- **Summative Assessment** - a three-hour examination that is representative of all the work covered is written at the end of the semester.

To pass the Informatics 3B module, students will need to successfully complete a number of assessment opportunities. The listing of each assessment opportunity and their weight towards the Module / Semester mark is presented below.

Assessment	Counts	Towards	Counts	Towards
Individual Practical Mark	65 %	Module / Semester Mark	50 %	Final Mark
Class Tests	5 %			
Semester Test 1	15 %			
Semester Test 2	15 %			
Examination			50 %	

In addition to requiring a 50% **Final Mark** to pass the module, students are also reminded of the following additional requirements:
- A minimum of 40% for the **Module / Semester** AND a minimum of **50%** for the **Individual Practical Mark** is required to gain entrance to write the Examination.
- A minimum of 40% must be obtained in the **Examination**.

The **Individual Practical Mark** is calculated as follows:

Practical Assessment	Counts	Towards	Counts	Towards
Alpha Deliverable – Mentor Mark	70 %	**Alpha**	10 %	**Individual Practical Mark**
Alpha Deliverable – Individual Mark	30 %			
Beta Deliverable – Mentor Mark	70 %	**Beta**	20 %	
Beta Deliverable – Individual Mark	30 %			
Final Deliverable – Mentor Mark	70 %	**Final**	70 %	
Final Deliverable – Individual Mark	30 %			

7.1. CLASS TESTS

As the final assessment in the module is of a theoretical nature, it is in the interest of the students to properly and adequately prepare for completing written assessments. To this end, each lecture and practical session presents an opportunity for a class test. Students should therefore be prepared to write class tests that will count towards the semester mark.

7.2. ASSIGNMENTS

All assignments must be submitted to the secretary at E-Ring 219 on or before the due date and time, with an electronic copy uploaded to EVE. You will be penalised for late submissions as follows:

You will lose 10% for each day that the assignment is late. This includes weekends and submissions on the same day after the stated time. For example, if the assignment is due at 17:00 on a specific day and you submit it at 18:00 on that day you will lose the 10%. TAKE NOTE: for an assignment to be considered as submitted it must be submitted to the secretary AND on EVE.

All assignment submissions must have a COMPLETED (i.e. signed) plagiarism declaration form as the cover page. The form can be found in the **General Undergraduate Learning Guide** (found on EVE). Your assignment will NOT be marked if the form is not the cover page and you will receive zero.

It is your responsibility to make sure that the electronic submission is correct. It is your responsibility to make regular backups of your work. Backups can be stored in an e-mail account as well as on EVE under the file storage section. No single media or backup mechanism should be regarded as infallible.

Please remember that the computer laboratories can get extremely busy and that a number of unforeseen circumstances CAN arise. Please refrain from waiting until the last hour before an assignment is due before attempting to upload.

READ carefully – ensure that the assignment is being uploaded to the CORRECT assignment directory.

7.3.   PROJECT DELIVERABLES

The following are the due dates for your deliverables (subject to change):

Semester 2
Alpha Demo:	21 - 25 July 2025
Beta Demo:	18 – 22 August 2025
Final Demo:	22 – 26 September 2025
Projects Day:	**15 October 2025**

7.4.   SEMESTER TESTS

The Informatics 3B module comprises two semester tests. Details of each semester test are provided in the following subsections.

7.4.1. Semester Test 1

Marks:	75
Duration:	90 minutes
Scope:	All work (theory and practical) covered thus far
Type:	Theory (Written)
Date, Time & Venue:	Wednesday, 20 August 2025
Supplementary Test Details	
Application Cut-Off:	TBA
Date, Time & Venue:	TBA

7.4.2. Semester Test 2

Marks:	75
Duration:	90 minutes
Scope:	All work (theory and practical) covered thus far
Type:	Theory (Written)
Date, Time & Venue:	Wednesday, 8 October 2025
Supplementary Test Details	
Application Cut-Off:	TBA
Date, Time & Venue:	TBA

7.5. EXAMINATION

The examination is a 3-hour theory paper worth 150 marks which can test on all work that was covered during the course of the semester, which is not limited to the lecture notes, but should include the practical assignments. A summary of the examination information may be found below.

Marks:	150
Duration:	3 hours
Scope:	All work covered during the semester
Type:	Theory (Written)
Exam Code:	120 Y
Date, Time & Venue:	23 October 2025, 12:30-15:30, TBA