



Faculty of Engineering, Built Environment and Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en
Inligtingtegnologie / Lefapha la Boetšenere,
Tikologo ya Kago le Theknolotši ya Tshedimošo

Study Guide

Department of Informatics

Module name

INF 171

Table of Contents

1	1
1.1	1
1.2	1
1.3	1
2	1
2.1	1
2.2	1
2.3	1
2.4	2
2.5	2
3	2
3.1	2
3.2	2
3.3	3
3.4	3
3.5	3
3.6	13
3.7	Error! Bookmark not defined.
4	13
4.1	13
4.2	Error! Bookmark not defined.
4.3	14
4.4	15
5	15
5.1	15
5.2	15
5.3	15

1 Introduction

1.1 Welcome

A warm welcome to you as a student in 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, which implies that the world of business is nothing new to them. The use of Information Technology in organisations is growing exponentially and new, more complex and challenging applications 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.

South Africa is an advanced user of Information Technology, and work opportunities for IT graduates have never been problematic. The work world and environment that we prepare you for through our degree in Informatics, is international and a substantial number of our students are successful when they, in the process of expanding their professional skills, seek employment 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. Our BCom (Informatics) degree is one of only a handful of qualifications outside the USA that is internationally accredited by ABET (see www.abet.org). Our best wishes accompany you - may you find pleasure 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 skills amongst 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 above skills.

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

Please read our Departmental Brochure on ClickUP. It is our hope that you will find your studies informative, formative and enjoyable.

1.3 Responsibilities of the student

The detailed schedule for the entire module is available on ClickUP, however, below is a summary of what you can expect throughout the year.

INF171 2021 Schedule

March	April	May	June	July	August	September	October	November	December
1 Mo	1 Th SUT 1.5	1 Sa	1 Tu SUT 4.4	1 Th No class	1 Su	1 We SUT 7.2	1 Fr Quiz 4 due	1 Mo Tut 5	1 We EXAM
2 Tu	2 Fr Public Holiday	2 Su	2 We SUT 4.5	2 Fr	2 Mo	2 Th SUT 7.2	2 Sa	2 Tu Revision	2 Th
3 We	3 Sa	3 Mo	3 Th SUT 4.5	3 Sa	3 Tu	3 Fr Quiz 3 due	3 Su	3 We Revision	3 Fr
4 Th	4 Su	4 Tu SUT 3.1	4 Fr	4 Su	4 We	4 Sa	4 Mo	4 Th Revision	4 Sa
5 Fr	5 Mo Public Holiday	5 We SUT 3.2	5 Sa	5 Mo Wednesday	5 Th	5 Su	5 Tu No class	5 Fr Quiz 5 due	5 Su
6 Sa	6 Tu SUT 2.1	6 Th SUT 3.2	6 Su	6 Tu Recess	6 Fr	6 Mo	6 We	6 Sa	6 Mo
7 Su	7 We SUT 2.2	7 Fr	7 Mo	7 We EXAM	7 Sa	7 Tu Revision	7 Th	7 Su	7 Tu EXAM
8 Mo	8 Th SUT 2.2	8 Sa	8 Tu SUT 4.8	8 Th	8 Su	8 We SEM TEST 2	8 Fr	8 Mo	8 We EXAM
9 Tu	9 Fr Quiz 1 due	9 Su	9 We SUT 5.1	9 Fr	9 Mo Public Holiday	9 Th No class	9 Sa	9 Tu Revision	9 Th
10 We UP Orientation	10 Sa	10 Mo	10 Th SUT 5.1	10 Sa	10 Tu	10 Fr	10 Su	10 We Revision	10 Fr
11 Th UP Orientation	11 Su	11 Tu	11 Fr Quiz 2 due	11 Su	11 We	11 Sa	11 Mo	11 Th Revision	11 Sa
12 Fr UP Orientation	12 Mo Tut 1	12 We	12 Sa	12 Mo	12 Th	12 Su	12 Tu SUT 8.5	12 Fr	12 Su
13 Sa	13 Tu SUT 2.3	13 Th	13 Su	13 Tu	13 Fr	13 Mo	13 We SUT 8.8	13 Sa	13 Mo
14 Su	14 We SUT 2.4	14 Fr	14 Mo Tut 2	14 We EXAM	14 Sa	14 Tu SUT 7.3	14 Th SUT 8.8	14 Su	14 Tu EXAM
15 Mo	15 Th SUT 2.4	15 Sa	15 Tu SUT 5.2	15 Th	15 Su	15 We SUT 8.1	15 Fr	15 Mo SEM TEST 3	15 We
16 Tu Admin SUT 1.1	16 Fr	16 Su	16 We Public Holiday	16 Fr	16 Mo	16 Th SUT 8.1	16 Sa	16 Tu No class	16 Th Public Holiday
17 We SUT 1.2	17 Sa	17 Mo	17 Th No class	17 Sa	17 Tu SUT 8.3	17 Fr Assign 3 due	17 Su	17 We No class	17 Fr Recess
18 Th SUT 1.2	18 Su	18 Tu SUT 4.1	18 Fr Assign 2 due	18 Su	18 We SUT 8.4	18 Sa	18 Mo	18 Th No class	18 Sa
19 Fr	19 Mo	19 We Revision	19 Sa	19 Mo	19 Th SUT 8.4	19 Su	19 Tu Class Test 2	19 Fr Assign 4 due	19 Su
20 Sa	20 Tu Class Test 1	20 Th Revision	20 Su	20 Tu	20 Fr	20 Mo Wednesday	20 We SUT 8.7	20 Sa	20 Mo
21 Su	21 We SUT 2.5	21 Fr	21 Mo	21 We	21 Sa	21 Tu Friday	21 Th SUT 8.7	21 Su	21 Tu
22 Mo Public Holiday	22 Th SUT 2.5	22 Sa	22 Tu SUT 8.1	22 Th	22 Su	22 We SUT 8.2	22 Fr	22 Mo	22 We
23 Tu SUT 1.3	23 Fr Assign 1 due	23 Su	23 We SUT 8.2	23 Fr	23 Mo	23 Th SUT 8.2	23 Sa	23 Tu Revision	23 Th
24 We No class	24 Sa	24 Mo SEM TEST 1	24 Th SUT 8.2	24 Sa	24 Tu SUT 8.5	24 Fr Public Holiday	24 Su	24 We Revision	24 Fr
25 Th Monday	25 Su	25 Tu SUT 4.2	25 Fr	25 Su	25 We SUT 8.8	25 Sa	25 Mo	25 Th Revision	25 Sa Christmas Day
26 Fr	26 Mo Recess	26 We SUT 4.3	26 Sa	26 Mo	26 Th SUT 8.8	26 Su	26 Tu SUT 8.8	26 Fr	26 Su Public Holiday
27 Sa	27 Tu Public Holiday	27 Th SUT 4.3	27 Su	27 Tu	27 Fr	27 Mo Tut 4	27 We SUT 8.9	27 Sa	27 Mo Public Holiday
28 Su	28 We Monday	28 Fr	28 Mo	28 We	28 Sa	28 Tu SUT 8.3	28 Th SUT 8.9	28 Su	28 Tu
29 Mo	29 Th No class	29 Sa	29 We No class	29 Th	29 Su	29 We SUT 8.4	29 Fr	29 Mo	29 We
30 Tu SUT 1.4	30 Fr	30 Su	30 We No class	30 Fr	30 Mo Tut 3	30 Th SUT 8.4	30 Sa	30 Tu	30 Th
31 We SUT 1.5		31 Mo		31 Sa	31 Tu SUT 7.1		31 Su		31 Fr

2 Administrative information

State where and how any other communication relating to the module (not included in the study guide) will take place, eg notice boards (specify the location), ClickUP (eg via the announcements tool), etc.

2.1 Contact details

	Name	Building and room number	Telephone number	Email address	Consulting hours
Module coordinator	Dr Komla Pillay	IT 5-100	012 420 5422	Komla.pillay@up.ac.za	
Lecturer	Dr Funmi Adebesein	IT 5-73	012 420 5667	Funmi.adebesein@up.ac.za	
Assistant lecturer	Ms Dané Coetzee	IT 5-72	012 420 2591	Dane.coetzee@up.ac.za	
Assistant lecturer	Ms Alberta Mokoena	IT 5-72	012 420 2591	Alberta.mokoena@up.ac.za	
Subject librarian	Ms Bulelwa Mandubu	Library	012 420 4922	bulelwa.mandubu@up.ac.za	



Your Faculty Student Advisor can advise you on goal-setting, adjustment to university life, time management, study methods, stress management and career exploration. Book an individual consultation or attend a workshop. For other support services see Section 5.

2.2 Timetable

Contact session	Day	Periods	Time	Venue
Lecture 1 (Group 1)	Tuesday	1	12:30-13:20	Vd Bijl Hall
Lecture 2 (Group 1)	Thursday	1	9:30 – 10:20	IT 2-23
Lecture 1 (Group 2)	Tuesday	1	15:30 - 16:20	IT 4-1
Lecture 2 (Group 2)	Wednesday	1	15:30 – 16:20	IT 4-1

2.2.1 Tutorials

Students must attend 5 compulsory tutorial sessions for the year. The dates are as follows:

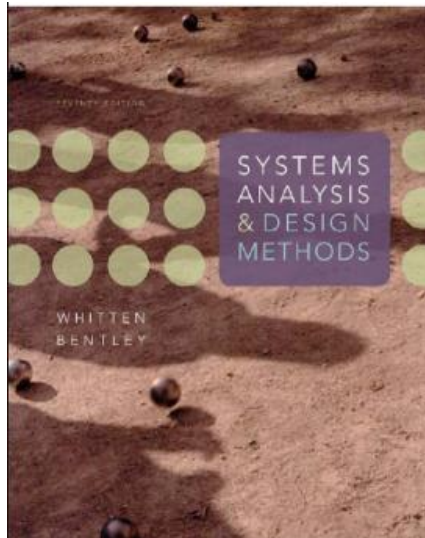
- 12 April 2021
- 14 June 2021
- 30 August 2021
- 27 September 2021
- 1 November 2021

Tutorials are conducted throughout the day – students must attend 1 1-hour session for each tutorial. An announcement will be posted closer to the time outlining the times of the slots.

2.3 Study material and purchases

To successfully complete the subject, students will be required to supplement class notes and class activities with material found in the recommended textbooks.

Please note that the following textbooks are recommended: Lonnie D. Bentley & Jeffrey L. Whitten. Systems Analysis and Design for the Global Enterprise., McGraw-Hill/Irwin. 2007. 7th Edition.



Download the textbook here for free:

<https://drive.google.com/file/d/1QUxwEd1L5IcSrHAv45TL1-ca7M7WJcn-/view?usp=sharing>

2.4 Programme/Departmental/Module rules, requirements and guidelines

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

2.5 Grievance procedures

All issues should be reported in writing, providing details of the complaint or issue. First consult the lecturer concerned about the complaint or issue. If the matter is, however, not resolved, you should 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 remains unresolved you should consult the module co-ordinator in the case of large module classes with multiple lecturers. Where the co-ordinator is unable to or fails to resolve the matter, you should consult the Head of Department. Should the matter remain unresolved, you may approach the Dean of the Faculty.

3 Module information

3.1 Purpose of the module

Informatics 171 introduces the systems theory to the students so that students understand the concept of an information system. The course also assists students to apply creative problem solving techniques. This course also focuses on the systems development lifecycle (SDLC) which includes the following concepts: systems

analysis, systems design and system implementation. The course aims to provide the student with competence in systems thinking, and to equip the student with different techniques and aids to ultimately understand the business analyst's environment

3.2 Module outcomes

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

MO1: Illustrate systems theory as an approach to problem solving through applying the systems approach diagram.

MO2: Interpret the problem solving approach by applying various creativity techniques to real-life problems.

MO3: Recognise and compare business processes and the effect these have on information systems.

MO4: Interpret and demonstrate the phases of the systems development lifecycle and various roles of the stakeholders on a functional level.

MO5: Identify and demonstrate data gathering techniques in structuring systems development requirements.

MO6: De-construct, design and illustrate modelling techniques given a business case study.

3.3 Articulation with other modules in the programme

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

3.4 Module structure

After completion of this module, the student will in terms of:

- *STUDY UNIT 1: Systems theory*

1. Define the following system concepts:

- System
- General systems theory
- Systems approach
- Connections/relations
- Information technology
- Information system
- Systems development life cycle
- Environment
- System input
- System processing
- System output
- Stimulus
- Reactive
- Proactive
- Impactive

2. Explain a system using the above mentioned system concepts, as well as relevant examples.

3. Use basic system principles as basis to contrast systems.

4. Argue for or against the inclusion or exclusion of specific elements in a defined system.
5. Identify the elements of a given system and explain the interaction between these elements.
6. Illustrate the hierarchy of a given system.
7. Explain the advantages and disadvantage of the systems approach.
8. Motivate the systems approach as an approach to problem solving.
9. Reason out, describe, and explain the reaction of a given system to a stimulus from the environment.
10. Explain the scope of a system in terms of basic system characteristics.
11. Identify, describe, and reason out systems analysis and problem solving for a specific problem.
12. Construct a rich picture to illustrate how a system works.
13. Identify the type of systems, the input, the processes and the output.
14. Apply all the above study objectives to a case study and/or problem statement.

References: Class notes to be provided

▪ *SYLLABUS THEME 2: Creative problem solving*

● **Study Unit Theme (SUT) 2.1: Introductory concepts and problem solving**

1. Define the following concepts:
 - Creativity
 - Problem Solving Framework
 - Brain profile
 - Whole brain thinking
 - Pattern forming thinking
 - Lateral thinking
 - Productive thinking
 - Right brain approach
 - Attitude barriers
 - Emotions
 - Creativity barriers
 - Problem solving
 - Systems Development Life Cycle (SDLC)
 - Brain dominance
 - Problem solving and problem forming cycle
 - Vertical thinking
 - Brain quadrants
 - Left brain approach
 - False assumptions
 - Mental barriers
 - Learned habits
2. Reason out factors which lead to the forming of problem solving frameworks.
3. Explain the typical steps in problem solving.
4. Define creativity.
5. Reason out the different views around the origin of creativity.
6. Name and describe the five types of creativity barriers.
7. Reason out the link between creativity and idea generation.
8. Motivate the statement: "More ideas are better!"
9. Reason out the link between creativity and brain dominance.
10. Name and describe the four thinking styles (brain quadrants).

11. Contrast left brain and right brain approaches.
12. Reason out the way in which your problem solving framework was formed.
13. Explain and illustrate a problem solving framework, using examples.
14. Explain the link between brain dominance and a problem solving framework.
15. Describe a given problem solving framework and apply it to a specific situation.
16. Contrast the one-to-one problem solving approach and the one-to-many problem solving approach.
17. Motivate problem solving as an Informatician's instrument.
18. Explain the working world of the Informatician.
19. Identify the components of the problem solving process and explain the mutual link between the components.
20. Explain the problem solving and problem forming cycle using applicable examples.
21. Contrast vertical and lateral thinking.

References: Class notes to be provided

● **Study Unit Theme (SUT) 2.2: Creativity techniques**

1. Define the following concepts:
 - Six Thinking Hats
 - Concept fan
 - Brainstorming
2. Apply the creativity techniques to various problem situations.
3. Explain and apply the idea formulation techniques.
4. Name and explain the ground rules of brainstorming.
5. Illustrate and explain the brainstorming process.
6. Explain the role of creativity in the Informatician's world of work.

References: Class notes to be provided

● **Study Unit Theme (SUT) 2.3: Additional creativity techniques**

1. Define the following concepts:
 - Idea association/Force fitting
 - Attribute listing/Morphology analysis/Matrix analysis
 - Random Input
 - Reframing matrix
 - Triz technique
 - Mental provocation
 - Plusses, Potentials and Concerns
 - Reversal
 - Reverse brainstorming
 - Do-it technique
 - Osborn check list
 - Method 635
2. Differentiate between perspective formers and idea generators.
3. Apply the above creativity techniques to various problem situations.
4. Explain and apply the idea formulation techniques.
5. Apply all the above study objectives to a case study and/or problem statement

References: Class notes to be provided

▪ **SYLLABUS THEME 3: Business Processes**

1. Define the Business Process (BP), Business process management (BPM).
2. Explain the characteristics of a business process.
3. Identify different types of business processes.
4. Explain the easy value chain diagram.
5. Practically apply the value chain to an organisation.
6. Differentiate between various types of organisations and explain how this affects the use of the value chain.
7. Identify a business analyst's role in the value chain.
8. Apply all the above study objectives to a case study and/or problem statement.

References: Class notes to be provided

▪ **SYLLABUS THEME 4: The Context of Systems Analysis and Design**

From this point on, the following textbook will be referenced:

Lonnie D. Bentley & Jeffrey L. Whitten. Systems Analysis and Design for the Global Enterprise., McGraw-Hill/Irwin. 2007. 7th Edition.

Syllabus theme objective:

● **Study Unit Theme (SUT) 4.1: The Value of Systems Analysis and Design**

1. Define the following concepts:
 - Information system (IS) / Internal users
 - Stakeholder / External users
 - Information worker / System designers
 - Systems owner / System builders
 - System user / Systems analyst
 - Client / System analysis
 - Systems design / Business analyst
 - Centre for excellence / Outsourcing
 - Consulting / Independent software vendors
 - Ethics
2. Explain what information systems are.
3. Contrast the six groups of stakeholders for information systems.
4. Explain what an information worker is.
5. Contrast the tasks of system owners, system users, system designers, system builders and systems analysts.
6. Describe the roles of the different types of system users and to recognise these users in a case study.
7. Describe the systems analyst as a creative problem solver.
8. Describe and explain the tasks, role, and place of a modern systems analyst.
9. Contrast the roles of a systems analyst and a business analyst.
10. Describe the systems analyst's role in a contemporary information services organisation.
11. Describe, contrast and justify outsourcing and consulting as business trends.
12. Describe and contrast modern business trends and explain how they can influence information systems development in the coming decade.

13. Describe the skills needed by the modern systems analyst and reason out which of these skills are more relevant than others.
14. Apply all the above study objectives to a case study and/or problem statement.

References:

Chapter 1 - Lonnie D. Bentley & Jeffrey L. Whitten. Systems Analysis and Design for the Global Enterprise., McGraw-Hill/Irwin. 2007. 7th Edition.

● **Study Unit Theme (SUT) 4.2: The Components of Information Systems**

1. Define the following system concepts:
 - Data / Back-office information system
 - Information / Front-office information system
 - Data maintenance /
 - Transaction Processing System (TPS) / Artificial intelligence
 - Management Information System (MIS) / Office Automation (OA)
 - Decision Support System (DSS) / Personal information system
 - Executive Information System (EIS) / Work group information system
 - Expert System / Information systems architecture
 - Business knowledge / Data requirements
 - Business functions / Cross-functional information system
 - Business processes / Process requirements
 - "Application programs / Prototyping"
 - Interface requirements / User dialogue
 - Middleware
2. Contrast the terms data and information.
3. Interpret the concept information system using various types of information systems.
4. Differentiate between front- and back-office information systems.
5. Justify the integration between the various information system building blocks.
6. Describe five classes of information system applications and how they interoperate.
7. Describe the role of information systems architecture in systems development.
8. Describe the various types of stakeholders in information systems development.
9. Describe and justify the role of the stakeholders involved in information systems development.
10. Explain the following concepts from the point of view of the systems owners, the systems users, the systems designers, and the systems builders:
 - Knowledge
 - Processes
 - Communications
11. Apply Zachman Framework (enterprise architecture) to a given case study
12. Apply all the above study objectives to a case study and/or problem statement.

References:

Chapter 1 & 2 - Lonnie D. Bentley & Jeffrey L. Whitten. Systems Analysis and Design for the Global Enterprise., McGraw-Hill/Irwin. 2007. 7th Edition.

● **Study Unit Theme (SUT) 4.3: Developing Information Systems**

1. Define the following concepts:

- Systems development process
 - Systems development life cycle
 - Systems development methodology
 - Process management
 - Cost effectiveness
 - Strategic information plan
 - Risk management / problem
 - Opportunity / directive
 - Steering committee
 - Problem statement
 - Constraint
 - Scope creep
 - Work statement
 - System model
 - Logical design
 - Analysis paralysis
 - Physical design
 - System support
 - Repository
 - Feasibility analysis
 - Process modelling
 - Data modelling
 - Object modelling
 - Prototype
 - Request for Proposal (RFP)
 - System request
 - Gap analysis
 - Capability maturity model (CCM)
 - PIECES Framework
2. Contrast the term systems development life cycle and methodology
 3. Name and describe the principles of systems development.
 4. Describe problems, opportunities and directives, which can lead to systems development projects.
 5. Explain and argue the PIECES framework for problem solving in systems analysis.
 6. Identify, within a given case study, the particular system's shortcomings, and apply the principles of systems analysis to these shortcomings.
 7. Describe, explain, and illustrate the systems development life cycle.
 8. Describe the activities which are performed throughout the systems development life cycle.
 9. Define and explain a project and its boundaries
 10. Name and describe the reasons for project initiation.
 11. Describe cross-life-cycle activities that overlap multiple system development phases.
 12. Define the project phases and how to manage a project accordingly
 13. Apply all the above study objectives to a case study and/or problem statement.

References: Chapter 3 & 5 - Lonnie D. Bentley & Jeffrey L. Whitten. Systems Analysis and Design for the Global Enterprise., McGraw-Hill/Irwin. 2007. 7th Edition.

● **Study Unit Theme (SUT) 4.4: Systems analysis**

1. Define the following concepts:

- System analysis
 - System development methodologies
 - Structured analysis
 - Methodologies
 - Rapid Application methodologies
 - Agile methodologies
 - Functional requirements
 - CASE tools
 - Cross life cycle activities
2. Identify a number of systems analysis strategies and explain the role of each of these in systems analysis
 3. Discuss and contrast a few systems analysis approaches for solving business system problems.
 4. Explain the relationship between systems planning and the systems planning phases of the systems development life cycle.
 5. Explain and describe the phases in systems analysis in terms of the information systems building blocks.
 6. Describe, explain and interpret the phases in systems planning in terms of objectives, activities, roles, inputs, outputs, tools, and techniques.
 7. Apply all the above study objectives to a case study and/or problem statement.

References: 3 & 5 - Lonnie D. Bentley & Jeffrey L. Whitten. Systems Analysis and Design for the Global Enterprise., McGraw-Hill/Irwin. 2007. 7th Edition.

● **Study Unit Theme (SUT) 4.5: Systems analysis**

1. Define the following concepts:
 - Project initiation
 - Project setup
 - Project sponsor
 - Systems request
 - Business need / requirement / value
 - Technical feasibility
 - Economic feasibility
 - Organisational feasibility
 - Schedule feasibility
 - Feasibility study
 - Return on investment
 - Break-even point
 - Net present value
 - Tangible and intangible benefits
2. Explain in detail the planning phase of the SDLC
3. Distinguish between the different types of feasibility – technical, economic, organisational, schedule
4. Compile a feasibility matrix / assessment
5. Review a feasibility assessment
6. Apply all the above study objectives to a case study and/or problem statement.

References: Chapter 5 - Lonnie D. Bentley & Jeffrey L. Whitten. Systems Analysis and Design for the Global Enterprise., McGraw-Hill/Irwin. 2007. 7th Edition

▪ **SYLLABUS THEME 5: Requirements gathering**

After this study theme, a student should know and apply techniques to discover and analyse information systems requirements.

Learning objectives:

1. Define the following concepts:

- Requirements discovery
- Functional Requirement
- Ishikawa diagram
- Requirements definition document
- Sampling
- Stratification
- Questionnaire
- Proxemics
- System requirement
- Non-functional requirement
- Fact-finding
- Requirements management
- randomisation
- Observation
- Interview
- Joint requirements planning

2. Define systems requirements and differentiate between functional and non- functional requirements;

3. Understand the activity of problem analysis and be able to create an Ishikawa (fishbone) diagram to aid in problem solving;

4. Identify seven fact-finding techniques and characterise the advantages and disadvantages of each;

5. Understand six guidelines for doing effective listening;

6. Understand what body language and proxemics are and why a system analyse should care;

7. Characterize the typical participants in a JRP session and describe their role;

8. Complete the planning process for a JRP session, including selecting and equipping the Location, selecting the participants and preparing an agenda to guide the JRP session;

9. Describe several benefits of using URP as a fact-finding technique;

10. Describe a fact-finding strategy that will make the most of your time with end users;

References: Chapter 6 - Lonnie D. Bentley & Jeffrey L. Whitten. Systems Analysis and Design for the Global Enterprise., McGraw-Hill/Irwin. 2007. 7th Edition

▪ *SYLLABUS THEME 6: Use case modelling*

General objectives

After this study theme a student should be able to know and apply tools and techniques necessary to perform use-case modelling to document systems requirements.

Learning objectives:

1. Define the following concepts:

- User centred development
- use-case modelling
- use-case diagram
- use-case description
- use-case
- actor
- temporal event

- association
- extension use-case
- abstract use-case
- use-case ranking and priority matrix
- use-case dependency diagram

2. Describe the benefits of use-case modelling
3. Define actors and use cases and be able to identify them from context diagrams and other sources
4. Describe the four types of actors
5. Describe the relationships that can appear on a use-case model diagram
6. Describe the steps for preparing a use-case model
7. Describe how to construct a use-case model diagram
8. Describe the various sections of a use-case narrative and be able to prepare one.
9. Define the purpose of the use-case ranking and priority matrix and the use-case Dependency Diagram.
10. Apply all the above study objectives to a case study and/or problem statement.

References: Chapter 7 - Lonnie D. Bentley & Jeffrey L. Whitten. Systems Analysis and Design for the Global Enterprise., McGraw-Hill/Irwin. 2007. 7th Edition

▪ *SYLLABUS THEME 7: Data modelling*

General objective

After the completion of this study unit, a student should be able to know and apply the data-modelling tool entity relationship diagrams to document the data that must be captured and stored by the information system.

SUT 7 Learning objectives:

1. Define the following concepts:
 - Data modelling
 - Model
 - Logical model
 - Physical model
 - Entity relationship diagram
 - Entity
 - Attribute
 - Domain
 - Data type
 - Key
 - Primary key
 - Relationship
 - Cardinality
2. Explain and argue the importance of data modelling during information systems analysis.
3. Read and interpret entity relationship diagrams.
4. Illustrate entity relationship diagrams by applying it to a problem statement.

References: Chapter 8 - Lonnie D. Bentley & Jeffrey L. Whitten. Systems Analysis and Design for the Global Enterprise., McGraw-Hill/Irwin. 2007. 7th Edition

▪ SYLLABUS THEME 8: Process modelling

General objective:

After the completion of this study unit, a student should be able to know and apply a process model called data flow diagrams to document a system's processes and data flows

SUT 8 Learning objectives:

1. Define the following concepts:

- logical model
- physical model
- process modelling
- data flow
- data flow diagram (DFD)
- system thinking
- process
- decomposition
- decomposition diagram
- function
- elementary process
- structured English
- policy
- decision table
- composite data flow
- control flow
- data conservation
- data-attribute
- data-type
- domain
- diverging data flow
- external agent
- data store
- event partitioning
- context data flow diagram
- actor
- event diagram
- Balancing

2. Contrast logical and physical models.

3. Explain and argue the importance of process modelling.

4. Explain how process modelling can be applied in systems planning and analysis.

5. Illustrate decomposition diagrams by applying it to a problem statement.

6. Illustrate context diagrams by applying it to a problem statement.

7. Explain the supplementary relationship between process and data models.

8. Explain the use of data flow diagram methodology during structured systems analysis.

9. Illustrate high, middle and primitive level dataflow diagrams and balancing to a case study and/or problem statement.

10. Apply all the above study objectives to a case study and/or problem statement.

References: Chapter 9

3.5 Learning presumed to be in place

What set of attributes (knowledge, skills and attitudes) should students have in place on entering this module?

3.6 Credit map and notional hours

The number of credits allocated to a module give an indication of the volume of learning required for the completion of that module and is based on the concept of notional hours. Given that this module carries a weighting of 20 credits, it follows that you should spend an average of 10 x 20 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 200 hours/28 week = 7 hours per week.

4 Assessment

In this section of the study guide it is important provide students with the titles and exact descriptions of all assessment tasks in the module.

4.1 Assessment plan

Include dates, opportunities and criteria.

Assessment type	Assessment task	About	Due date	Marks or weight
ClickUP Quiz 01	Complete quiz on ClickUP	SUT 1	9 April 2021	10 (2 per Quiz)
ClickUP Quiz 02	Complete quiz on ClickUP	SUT 3 & 4	11 June 2021	
ClickUP Quiz 03	Complete quiz on ClickUP	SUT 5 & 6	3 September 2021	
ClickUP Quiz 04	Complete quiz on ClickUP	SUT 7	1 October 2021	
ClickUP Quiz 05	Complete quiz on ClickUP	SUT 8	5 November 2021	
Class test 01	Written in class	SUT 1 & 2	20 April 2021	10 (5 per test)
Class test 02	Written in class	SUT 6	19 October 2021	
Assignment 01: Individual	Submit on ClickUP	SUT 1	23 April 2021	15 (2.5 Assign 1 2.5 Assign 2 5 Assign 3 5 Assign 4)
Assignment 02 Individual	Submit on ClickUP	SUT 3	18 June 2021	
Assignment 03: Group Deliverable 1	Written submission	SUT 6 & 7	17 September 2021	
Assignment 04: Group Deliverable 2	Written submission	SUT 8	19 November 2021	
Class assignment 1	Written	SUT 1.5	31 March / 1 April 2021	
Class assignment 2	Written	SUT 3.2	5 & 6 May 2021	

Class assignment 3	Written	SUT 4.3	26 & 27 May 2021	10 (1 per class assignment)
Class assignment 4	Written	SUT 5.2	15 June 2021	
Class assignment 5	Written	SUT 6.2	23 & 24 June 2021	
Class assignment 6	Written	SUT 6.6	25 & 26 August 2021	
Class assignment 7	Written	SUT 7.3	14 September 2021	
Class assignment 8	Written	SUT 8.3	28 September 2021	
Class assignment 9	Written	SUT 8.7	20 & 21 October 2021	
Class assignment 10	Written	SUT 8.9	27 & 28 October 2021	
Tutorial 1	Written	Rich Picture / input output table	12 April 2021	10 (2 per tutorial)
Tutorial 2	Written	Feasibility matrix	14 June 2021	
Tutorial 3	Written	Use Case	30 August 2021	
Tutorial 4	Written	Data modelling	27 September 2021	
Tutorial 5	Written	Process modelling	1 November 2021	
Formal semester test 1	Written	SUT 1.1 – 4.1	24 May 2021	45 (15 per test)
Formal semester test 2	Written	SUT 4.2 – 7.2	8 September 2021	
Formal semester test 3	Written	SUT 5, 6, 7, 8	15 November 2021	
FINAL YEAR/SEMESTER AVERAGE [40% REQUIRED TO WRITE EXAM]				100

Absence from a module test must be supported by official and valid documentation (e.g. a relevant medical certificate) and must be submitted at the Informatics Help desk within three days of the date of the test. A special module test for all legitimate absentees can be taken on the specified date.

Pass requirements:

- A sub-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.

FINAL MODULE AVERAGE [AS CALCULATED AT THE END OF THE EXAM]	
FINAL YEAR/SEMESTER AVERAGE [40% REQUIRED TO WRITE EXAM]	50
FINAL EXAM MARK [SUB-MINIMUM OF 40% REQUIRED]	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.

4.2 Assessment policy

Please refer to the **Departmental Brochure** for general rules related to assessment. Make sure to review the departmental 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. **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 gain access 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. All assignments due will be posted onto ClickUP. Completed practicals/assignments should be uploaded onto ClickUP. **All tests, assignments and activities will contribute towards your final mark.**

4.3 Plagiarism

Plagiarism is a serious form of 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 website:

<http://www.library.up.ac.za/plagiarism/index.htm>.

5 Support services

Please download a QR code reader on your cellphone. 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


- For any safety or emergency related matters, eg 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).
- 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.
- 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 E-learning support

- Report a problem you experience to the Student Help Desk on your campus.
- Visit the open labs in the Informatorium Building or IT labs on your campus to report problems at the offices of the Student Help Desk.
- Approach the assistants at the help desks—campus specific (for example: adjacent to the Student Computer Laboratories in IT Building, NW2, CBT or Aldoel Building IT labs, etc).
- Call 012 420 3837.
- Email studenthelp@up.ac.za

5.3 Other support services:

FLY@UP: The Finish Line is Yours	<ul style="list-style-type: none"> ● 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: <ul style="list-style-type: none"> ● 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	
Centre for Sexualities, AIDS and Gender	Identifies and provides training of student peer counsellors	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	012 420 3051 studenthelp@up.ac.za	