

# IS3430: SYSTEMS ANALYSIS AND DESIGN

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## Effective Term

Semester B 2024/25

## Part I Course Overview

### Course Title

Systems Analysis and Design

### Subject Code

IS - Information Systems

### Course Number

3430

### Academic Unit

Information Systems (IS)

### College/School

College of Business (CB)

### Course Duration

One Semester

### Credit Units

3

### Level

B1, B2, B3, B4 - Bachelor's Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Nil

### Precursors

Nil

### Equivalent Courses

Nil

### Exclusive Courses

IS3431 Systems Analysis

## Part II Course Details

### Abstract

The purpose of this course is to provide students with an opportunity to develop the skills required for effectively analysing and designing information systems. This course aims to convey the basics of systems analysis and design and how

businesses use information systems to support their business processes. It is designed to provide methods of analysing and designing systems tailored to business requirements. The students will get familiar with modelling techniques and the design of solution for information system using Unified Modelling Language (UML). This course is designed to be useful to those who are potential system analysts, system designers/consultants and project managers. Upon completing this course successfully, the students would be able to understand the processes of system analysis and design, and the key principles of system development life cycle (SDLC), and be able to apply the techniques and skills in designing new information systems especially for business applications.

### Course Intended Learning Outcomes (CILOs)

| CILOs |                                                                                                                                                                                                                            | Weighting (if app.) | DEC-A1 | DEC-A2 | DEC-A3 |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------|--------|--------|
| 1     | Apply the ability to discover the best practices of modelling in information systems analysis and design, and the interactions between users, customers and managers involved in information systems development projects. | 20                  | x      | x      |        |
| 2     | Formulate and model creative and effective system solutions for business problems using Unified Modelling Language.                                                                                                        | 30                  | x      | x      | x      |
| 3     | Compare different types of models of information systems requirements and suggest innovative improvements.                                                                                                                 | 20                  |        | x      |        |
| 4     | Apply the knowledge learned, and operate effectively in a collaborative environment and demonstrate skills in team building and project management.                                                                        | 10                  |        |        | x      |
| 5     | Describe and present information effectively in formats adopted for information systems development.                                                                                                                       | 20                  |        | x      | x      |

#### A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

#### A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

#### A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

### Learning and Teaching Activities (LTAs)

| LTAs |              | Brief Description                                                                                                                                                                                                                                                                                                                                                                               | CILO No. | Hours/week (if applicable) |
|------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------|
| 1    | LTA1:Seminar | Students will learn the concepts of object-oriented systems analysis and design methods, and associated modelling techniques (functional, structural and behavioural) through using activities designed to enable students to apply different modelling techniques, to select appropriate requirements gathering technique and to evaluate different design options especially user interfaces. | 1, 2, 3  | 3 Hour/Week                |

|   |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |  |
|---|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--|
| 2 | LTA2: Online class exercises | <p>During class exercise sessions, students will participate in the following activities which are used to reinforce and practice of various modelling techniques learnt in lectures:</p> <p>Exercises: Students will participate hands-on activities using a CASE tool (e.g., Microsoft Visio) as part of systems modelling exercises such as requirement gathering using interviews, use case models, functional models, structural models, behavioural models, and user interface designs.</p> <p>Discussion: Discussion on implications of various concepts learnt in lectures, and how they can be applied to a typical information system analysis project. Critique requirements models and suggest improvements.</p> <p>Presentations: Members of project team will make presentation of their draft project work, and the rest of the tutorial group and the instructor will comment and offer suggestions for improvements.</p> | 1, 2, 3, 4, 5 |  |
| 3 | LTA3: Peer Discussions       | <p>Students will complete a group project to perform systems analysis and design activities aimed at capturing requirements of an information system in business sector and finding suitable solutions. The group project work will be submitted at different phases for review and comments by the instructor/tutors.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1, 2, 3, 4, 5 |  |

#### Assessment Tasks / Activities (ATs)

| ATs |                                                                                                                                                                                                             | CILO No.      | Weighting (%) | Remarks (e.g. Parameter for GenAI use) |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|----------------------------------------|
| 1   | AT1: Continuous Assessment Participation in class activities such as: application of systems analysis techniques (including information gathering techniques), modelling exercises completed and submitted. | 1, 2, 3, 4, 5 | 15            |                                        |
| 2   | AT2: Project Presentation<br>Each project team makes one presentation of their draft project work and the rest of tutorial group members will participate in discussion and offer improvements.             | 1, 5          | 5             |                                        |
| 3   | AT3: Project<br>Each student will participate in group project aimed at gathering requirements of an information system, and modelling those requirements using appropriate techniques.                     | 1, 2, 3, 4, 5 | 30            |                                        |

**Continuous Assessment (%)**

50

**Examination (%)**

50

**Examination Duration (Hours)**

2

**Assessment Rubrics (AR)****Assessment Task**

AT1: Continuous Assessment

**Criterion**

Ability to discover the best practices of modelling in information systems analysis and design, and the interactions between users, customers and managers involved in information systems development projects.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

AT1: Continuous Assessment

**Criterion**

Capability to devise and model creative and effective system solutions for business problems using Unified Modelling Language.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

**Assessment Task**

AT1: Continuous Assessment

**Criterion**

Capability to evaluate different types of models of information systems requirements and suggest innovative improvements.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

### Assessment Task

AT1: Continuous Assessment

#### Criterion

Capability to operate effectively in a collaborative environment and demonstrate skills in team building and project management.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

### Assessment Task

AT1: Continuous Assessment

#### Criterion

Ability to communicate and present information effectively in formats adopted for information systems development.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

### Assessment Task

AT2: Project Presentation

#### Criterion

Ability to discover the best practices of modelling in information systems analysis and design, and the interactions between users, customers and managers involved in information systems development projects.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

**Assessment Task**

AT2:Project Presentation

**Criterion**

Ability to communicate and present information effectively in formats adopted for information systems development.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

**Assessment Task**

AT3: Project

**Criterion**

Ability to discover the best practices of modelling in information systems analysis and design, and the interactions between users, customers and managers involved in information systems development projects.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

**Assessment Task**

AT3: Project

**Criterion**

Capability to devise and model creative and effective system solutions for business problems using Unified Modelling Language.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

**Assessment Task**

AT3: Project

**Criterion**

Capability to evaluate different types of models of information systems requirements and suggest innovative improvements.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

**Assessment Task**

AT3: Project

**Criterion**

Capability to operate effectively in a collaborative environment and demonstrate skills in team building and project management.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

**Assessment Task**

AT3: Project

**Criterion**

Ability to communicate and present information effectively in formats adopted for information systems development.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

AT4:Final Examination

**Criterion**

Ability to discover the best practices of modelling in information systems analysis and design, and the interactions between users, customers and managers involved in information systems development projects.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

AT4:Final Examination

**Criterion**

Capability to devise and model creative and effective system solutions for business problems using Unified Modelling Language.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

AT4:Final Examination

**Criterion**

Capability to evaluate different types of models of information systems requirements and suggest innovative improvements.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

## Part III Other Information

### Keyword Syllabus

Information systems development life cycle; Unified modelling language; Unified process; System requirements; Process modelling; Case diagrams; Use-case descriptions; Activity diagrams; Structural modelling; Inheritance; Encapsulation; Polymorphism; Systems design.

### Reading List

#### Compulsory Readings

| Title |                                                                                                                                                  |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Dennis, A., Wixom, B.H. and Tegarden, D., Systems Analysis & Design with UML Version 2.0: An Object-Oriented Approach, 5th edition, Wiley, 2015. |

#### Additional Readings

| Title |                                                                                                                                                       |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Dennis, A., Wixom, B.H. and Tegarden, D., Systems Analysis & Design with with UML Version 2.0: An Object-Oriented Approach, 3rd edition, Wiley, 2009. |
| 2     | Satzinger, Jackson and Burd, Systems Analysis & Design in a Changing World, 6th edition, Course Technology, 2011, ISBN: 978-1111534158.               |
| 3     | George, J.F., Batra, D., Valacich, J.S. and Hoffer, J.A., Object-oriented Systems Analysis and Design, 2nd edition, Prentice Hall, 2006.              |
| 4     | Bennett, S., McRobb, S. and Farmer, R., Object-Oriented Systems Analysis and Design Using UML, 4th edition, McGraw Hill, 2010.                        |
| 5     | Larman, C., Applying UML and Patterns, 3rd edition, Prentice Hall PTR, 2004.                                                                          |
| 6     | George, J.F., Batra, D., Valacich, J.S. and Hoffer, J.A., Object-oriented Systems Analysis and Design, Prentice Hall, 2004, ISBN: 0131133268.         |