Course Outline – Systems Analysis and Design

Part A – Introduction

1.	**Course No. / Course Code**	**:** CSE 305
2.	**Course Title**	**:** Systems Analysis and Design
3.	**Course Type**	**:** Core Course
4.	**Level/Term and Section**	**:** 3rd year 1st semester
5.	**Academic Session**	**:** Spring 2025
6.	**Course Instructor**	**:** Dr. Shah Murtaza Rashid Al Masud, Professor
7.	**Prerequisite (If any)**	**:**
8.	**Credit Value**	**:** 3.00
9.	**Contact Hours:**	: 3.00
10.	**Total Marks**	**:** 100
11.	**Class Hours:**	Section A: Tuesday: 9:30 am-10:50 am (R702) Wednesday: 9:30 am-10:50 am (R702) Section B: Tuesday: 11:00 am-12:20 pm (R713) Wednesday: 11:00 am-12:20 pm (R713) Section C: Tuesday: 12:30 am-13:50 pm (R713) Wednesday: 12:30 am-13:50 pm (R714)

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12. Course Objectives and Course Summary:

The objectives of this course are to:

1. Understand the objective of Information system designing.
2. Explain the principles, methods and techniques of system development.
3. Analyze requirements, feasibility to develop a system.
4. Apply normalized concept to select the best methodology to develop a system
5. Create project proposals, behavioral diagrams, and structural diagrams.

13. Course Learning Outcomes: at the end of the Course, the Student will be able to –

CLO 1	**Describe** the concepts of a system and different stages of system development life cycle
CLO 2	**Demonstrate** standard project planning and project management techniques to feasibility study about the system
CLO 3	**Explain** clear and concise system requirements and convert them into technical specifications
CLO 4	**Design** systems using different models and diagrams

14. Mapping / Alignment of CLOs with Program Learning Outcomes (PLO) (Optional):

CLO No.	Corresponding PLOs (Appendix-1)	Bloom's taxonomy domain/level (Appendix-2)	Delivery methods and activities	Assessment Tools
CLO1	1	1/Understand	Lecture, Example from Real Life Systems, Problem solving, Group discussion	Class Tests, Exams
CLO2	2	1/Apply	Lecture, Example from Real Life Systems, Problem solving, Group discussion	Class Tests, Exams
CLO3	3	1/Analyze	Lecture, Example from Real Life Systems, Problem solving, Group discussion	Class Tests, Exams
CLO4	3	1/Create	Lecture, Example from Real Life Systems, Problem solving, Group discussion	Class Tests, Exams

Part B – Content of the Course

15. Course Content:

- Introduction: Introduction to information system, System Analyst Responsibilities, Information Gathering
- System Development Life Cycle: System Development Life Cycle (SDLC) Models, SDLC phases description
- Understanding organizational Systems: Data Flow Diagram, E-R Diagram
- Managing the Information System Projects
- Determining and analyzing System Requirements
- Object oriented Systems analysis and design
- Use Case Diagram
- Activity Diagram
- Class Diagram
- Designing Databases
- Implementing and Maintaining the System, Systems Repository

16. Alignment of topics of the courses with CLOs:

SL. No	Topics / Content	Course Learning Outcome (CLO)
1	Introduction : Introduction to information system, System Analyst Responsibilities, Information Gathering	CLO1
2	System Development Life Cycle : System Development Life Cycle (SDLC) Models, SDLC phases description	CLO1
3	Understanding organizational Systems: Data Flow Diagram, E-R Diagram	CLO4

4	Managing the Information System Projects	CLO2
5	Determining and analyzing System Requirements	CLO3
6	Object oriented Systems analysis and design, Use Case Diagram	CLO4
7	Activity Diagram	CLO4
8	Class Diagram	CLO4
9	Designing Databases	CLO4
10	Implementing and Maintaining the System, Systems Repository	CLO4

17. Class Schedule/Lesson Plan/Weekly plan:

Topics	**Specific Outcome(s)**	**Time Frame**	**Suggested Activities**	**Teaching Strategy(s)**	**Alignment with CLO**
Introduction to information system, System Development Life Cycle (SDLC)	PLO1	Week 1	Get an overview of information systems, SDLC	Lecture, multimedia, Discussions	CLO1
System Development Life Cycle(contd.), SDLC phases Description, System Analyst Responsibilities, Information Gathering	PLO1	Week 2	Learn different types of SDLCs through pros and cons analysis	Lecture, multimedia, Discussions	CLO1
Understanding Organizational Systems: Data Flow Diagram, E-R Diagram	PLO3	Week 3	Design diagrams based on some problem scenario	Lecture, multimedia, Discussions	CLO4
Class test	PLO3	Week 4	Design for a real life problem		CLO4
Managing the Information System Projects	PLO2	Week 5	Learn to estimate required time	Lecture, multimedia, Discussions	CLO2
Managing the Information System Projects	PLO2	Week 6	Learn to estimate required cost	Lecture, multimedia, Discussions	CLO2
Determining and analyzing System Requirements	PLO3	Week 7	Learn to identify the systems requirements	Lecture, multimedia, Discussions	CLO3
MID-TERM EXAMINATION					
Object oriented Systems analysis and design	PLO3	Week 8	Learn various concepts of OOAD	Lecture, multimedia, Discussions	CLO4
Use Case Diagram	PLO3	Week 9	Design diagrams based on some problem scenario	Lecture, multimedia, Discussions	CLO4

Activity Diagram	PLO3	Week 10	Design diagrams based on some problem scenario	Lecture, multimedia, Discussions	CLO4
Class Diagram	PLO3	Week 11	Design diagrams based on some problem scenario	Lecture, multimedia, Discussions	CLO4
Sequence Diagrams	PLO3	Week 12	Design diagrams based on some problem scenario	Lecture, multimedia, Discussions	CLO4
Implementing and Maintaining the System, Systems Repository	PLO3	Week 13	Learn about maintenance, repositories like Github	Lecture, multimedia, Discussions	CLO4
Review Class	PLO1, PLO2, PLO3	Week 14		Lecture, multimedia, Discussions	All CLOs
FINAL EXAMINATION					

18. Teaching-Learning Strategies:

Strategies	**Topics**
Active Learning and Discussions	SDLC, System Requirements, Project Scheduling, Implementing and Maintaining the System, Systems Repository
Problem-Based Learning	Project Scheduling, Feasibility Study
Case-Based Learning	ER Diagram, Data Flow Diagram, Use Case Diagram, Class Diagram, Activity Diagram, Sequence Diagram
Simulations and Role-Playing	Implementing and Maintaining the System, Systems Repository

19. Assessment Techniques of each topic of the course:

SL. No	**Topics / Content**	**Assessment Techniques**
1	SDLC, System Requirements, Project Scheduling	Class Test/Quiz-01, Mid-Term Exam
2	ER Diagram, Data Flow Diagram	Mid-Term Exam, Class Test/Quiz-02
3	Use Case Diagram, Class Diagram	Class Test/Quiz-03, Final Exam
4.	Feasibility Study	Class Test/Quiz-04, Final Exam
5.	Activity Diagram, Sequence Diagram	Final Exam

6.	Implementing and Maintaining the System, Systems Repository	Final Exam

Part C – Assessment and Evaluation

20. Assessment Strategy

Class Tests: Total 4 class tests will be taken during the semester. Best 1 class test will be counted from the class tests 2 and 3, where class tests 1 and 4 are mandatory.

Note: CLOs covered by each CT

CT1: CLO1, CT2-CT3: CLO2 and CT4: CLO4

CIE- Continuous Internal Evaluation (30 Marks)

Bloom's Category	Marks (out of 30)
Remember	
Understand	10
Apply	10
Analyze	
Evaluate	
Create	10

SMEB- Semester Mid & End Examination (70 Marks)

Bloom's Category	Mid	Final
Remember		
Understand	5	10
Apply	10	10
Analyze		20
Evaluate		
Create	5	10

21. Evaluation Policy

Grades will be calculated as per the university grading structure and individual students will be evaluated based on the following criteria with respective weights.

1. Class Tests 30%
2. Term Examination 50%
3. Mid-Term Examination 20%

Special Instruction:

Minimum attendance: 70% class attendance is mandatory for a student in order to appear at the final examination.

Late attendance: Students who will enter the class after the attendance call will be marked as absent.

Assignment: Assignment (Written and/or presentation.) will be given throughout the semester. **Copied** assignments will be graded as zero. Late submission will result in a 50% deduction in score

Student's responsibilities: Students must come to the class prepared for the course material covered in the previous class. They must submit their assignments on time.

UAP Grading Policy

Numeric Grade	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	D	2.00
Less than 40%	F	0.00

Part D – Learning Resources

22. Text Book

1. System Analysis and Design by Kendall & Kendall, Latest Edition
2. Modern Systems Analysis and Design by Hoffer, George, Latest Edition

Prepared by (Course Teacher)	**Checked by** (Chairman, PSAC committee)	**Approved by** (Head of the Department)
Prof. Dr. Shah Murtaza Rashid Al Masud		

Appendix-1:

Washington Accord Program Outcomes (PO) for engineering programs:

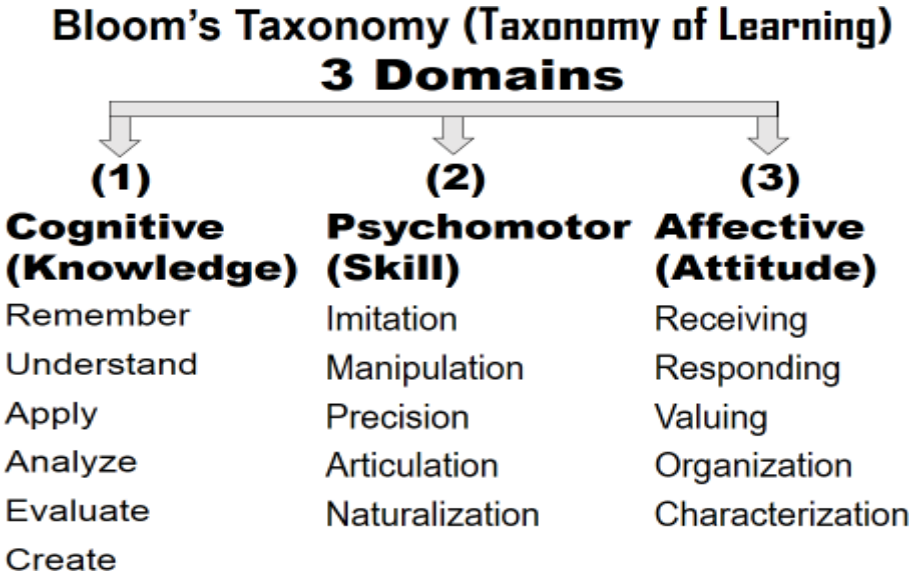
PO No.	Differentiating Characteristic
a	Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in K1 to K4 respectively to the solution of complex engineering problems.
b	Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (K1 to K4)

c	Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (K5)
d	Conduct investigations of complex problems using research-based knowledge (K8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
e	Create, select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modeling, to complex engineering activities with an understanding of their limitations.
f	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (K7)
g	Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (K7)
h	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (K7)
i	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
j	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
k	Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
l	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Knowledge Profile

K1	A systematic, theory-based understanding of the natural sciences applicable to the discipline
K2	Conceptually based mathematics, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modelling applicable to the discipline
K3	A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline
K4	Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline
K5	Knowledge that supports engineering design in a practice area
K6	Knowledge of engineering practice (technology) in the practice areas in the engineering discipline
K7	Comprehension of the role of engineering in society and of the identified issues in engineering practice in the discipline: ethics and the engineer's professional responsibility to public safety; the impacts of engineering activity in economic, social, cultural, environmental and sustainability terms
K8	Engagement with selected knowledge in the research literature of the discipline

Appendix-2


Bloom's Taxonomy (Taxonomy of Learning)
3 Domains
(1)
Cognitive (Knowledge)
Remember
Understand
Apply
Analyze
Evaluate
Create
(2)
Psychomotor (Skill)
Imitation
Manipulation
Precision
Articulation
Naturalization
(3)
Affective (Attitude)
Receiving
Responding
Valuing
Organization
Characterization