



Course Information

Program	: B.Sc. Engineering in CSE
Course Code	: CSE 317
Course Title	: System Analysis and Design
Course Credit	: 3.00
Contact Hours	: 3 _{hrs}
Semester	: Summer, 2020
Intake	: 39 [Shift: Day]
Section	: 01
Prerequisites	: CSE 207 (Database Systems)

Course Objectives

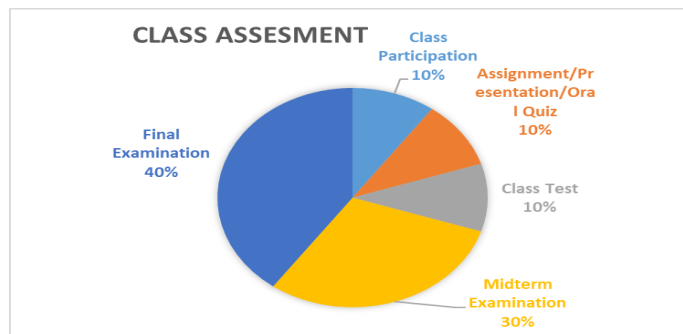
This course provides a methodical approach to develop computer systems including systems planning, design, testing, implementation and software maintenance. Emphasis is on the strategies and techniques of systems analysis and design for producing logical methodologies for dealing with complexity in the development of information systems. The course emphasis on the development information system from a problem-solving perspective.

Course Synopsis

System analysis fundamentals, Roles and qualifications of a system analyst, System Development Life cycle (SDLC), Software development models (waterfall model, spiral model, agile modeling, prototyping, Object-Oriented methodology), system design and modeling (DFD, ERD, Use case), project management, activity planning and controls (Gantt, PERT), managing analysis and design, information gathering (JAD, questionnaire), Object Oriented Analysis and Design (UML, Activity Diagram, Sequence Diagram, Communication Diagram, Class diagram, Statechart Diagrams), Designing Effective Output (website, app), Designing Effective Input (webform design, website design), Human-Computer Interaction, Quality Assurance and Implementation (six sigma, Testing, Maintenance, and Auditing)

Assessment

Class Participation	:	10%
Assignment/Presentation/Oral Quiz	:	10%
Class Test	:	10%
Midterm Examination	:	30%
Final Examination	:	40%





Course Outcomes (COs)

After completion of this course students will be able to:

SL. No.	Course Outcome
CO1	Understand key aspects of the systems development process: interviewing techniques, project planning, and system development methodologies.
CO2	Analyze organizational structure: requirements, flows of information, managerial structure of system.
CO3	Evaluate systems development alternatives to show how a proposed system development solution can affect the resulting system.
CO4	Design and develop high-level logical system: DFD,UML,ERD, I/O Design etc.

Mapping of Course Outcomes (COs) to Program Outcomes (POs)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√											
CO2		√										
CO3				√								
CO4			√									

Sl. No.	COs	Corresponding POs	Bloom's taxonomy domain/level	Delivery methods and activities	Assessment tools
1	Identify and understand key aspects of the systems development process: interviewing techniques, project planning, and system development methodologies.	PO1	Understanding	Class Lecture and Discussion	Midterm, Final
2	Analyze organizational structure: requirements, flows of information, managerial structure of system	PO2	Analyzing	Class Lecture and Discussion	Midterm, Final
3	Evaluate systems development alternatives to show how a proposed system development	PO4	Evaluating	Class Lecture and Discussion	Midterm



	solution can affect the resulting system.				
4	Design and develop high-level logical system: DFD,UML,ERD, I/O Design etc.	PO3	Applying	Class Lecture and Discussion	Final

Descriptions of Program Outcomes (POs)

PO1	Engineering Knowledge (Cognitive): Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2	Problem Analysis (Cognitive): Identify, formulate, research the literature and analyze complex engineering problems and reach substantiated conclusions using first principles of mathematics, the natural sciences and the engineering sciences.
PO3	Design/Development of Solutions (Cognitive, Affective): Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety as well as cultural, societal and environmental concerns.
PO4	Investigation (Cognitive, Psychomotor): Conduct investigations of complex problems, considering design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5	Modern Tool Usage (Psychomotor, Cognitive): 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 the limitations.
PO6	The Engineer and Society (Affective): Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7	Environment and Sustainability (Affective, Cognitive): Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics (Affective): Apply ethical principles and commit to professional ethics, responsibilities and the norms of the engineering practice.
PO9	Individual Work and Teamwork (Psychomotor, Affective): Function effectively as an individual and as a member or leader of diverse teams as well as in multidisciplinary settings.
PO10	Communication (Psychomotor, Affective): Communicate effectively about complex engineering activities with the engineering community and with society at large. Be able to comprehend and write effective reports, design documentation, make effective presentations and give and receive clear instructions.
PO11	Project Management and Finance (Cognitive, Psychomotor): Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work as a member or a leader of a team to manage projects in multidisciplinary environments.
PO12	Life-Long Learning (Affective, Psychomotor): Recognize the need for and have the preparation and ability to engage in independent, life-long learning in the broadest context of technological change.



Weekly Schedule

Teaching-Learning Method:

Lecture, Class discussion, Discussion outside class with Instructor

Week	Lec	Topics	Rem.	CO
1	1	Introduction: Introduction to system analysis and design, course overview and objectives		
	2	System Fundamentals: Defining a system, system characteristics and elements	Ch- 1	CO1
	3	Roles and qualifications of a system analyst; Analyst values and client expectations	“	“
2	4	System Analyst and Development Process: System Development Life cycle (SDLC) CASE tools	“	CO1, CO2, CO3
	5	Software Development Models: Waterfall model, spiral model, Object-Oriented Methodologies	Ch- 1,6 (Kendall)	CO1, CO2, CO3
	6	Agile Modeling, prototyping	“	“
3	7	System Design and Modeling: Organizations as system and organizational environment Depict systems graphically using context-level, DFD (Level 0)	Ch- 2,7 (Kendall)	CO2, CO3,
	8	DFD Level 1, Creating Child Diagrams (More Detailed Levels), Checking Diagrams for Errors	“	“
	9	Logical DFD and physical DFD	“	“
4	10	Entity relationship diagrams, Preparation of ERD	Ch- 2,13 (Kendall)	“
	11	Use cases, and use case scenarios.	“	“
	12	Case study analysis and example	Ch- 2,7 (Kendall) CT-1	“
5	13	Project Management: Project initiation, defining problem, feasibility analysis	Ch- 3 (Kendall)	CO1, CO2



	14	Project selection, ascertaining software and hardware needs.	“	“
	15	Activity Planning and Controls: Identifying, Forecasting and Comparing Costs and Benefits	“	
	16	Estimating time, project scheduling (Gantt & PERT chart) and critical path analysis, assembling a team.	“	CO2, CO3
6	17	Managing Analysis and Design: Managing risk analysis, writing system proposal, pointing project charter and failure conditions,	“	“
	18	<i>Troubleshooting Case Study and Review classes</i>	“	
	<i>Mid term</i>			
7	19	Information Gathering: Interview preparation and question types, Five Steps in Interview Preparation	Ch- 4 (Kendall)	CO1, CO2
	20	JAD, Use of JAD, Who Is Involved, Where to Hold JAD Meetings, Benefits and Drawback of Using JAD	“	“
	21	Planning for the use of questionnaires, designing questionnaire	“	“
8	22	Object Oriented Analysis and Design: Object oriented concepts	Ch- 10 (Kendall)	CO1
	23	CRC cards and object think	“	CO2, CO4
	24	Unified Modeling Language (UML), Activity Diagram	“	“
9	25	Sequence Diagram, Communication Diagram	“	“
	26	Class diagram , Statechart Diagrams	“	CO1, CO2, CO4
	27	Case study analysis and example	“	“
10	28	Designing Effective Output: Output Design Objectives, Relating Output Content to Output Method	Ch- 11 (Kendall)	CO1, CO2, CO4
	29	Designing output for displays, Designing a website, Web 2.0 technologies, Design apps for smartphones and tablets	“	“



	30	Designing Effective Input: Good Form Design, Good Display and Web Form Design	Ch- 12 (Kendall)	CO2, CO4
11	31	GUI design : Website Design	“	“
	32	Case study analysis and example	Ch- 11,12 (Kendall) CT-2	“
	33	Human-Computer Interaction: Understanding HCI, designing for cognitive style of users,	Ch- 14 (Kendall)	CO4
12	34	Human limitations, disabilities and physical consideration in HCI design, types of user interfaces	“	CO2, CO4
	35	Guideline for dialog and user feedback design, Feedback for user	“	“
	36	Quality Assurance and Implementation: Quality management and six sigma	Ch- 16 (Kendall)	CO1, CO2
13	37	Documentation approaches	“	“
	38	Testing, Maintenance, and Auditing	“	CO2, CO4
	39	<i>Troubleshooting Case Study and Review classes</i>		
Semester Final Examination				

Descriptions of Cognitive Domain (Anderson and Krathwohl's Taxonomy 2001):

The **cognitive domain** involves the development of our mental skills and the acquisition of knowledge.

Level	Category	Meaning	Keywords
L1	Remembering	Recognizing or recalling knowledge from memory. Remembering is when memory is used to produce or retrieve definitions, facts, or lists, or to recite previously learned information.	Define, describe, draw, find, identify, label, list, match, name, quote, recall, recite, tell, write
L2	Understanding	Constructing meaning from different types of functions be they written or graphic messages or activities like interpreting, exemplifying, classifying, summarizing, inferring, comparing, or explaining.	Classify, compare, exemplify, conclude, demonstrate, discuss, explain, identify, illustrate, interpret, paraphrase, predict, report
L3	Applying	Carrying out or using a procedure through executing, or implementing. Applying relates to or refers to situations where learned material is used through products like models,	Apply, change, choose, compute, dramatize, implement, interview, prepare, produce, role play, select,



		presentations, interviews or simulations.	show, transfer, use
L4	Analyzing	Breaking materials or concepts into parts, determining how the parts relate to one another or how they interrelate, or how the parts relate to an overall structure or purpose. Mental actions included in this function are differentiating, organizing, and attributing, as well as being able to distinguish between the components or parts. When one is analyzing, he/she can illustrate this mental function by creating spreadsheets, surveys, charts, or diagrams, or graphic representations.	Analyze, characterize, classify, compare, contrast, debate, deconstruct, deduce, differentiate, discriminate, distinguish, examine, organize, outline, relate, research, separate, structure
L5	Evaluating	Making judgments based on criteria and standards through checking and critiquing. Critiques, recommendations, and reports are some of the products that can be created to demonstrate the processes of evaluation.	Appraise, argue, assess, choose, conclude, critique, decide, evaluate, judge, justify, predict, prioritize, prove, rank, rate, select, monitor
L6	Creating	Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing. Creating requires users to put parts together in a new way, or synthesize parts into something new and different creating a new form or product. This process is the most difficult mental function.	Construct, design, develop, generate, hypothesize, invent, plan, produce, compose, create, make, perform, plan, produce

Teaching Materials/Equipment

- Reference Book** : 1. Systems Analysis and Design (9th edition)
- Kenneth E. Kendall, Julie E. Kendall
- Recommended References:** 2. Analysis and Design of Information System
- V. Rajaraman
3. **System Analysis and Design** – *Elias M. Awad*
4. **Lean Software Development: An Agile Toolkit for Software Development Managers**
– *Mary Poppendieck, Tom Poppendieck, Ken Schwaber*
5. **Software Project Management**
– *Hughes, Cotterell*

Overall CO Assessment Scheme

Assessment Area	CO				Assessment Area Mark
	CO1	CO2	CO3	CO4	
Class Participation/Oral Quiz					
Assignment/Presentation					
Class Test					
Midterm Exam	10	10	10		30
Final Exam	10	10		20	40
Total Mark	20	20	10	20	70



Bangladesh University of Business and Technology (BUBT)
Department of Computer Science and Engineering (CSE)

Grading System

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

Instructor Information

Instructor	M.M. Fazle Rabbi Assistant Professor, Department of Computer Science & Engineering
Office	Room No- 321 (Building-2)
Phone	+8801913446575
Email	rabbib@bubt.edu.bd

Class Schedule

Day	Time	Room No
Sunday	10:00 AM – 11:20 AM	318(B-2)
Wednesday	11:30 AM – 12:50 PM	317 (B-2)

Office Hour

DAYS	8:30-09:30	09:35-10:35	10:40-11:40	11:45-12:45	12:45-1:15	01:15-02:15	02:20-03:20	03:25-04:25	04:30-05:30
SUN		Office Hour	Office Hour	Office Hour					
MON				Office Hour		Office Hour	Office Hour		
TUE			Office Hour	Office Hour	Office Hour				
WED									
THU			Office Hour						

Special Instructions



- Students are expected to attend all classes and examinations. A student **MUST** have at least 70% class attendance to sit for the final exam.
- Students will not be allowed to enter into the classroom after 20 minutes of the starting time.
- For plagiarism, the grade will automatically become zero for that exam/assignment.
- All mobile phones **MUST** be turned to silent mode during class and exam period.
- There is zero tolerance for cheating in exam. The only penalty for cheating is expulsion for several semesters as decided by the Disciplinary Committee of the university.

Prepared by:

Checked by:

Approved by: