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|  | **Daffodil International University****Department of Computer Science and Engineering (CSE)****Course Outline** |  |
| **Course Code:** | CSE321 |
| **Course Title:** | System Analysis and Design |
| **Program:** | B.Sc. in CSE |
| **Faculty:** | Faculty of Science and Information Technology (FSIT) |
| **Semester:** | Summer 2020 | **Year:** | 2020 |
| **Credit:** | 3.0 | **Contact Hour:** | 3.0 |
| **Course Level:** | Level 3 Term 2 | **Prerequisite:** | No |
| **Course Category:** | Core Engineering |
| **Instructor Name:** | Israt Ferdous |
| **Designation:** | Lecturer |
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| **Office Address:** | Room 111, Daffodil Tower, Department of CSE |

1. **Course Rationale**

The main goal of this course is to provide students with a solid background in information systems analysis and design techniques through a combination of theory and practice. It introduces the vital logical and design considerations addressed during system and application software development.

* 1. **Course Objective**

Upon completion of the course, students are expected to be able to:

1. Define various system analysis and design based concepts and terminologies and different stages of the system development life cycle model.
2. Compare, use and synthesize different conceptual modeling techniques for systems analysis (including EROs, DFDs and UML).
3. Apply logic modeling techniques (decision tree/table, structured English).
4. Address the managerial issues involved in system analysis and design and model the importance of collaboration and communication during system development and maintenance.
5. Describe and Apply different analysis and design based methodologies for real world and state-of-the-art systems development.
	1. **Course Outcomes (CO’s)**

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| **CO1:** Able to define and describe concepts of a system and what it means to develop and implement an information system, and the system development life cycle. |
| **CO2:**Able to familiar with a variety of problem solving tools and approaches for the design and analysis of information systems.  |
| **CO3:** Able to write clear and concise system requirements (functional and non-functional) and convert them into technical specifications. |
| **CO4:** Able to create context and level-1 data flow diagrams |
| **CO5:**Able to create a user interface form data input and output, data to represent common business situations, working in a group which carried out a system development project with four phased deliverables: system proposal, requirements specifications, design specifications and a working prototype with emphasis on user interfaces. |

* 1. **Program Outcomes (PO’s):**

Program Outcomes are reported in Appendix-I.

* 1. **CO-PO Mapping**

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| --- | --- | --- | --- | --- | --- |
|  | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| PO1: Engineering knowledge | 3 | 2 |  |  |  |
| PO2: Problem analysis |  | 2 | 2 | 2 | 2 |
| PO3: Design/development of solutions |  | 3 |  | 2 | 3 |
| PO4: Investigation |  | 2 |  | 2 | 2 |
| PO5: Modern tool usage |  | 3 |  | 3 | 3 |
| PO6: The engineer and society |  |  |  |  |  |
| PO7: Environment and sustainability |  |  |  |  |  |
| PO8: Ethics |  |  |  |  |  |
| PO9: Individual work and teamwork |  |  |  |  | 2 |
| PO10: Communication |  |  |  |  | 2 |
| PO11: Project management and finance |  |  |  |  |  |
| PO12: Life-long learning |  |  |  |  |  |

* 1. **CO Assessment Scheme**

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| --- | --- | --- |
| **Assessment Task** | **CO’s** | **Mark****(Total=100)** |
| **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| Attendance | -- | -- | -- | -- | -- | 7 |
| Class Test (CT1, CT2, CT3) | -- | -- | -- | -- | -- | 15 |
| Assignment | -- | -- | -- | -- | -- | 5 |
| Presentation | -- | -- | -- | -- | -- | 8 |
| Midterm Examination | -- | -- | -- | -- |  | 25 |
| Semester Final Examination | -- | -- | -- | -- | -- | 40 |
| Total Mark | -- | -- | -- | -- | -- | 100 |

# **Strategies and approaches to learning**

# **Teaching and Learning Activities (TLA)**

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| **TLA1** | Lectures twice a week using multimedia of different topics. |
| **TLA2** | Active discussion in class regarding efficient solving of the logical and mathematical problems. |
| **TLA3** | Group discussion and presentation regarding diverse problems and corresponding lectures. |
| **TLA4** | Evaluation of class performances to reach each student in a class for every topic. |

1. **Course Schedule and Structure**
	1. **Textbook**

**System Analysis and Design,** by Elias M. Awad

* 1. **Reference Books**
1. **Systems Analysis and Design,** Kendall and Kendall, Fifth Edition
2. **Management Information Systems: Managing the Digital Firm** (11th edition), Pearson/PrenticeHall
3. **Software Engineering,** Pressman, Current Edition
4. **Systems Analysis and Design Methods**, Jeffrey Whitten, Lonnie Bentley.
	1. **Course Plan/Lesson Plan**

| **Week** | **Lesson.** | **Topic** | **Teaching and Learning Activities (TLAi)** | **Textbook & Video Reference** | **Related CO’s** |
| --- | --- | --- | --- | --- | --- |
| 1 | Les. 1 | Data and Information, Types of Information, Need for an Information System, Qualities of Information | TLA1  | **Elias M. Awad(Ch-1)*****(Page 6-11)*** | CO1 |
| Les. 2 | System concept and Definition, Characteristics, Attributes, Elements of a system, Types of System | TLA1,TLA2  | Elias M. Awad(Ch-3)***(Page 60-83)*** | CO1 |
| 2 | Les. 3 | Nine steps involved in analysis and design. Role of a system analyst, attributes. | TLA1,TLA2 | Elias M. Awad(Ch-2)***(Page 40-57)*** | CO2 |
| Les. 4 | Tools used by system analyst.  |  | Elias M. Awad(Ch-2)***(Page 40-57)*** | CO3 |
| 3 |  | **(Class Test – 1, Assignment – 1)** |  |
| Les. 5 | Information gathering strategies, Information gathering tools, Information gathering other | TLA3 | Elias M. Awad(Ch-5)***(Page 126-150)***Kendall and Kendall(Ch-4) | CO1,CO2 |
| Les. 6 | Used and apply Information gathering tools | TLA2,TLA3 | Elias M. Awad(Ch-5)***(Page 126-150)***Kendall and Kendall(Ch-4) | CO3 |
| 4 | Les. 7 | Flow oriented model, Data Flow Diagram(DFD) and why DFD, DFD notations, DFD lavels and layers, Physical and logical DFD | TLA1,TLA2 | Elias M. Awad(Ch-9)***(Page 261-283)***Kendall and Kendall(Ch-7)***(Page 193-217)*** | CO2 |
| Les. 8 | Practicing and applying tools available to draw DFDs | TLA2,TLA3 | Elias M. Awad(Ch-9)***(Page 261-283)***Kendall and Kendall(Ch-7) | CO3 |
| 5 |  | **(Class Test – 2)** |  |
| Les. 9 | **Project Specification, Definition, Structured English Language, Decission Tree, Decission Table**  | TLA2,TLA3 | Kendall and Kendall(Ch-9)***(Page 259-273)*** | CO2,CO3 |
| Les. 10 | Practicing and applying tools to convert the technical tools from specifications.  | TLA3 | Kendall and Kendall(Ch-9)***(Page 259-273)*** | CO2,CO3 |
| 6 | Les. 11 | Feasibility Analysis – Steps in feasibility analysis, Evaluating alternative solution, Cost and benefit calculation and analysis, System proposal structure | TLA1,TLA3 | Elias M. Awad(Ch-7,8)***(Page 196-254)*** | CO2,CO3 |
| Les. 12 | Practicing and applying tools to convert the find the deficiency, goal, sub goals, and find the cost and benefits from scenario.  | TLA3 | Elias M. Awad(Ch-7,8)***(Page 196-254)*** | CO2,CO3 |
| (MID–TERM EXAM) |
| 7 | Les. 13 | Input Design**,** Output Design**,** File and database design**,** System architecture**,** Systems maintenance | TLA1,TLA3 | Elias M. Awad(Ch-10)***(Page 285-313)***Kendall and Kendall(Ch-11,12,13) | CO1,CO3 |
| Les. 14 | Appreciate system architecture of Input, output and database design practicing | TLA3 | Elias M. Awad(Ch-10)Kendall and Kendall(Ch-11,12,13) | CO3  |
| 8 | Les. 15 | Systems Testing, Failure, Bug and Error, Testing, Types of system testing, Software testing life cycle, Rules for System Testing, Stages of System Testing, Dynamic System Testing, Objectives of Quality Assurance | TLA1,TLA4 | Elias M. Awad(Ch-12) | CO1,CO4 |
| Les. 16 | Testing and validation of manual testing and using tools for real life application both web and mobile. | TLA1,TLA4 | Elias M. Awad(Ch-12) | CO1,CO4 |
| 9 | Les. 17 | Managing the Information System Projects, Importance of Project Management, System Service Request (SSR). | TLA1,TLA3 | Elias M. Awad(Ch-15) | CO1,CO4 |
| Les. 18 | Managing Information System Project, Representation and Scheduling project plans: critical path scheduling, Gantt charts, and Network diagrams | TLA3 | Elias M. Awad(Ch-15) | CO4 |
| 10 |  | **(Class Test-3, Assignment – 2)** |  |
| Les. 19 | Information Security And Cybercrime, Security Challenges and Vulnerabilities of Information System, Computer and Cybercrime, Information Security and Control, Safe and Ethical Uses of Computer | TLA1,TLA4 | Elias M. Awad(Ch-16) | CO4 |
| Les. 20 | Find out the challenges and know how to break the challenges | TLA1,TLA4 | Elias M. Awad(Ch-16) | CO4 |
| 11 | Les. 21 | E-commerce: Digital Marketing and Digital Goods, Electronic Commerce and the Internet, The Growth of E-Commerce, Eight unique features of E-Commerce technology, The Benefits of Disintermediation to the Consumer.  | TLA1,TLA4 | Pearson /PrenticeHall(Ch-10) | CO4,CO5 |
| Les. 22 | Types of Electronic Commerce, Types of electronic payment systems | TLA1,TLA4 | Pearson /PrenticeHall(Ch-10) |  |
| 12 | Les. 23 | Systems Analysis and Design Research: Past, Present and Future | TLA3 | Handout | CO5 |
| Les. 24 | Research on Modern Systems Analysis and Design Technologies and Applications | TLA3 | Handout | CO5 |
| **(FINAL EXAM)** |

1. **Assessment Methods**
	1. **Grading System**

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| --- | --- | --- |
| **Numerical Grade** | **Letter Grade** | **Grade Point** |
| 80-100 | A+ | 4.00 |
| 75-79 | A | 3.75 |
| 70-74 | A- | 3.50 |
| 65-69 | B+ | 3.25 |
| 60-64 | B | 3.00 |
| 55-59 | B- | 2.75 |
| 50-54 | C+ | 2.50 |
| 45-49 | C | 2.25 |
| 40-44 | D | 2.00 |
| Less than 40 | F | 0.00 |

1. **Additional Support for Students**
* Student Portal:

<http://studentportal.diu.edu.bd/>

* Academic Guidelines

<https://daffodilvarsity.edu.bd/article/academic-guidelines>

* Rules and Regulations of DIU

<https://daffodilvarsity.edu.bd/article/rules-and-regulation>

* Career Development Center:

<https://cdc.daffodilvarsity.edu.bd/>

* For general queries:

<http://daffodilvarsity.edu.bd/>

**Program Outcomes and Assessment**

Program Outcomes (POs) are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills and attitudes that students acquire while progressing through the program. The program must demonstrate that by the time of graduation, students have attained a certain set of knowledge, skills and behavioral traits to some acceptable minimum level. The BAETE specifically requires that students acquire the following graduate attributes.

**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

**(PO2: Problem analysis:** 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**: 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:** 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:** 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:** 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:** Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

**PO8: Ethics:** Apply ethical principles and commit to professional ethics, responsibilities and the norms of the engineering practice.

**PO9: Individual work and teamwork:** Function effectively as an individual and as a member or leader of diverse teams as well as in multidisciplinary settings.

**PO10: Communication:** 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:** 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:** Recognize the need for and have the preparation and ability to engage in independent, life-long learning in the broadest context of technological change.