IT 242: Software Design and Development
(BIM 5th Sem)

Credits:3
Lecture Hours: 48

Course Description:
This course covers different concepts of software design and development including SDLC and different phases, development methodologies, software project management, and some concepts of object-oriented development.

Course Objectives:
The main objective of this course is to provide knowledge of different concepts of software development to students. After completing this course, students will be able to

- Understand importance of software and its systematic development,
- Understand SDLC and its phases,
- Use each SDLC phase to develop software,
- Use project management activities for software development projects,
- Use different methodologies in software development,
- Apply object-oriented development concepts in software development.

Course Details

Unit 1: Systems Development Environment **6 LHs**

Introduction; Modern Approach to Systems Analysis and Design; Developing Information Systems and Systems Development Life Cycle; Heart of Systems Development Process; Waterfall SDLC; Prototyping; Spiral Development; Agile Methodologies.

Unit 2: Project Management **4 LHs**

Project Management and Project Management Activities; Gantt Chart and Network Diagram; Representing and Scheduling Project Plans; Using Project Management Software.

Unit 4: Planning **5 LHs**

Identifying and Selecting Systems Development Projects; Corporate and Information Systems Planning; Initiating and Planning Systems Development Projects; Project Feasibility; Building and Reviewing the Baseline Project Plan.

Unit 5: Analysis **12 LHs**

Performing Requirements Determination; Traditional, Contemporary, and Radical Methods for Requirements Determination; Process Modeling; Data Flow Diagramming Mechanics; Guidelines for Drawing DFDs; Modeling Logic with Decision Tables; Conceptual Data Modeling; Gathering Information for Conceptual Data Modeling; Introduction to E-R Modeling; Conceptual Data Modeling and the E-R Model; Representing Supertypes and Subtypes; Business Rules; Packaged Conceptual Data Models.

Unit 6: Design **8 LHs**

Database Design; Normalization; Transforming E-R Diagrams into Relations; Merging Relations; Physical File and Database Design; Designing Forms and Reports; Formatting Forms and Reports**;** Designing Interfaces and Dialogues; Interaction Methods and Devices; Designing Interfaces; Designing Dialogues; Designing Interfaces and Dialogues in Graphical Environments.

Unit 7: Implementation and Maintenance **5 LHs**

System Implementation; Software Application Testing; Installation; Documenting the System; Training and Supporting Users; Organizational Issues in Systems Implementation; Maintaining Information Systems; Conducting Systems Maintenance.

Unit 8: Object-Oriented Development **8 LHs**

Introduction to Object-Oriented Development; Unified Modeling Language; Functional, Structural and Behavioral Models.

Laboratory Works:

The laboratory work includes using project management software to represent and schedule project plans and using drawing tool to create different models used in software development. Students should also prepare a report that includes at least analysis and design phases of software development considering any appropriate organization.

Suggested Reading

Joseph S. Valacich and Joey F. George, Modern Systems Analysis and Design, 9th Edition, Pearson

Alan Dennis, Barbara Haley Wixom, and David Tegarden, Systems Analysis and Design – An Object-Oriented Approach with UML, 5th Edition, Wiley

Ian Sommerville, Software Engineering, 10th Edition, Pearson

Alan Dennis, Barbara Haley Wixom, and Roberta M. Roth, Systems Analysis and Design, 7th Edition, Wiley