**Course Title: System Analysis and Design (3 Cr.)**

**Course Code: CACS2O3**

**Year/Semester: II/III**

**Class Load: 4 Hrs. / Week (Theory: 3Hrs, Tutorial: 1 Hrs.)**

**Course Description**

This course mainly focuses on different aspect of system analysis and design such as foundation, planning, analysis, design, implementation and maintenance.

**Course objectives**

The general objective of this course is to provide concepts related to information systems development in a systematic approach including foundations, planning, analysis, design, implementation and maintenance.

**Course Content**

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| --- | --- |
| **Specific Objectives** | **Content** |
| * Define information systems analysis and design * Discuss the modern approach to systems analysis and design * Describe the organizational roles involved in information systems development * Describe different types of information systems: * Describe the information systems development life cycle (SDLC) * Discuss alternatives to the systems development life cycle * Discuss the role of computer-aided software engineering (CASE) tools in systems development * Explain the process of managing an information systems project * Discuss skills required to be an effective project manager * Describe skills and activities of a project manager during project initiation, planning, execution and closedown * Explain Gantt and Pert charts * Review commercial project management software packages | **Unit 1 System Development Fundamentals 9 Hrs.**   1. **The Systems Development Environment**   Introduction, Modern Approach of System Analysis and Design, Information System and its Type, Developing Information Systems and the Systems Development Life Cycle, The Heart of the Systems Development Process, The Traditional Waterfall SDLC, Approaches for Improving Development, CASE Tools, Rapid Application Development, Service-Oriented Architecture, Agile Methodologies, eXtreme Programming, Object- Oriented Analysis and Design   1. **The Origins of Software**   Introduction, System Acquisition, Reuse   1. **Managing the Information Systems Project**   Introduction, Managing Information Systems Project, Representing and Scheduling Project Plans, Using Project Management Software |
| * Describe the project identification and selection process * Describe the corporate strategic planning and information systems planning process * Explain the relationship between corporate strategic planning and information systems planning * Describe how information systems planning can be used to assist in identifying and selecting systems development projects * Analyze information systems planning matrices to determine affinity between information systems and IS projects and to forecast the impact of IS projects on business objectives   Describe steps involved in the project initiation and planning  process   * Explain the need for and the contents of a Statement of Work and Baseline Project Plan * List and describe various methods for accessing project feasibility * Describe the differences between intangible and tangible costs and benefits and between recurring and one-time benefits and costs * Detail various methods of cost/benefit analysis * Describe the general rules for evaluating the technical risks associated with a systems development project * Describe the activities and participant roles within a structured walkthrough | **Unit 2 Planning 7 Hrs.**   1. **System Development Projects: Identification and Selection**   Introduction, Identifying and Selecting Systems Development Projects, Corporate and Information Systems Planning   1. **System Development Projects: Initiation and Planning**   Introduction, Initiating and Planning Systems Development Projects, Process of Initiating- and Planning IS Development Projects, Assessing Project Feasibility, Building and Reviewing the Baseline Project Plan |
| * Describe options for designing and conducting interviews and develop a plan for conducting an interview to determine system requirements * Design, distribute, and analyze questionnaires to determine system requirements * Explain advantages and pitfalls of observing workers and analyzing business documents to determine requirements * Explain how computing can provide support for requirements determination * Learn about Joint Application Design   (JAD)   * Use prototyping during requirements determination * Select the appropriate methods to elicit system requirements | **Unit 3 Analysis 13 Hrs.**  **a. System Requirements**  Introduction, Performing Requirements Determination, Traditional Methods for  Determining Requirements; Contemporary Methods for Determination System  --  Requirements, Radical Methods for Determining System. Requirements, Requirements Management Tools, Requirements Determination Using Agile Methodologies   1. **System Process Requirements**   Introduction, Process Modeling, Data Flow Diagramming Mechanics, Using Data Flow Diagramming in the Analysis Process, Modeling Logic with Decision Tables   1. **System Data Requirements**   Introduction, Conceptual Data Modeling, Gathering Information for Conceptual Data Modeling, Introduction to E-R Modeling, Conceptual Data Modeling and the E-R Model, Representing Super-types and Sub-types, Business Rules, Role of Packaged Conceptual Data Models — Database Patterns |
| * Concisely define each of the following key database design terms: relation, primary key, normalization, functional dependency, foreign key, referential integrity, field, data type, null value, denormalization, file organization, index, and secondary key. * Explain the role of designing databases in the analysis and design of an information system. * Transform an entity-relationship (E-R) diagram into an equivalent set of well-structured (normalized) relations. * Merge normalized relations from separate user views into a consolidated set of well-structured relations. * Choose storage formats for fields in database tables. * Translate well-structured relations into efficient database tables. * Explain when to use different types of file organizations to store computer files. * Describe the purpose of indexes and the important * considerations in selecting attributes to be indexed * Explain the process of form and report design. Apply general guidelines for formatting forms and reports. * Use color and know when color improves the usability of information. * Format text, tables, and lists effectively. * Explain how to assess usability and describe factors affecting usability. * Explain the process of designing interfaces and dialogues and the deliverables for their creation * Contrast and apply several methods for interacting with a system * List and describe various input devices and discuss usability issues for each in relation to performing different tasks * Discuss the general guidelines for   interface design including:   * Layout and design * Structuring data entry fields * Providing feedback * System help * Discuss the design of human-computer dialogues and the use of dialogue diagramming * Design graphical user interfaces * Explain interface design guidelines   unique to the design of Internet based  electronic commerce systems | **Unit 4 Design 12 Hrs.**   1. **Designing Databases**   Introduction, Database Design, Relational Database Model, Normalization, Transforming E-R Diagrams into Relations, Merging Relations, Physical File and Database Design, Designing Fields, Designing Physical Tables   1. **Designing Forms and Reports**   Introduction, Designing Forms and Reports, Formatting Forms and Reports, Assessing Usability   1. **Designing Interfaces and Dialogues**   Introduction, Designing Interfaces and Dialogues, Interaction Methods and Devices, Designing Interfaces and Dialogues in Graphical Environments. | |
|  | **Unit 5 Implementation and Maintenance 4 firs.**   1. **System Implementation**   Introduction, System Implementation, Software Application Testing, Installation, - Documenting the System, Training and Supporting Users, Organizational Issues in Systems Implementation   1. **System Maintenance**   Introduction, Maintaining Information Systems, Conducting Systems Maintenance |

**Teaching Methods**

The teaching faculties are expected to create environment where students can update and upgrade themselves with the current scenario of computing and information technology with the help of topics listed in the syllabus. The general teaching pedagogy that can be followed by teaching faculties for this course includes class lectures, group discussions, case studies, guest lectures, research work, project work, assignments (Theoretical and Practical), and written and verbal examinations.

**Evaluation**

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| --- |
| Internal Assessment Format [FM = 40] – Subject Teacher |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Term Examination | | Assignment | Attendance | Total | | First | Final | | 8 | 12 | 15 | 5 | 40 | |
|  |
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Note: Assignment may be subject specific case study, seminar paper preparation, report writing, project work, research work, presentation, problem solving etc.

Final Examination Questions Format [FM = 60, Time = 3 Hrs.]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SN** | **Question Type** | **Number of Questions Given** | **Marks per Question** | **Total Marks** |
| 1 | Group – 'A'  Objective Type Questions (Multiple Choice Questions)  Attempt all the questions. | 10 | 1 | 10 x 1 = 10 |
| 2 | Group – 'B'  Short Questions (Attempt any **SIX** questions.) | 7 | 5 | 6 x 5 = 30 |
| 3 | Group – 'C'  Long Questions (Attempt any **TWO** questions.) | 3 | 10 | 2 x 10 = 20 |

**Text Books**

Jeffery A. Hoffer, Joey George, Joe Valacich, “Modern System analysis and Design” 6/e Prentice Hall India.

**Reference Book**

Jeffery Whiten, Lonnie Bentley, “system Analysis and design methods” 7/e McGraw-Hill

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**Faculty of Humanities & Social Sciences**

**OFFICE OF THE DEAN**

**Model Question**

**Bachelor in Computer Application Full Marks: 60**

**Course Title: System Analysis & Design Pass Marks: 24**

**Course code: CACS 203 Time: 3 hours**

**Semester: III**

***Candidates are required to answer the questions in their own words as far as possible.***

**Group “A”**

**Attempt all the questions**  **[10 X 1=10]**

**Circle ( ) ) ) the correct answer in the following questions**.

1. **Which of the following Information systems are aimed at improving the routine business activities on which all organizations depend?**

a) Management Information systems b) Decision support systems

c) Transaction Processing Systems d) Executive Information

1. **The project life cycle consists of**
2. Understanding the scope of the project b) Objectives of the project
3. Formulation and planning various activities d) All of the above
4. **Which is the most important feature of spiral model?**
5. Quality Management b) Efficiency Management

c) Risk Management d) Performance Management

1. **………. includes the existing system, the proposed system, system flow charts, modular design of the system, print layout charts and data file designs.**

a) Feasibility Report b) Functional Specification Report

c) Design Specification Report d) Terms of Reference

5. **For the best Software model suitable for the project, in which of the phase the developers decide a roadmap for project plan?**

a) Software Design b) System Analysis c) Coding d) Testing

1. **Using the ………. approach, a new system is tested in one part of the organization before being implemented in others.**

a) Direct b) Parallel c) phased d) pilot

7. **…………….. extends the software beyond its original functional requirements.**

a) Adaptive maintenance b) Perfective maintenance

c) Corrective maintenance d) Preventive maintenance

8. **Which normal form looks at removing partial dependencies?**

a) First Normal Form b) Second Normal Form

c) Third Normal Form d) Fourth Normal Form

9. **In constructing ER diagrams, double ovals are used to denote……………**

a) Multi-value table b) Multi-value entity c) Multi-value attributes d) Multi-value key

10**. Testing beyond normal operational capacity is …………….**

a) Performance testing b) Stress testing c) Recovery testing d) None of the above

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**Semester: III Time: 3 hours**

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**Group “B”**

**Attempt any SIX Questions. [6\*5=30]**

1. When would you use agile methodologies? How is it different from waterfall approach to system development?
2. Why is project management important? Briefly explain the activities performed by the project manager during project execution.
3. List various methods of interacting with a system. Briefly explain the factors to be considered while designing a form?
4. What are the deliverables from coding and testing? Briefly explain the different approaches to installation.
5. Why is normalization required? State second normal form and explain it with a proper example.
6. Construct an E-R Diagram for football club that has a name and a ground and is made up for players. A player can play for only one club and a manager identified by his name manage a club. A footballer has a registration number, name and age. A club manager also buys players. Each club plays against other clubs in the league and matches have a date, venue and score.
7. Maintenance is an on-going process. Do you agree? Explain the process of maintaining information systems.

**Group – “C”**

**Attempt any TWO Questions. [2\*10=20]**

1. Develop a context diagram and top level logical DFD for the system made up of the following.

B & B is a mail-order company that distributes CDs, DVDs of music, games, movies, software at discount prices to club members.

* When an order processing clerk receives an order form, he or she verifies that the sender is a club member by checking the Member file.
* If the sender is not a member, the clerk returns the order along with a membership application form.
* If the customer is a member, the clerk verifies the order item data by checking the Item file.
* Then the clerk enters the order data and saves it to the Daily Order file. The clerk also prints an invoice and shipping list for each order, which are forwarded to Order Fulfillment Department.

1. With proper reasoning, explain how CASE Tools aid in information system development? You have been hired as a system analyst in TUtech software Development Company and you are asked to analyze the way system works. What qualities do you need to have to analyze such type of system?
2. Why software project often fails? Explain different types of software testing?
3. List features of OOAD. Differentiate between structured methodologies and object oriented methodologies.

**~~~Best of Luck~~~**

**Key: 1-c, 2-d, 3-c, 4-c, 5-b, 6-d, 7-b, 8-b, 9-c, 10-b**