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| **Pokhara University**  **Faculty of Science and Technology** | |
| Course Code: CMP 221 (3 Credits) | Full Marks: 100 |
| Course Title: System Analysis and Project Management(3-0-1) | Pass Marks: 45 |
| Nature of the Course: Theory/Practical | Total Lectures: 48 hours |
| Level: Bachelor | Year: II / Semester: III | Program: Bachelor of Computer Application |

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| **1. Course Description:** | | |
| This course provides a comprehensive overview of the core elements of system analysis, design, implementation, and project management. Students will explore system concepts, the System Development Life Cycle (SDLC), and the critical role of system analysts. Key topics include requirements analysis techniques, system design principles, input/output and database design, as well as system architectures. Additionally, the course covers system implementation processes such as testing, documentation, and user training, while also delving into project management tools and techniques for effective planning, monitoring, and control. Through practical case studies, students will gain the skills necessary to apply these concepts in real-world scenarios. | | |
| **2. General Objectives**: | | |
| The general objectives of this course are to equip students with fundamental knowledge and skills in System Analysis, Design, and Project Management. By the end of the course, students will be able to:   1. To understand the fundamental concepts of systems, their characteristics, and the phases of the System Development Life Cycle (SDLC). 2. To apply various techniques for system requirements analysis, including fact-finding, modeling with Data Flow Diagrams (DFDs), Entity-Relationship Diagrams (ERDs), and use case modeling. 3. To understand the processes and challenges of system implementation, including testing, documentation, and providing user support. 4. To manage project effectively through scheduling, monitoring, controlling, and risk management to ensure successful project outcomes. | | |
| **3.** **Methods of Instructions:** | | |
| * Lecture and discussion * Practical * Demonstration * Presentation * Case study | | |
| **4. Course Contents:** | | |
| **Specific Objectives** | **Contents** | |
| **Unit 1: Introduction to System Analysis and Design 6 hours** | | |
| * Explain the fundamental concepts of systems analysis and design, and their importance in software systems. * Analyze the phases of the Systems Development Life Cycle (SDLC) and perform feasibility analysis. | 1.1 **Overview of System Analysis and Design**   * Introduction to system analysis and design concepts.   1.2 **Systems Development Life Cycle (SDLC)**   * Phases of SDLC: Planning, Analysis, Design, Implementation, and Maintenance. * Introduction to system requests and feasibility analysis (technical, economic, legal, and organizational).   1.3 **Role and Skills of the Systems Analyst**   * Introduction of programmer and system analyst * Skills and responsibilities of the systems analyst. * Characteristics of a system analyst * Interaction with stakeholders in system development projects. * The systems analyst as a bridge between technical teams and business stakeholders. | |
| **Unit 2. Project Management Fundamentals 12 hours** | | |
| * Apply project selection and planning techniques to initiate and plan a system project. * Utilize project management tools like Gantt charts, CPM, PERT, and EVM to monitor and control project activities.   **--Upto this** | 2.1 **Project Selection and Planning**   * Selection methodologies and criteria for project approval. * Project planning: time, schedule and cost.   2.2 **Project Methodologies**   * Traditional verses Agile methodologies. * Choosing the appropriate project management methodology.   2.3 **Managing and Controlling Projects**   * Managing scope, time, and resources. * Staffing and coordinating project activities. * Risk management strategies.   2.4 **Project Management Tools**   * Use of work breakdown structure (WBS), Gantt charts, Critical Path Method (CPM), and Program evaluation review technique (PERT). * Earned value management (EVM) and Key performance indicators (KPIs) for project monitoring and control. | |
| **Unit 3: Requirements Determination and Use Case Modeling 8 hours** | | |
| * Implement requirements gathering techniques such as JAD, interviews, and observation to define system requirements. * Develop use case diagrams and descriptions to capture functional system requirements. | 3.1 **Requirements Determination**   * Techniques for gathering requirements: Interviews, Joint Application Development (JAD), document analysis, and observation. * Developing the requirements definition statement.   3.2 **Use Case Analysis**   * Identifying use cases and creating use case diagrams. * Use cases as tools for capturing functional requirements, testing, and design | |
| **Unit 4: Process and Data Modeling 8 hours** | | |
| * Create Data Flow Diagrams (DFDs) and Entity-Relationship Diagrams (ERDs) to model business processes and data structures. * Validate and refine process and data models for accuracy and completeness. | 4.1 **Process Modeling**   * Creating Data Flow Diagrams (DFDs) to define business processes. * Levels of DFDs: Context diagrams, Level 0, and Level 1 DFDs. * Process description and validation of models.   4.2 **Data Modeling**   * Introduction to Entity-Relationship Diagrams (ERDs) for database modeling. * Elements of ERDs: Entities, attributes, relationships. * Creating and normalizing ERDs, and balancing ERDs with DFDs. * Data dictionary | |
| **Unit 5: System Design and Architecture** | | **8 hours** |
| * Design system architectures, including client-server and cloud-based systems, based on business requirements. * Apply user interface design principles to create and evaluate effective system interfaces. | 5.1 **Transition from Requirements to Design**   * Custom development vs packaged software vs outsourcing. * Developing system acquisition strategies based on business needs.   5.2 **System Architecture Design**   * Designing client-server architectures and multi-tiered systems. * Introduction to cloud architecture and its relevance to modern system design. * Operational, performance, and security considerations in architecture design.   5.3 **User Interface Design**   * Principles for effective UI design: Layout, aesthetics, consistency, and usability. * Prototyping and evaluating user interfaces. | |
| **Unit 6: Project Implementation and Post-Implementation Activities 6 hours** | | |
| * Coordinate programming, testing, and system migration strategies to ensure successful system implementation. * Conduct post-implementation reviews and manage ongoing system maintenance to meet organizational needs. | * 1. **Managing the Programming Process** * Coordinating programming tasks and managing schedules. * Testing strategies: Unit tests, integration tests, system tests, and acceptance tests.   1. **System Transition and Change Management** * Migration strategies: Direct, parallel, phased, and pilot conversions. * Managing user resistance, training, and change management.   1. **Post-Implementation Reviews and Maintenance** * Conducting post-implementation reviews and ensuring system support. * Ongoing system maintenance and updates. | |
| **5. Practical Works:**  The laboratory works should involve hands-on implementation and evaluation of concepts through unit-wise case studies, utilizing appropriate software tools. Students should work in groups to visualize and present their findings on systems analysis and project management.   1. Real-world application of systems analysis and project management concepts. 2. Hands-on experience with project management tools (Gantt charts, CPM, PERT) and modeling tools (DFDs, ERDs). 3. A comprehensive project involving system analysis, design, and management tasks. 4. Explore prototyping and methodologies such as RUP and CASE tools. | | |
| **6. Evaluation System and Students’ Responsibilities:** | | |
| **6.1 Evaluation System:** | | |
| In addition to the formal exam(s) conducted by the Office of the Controller of Examination of Pokhara University, the internal evaluation of a student may consist of class attendance, class participation, quizzes, assignments, presentations, written exams, etc. The tabular presentation of the evaluation system is as follows.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Internal Evaluation** | **Weight** | **Marks** | **External Evaluation** | **Marks** | | **Theory** |  | **30** | **Semester End examination** | **50** | | Attendance / Class Participation | 10% |  | | Assignments | 20% |  | | Project Work/Presentations | 10% |  | | Term Exam | 60% |  | | **Practical** |  | **20** | | Attendance and Lab Participation | 10% |  | | Lab Report | 20% |  | | Lab Examination | 40% |  | | Viva Examination | 30% |  | | **Total Internal Marks** |  | **50** | | **Full marks=50+50** | | | | | | | |
| **6.2 Students’ Responsibilities**: | | |
| To be eligible for the Semester End Examinations, each student must secure at least 45% marks in the internal evaluation with 80% attendance in the class to appear in the Semester End Examination. Failing to obtain such score will be given NOT QUALIFIED (NQ) and the student will not be eligible to appear in the End-Term examinations. Students are advised to attend all the classes and complete all the assignments within the specified time period. If a student does not attend the class(es), it is his/her sole responsibility to cover the topic(s) taught during the period. If a student fails to attend a formal exam, quiz, test, etc. there won’t be any provision for a re-exam. | | |
| **7. Prescribed Books and References:** | | |
| **Text Books**   1. Dennis, A., Wixom, B. H., & Roth, R. M. (2012). *System analysis and design*. John Wiley & Sons, Inc. <http://www.wiley.com/college/dennis> | | |
| **Reference Books**   1. Jeffery Whitten, Lonnie Bently, System Analysis Design Methods 7/E McGraw-Hill 2. J.F. George and J. S. Valacich, *Modern System Analysis and Design*, 8/E. Pearson Education Inc., 2017 3. J. Satzinger, R. Jackson and S. Burd, System Analysis and Design in a Changing World, 7/E, Cengage Learning, 2016s | | |