Las Positas CurricUNET LAS POSITAS COLLEGE

Las Positas College
3000 Campus Hill Drive
Livermore, CA 94551-7650
(925) 424-1000
(925) 443-0742 (Fax)

Course Outline for CIS 60

SYSTEMS ANALYSIS AND DESIGN

Effective: Spring 2003

I. CATALOG DESCRIPTION:
CIS 60 — SYSTEMS ANALYSIS AND DESIGN — 3.00 units

Principles of systems analysis’ techniques of analysis and design. This course will explore systems analysis and design from the early days of second generation systems development up to and including graphical user interface design and development (GUI). Exercises and case projects to develop knowledgeable use of the entire system development life cycle. Data gathering, problem solving, data flow diagrams, decision tables, pseudocode, database design and implementation, program coding and the use of Computer-Aided Software Engineering (CASE) tools.

3.00 Units Lecture

Prerequisite
CIS 55 - Integrating Office Applications
and

CIS 57 - Database Concepts
and

CIS 80 - Intro Prog/Basic/Visual Basic
or

CS 1 - Computing Fundamentals I

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	54.00
No Unit Value Lab	18.00
Total Hours:	72.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. CIS55
B. CIS57
C. CIS80
D. CS1

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. Systems Analysis
   1. Gather data to identify client requirements;
   2. Interpret and evaluate requirements for completeness, relevance, accuracy, and consistency;
   3. Identify time, technology and resource constraints;
   4. Resolve conflicts between requirements and constraints, and negotiate resolution with client;
   5. Develop high-level systems and functional specifications;
   6. Perform data flow, event analysis and object modeling;
   7. Develop concepts including alternatives and prepare a cost/benefit estimate for each option;
   8. Identify risks and their impact on the overall project;
   9. Define general scope of work to meet requirements and constraints;
   10. Establish measurable performance requirements;
   11. Develop business process and logical data model.

B. Systems Design
   1. Specify major subsystems and interfaces;

2. Perform feasibility studies of design alternatives;
3. Prepare and conduct design reviews.

C. Database Design
1. Explain database design concepts and the role of database components;
2. Model data and design database structure;
3. Explain the use of databases and information in the business environment.

D. Technical Documentation
1. Write in a concise and precise form appropriate for technical documentation;
2. Explain and use the processes and techniques of technical documentation;
3. Record system specifications accurately and completely;
4. Prepare materials written to convey specific technical problems, their related issues, and their solutions;
5. Adhere to documentation industry and organization guidelines and standards
6. Document design changes as they are adopted;
7. Create and update documentation through all phases of the systems life cycle;
8. Accurately document strengths and weaknesses of the system.

E. Testing and Debugging
1. Select debugging and testing methodology, and develop comprehensive and systematic test plan

F. User Interface Design
1. Define the requirements for the user interface;
2. Define candidate solutions to business problem, and select best approach with client;
3. Develop user interface schema to meet user requirements.

G. Problem Solving
1. Recognize a wide range of problems, and assess their impact on the system;
2. Use a wide range of troubleshooting methods and tools to isolate problems;
3. Select the appropriate approach to identify causes of the problem based on the given situation;
4. Perform systematic analysis to identify problem causes using the best available tools and processes;
5. Listen for input and ask critical questions to identify the problem and its probable causes;
6. Identify, develop and test potential solutions, and develop resolution plan;
7. Identify the potential risks in implementation, assess the cost/benefit of implementation alternatives (including non-implementation), and make recommendations;
8. Communicate and implement solution in a manner that minimizes risk and disruption to productivity;
9. Document and communicate problem, analysis and resolution process, solution and outcome;

H. User Validation
1. Develop a usability test plan that meets the goals and scope of the project, and company policies;
2. Define the target audience, the feedback process, the testing procedure and the test sample population for each series of tests;
3. Assess overall product effectiveness and performances, and perform summative evaluation.

V. CONTENT:

A. Introduction to the Analysis & Design Process
1. The importance of planning, analysis, requirements definition
2. Structured versus traditional versus O/O development
3. Productivity and the structured approach
4. The project and systems life cycle: Phase and deliverables
5. Tools and techniques of structured systems development

B. Systems Initiation and Planning
1. Organizational systems: Goals and objectives
2. Gathering and analyzing problems, opportunities and issues
3. Context and entity diagrams: Defining systems scope, objectives and identifying functions
4. Systems success through user/client involvement
5. Team development and applied walkthroughs

C. Analysis: Tools and Techniques
1. Organizational analysis: Formal and informal
2. Understanding existing and new system
3. Analyzing and defining functions: Interviews, questionnaires, level 0
4. Data flow and analysis diagrams
5. Warnier diagrams: Notation and logical operators

D. Requirements analysis and definition
1. The different types, levels and perspectives of requirements
2. Functional and non-functional requirements
3. How to identify and define requirements and constraints: Input, process and outputs

VI. METHODS OF INSTRUCTION:

A. **Lecture** -
B. **Lab** - Assignments
C. Optional: System analysis and design project completed in teams
D. **Discussion** -
E. **Demonstration** -

VII. TYPICAL ASSIGNMENTS:

A. Homework and lab programming assignments will be given throughout the course, each to be awarded points. At the student’s option, a project may be completed in lieu of some small assignments. B. Homework includes 1. Reading assignments a. Technical writing and system design activities i. You work in the circulation department for a magazine. The magazine’s IS department prints a monthly report showing the current number of subscribers in each ZIP code. One of your tasks each month is to calculate the total number of users for the current month and enter the total into a worksheet. You then create a line chart showing the increase or decrease in total subscribers for the current year. It currently takes you four hours each month to complete this task. Write a one-page report that defines the problem, identify and describe two possible solutions to the problem, and recommend a solution.

VIII. EVALUATION:

A. **Methods**
1. Exams/Tests
2. Quizzes
3. Group Projects
4. Home Work
5. Other:
   a. Methods

1. All assignments are evaluated on correctness, completeness, timely submission, documentation (both internal and external), style, structure, testing, and reporting of results.
2. Written homework
3. Group project(s)
4. Exams and/or quizzes
5. Final examination – proctored on campus

B. **Frequency**

1. Frequency of Evaluation
   a. Recommend 2 or 3 quizzes/exams plus final examination
   b. Recommend assignments to cover each topic within course content. Contents can be combined.
2. Types of Exam Questions
   a. Identify the different phases of the software Life-Cycle.
   b. Identify the different deliverables of the software Life-Cycle.
   c. Create a table that shows the differences between unit testing, integration testing, system testing, and acceptance testing. Your table should show the purpose of the test, what is tested, and the phase of the system development life cycle in which it is tested.

IX. TYPICAL TEXTS:

1. Whitten, Jeffrey I. And Lonnie D *Systems Analysis and Design Methods.* 4th ed., Bentley Irwin McGraw-Hill, 0.
2. Shelly, Cashman, and Rosenblatt *Systems Analysis and Design.* 4th ed., Course Technology, 2000.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Access to a word processor, such as Microsoft Word
B. Software that can be used to draw analysis diagrams is invaluable. Visio is ideal, but the Microsoft Office Suite drawing tools are adequate.
C. Computer Lab Supplies Certificate.