SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: SYSTEM PROTOTYPING AND PRESENTATION I

Code No.: EDP 307-6

Program: COMPUTER PROGRAMMER/ANALYST

Semester: FIVE

Date: SEPTEMBER, 1985

Author: BOB LAILEY

NEW: _____ REVISION: X

APPROVED: _____ DATE: 85-09-09
Chairperson Date

EDUCATIONAL GOAL

To prepare the future professional programmer/analyst for their role in the analysis and design of information systems including project planning and control. This is not a programming course. It is an in-depth study of the thought process, tools and techniques used to analyze Business Problems which may or may not lead to computerized solutions. The emphasis is on th management/user perspective rather than the technical aspects.

OVERVIEW

This course follows the Structured Design process through the following stages
- Problem Definition (Initiation)
- Feasibility
- Analysis
- System Desi
- Detail Design
- Implementation & Maintenance

Developing methodologies, tools and techniques such as;
- The System Life Cycle
- The Statement of Scope and Objectives
- Data & System Flow Diagrams
- System Prototyping
- Data Dictionaries
- IPO and Hierarchy Charts
- Logic Structure Charts
- Cost/Benefit Analysis
- File, Form, Screen and Report Design

Stressing creative thinking, problem solving, communication, project planning and control through;
- Brainstorming Sessions
- Interviews
- The Inspection
- The Management Review (Presentation)
- The Walkthrough
- Alternative Solutions and Recommendations
- PERT and CPM
- Gantt Charts.

STUDENT EVALUATION

Chapter Quizzes	10%
Tests	40%
Written Reports	20%
Oral Presentations	20%
Participation	10%

STUDENT GRADING

A	80 - 100
B	70 - 79
C	55 - 69
R	0 - 54

TEXTBOOK

SYSTEM ANALYSIS AND DESIGN - A Structured Approach
By William S. Davis - Addison Wesley

STUDENT RESPONSIBILITIES AND EVALUATION CRITERIA

A session is a 2-hour class usually half lecture and demonstration, hal discussion and application.

Some classes will be mini-presentations, ie. Inspections, Management Reviews and Walkthroughs.

You must have assignments and required reading fully completed befor class to fully benefit from and participate in discussions and mini presentations.

There will be quizzes throughout the semester with little or no warning based on the specific learning objectives attached.

There will be two or three tests through the term, depending on the schedule, each lasting two hours.

You will conduct a parallel Analysis & Design in an area of your choice Most of the work will be done outside class using methodologies, tools and techniques learned in class. The instructor will serve as management; reviewing progress, authorizing funds & deadlines, making go/no go decisions and alternative selection based on your documentation and presentations.

A final written report (a compilation of all relevant documentation) will be handed in. An oral presentation of entire project will be made to the rest of the class and will also be graded.

*** The semester schedule is tentative and may change to meet student needs **

****NOTE**** For 1985 only, emphasis on some tools will be reduced in order to allow students an opportunity to be introduced to "Powerhouse" on the VAX and "DBASE III" on the IBM PC's. Students in later years will have had this exposure in semester 4.

English 325 is a co-requisite of this course.

SEMESTER SCHEDULE

SESSION	REFERENCE	TOPIC
1		Course Outline, Admin.
2	Chapter 1	Structured Systems Analysis & Design Overview
3	" "	plus Module A - Inspections & Walkthroughs
		CASE STUDY A - THE PRINT SHOP
4	Chapter 2	Problem Definition
		plus Module B - Interviewing
5	Chapter 3	The Feasibility Study
6	" "	plus Module C - The Feasibility Study
7	" "	plus Module D - Data Flow Diagrams
	" "	" " " " " "
8	" "	plus Module E - Data Dictionaries
9	" "	plus Module F - System Flow Diagrams
10	" "	plus Module G - Cost/Benefit Analysis
11	Chapter 4	Analysis
12	" "	" "
13	" "	" "
14	Chapter 5	System Design
15	" "	" "
16	" "	plus Module L - PERT and CPM
17	Chapter 6	Detailed Design
18	" "	plus Module H - HIPO & Structured English
19	" "	plus Module I - Pseudocode
20	" "	plus Module J - Logic Flow Diagrams
21	Chapter 7	Implementation & Mtce
		Summary
22		* TEST * (MID-OCTOBER)
		CASE STUDY B - A SMALL BUSINESS SYSTEM
23	Chapter 8	Problem Definition
	Chapter 9	The Feasibility Study
24	Chapter 10	Analysis
25	" "	" "
26	Chapter 11	System Design
27	Chapter 12	Detailed Design
28	Chapter 13	Implementation & Mtce
29		Summary
30		* TEST * (MID-NOVEMBER)
31-45	***	Presentations of Outside Projects

SPECIFIC LEARNING OBJECTIVES

UPON COMPLETING THE MATERIAL IN EACH CHAPTER AND ASSOCIATED MODULES THE STUDENT IS RESPONSIBLE FOR THE ACTIVITIES LISTED FOR THAT CHAPTER.

Chapter 1 - Structured Systems Analysis and Design

1. Complete the exercises at the end of the chapter.
2. Formally define the term system.
3. Explain, generally, what a systems analyst does and why systems analysis is necessary.
4. Explain why a methodical approach is important in designing complex systems.
5. List the steps in the system life cycle.
6. State the objective of each step in the system life cycle.
7. List the exit criteria for each step in the system life cycle.
8. Distinguish, conceptually, between logical and physical design.
9. Clearly distinguish the process of systems analysis and design from the tools of the analyst.

Chapter 2 - Case A: Problem Definition

1. Complete the exercises at the end of the chapter.
2. Explain what is meant by a project's scope.
3. Explain what is meant by a project's objectives.
4. Explain why a sense of both scope and objectives is essential early in the project.
5. Given a reasonable description of a single, non-integrated problem, develo a statement of scope and objectives.

Chapter 3 - Case A: The Feasibility Study

1. Complete the exercises at the end of the chapter.
2. List the steps in a typical feasibility study.
3. Prepare a system flow diagram to document an existing (single application) system.
4. Use a data flow diagram to model a simple logical system.
5. Use automation boundaries on a data flow diagram, check lists, and other techniques to generate alternative physical solutions to a problem.
6. Given a set of development costs and operating costs, a discount rate, and a project life, compute net present value and a payback period, and estimate the internal rate of return.
7. Prepare a feasibility study report for a simple (single application) problem.
8. Explain the need to balance scope and objectives.
9. Distinguish technical, operational, and economic feasibility.

SPECIFIC LEARNING OBJECTIVES...CONT'D

Chapter 4 - Case A: Analysis

1. Complete the exercises at the end of the chapter.
2. Clearly define the objectives of analysis.
3. Given a high-level data flow diagram and a list of data elements, trace each data element from its destination to its source, identifying needed algorithms and other data elements.
4. Given a list of data elements, prepare a preliminary data dictionary.
5. Explain the purpose of a black box.
6. Given an English-language description of an algorithm, prepare a black box description.
7. Explain the spiral nature of structured analysis and design.
8. Given a high-level data flow diagram and an English-language description of its functions, explode the data flow diagram to a lower level.
9. Explain the importance of formal exit criteria.
10. Describe a typical inspection. Explain the purpose of an inspection.
11. Explain the purpose of a management review.

Chapter 5 - Case A: System Design

1. Complete the exercises at the end of the chapter.
2. Clearly state the purpose of system design.
3. Describe the system design exit criteria.
4. Given a data flow diagram and the timing requirements of each process, define reasonable automation boundaries, and use these automation boundaries to generate alternative physical solutions.
5. Given a data flow diagram with automation boundaries and/or a verbal description of the physical components of a system, draw a reasonable system flow diagram
6. Given a system flow diagram, compile a list of physical system components.
7. Given a series of annual benefits, a development cost, and a discount rate, compute net present value and the payback period, and estimate the internal rate of return.
8. Given estimated implementation times for the various components of a system, develop an implementation schedule.
9. Conduct or participate in a formal inspection.

Chapter 6 - Case A: Detailed Design

1. complete the exercises at the end of the chapter.
2. Given a data dictionary and a system flow diagram, prepare data structures for the various files accessed by a given program.
3. Explain why detailed design should start with the data.
4. Explain why test data are so important.
5. Given an exploded data flow diagram, prepare a high-level hierarchy chart.

SPECIFIC LEARNING OBJECTIVES...CONT'D

Chapter 6 - Case A: Detailed Design (Cont'd)

6. Explain the process of functional decomposition.
7. Given a high level hierarchy chart for a common program (such as payroll). functionally decompose the logic.
8. Given a hierarchy chart containing well-defined module blocks, prepare a set of IPO charts.
9. Define the term cohesion.
10. Given a hierarchy chart and a set of IPO charts, evaluate the cohesion of selected modules.
11. Explain coupling.
12. Given a hierarchy chart and a set of IPO charts, evaluate the coupling of selected modules.
13. Given a hierarchy chart and a set of IPO charts, prepare a structure chart
14. Conduct or participate in an inspection of detailed design exit criteria.

Chapter 7 - Implementation and Maintenance

1. Complete the exercises at the end of the chapter.
2. Briefly explain the benefits of structured programming.
3. Explain why documentation is important.
4. Explain how a step-by-step to approach implementing a program helps to simplify program debug.
5. Describe a structured walkthrough.
6. Participate in a structured walkthrough.
7. Describe a system test.
8. Describe a parallel run.
9. Explain why training is so important.
10. Discuss the maintenance stage of the system life cycle.

Chapter 8 - Case B: Problem Definition

Same as Chapter 2
Differences will be found in exercises at end of chapter.

Chapter 9 - Case B: The Feasibility Study

Same as Chapter 3
Differences will be found in exercises at end of chapter...plus

1. Observe a relatively simple system in operation, collect data to describe this system, and use a system flowchart to summarize these data.
2. Given a system flow diagram and/or a verbal description of a process or a procedure, prepare a data flow diagram to represent the key functions.
3. Clearly distinguish the need to understand the present system from the natural tendency to document it.
4. Given a set of development costs, operating costs, and cost savings, prepare a cost/benefit analysis, computing net present value, a payback period, and and internal rate of return.

SPECIFIC LEARNING OBJECTIVES...CONT'D

Chapter 10 - Case B: Analysis

Same as Chapter 4
Differences will be found in exercises at end of chapter...plus

1. Given a data flow diagram and a preliminary data dictionary for a well-understood system, trace each data element to its source, identifying needed algorithms and subsequent data elements.
2. Given a high-level data flow diagram of a well-understood system, explode it to a lower level of detail.
3. Explain, in response to an essay question, the process of exploding a data diagram.

Chapter 11 - Case B: System Design

Same as Chapter 5
Differences will be found in exercises at end of chapter...plus

1. Given a complete data flow diagram for a well-understood system, develop a reasonable set of alternative physical solutions.
2. Given the estimated development costs, operating costs, and benefits for each of several alternative solutions, perform a comparative cost/benefit analysis.
3. Explain, in response to an essay question, the quandry facing the analyst and the doctor in this case study.

Chapter 12 - Case B: Detailed Design

Same as Chapter 6
Differences will be found in exercises at end of chapter...plus

1. Understand that not all systems require the writing of original programs

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Chapter 13 - Case B: Implementation and Maintenance

Same as Chapter 7
Differences will be found in exercises at end of chapter...plus

1. Explain the responsibilities of the systems analyst just before and just after a turnkey system is installed.
2. Briefly explain an analyst's training responsibility.
