SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: SYSTEM PROTOTYPING AND PRESENTATION

Code No.: EDP317-6

Program: COMPUTER PROGRAMMER/ANALYST

Semester: SIX

Date: JANUARY, 1985

Author: LINDA SHARP

NEW: X REVISION: _____

APPROVED: _____ DATE: 85.01.25
Chairperson Date

SYSTEM PROTOTYPING & PRESENTATION EDP317-

EDUCATIONAL GOALS

This course is designed to:

prepare the future professional programmer/analyst for their role in the analysis and design of information systems;

continue the study of system development started in EDP316, SYSTEM DESIGN AND PRESENTATION, emphasizing Prototyping as an effective enhancement to the analysis process;

give the student a working knowledge of a 4th generation language.

OVERVIEW

PROTOTYPING is USER-INVOLVED system development, an enhancement to the traditional system development process. Operational, working systems are created virtually on a real-time basis. That is, a transition is made directly from user requests to computerized implementation of a system that complies with this request. This is done with powerful application software development tools that make it possible to create all of the files and processing programs needed for a business application in a matter of days, perhaps even hours.

A PROTOTYPE is, in fact, a working system. It can be developed quickly and inexpensively - given the necessary software tools. Prototypes are built iteratively. Basic requirements are identified and implemented quickly. Then, the prototype is used, requirements are modified, and the process is repeated. The result may serve as the primary statement of new system requirements in the analysis and general design phase of the system development life cycle, or it may be accepted as the new system itself.

This course consists of two one hour lectures and two two hour labs.

In the lectures, a prototyping case study for an online information system is followed from start to finish.

In the labs, a 4th generation language (data management system) is investigate and used to develop prototypes. The language used is POWERHOUSE. The study begins with a low level walkthru of the tool, using the PRIMER and then the features of POWERHOUSE are investigated in more depth and ends with the development and presentation of working prototypes.

SYSTEM PROTOTYPING & PRESENTATION EDP317-

STUDENT RESPONSIBILITIES AND EVALUATION CRITERIA

You must have Assignments and required reading fully completed before clas 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.

*** The semester schedule is tentative and may change to meet student needs **
A SESSION is a 1-hour lecture or a 2-hour lab. 16 sessions are accounted for on topic schedule allowing time for assignments and tests as there are 24 sessions in the semester (12 weeks/2 sessions per week).

STUDENT EVALUATION		STUDENT GRADING	
Tests & Quizzes	50%	A	85 -100
Assignments	20%	B	75 - 84
Presentations	20%	C	60 - 74
Participation	10%	R	0 - 59

TEXTBOOK AND MATERIALS

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

HOW TO DEVELOP BUSINESS APPLICATIONS WITH POWERHOUSE
A PowerHouse Primer for VAX/VMS - Cognos
PowerHouse Dictionary - Reference Card - Cognos
PowerHouse Quick - Reference Card - Cognos

PowerHouse Manuals - available for reference in Work Room

SYSTEM PROTOTYPING & PRESENTATION EDP317-

SEMESTER LECTURE SCHEDULE

SESSION	REFERENCE	TOPIC
1		Course Outline, Admin.
2	Chapter 1	Structured Systems Analysis & Design Overview
		CASE STUDY C - AN ONLINE SYSTEM
3	Chapter 14	Problem Definition
4	Chapter 15	The Feasibility Study
5	" "	" " "
6	Chapter 16	Analysis
7	" "	" "
8	Chapter 17	System Design
9	" "	plus Module L - PERT and CPM
10		Summary
11	Chapter 18	Detailed Design
12	" "	plus Module M - File Design & Space Estimates
13	" "	plus Module N - Forms & Reports
14	Chapter 19	Implementation
15	" "	Maintenance
16		Summary

SEMESTER LAB SCHEDULE

SESSION	REFERENCE	TOPIC
1	Primer	Introduction to the Dictionary
2	" "	" " to QUICK
3	" "	" " to QUIZ
4	Manuals	More QUIZ
		- SELECT, SORT statements
		- CHOOSE statement
5		- Multi-File Access
6		- producing reports
		- element formatting
		- PAGE HEADING, PAGE FOOTING statements
7		- Temporary items
		- Define statement
		- defining string, numeric, & date data
8	Manuals	Introduction to QTP
9		- REQUEST, ACCESS, & OUTPUT statements
10		- ITEM, SELECT, & SUB FILE statements
		- EDIT & SORT statements
11		- adding, updating, deleting
12		- EDIT statement (LOOKUP options)
		- ITEM statements (INITIAL, FINAL, SUBTOTAL options)
13		- OUTPUT statement (IF, VIA, USING options)
14		More on QUICK
15		- SCREEN, FILE, TITLE, GNERATE, BUILD statements
16		- How to use Q DESIGN & QUICK

SYSTEM PROTOTYPING & PRESENTATION EDP317-

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 14 - Case C: 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, develc a statement of scope and objectives.
6. Given a summary of preliminary ideas for a large project (similar to the one on pages 178,179), extract the relevant information and prepare a statement of scope and objectives.

Chapter 15 - Case C: 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.
10. Explain, in response to an essay question, why a system's scope and objectives must be in balance
12. Explain the objectives of a prototype.

SPECIFIC LEARNING OBJECTIVES...CONT'D

Chapter 16 - Case C: 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.
12. Discuss, in response to an essay question, the unique problems associated with group analysis and design.

Chapter 17 - Case C: 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 boudaries 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.
10. Explain, in response to an essay question, why a prototype must be planned within the context of a complete system design.
12. Given a system flowchart for a well-understood system, prepare a list of physical components.
13. Given the list of components from objective 3, select and functionally decompose one or more well understood programs, compiling a list of functions.
14. Given a list of functions for a well-understood program, estimate the program cost using a reasonable lines-of-code standard.
15. Given a set of cost estimates for the functions comprising a program (perhaps in priority order) and a limit on the program's cost, identify the funcitonal modules that might economically be included in the finished product.
16. Describe, in response to an essay question, the process of selecting the functional components to be included in a prototype.

SYSTEM PROTOTYPING & PRESENTATION EDP317-6

SPECIFIC LEARNING OBJECTIVES...CONT'D

Chapter 18 - Case C: 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.
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 hirarchy chart and a set of IPO charts, prepare a structure chart.
14. Conduct or participate in an inspection of detailed design exit criteria.
15. Explain, in response to an essay question, why it is so important to have a common model on which to base the design of each module in a large, complex system such as the games and recreation system.
16. Relate, in response to an essay question, the concepts of cohesion and coupling to the general problem of program design, and explain how a structure chart can help to evaluate a design's cohesion and/or coupling.
17. Design a screen format, and translate it to source code.

Chapter 19 - Case C: 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.
11 In response to an essay question, briefly explain why adding personnel to an already late project can make matter worse.