SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Outline: SYSTEM ANALYSIS AND DESIGN

Code No.: EDP 108 - 4

Program: BUSINESS PROGRAMMER

Semester: 3

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Chairperson Date

SYSTEM ANALYSIS & DESIGN — Course Name

EDP108 — Course Number

CURRICULUM OVERVIEW:

a) Course Name: Systems Analysis and Design
Course #: EDP108
Semester: III

b) Prerequisites: EDP100

c) Course Synopsis:

The course is based on the theory that all "systems" follow the same organizational rules and are basically subject to the same methods of analysis. Once the student has mastered the technique of analysis in one subject area, the knowledge is easily applied to solve other syste problems in other areas. The course will focus on converting manual operations into a computer based system. The majority of time will be spent oln analyzing the traditional life cycle methodology to solving business problems and conclude with some present trends and future directions of the science of System Analysis and Design.

Course Role Within the Program:

The course will prepare the student to design and implement large computer-based systems in a team environment. The student will utilize these skills of analyzing, designing, and implementing systems throughout all courses they are taking.

d) Textbook: "Systems Analysis and Design Methods" by Whitten, Bentley, and Ho

e) Module Description:

Module 1: Systems Analysis and Design, Concepts, Philosophies, and Trends

OBJECTIVES:

Students should be able to:

1. Define the systems analyst's role and responsibilities in a typical organization.
2. Define systems analysis, systems design, and systems implementation -- the three principle activities performed by the analyst.
3. Differentiate between a systems analyst, a programmer/analyst, and an information analyst.
4. Differentiate between the types of work done by the systems analyst and the computer programmer.
5. Describe how the systems analyst fits into the data processing function.
6. Develop a plan of study for your education or continuing education that will prepare you for a career as a systems analyst.
7. Define "information system".
8. Identify knowledge workers in an organization system or subsystem and characterize them as clerical and service staff, supervisory staff, middle-management and professional staff, or executive-management.
9. Describe how an information system serves knowledge workers.
10. Using the suprasystem/system/subsystem concept, explain the relationship between the business system, information system, computer system, and knowledge workers.
11. Describe the mission of a business by defining the purpose, goals, objectives, and polities for a simple business subsystem.
12. Explain the relationships between data, information, input, processing and output, and give examples of each item.
13. Recognize, describe, and give examples of the following three types of information support an information system can provide to knowledge workers: transaction processing, management reporting, and decision support.
14. Recognize, describe, and give examples of the input, process, and output components of an information system, including data, information, knowledge workers, methods and procedures, data storage, hardware, software, and internal controls.

15. Describe the importance of keeping up with information system trends and explain several current trends in modern information systems.

16. Describe where information systems development projects come from.

17. Describe a typical information systems problem in terms of its performance, information, economic, control, efficiency, and service implications.

18. Explain, by example, three serious problems that often prevent successful information systems development.

19. Use seven fundamental principles of problem solving and describe their relevance to system development.

20. Apply a problem-solving approach to identify the phases of a system development life cycle.

21. For each phase in our system development life cycle,
    a) describe the purpose of that phase
    b) describe the inputs and outputs of that phase

22. Describe three false phases found in many life cycles and suggest how those activities should be incorporated into the life cycle.

23. Compare and contrast alternative implementations of the system development life cycle.

24. Differentiate between systems analysis, systems design, and systems implementation.

25. Differentiate between the system development life cycle and a system development methodology, and describe three different types of methodologies.

Module 2: Systems Analysis Tools and Techniques:

1. Define "systems analysis" and relate the term to the survey, study, definition, and evaluation phases of the life cycle.

2. Describe the survey, study, definition, and evaluation phases of the life cycle in terms of:
    a) purpose and objectives
    b) tasks or activities that must or may be performed
    c) skills you need to master to properly perform the phase

3. Describe the relationship between the systems analysis phases and cost/benefit analysis.

4. Explain how the time spent on systems analysis can be managed.

5. Factor a system into component subsystems, functions, and tasks and depict its structure using a hierarchy chart.

6. Document the interfaces between subsystems, functions, and tasks using a data flow diagram.

7. Describe how data flow diagrams document an information system and how they can be used during the systems analysis phases.

8. Develop a set of leveled data flow diagrams for an existing or proposed information system.

9. Differentiate between physical and logical data flow diagrams and explain when to use each.

10. Describe the need for a systems data dictionary, its contents, and its value as a documentation tool.

11. Define the contents of dat flows and data stores in terms of restricted data structures that consist of data elements.

12. Create complete data dictionary entries for data flows and data stores. These entries should include pertinent facts about terminology, properties, and content.

13. Create complete data dictionary entries for data elements. These entries should include pertinent facts about terminology, properties, and values (ranges).

14. Analyze and define a code for a data element.

15. Organize, implement, and present a systems data dictionary.

16. Differentiate between a policy and a procedure.

17. Describe some of the typical problems encountered in documenting procedures, and explain the ambiguities of ordinary English as a policy and procedure specification tool.

18. Construct a decision table to describe a policy in terms of conditions and actions to be taken under various combinations of conditions.

19. Use Structured English to write procedure specifications.

20. Explain why decision tables and Structured English documentation are useful in performing systems analysis.

Module 3: Systems Design and Implementation: Tools & Techniques:

1. Define systems design and relate the term to the design and selection phases of the life cycle.
2. Describe the design and selection phases in terms of:
   a) purpose and objectives
   b) tasks and activities that must or may be performed
   c) skills you must master to perform the phase properly
3. Describe the continued importance of cost/benefit analysis during the systems design phases.
4. Explain how the time spent on systems design can be managed.
5. Define the appropriate format and media for a computer output.
6. Differentiate between internal, external, and turnaround outputs.
7. Apply human factors to the design of compute outputs.
8. Design internal controls into computer outputs.
9. Identify data flows on the DFD that must be designed as computer outputs.
10. Define output design requirements, and record those requirements in an expanded data dictionary format.
11. Use printer spacing charts and display layout charts to format internal and external computer outputs.
12. Define the appropriate input method and medium alternative for a computer input.
13. Apply human factors to the design of computer inputs.
14. Design internal controls into computer outputs.
15. Identify data flows on the BDFD (bounded data flow diagram) that must be designed as computer inputs.
16. Define input design requirements, and use an expanded data dictionary format to record them.

17. Design a source document for data capture.

18. Use input record layout charts and display layout charts to format batch and on-line computer inputs.

19. Detemine which features on the available display terminal(s) can be used for effective terminal dialogue design.

20. Identify the type(s) of users who will use an on-line system.

21. Design or evaluate the human engineering in a terminal dialogue for a typical information system.

22. Apply appropriate terminal dialogue strategies to an on-line information system.

23. Use a dialogue chart to plan and coordinate a terminal dialogue for an on-line information system.

24. Differentiate between batch, on-line, remote batch, and distributed methods of data processing.

25. Describe the general procedures required to implement each of the data processing methods just listed.

26. Define and design methods and procedures for internal controls, including backup and recovery.

27. Explain ow systems flowcharts are used for systems design and how they relate to the tools you learned in Chapters 11 through 14.

28. Read, prepare, and present systems flowcharts describing typical data processing methods and procedures. (Systems flowcharts should conform to guidelines to enhance their communication value to both technical and nontechnical audiences).

29. Factor a program into manageable program modules around which complete specifications can be organized.

30. Use the IPO model to characterize the programmer's specification needs.

31. Define systems implementation and relate the term to the construction and delivery phases of the life cycle.

32. Describe the construction and delivery phases of the life cycle in terms of:
    a) purpose and objectives
    b) each dimension of the information system pyramid
    c) tasks and activities that must or may be performed
    d) skills you need to master to properly perform the phase

33. Explain how the time spent on systems implementation can be managed.

STUDENT EVALUATION:

a) The student's final grade will be determined from the following components:

Tests (3 @ 20)	=	60%
Assignments (7 @ 4)	=	28%
Presentation	=	7%
Participation/Attitude	=	5%
		100%

b) **Grading:**

"A+"	=	90 - 100%
"A"	=	80 - 89%
"B"	=	70 - 79%
"C"	=	55 - 69%
"R"	=	0 - 54%

NOTE: Students are expected to attend class regularly and to participate in class discussions. Late assignments are subject to a zero grade unless the student has **PRIOR** permission to hand the assignment in at a later date from the instructor. Students will be prepared to discuss chapter questions that will be collected and marked on a random basis. **There will be no re-writes in this course.**