SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: SYSTEMS ANALYSIS AND DESIGN

CODE NO. EDP108

PROGRAM BUSINESS PROGRAMMER

SEMESTER THREE

DATE SEPTEMBER, 1993

AUTHOR FRAN DEW

NEW ___ REVISION X

APPROVED Rose M. Lucas 93/09/01

CHAIRPERSON DATE

SYSTEMS ANALYSIS AND DESIGN — COURSE NAME

EDP108 — CODE NO.

Total credit time: 60 hours

Prerequisites: EDP100

I PHILOSOPHY/GOALS:

This course introduces the student to the total information system environment and to the analysis and design of information system development. Students will make a systems presentation of a typical information system.

II STUDENT PERFORMANCE OBJECTIVES:

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

1. understand the concepts, philosophies and trends of Systems Analysis and Design

2. develop skills in use of Systems Analysis tools and techniques

3. develop skills in use of Systems Design tools and techniques

III TOPICS TO BE COVERED

1. The Information Systems Analyst
2. The Business and its Users as a System
3. Modern Information Systems
4. A Systems Development Life Cycle
5. The Structured Methodology
6. How to Analyze an Information System: A Problem-Solving Approach
7. Process Modeling with Physical Data Flow Diagrams
8. Data Modeling with Logical Entity Relationship Diagrams
9. Process Modeling with Logical Data Flow Diagrams
10. Defining Logical Data and Information Requirements in a Project Dictionary
11. Defining Logical Policies and Procedures in a Project Dictionary
12. How to Design an Information System: Traditional and Prototyping Approaches
13. Designing Conventional Computer Files and Controls
14. Project Management Tools and Techniques
15. Fact-Finding Techniques
16. Communication Skills for the Systems Analyst

17. Feasibility and Cost-Benefit Analysis Tools and Techniques
18. Introduction to Computer Assisted Systems Engineering (CASE), using Excelerator

IV LEARNING ACTIVITIES

1. The Information Systems Analyst
   Upon successful completion of this unit, the student will be able to
   a define the system analyst's role and responsibilities in a typical organization
   b differentiate between the types of work done by a Systems Analyst and a Computer Programmer

2. The Business and its Users as a System
   Upon successful completion of this unit, the student will be able to
   a describe information system
   b describe end-users, and their interaction with business systems, information systems and computer systems

3. Modern Information Systems
   Upon successful completion of this unit, the student will be able to
   a describe the interaction among data, information, input, processing and output
   b explain transaction processing, management reporting and decision support
   c describe and illustrate information system components, including data, information, end-users, methods and procedures, data storage, hardware, software and internal controls

4. A Systems Development Life Cycle
   Upon successful completion of this unit, the student will be able to
   a explain six basic principles of systems development
   b discuss origins of systems development projects
   c identify and explain systems development phases, including the purpose, input and output for each phase
   d discuss overlapping activities of the life cycle

SYSTEMS ANALYSIS AND DESIGN — COURSE NAME
EDP108 — CODE NO.

5. The Structured Methodology
Upon successful completion of this unit, the student will be able to
   a describe, compare and contrast process modeling, data modeling and working modeling methodologies
   b describe computer tools used with systems development
   c explain desirability of using a combination of methodologies, instead of using one methodology

6. How to Analyze an Information System: A Problem-Solving Approach
Upon successful completion of this unit, the student will be able to
   a define systems analysis and relate the term to the survey, study, definition, and selection phases of the life cycle
   b analyze the survey, study, definition, and selection phases of the life cycle
   c describe systems analysis in terms of problem solving
   d describe the roles of fact-finding, interpersonal communications and cost-benefit analysis in systems analysis

7. Process Modeling with Physical Data Flow Diagrams
Upon successful completion of this unit, the student will be able to
   a use physical data flow diagrams to document data flow, showing what a system does, and how it is currently implemented
   b describe the uses of data flow diagrams
   c explode data flow diagrams into subsystems

8. Data Modeling with Logical Entity Relationship Diagrams
Upon successful completion of this unit, the student will be able to
   a define and explain data modeling
   b identify data elements, and draw entity relationship diagrams
   c identify the data elements describing each data entity
   d explain the need to analyze an entity relationship data model for simplicity, redundancy and flexibility
   e modify an entity relationship data model into third normal form, using data analysis

9. Process Modeling with Logical Data Flow Diagrams
Upon successful completion of this unit, the student will be able to
   a distinguish between logical and physical data flow diagrams (DFDs)
   b factor a system into component subsystems, functions and tasks, depicting its structure with a decomposition diagram
   c document the interaction among subsystems, functions and tasks using logical data flow diagrams
   d develop data flow diagrams for an information system
   e explain the relationship between logical entity relationship diagrams and logical data flow diagrams

10. Defining Logical Data and Information Requirements in a Project Dictionary
Upon successful completion of this unit, the student will be able to
   a describe the need for a project dictionary
   b define the contents of data entities, data flows and data stores in terms of restricted data structures consisting of data elements
   c create complete project dictionary entries for data entities, data flows, data stores, data elements and codes for data elements

11. Defining Logical Policies and Procedures in a Project Dictionary
Upon successful completion of this unit, the student will be able to
   a differentiate between a policy and a procedure
   b describe problems encountered in documenting procedures, particulary with the English language
   c construct a decision table, describing policies in terms of conditions and actions
   d write procedure specifications using structured English

SYSTEMS ANALYSIS AND DESIGN — EDP108
COURSE NAME — CODE NO.

12. How to Design an Information System: Traditional and Prototyping Approaches
Upon successful completion of this unit, the student will be able to
a define and describe the systems design process in terms of the acquisition and physical design phases of the life cycle
b describe and compare traditional and prototyping approaches to physical systems design
c describe the continuing roles of fact-finding, interpersonal communications and cost-benefit analysis in systems design

13. Designing Conventional Computer Files and Controls
Upon successful completion of this unit, the student will be able to
a design fixed and variable length logical records for files in a computer based information system
b explain and determine optimal field storage format and blocking factors
c differentiate among types of files
d determine optimal file organization
e design internal controls, define file design requirements, and enter them into a project dictionary

14. Project Management Tools and Techniques
Upon successful completion of this unit, the student will be able to
a describe project management
b describe and construct PERT charts and Gantt charts

15. Fact-Finding Techniques
Upon successful completion of this unit, the student will be able to
a sample existing documentation, forms and files for facts
b describe research and conduct site visits
c conduct observations of work environments
d set up, administer and interpret questionnaires
e perform interviews and group work sessions

16. Communication Skills for the Systems Analyst
Upon successful completion of this unit, the student will be able to
a describe the procedures to conduct meetings, presentations and walkthroughs with the project team, end-users and management
b write business and technical reports

17. Feasibility and Cost-Benefit Analysis Tools and Techniques
Upon successful completion of this unit, the student will be able to
a conduct feasibility evaluations at successive phases in the project
b perform cost-benefit analyses on systems

18. Introduction to Computer Assisted Systems Engineering (CASE), using Excelerator.
Upon successful completion of this unit, the student will be able to
a describe uses of a CASE tool, Excelerator, in assisting in systems analysis and design
b use Excelerator in a basic fashion

V EVALUATION METHODS

Tests (3 @ 25%)	75%
Term Project	20%
Participation	5%
	100%

Grading:

A+	90 and over
A	80 and over
B	70 and over
C	60 and over
R	under 60

VI REQUIRED STUDENT RESOURCES

Text: "SYSTEMS ANALYSIS AND DESIGN METHODS"
by Whitten, Bentley, Barlow Second Edition
1989

available in the Campus Shop

SYSTEMS ANALYSIS AND DESIGN — COURSE NAME

EDP108 — CODE NO.

VII SPECIAL NOTES

Term projects received after the due date are subject to a failing grade.

Students with special needs, such as physical limitations, visual impairments, hearing impairments, or learning disabilities, are encouraged to discuss required accommodations, confidentially, with the instructor.

Your instructor reserves the right to modify the course as she deems necessary to meet the needs of students.

EDP108 TERM PROJECT

SCAAT Inn has decided to open a new convention centre next fall. It is anticipated that the number of guests at the Inn will increase substantially. A new billing system is being considered, wherein guests will be encouraged to charge pay TV, restaurant and bar bills to their rooms after they check in. Each guest will pay for these charges at check-out time.

The expected increase of guests will swamp the present manual billing system. The present guest billing system is inadequate, in that sometimes charges are forgotten, or made for something the quest has not received. Also one guest may be billed instead of another. Presently, a guest checkout takes about ten minutes to process. Customers are complaining.

Files:

In the Accounting Department, the guest file includes registered guests, who average 200 at a time, and peak to 275, in July and August. The growth rate is 4% per year. Only Accounting Department staff can change the information. Each record contains pertinent information:

Guest: Name, Phone Number, Street Address, P.O. Box Number, City, Province, Postal Code,
Company represented, Auto Licence number, Number of people in the party

Also in the Accounting Department, the charges file includes an average of 1400 charges, and peak to 1800, in July and August. The growth rate is 4% per year. Only Accounting Department staff can update the file. Each record contains:

Charge: date, type, status, description, amount
authorizing guest

INPUTS

A **Reservation Request** is prepared on demand, at any time. The average volume is 125 per day, with a peak of 175 per day, from June through August. The input contains the following data elements:

Guest: Name, Phone number, Street Address, P.O. Box Number, City, Province, Postal Code, Representing Company, Auto licence
Number of Guests in group
Room: number, type, level, rate, status
Number of: single beds, Double beds, Queen beds, King beds

Registration: number, Date, Time, Staff Member

A **Guest Charge** is prepared on demand, at any time. The average volume is 375 per day, with a peak of 600 per day from June through August. The input contains the following data elements:

Charge: Date, Type, Status, Description, Amount
Authorizing Guest, Room number

OUTPUTS:

A **Charge-by-Type report**, a breakdown of the charges that have been made for each type of charge, will be produced twice-daily, at 10:00 AM and 7:00 PM, by the Accounting Department. The average volume is 8 to 12 pages. The data elements contained in the report are:

Date of report, Time of report, Page number,
Guest name, Room number, Registration number,
Charge: date, type, status, description, amount,
Authorizing Guest,
Number of charges, Total amount of charges

There is also a **Guest Inquiry**, an information report for any inquiring guest, concerning charges that have been made. The display is produced at any time, and the average volume is one screen. The data elements contained in the display are:

Guest name, Room number, Registration number,
Charge Date, Charge Type, Charge Status,
Charge Description, Charge Amount, Authorizing Guest,
Bill Number, Number of Charges, Total Amount of Charges,
Sales Tax Amount, Total Amount Due, Bill Date

* Guests' Bills

EDP108 SYSTEMS ANALYSIS AND DESIGN TERM PROJECT

THE TERM PROJECT IS WORTH A TOTAL OF 20 MARKS.

Analysts in the Group

_____ _____

_____ _____

____ (5) Report Structure
a refer to Module C, Communication Skills for the Systems Analyst
b the report is to be between 10 and 15 pages long, double spaced, not including the appendices.

____ (5) Report content, including
___ analysis of present system
___ two possible system solutions
___ recommendation of best system solution
___ system testing and maintenance procedures
___ implementation and evaluation procedures

____ (5) Correct Grammar, including sentence structure

____ (5) Oral Presentation
___ each member of the group contributes to the presentation
___ effective use of charts and other visual aids

____ (20) TOTAL