



**I. COURSE DESCRIPTION:**

In this course we will follow a structured, methodical approach to systems analysis and design. The student will gain a thorough understanding of the System Development Life Cycle (SDLC) through the preparation of deliverables (documents, discussions, coding) at each stage. We will also compare and contrast some of the newer development methodologies such as the modified SDLC, Rapid Application Design (RAD), Object Oriented Analysis and Design (OOA&D), and others.

The most important component of system development will always be communication. Therefore, communication is the key to success in software development and thus oral, written and interpersonal communication skills will be the main focus of this course.

Students will work individually, and within a team environment, to develop their analytic/system design skills and prepare a complete system proposal.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

1. Discuss the elements of Systems Analysis and Design

Potential Elements of the Performance:

- Describe the impact of information technology
- Define systems analysis and design and the role of a systems analyst
- Define an information system and describe its components
- Explain how to use business profiles and models
- Explain Internet business strategies and relationships, including B2C and B2B
- Identify various types of information systems and explain who uses them
- Distinguish among structured analysis, object-oriented analysis, and agile methods
- Explain the waterfall model, and how it has evolved
- Discuss the role of the information technology department and the systems analysts who work there

2. Analyze a basic business case.

Potential Elements of the Performance:

- Explain the concept of a business case and how a business case affects an IT project
- Describe the strategic planning process and why it is important to the IT team
- Explain the purpose of a mission statement
- Conduct a SWOT analysis and describe the four factors involved
- Explain how the SDLC serves as a framework for systems development
- List reasons for systems projects and factors that affect such projects
- Describe systems requests and the role of the systems review committee
- Define operational, technical, economic, and schedule feasibility
- Describe the steps and the end product of a preliminary investigation

3. Describe the various tools and techniques that relate to Managing the Systems Project

Potential Elements of the Performance:

- Explain project planning, scheduling, monitoring, and reporting
- Draw a project triangle that shows the relationship among project cost, scope, and time
- Describe work breakdown structures, task patterns, and critical path analysis
- Explain techniques for estimating task completion times and costs
- Describe various scheduling tools, including Gantt charts and PERT/CPM charts
- Analyze task dependencies, durations, start dates, and end dates
- Describe project management software and how it can assist you
- Discuss the importance of managing project risks
- Understand why projects sometimes fail
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#### 4. Describe the Systems Analysis Phase – Requirements Modeling

##### Potential Elements of the Performance:

- Describe systems analysis phase activities
- Explain joint application development (JAD), rapid application development (RAD), and agile methods
- Use a functional decomposition diagram (FDD) to model business functions and processes
- Describe the Unified Modeling Language (UML) and examples of UML diagrams
- List and describe system requirements, including outputs, inputs, processes, performance, and controls
- Explain the concept of scalability
- Use fact-finding techniques, including interviews, documentation review, observation, questionnaires, sampling, and research
- Define total cost of ownership (TCO)
- Conduct a successful interview
- Develop effective documentation methods to use during systems development

#### 5. Describe the Data and Process Modeling Phase

##### Potential Elements of the Performance:

- Describe data and process modeling concepts and tools, including data flow diagrams, a data dictionary, and process descriptions
- Describe the symbols used in data flow diagrams and explain the rules for their use
- Draw data flow diagrams in a sequence, from general to specific
- Explain how to level and balance a set of data flow diagrams
- Describe how a data dictionary is used and what it contains
- Use process description tools, including structured English, decision tables, and decision trees
- Describe the relationship between logical and physical models

## 6. Understand fundamental concepts of Object Modeling

### Potential Elements of the Performance:

- Explain how object-oriented analysis can be used to describe an information system
- Define object modeling terms and concepts, including objects, attributes, methods, messages, classes, and instances
- Explain relationships among objects and the concept of inheritance
- Draw an object relationship diagram
- Describe Unified Modeling Language (UML) tools and techniques, including use cases, use case diagrams, class diagrams, sequence diagrams, state transition diagrams, and activity diagrams
- Explain the advantages of using CASE tools in developing the object model
- Explain how to organize an object model

## 7. Understand how to Develop Strategies

### Potential Elements of the Performance:

- Describe the concept of Software as a Service
- Define Web 2.0 and cloud computing
- Explain software acquisition alternatives, including traditional and Web-based software development strategies
- Describe software outsourcing options, including offshore outsourcing and the role of service providers
- Explain advantages and disadvantages of in-house software development
- Discuss cost-benefit analysis and financial analysis tools
- Describe a request for proposal (RFP) and a request for quotation (RFQ)
- Describe the system requirements document
- Explain the transition from systems analysis to systems design

8. Understand how to design an effective user interface

Potential Elements of the Performance:

- Explain the concept of user interface design and human computer interaction, including basic principles of user-centered design
- Explain how experienced interface designers perform their tasks
- Describe rules for successful interface design
- Discuss input and output technology issues
- Design effective source documents and forms
- Explain printed output guidelines
- Describe output and input controls and security
- Explain modular design and prototyping techniques

**III. TOPICS:**

1. Introduction to Systems Analysis & Design
2. Analyzing a basic business case
3. Tools and Techniques to manage the project
4. The Systems Analysis Phase
5. Data Modeling Phase
6. Basic Concepts of Object Modeling
7. Developing Strategies
8. The User Interface and Data Design

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

CUSTOM PUB: Systems Analysis and Design  
Harry J. Rosenblatt  
**ISBN-13:** 9780176588359

Instructor's handouts, guidance, and material as it relates to the individual topics.

Additional reference material will be provided to students or referenced from the Internet.

**V. EVALUATION PROCESS/GRADING SYSTEM:**

The mark for this course will be arrived at as follows:

Tests/Quizzes	50%
Practical Lab Assignments	30%
Project	20%
Total	100%

The following semester grades will be assigned to students:

<b>Grade</b>	<b><u>Definition</u></b>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	Below 50%	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

**VI. SPECIAL NOTES:**Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers will not be granted admission to the room.>

Absenteeism will affect a student's ability to succeed in this course. Absences due to medical or other unavoidable circumstances should be discussed with the professor. Students are required to be in class on time and attendance will be taken within the first five minutes of class. A missed class will result in a penalty in your marks unless you have discussed your absence with the professor as described above. The penalty depends on course hours and will be applied as follows:

<b>Course Hours</b>	<b>Deduction</b>
5 hrs/week (75 hrs)	1% per hour
4 hrs/week (60 hrs)	1.5% per hour
3 hrs/week (45 hrs)	2% per hour
2 hrs/week (30 hrs)	3% per hour

**VII. COURSE OUTLINE ADDENDUM**

The provisions contained in the addendum located on D2L form part of this course outline.