

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** SOFTWARE ENGINEERING

**CODE NO. :** CSD306 **SEMESTER:** v

**PROGRAM:** COMPUTER ENGINEERING

**AUTHOR:** DOUGLAS MCKINNON

**DATE:** June 04 **PREVIOUS OUTLINE DATED:** Aug 03

**APPROVED:**

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**DEAN**

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**DATE**

**TOTAL CREDITS:** 6

**PREREQUISITE(S):** N/A

**HOURS/WEEK:** 4

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**I. COURSE DESCRIPTION:**

In this course we will follow a structured, methodical approach to software engineering. 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 software engineering 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. Describe why Software Engineering is so important and why there is a need for effective communication.

Potential Elements of the Performance:

- Describe the historical evolution of Systems Analysis and Design
- Describe what systems analysis is and what systems design is
- Describe the quality, effectiveness, productivity and political aspects of Software Engineering
- Define what a system is and be able to differentiate between various classifications of software systems

2. Work in teams to demonstrate the people aspects of Software Engineering

Potential Elements of the Performance:

- Define and describe the categories of people involved in software development
- Define and describe the categories of users as well as the different objectives they have

- Describe the role of the system analyst in a system development project
  - Describe the role of management in a systems development project
  - Identify and describe the roles of others in a software project
  - Demonstrate teamwork skills and accept individual and group responsibilities
3. Describe the various tools and techniques that relate to system development methodologies.

Potential Elements of the Performance:

- Describe the concept of a project life cycle
  - Describe the characteristics of the classical project life cycle
  - Describe the differences between radical and conservative life cycles
  - Describe the prototyping approach
  - Explain the changes that have taken place in structured analysis
  - Describe why automated tools are important to the future of software engineering
4. Manage and effectively plan all aspects of the system development process

Potential Elements of the Performance:

- Demonstrate the concept of planning and its relevance
- Define and produce project goals and requirements
- Recognize the relationship of planning with respect to project size
- Produce and use project planning development processes including: Project Phases; Milestones, documents, reviews; Project costing; Prototyping; Successive Versions
- Work within a project planning organizational structure that includes: Project Format; Project Team Structure; Project Quality Assurance; Project Verification and Validation
- Produce the project feasibility study

5. Analyze and problem solve in a team environment by using various tools, techniques, and standard documentation practices that relate to software engineering methodologies.

Potential Elements of the Performance:

- Produce effective system documentation to assist in the analysis by using standard modeling techniques such as: Dataflow Diagrams; Data Dictionary; Process Specifications; Entity Relationship Diagrams; Joint Application Design Sessions (JAD)
  - Produce documentation deliverables at each stage of the SDLC such as: Problem Statement, Feasibility Study, Project Plan, Requirement Specifications, Functional Specifications, and Managerial Presentation of your findings
6. Understand fundamental concepts of technical report writing.

Potential Elements of the Performance:

- Write clear, effective technical documents including user manuals and technical reports
- Assess your target audience and develop documents to meet their needs
- Test your document at every stage of the development process to ensure success
- Choose the appropriate writing style to communicate successfully
- Use diagrams, tables, charts and other graphical tools effectively
- Create informative and interesting content that your readers will comprehend and utilize

**III. TOPICS:**

1. Introduction to Software Engineering fundamentals
2. People Aspects of Software Engineering
3. Systems Development Life Cycle Methodologies
4. Project Planning and Management
5. Teamwork, Modeling Techniques and Project Deliverables
6. Technical Report Writing

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

Systems Analysis and Design; 6<sup>th</sup> edition (Kendall & Kendall)  
ISBN: 0-13-145455-2

- a) At least 5 3.5" high density floppy disks
- b) Instructor's handouts, guidance, and material as it relates to the individual topics
- c) Additional reference material will be provided to students, placed in the library for the student use, or referenced from the Internet

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

Theory tests, practical tests and quizzes	40%
Assignments and lab work	40%
Semester Project	20%

The tentative breakdown is as follows:

2 Formal Theory Tests	@ 15% each
1 Take Home Test	@ 10%
1 Semester Project	@ 20%
4 Assignments/Quizzes	@ 5% each
2 Assignments	@ 10% each

Some minor modifications to the above percentages may be necessary. The instructor reserves the right to adjust the mark up or down 5% based on attendance, participation and whether there is an improving trend.

The student must pass both the assignment portion and the testing portion of the evaluation scheme. Quizzes may appear without prior notice to students.

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00

D	50-59%	1.00
F (Fail)	49% and below	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.	

### **UPGRADING OF INCOMPLETES:**

When a student's course work is incomplete or final grade is below 50%, it is possible to upgrade to a pass when a student meets all of the following criteria:

1. The student's attendance has been satisfactory.
2. An overall average of at least 40% has been achieved.
3. The student has not failed all of the theory tests taken.
4. The student has made reasonable efforts to participate in class and complete assignments.

The instructor will ultimately determine student eligibility and the nature of the upgrading requirements. Upgrading requirements may involve one or more of the following: completion of existing labs and assignments, completion of additional assignments, re-testing on individual parts of the course or a comprehensive test on the entire course.

### **VI. SPECIAL NOTES:**

#### Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493 so that support services can be arranged for you.

Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

### Assignment Due Dates:

All assignments must be completed satisfactorily to complete this course. Late hand in penalties will be 5% per day per assignment. Assignments will not be accepted past one week late unless there are extenuating and legitimate circumstances.

Due to the heavy emphasis on group effort and teamwork, late hand ins will not be allowed for some assignments. Absenteeism and lack of group cohesiveness will disrupt all members of the group and will not be tolerated.

Mandatory work that is critical to the rest of the team players will be absolutely required within the agreed upon time frame. Failing to comply may result in action taken.

### Attendance:

A student who is absent for 3 or more times without any valid reason or effort to resolve the problem will result in action taken.

NOTE: If action is to be taken, it will range from marks being deducted up to and including removal from the course.

## **VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

## **VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.