SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: SYSTEMS ANALYSIS AND DESIGN

Code No.: CSD 202/ CET 311

Program: COMPUTER PROGRAMMER / COMPUTER ENGINEERING

Semester: THIRD AND FIFTH

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Date: SEPTEMBER 1996

Previous Outline Dated: JANUARY 1995

Approved: _____ Date: _____
Dean

TOTAL CREDITS: 5 TOTAL CREDIT HOURS: 80

PREREQUISITES: NONE

LENGTH OF COURSE: 4 hours per week
comprised of:
2 - 1 hour theory classes(combined sections) with Professor
1 - 2 hour lab class per section with Professor

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COURSE OUTLINE

I. Course Description:

In this course we will follow a systematic 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 discuss and use some of the newer developments such as the modified SDLC, Rapid Application Design, Object Oriented Programming and others.

In all the tools and techniques, the most important component 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.

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II. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE:

(Generic Skills Learning Outcomes placement on the course outline will be determined and communicated at a later date.)

In this course, the student will be introduced to a variety of tools, techniques and methodologies that will allow them to properly analyze and design computer solutions. The following outcomes will not necessarily follow any chronological order. Topics will be covered as deemed appropriate. The main focus is to have students appreciate that developing software is much more than just having the technical ability to program.

Communication, people, technologies, environment and many other factors are also critical factors towards successful development.

A. Learning Outcomes:

1. Describe why Systems Analysis is so important and why there is a need for effective communication.

2. Work in teams to demonstrate the people aspects of Systems Development.

3. Describe the various tools and techniques that relate to system development methodologies.

4. Manage and effectively plan all aspects of the system development process.

5. Analyze and problem solve by using various tools techniques, and documentation that relate to systems development methodologies.

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II. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE (Continued):

B. Learning Outcomes and Elements of the Performance:

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

1. Describe why Systems Analysis 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 Projects.
   - define what a system is and what the different system categories are.

This will constitute approximately 10% of the course grade (possible weighting strategy) and take approximately 2 weeks.

RESOURCES:

TEXTBOOK: Chapters 1,2,3
Professor's handouts, guidance and material transparencies, class notes, articles

II. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE (Continued):

B. Learning Outcomes and Elements of the Performance (Continued):

2. Work in teams to demonstrate the people aspects of Systems Development.

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
- describe the roles of others in a software project
- demonstrate teamwork skills and accept individual and group responsibilities

This will constitute approximately 15 % of the course grade (possible weighting strategy) and take approximately 3 weeks.

RESOURCES:

TEXTBOOK: Chapters 5,6,7,8
Professor's handouts, guidance and material transparencies, class notes, articles

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued):

B. Learning Outcomes and Elements of the Performance (Continued):

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 systems analysis

This will constitute approximately 10% of the course grade (possible weighting strategy) and take approximately 2 weeks.

RESOURCES:

TEXTBOOK: Chapters 1,2,8
Professor's handouts, guidance and material transparencies,articles,research material

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued):

B. Learning Outcomes and Elements of the Performance (Continued):

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 (also known as the engineering study)

This will constitute approximately 25% of the course grade (possible weighting strategy) and take approximately 4 weeks.

RESOURCES:

TEXTBOOK: Chapters 3, 20, 21, 22
Professor's handouts, guidance and material transparencies, articles and research material

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II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued):

B. Learning Outcomes and Elements of the Performance (Continued):

5. Analyze and problem solve in a team environment by using various tools techniques, and documentation that relate to systems development methodologies.

   These outcomes will represent the majority of the material covered in this course. There will be extensive use of teamwork, tools and techniques to properly analyze and design computer systems. The student will also be exposed to the software deliverables in this course. Subsequent courses will develop these skills in greater detail. Some of these tools and deliverables will be covered in greater detail than others.

   Potential elements of the performance:

   - Produce effective system documentation to assist in the analysis by using the major modelling tools such as:
     Dataflow Diagrams, Data Dictionary,
     Process Specifications,
     Entity Relationships,
     Joint Application Design Sessions (JAD)
   - Produce software deliverables at each stage of the SDLC such as:
     Problem Statement, Feasibility Study
     Project plan, Requirement specs
     Functional specs,
     Managerial Presentations

This will constitute approximately 40% of the course grade (possible weighting strategy) and take approximately 5 weeks.

RESOURCES:

TEXTBOOK: Chapters 9,10,11,12,13,14,20,21,22
Professor's handouts, guidance and material transparencies, articles and research material

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued):

C. Learning Outcomes and Elements Summary:

Many software systems are still being produced that are unreliable, over budget, poorly documented and not well suited to the user. A well engineered software system must be reliable, understandable, and maintainable.

A disciplined software development approach is absolutely critical to minimize the common problems with software. Most organizations follow a structured and disciplined approach to software development. They use different tools, techniques and methodologies and levels of sophistication but for the most part follow the System development Life Cycle (SDLC).

We will use a variety of tools and techniques to accomplish the outcomes as set out in the previous sections.

Students will be asked to formally and informally answer several specific questions on an individual basis as well as part of a group effort.

Students are also required to be team players and work in small groups to answer some of the questions and solve mini cases. The objective here is to build a strong team atmosphere as well as having students appreciate that there isn't always a clear cut answer to development and people with different perspectives can improve the results. The students are to bring motivation, participation and good listening skills to the table to help each other come up with a better collective solution.

Once we work with the variety of tools used in SDLC, students will be required to provide graphical documentation such as Dataflow Diagrams and Entity Relationship Diagrams. If the facilities are available, the students will be required to use productivity tools such as EXCELERATOR to produce this documentation. We may also use tools for project management such as Microsoft Project. We will also simulate a common repository (dictionary) for software development and maintain internal communication documentation.

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III. TOPICS TO BE COVERED:

* NOTE: These topics sometimes overlap several areas of skill development and are not necessarily intended to be explored in isolated learning units or in the order below.

This particular course assumes the student has already attained significant programming skills and techniques through previous courses. The course focuses on the crucial analytical side of software development. it takes much more than a great programmer to be successful in building software.

	TOPICS	APPROXIMATE TIME
1.	Introduction to Systems Analysis and Design	2 WEEKS
2.	People Aspects in software	3 WEEKS
3.	Systems Development Life Cycle Methodology	2 WEEKS
4.	Project Planning and Management	4 WEEKS
5.	Teamwork, Modelling Tools and Software Deliverables	5 WEEKS

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

TEXTBOOK:

1. "SYSTEMS ANALYSIS AND DESIGN" 3rd edition
   Kendall & Kendall

MATERIALS:

2. At least 5 3.5" high density floppy disks
3. Additional reference material will either be given to the students or placed in the library for the student's use.
4. Instructor's Handouts, Guidance, and Material as it relates to the individual topics.

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V. EVALUATION PROCESS/GRADING SYSTEM:

Theory Tests, Practical Tests and Quizzes	60 %
Assignments and Lab Work	40 %

The tentative breakdown is as follows:

2	FORMAL THEORY TESTS	AT 15 % EACH
2	Take Home Tests	AT 15 % EACH
4	ASSIGNMENTS	AT 5 % EACH
2	ASSIGNMENTS	AT 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.

As per school policy, the student must pass both the assignment portion and the testing portion of the evaluation scheme.

* - All Assignments must be completed satisfactorily to complete this course. Late hand in penalties will be 5% per day. 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 team work, 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.

* - The professor reserves the right to adjust the number of tests, practical tests and quizzes based on unforeseen circumstances. The students will be given sufficient notice to any changes and the reason thereof.

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V. EVALUATION PROCESS/GRADING SYSTEM (continued):

* - Mandatory work that is individual in nature will result in an Incomplete with the option of makeup work at the end of the semester.

* - 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.

* - 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.

GRADING SCHEME

1. TESTS

Written tests will be conducted as deemed necessary; generally at the end of each block of work. They will be announced about one week in advance. Quizzes may be conducted without advance warning.

2. ASSIGNMENTS

Assignments not completed by the assigned due-date will be penalized by 5% per day late. All assignments must be completed satisfactorily to complete the course.

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V. EVALUATION PROCESS/GRADING SYSTEM (continued):

3. GRADING SCHEME

A+	90 - 100%	Outstanding achievement
A	80 - 89%	Excellent achievement
B	70 - 79%	Average Achievement
C	55 - 69%	Satisfactory Achievement
R	less than 55	Repeat
CR	Credit given	Credit Exemption
S	Satisfactory	used at midterm only
U	Unsatisfactory	unsatisfactory
X	A temporary grade	

An 'X' grade is limited to instances where exceptional circumstances have prevented the student from completing objectives by the end of the semester. An X grade must be authorised by the Chairperson. It reverts to an R if not upgraded in an agreed-upon time, less than 120 days.

4. UPGRADING OF INCOMPLETE

When a student's course work is incomplete or final grade is below 55%, there is the possibility of upgrading to a pass when the student's performance warrants it. Attendance and assignment completion will have a bearing on whether upgrading will be allowed. A failing grade on all tests will remove the option of any upgrading and an R grade will result. The highest grade on re-written tests or assignments will be 56%.

Where a student's overall performance has been consistently unsatisfactory, an R grade may be assigned without the option of make-up work.

The method of upgrading is at the discretion of the teacher and may consist of one or more of the following options: assigned make-up work, re-doing assignments, re-writing of tests, or writing a comprehensive supplemental examination.