

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: SOFTWARE ENGINEERING

Course No.: CET305

Program: COMPUTER ENGINEERING TECHNOLOGY

Semester: SIXTH (6)

Date: MAY 1994

Author: FRANK TURCO

Previous Outline

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APPROVED:

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Date 94-06-24

SOFTWARE ENGINEERING

CET305

C O U R S E O U T L I N E

TOTAL CREDIT HOURS: 6

**PREREQUISITES:** Successful completion of CET311, and CET301 or Permission granted by the Instructor pending completion of CET311 and/or CET301.

I. PHILOSOPHY/GOALS

The prerequisite courses have prepared the student with the knowledge and exposure to a variety of tools, techniques, methodologies, approaches and database design. This course provides the student the necessary tools and techniques to collectively develop a major software project. Communication is the key to success in software development and therefore documentation, oral, written and interpersonal communication will be the main focus of this course.

II. STUDENT PERFORMANCE OBJECTIVES (OUTCOMES)

Upon successful completion of this course the student will:

1. Review what Software Engineering is.
2. Produce effective project plans, estimates and actual activities.
3. Analyze and design a portion of a major project.
4. Produce, program code, test and implement portions of the major project.
5. Test, verify and validate the entirely integrated project.

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III. TOPICS TO BE COVERED

1. Software Engineering Concepts.
2. Project Planning and Project Management.
3. Systems Analysis and Design.
4. Programming, testing and Implementation in a modular mode.
5. Verification and validation of the entirely integrated project.

IV. LEARNING ACTIVITIES/REQUIRED RESOURCES

1.0 Software Engineering Concepts

Learning Activities:

- 1.1. Review all the stages in SDLC.
- 1.2 Listen to instructor presentation on the overview the general system requirements for the term project.
- 1.3 Discuss the tools available to properly do Software Engineering.
- 1.4 Discuss the individual roles as team members on a major project in Software development.

REQUIRED RESOURCES:

Minutes of Meetings

Overheads

Previous Course notes

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2.0 Planning a Software Project (Project Management)

LEARNING ACTIVITIES:

- 2.1. Describe the concept of planning and its relevance.
- 2.2. Define project goals and requirements.
- 2.3. Discuss the relationship of planning with respect to project size.

REQUIRED RESOURCES

MICROSOFT PROJECT

3.0 Systems Analysis and Design

LEARNING ACTIVITIES

- 3.1. Demonstrate communication skills through meetings and user interviews.
- 3.2. Prepare for a management overview presentation of the system prior to the programming stage.
- 3.3. Obtain management approval to proceed.
- 3.4. Produce design analysis tools such as
  - a) milestones
  - b) walkthrus
  - c) inspections
  - d) Data Flow Diagrams
- 3.5. Comply with design guidelines, policies and procedures.

REQUIRED RESOURCES

Participation, Communication

Project Work

Individual Research

Documentation

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4.0 Programming, Testing and Implementing

LEARNING ACTIVITIES

- 4.1. Produce Program Code based on the Project guidelines and plan.
- 4.2. Demonstrate standardization of program code.
- 4.3. Produce effective documentation related to the program needs and approach taken.
- 4.4. Perform proper data definition
- 4.5. Construct code in a reusable form.

REQUIRED RESOURCES

Communication, Documentation

Previous Course Notes

PARADOX Tutorials and Reference Material

IV. LEARNING ACTIVITIES

5.0 Verification and Validation Techniques

- 5.1. Discuss the purpose of software quality assurance.
- 5.2. Demonstrate the usefulness of walkthrus and inspections throughout the software life cycle.
- 5.3. Demonstrate unit testing and debugging.
- 5.4. Describe software system testings such as:
  - a) integration testing
  - b) acceptance testing
- 5.5. Produce a system overview document.
- 5.6. Post implementation managerial presentation.

REQUIRED RESOURCES

Communication, Documentation

Previous Course Notes

IV. LEARNING ACTIVITIES / RESOURCES SUMMARY

A variety of tools and techniques are used to accomplish the objectives as set out in the previous sections.

The following are some of the major activities that will take place in this course.

Students will be asked to formally and informally do research on specific areas related to the project. These request will be both on an individual and group basis. These questions will reinforce the topics necessary to successfully build the given project.

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 solid 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.

Students will produce graphical documentation such as DataFlow Diagrams, Entity Relationship Diagrams and Project Plans. There will be a common repository (dictionary) for software development and the students will maintain internal communication documentation either on the VAX or the LAN or a single protected Hard Drive. They will also be expected to produce and maintain day to day documentation such as the bi weekly progress reports, logs, project plans and minutes of meetings to facilitate communication with all of their peers.

V. EVALUATION METHODS:

Tests and Quizzes	30%
Assignments and Lab Work	70%

The tentative breakdown is as follows:

1	Formal Theory Test	at 15 %
1	TAKE HOME Test	at 15 %
4	Assignments	at 5 %
1	Major Project broken down as follows:	
	Bi-Weekly progress reports and results	at 5 %
	Personal Log	at 5 %
	Individual Presentation & Documentation	at 10 %
	Programming, Testing & Documenting of the students individual project tasks	at 30 %

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, leadership, creativity and whether there is an improving trend.

- \* All Assignments must be completed satisfactorily to complete the 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 effort will disrupt all members of the group and will not be tolerated. Possible actions taken will be discussed in the following description.

V. EVALUATION METHODS (CONTINUED)

- \* The instructor 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 reasons thereof.
  
- \* Mandatory work that is individual and non-impacting 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 timeframe. 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 to a maximum of removal from the course.

GRADING DETAILS

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.



V. EVALUATION METHODS (CONTINUED)

3. GRADING SCHEME

- A+ 90 - 100% Outstanding achievement
- A 80 - 89% Excellent achievement
- B 70 - 79% Average Achievement
- C 55 - 69% Satisfactory Achievement
  
- U Incomplete:Course work not complete at Mid-term.  
Only used at mid-term.
  
- R Repeat
  
- X A temporary grade that is limited to instances where special circumstances have prevented the student from completing objectives by the end of the semester. An X grade must be authorized by the Chairman. 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.

VII. REQUIRED STUDENT RESOURCES

TEXTBOOK:

1. "Systems Analysis & Design Methods" by Whitten / Bentley / Barlow

VIII. ADDITIONAL RESOURCE MATERIALS

Additional reference material will either be given to the students or placed in the library for the student's use.

Instructor's Handouts, Guidance, and Material as it relates to the individual topics.

Use of research modes such as INTERNET, Library Data Base Searches, and articles.

IX. SPECIAL NOTES

1. Students with special needs are encouraged to discuss required accommodations confidentially with the instructor.
2. Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.