

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: RESEARCH PROJECT

Course No.: CET308

Program: COMPUTER ENGINEERING TECHNOLOGY

Semester: FIFTH (5)

Date: 10 January 1994

Author: Fred Carella

Previous

Outline Dated: JANUARY 1993 (Frank Turco)

APPROVED:

Dean

*J. Smith*

Date

*April 4/97*

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**Prerequisites:** The two year Technician Diploma or Permission granted by the Dean

**LENGTH OF COURSE:** 3 HOURS PER WEEK

**TOTAL CREDIT HOURS:** 45

**I. PHILOSOPHY/GOALS**

The Research Report (CET308) and Research Project (CET316) courses are intended to provide a vehicle for the student to consolidate the skills developed in the first two years of the program, and to apply those skills to a hardware and/or software project of some significance.

The student is expected to display a high degree of self-motivation, discipline, organization, technical skill, and communications skills during the course.

The course spans two semesters (fifth and sixth). The CET 308 Research Project course (fifth semester) is a prerequisite for the sixth semester CET 316 Research Report course. Each semester has its individual requirements and will be assessed accordingly.

CET 308 Research Report will primarily assess the student's ability to do a detailed analysis and research on the topic he/she has chosen. At the culmination of this semester, the student will be required to provide an in depth analytical and technical report that illustrates a thorough knowledge of the topic as well as a well orchestrated plan of how he/she will proceed with the implementation of the project.

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The analysis and design phases of the project shall be carried out in CET 308.

The student will be required to:

- \* provide bi-weekly progress reports that identify his/her plans, tasks completed and issues that need to be resolved.
- \* maintain a detailed project log that identifies all the results of research activities as they progress. This log will be handed in for assesment.
- \* verbally discuss his/her progress and problems in a round table discussion among his/her peers and the instructor.

These activities will be assessed and can be excellent sources of documentation to be used in producing the final analysis report.

If the project is a hardware job, the report should include the design of the system including block and circuit diagrams, an analysis of system operation, and a plan for implementing and testing the system.

The software description should contain context and data flow diagrams, data descriptions, and program design including structure charts.

The sixth semester is the time for implementing, testing, and completing the documentation of the system. The semester culminates in a technical report describing the project. This report is an extension of the previous report, and should contain complete documentation of the project plus a technical description of it. The student must submit the hardware and software for the system, demonstrate the operation of the system, to a group. The documentation must be complete including program listings, pseudocode, test plans, and results.

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II. STUDENT PERFORMANCE OBJECTIVES (FIFTH SEMESTER)

At the end of this course the student will:

1. Understand the concept of Independent Research.
2. Demonstrate Technical Proficiency on their specific Project.
3. Demonstrate Organizational Skills.
4. Demonstrate proper time management and discipline.
5. Demonstrate a significant level of effort towards the successful completion of the Project.
6. Demonstrate a proficient command of both oral and written communication skills.
7. Provide detailed and valuable bi-weekly progress reports.
8. Provide a detailed chronological log of the research activities and results.
9. Participate in round table discussions of his/her project with peers and the instructor.
10. Participate and provide constructive criticism comments and assistance to his/her peers.
11. Produce and maintain a project plan.
12. Produce and deliver a preliminary research report.
13. Formally present the highlights of the research report to peers, the instructor and possibly other faculty and guests.
14. Provide a well researched and documented game plan and schedule for implementation of the project over the sixth semester.

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III. TOPICS TO BE COVERED

This particular course does not introduce new topics other than those derived through communication and independent research. However, this course is a culmination of previous and current courses the student's are taking. The concepts taken in other courses are reinforced to aid the student approach problem solving related to an individual project. The following information will be emphasized as it relates to the student's individual research project.

1. Project Management.
2. Structured Approach to Problem Solving.
3. Walk Through's and informal presentations.
4. Software/Hardware Development LifeCycle.
5. Proper Documentation Skills.
6. Object oriented Analysis.
7. Problem versus solution orientation.
8. Various research tools and techniques available.

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IV. LEARNING ACTIVITIES / REQUIRED RESOURCES

In this course a student will be developing an understanding of all aspects related to a specific project of their own choosing.

Each student will learn and build some expertise in their individual project, however, there will be some general learning activities that will be addressed and tailored to the individual student's needs. (Some minor modifications to these objectives may be required if time constraints apply)

LEARNING ACTIVITIES

PLANNING AND ANALYSIS OF THE RESEARCH TOPIC

This block will be the duration of the entire fifth semester. The primary focus is for the student to grasp enough detail and develop a disciplined approach to problem solving that will allow him/her to successfully complete the design in the sixth and final semester. The fifth semester allows the student to become proficient in what he/she wishes to accomplish and provides a framework of detailed findings and a plan that will ensure successful completion of the project.

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IV. LEARNING ACTIVITIES (Continued)

REQUIRED RESOURCES

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

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| <ol style="list-style-type: none"> <li>1. Appreciate the complexity of Research.</li> <li>2. Understand the need for a Planned approach to Research.</li> <li>3. Determine, define and provide a general description of the chosen research topic.</li> <li>4. Prepare and discuss Bi-Weekly Plans and Progress Reports.</li> <li>5. Prepare an Informal Project Proposal.</li> <li>6. Document and periodically present a summary of the findings.</li> <li>7. Prepare and document the issues, concerns and accomplishments on a Bi-Weekly basis.</li> <li>8. Demonstrate both technical and organizational progress towards successful completion of the project.</li> </ol> | <p>Instructor's Handouts, Guidance, and Material as it relates to the individual's project.</p> <p>library searches, periodicals (BYTE, PCMAG, Dr Dobbs Journal, Microsoft Systems Journal, Computer Craft Magazine, EDN, Windows Magazine) , technical people, manufacturers, support people etc.</p> <p>especially the INTERNET.</p> |
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V. MANDATORY REQUIREMENTS

Students will be required to:

1. Prepare and discuss the Bi-Weekly Progress Reports.
2. Maintain a daily log. This log will be handed in for assessment at the end of the semester. Spot checks of the daily log will be carried out periodically.
3. Weekly attendance in order to participate in the Weekly Project "RAP" sessions where we share our project successes and problems with each other.

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The weekly meetings are mandatory since they assist us in following a plan and limits duplication of efforts.

VI. 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.

VII. ASSESSMENT

The student shall be assessed a letter grade per deliverable on some or all of the following criteria:

1. Technical Demonstration and Ability.
2. Organizational Skills.
3. Preparedness and attendance of the weekly meetings.
4. Level of effort, detail and participation.
5. Communication Skills.
6. Project Management Skills.
7. Project Completeness and depth.
8. Documentation and Reports.



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The following is a tentative breakdown of marking scheme based on the periodic deliverables throughout the semester.

- a) Bi-weekly Report (2% ea report) 20%

BiWeekly Progress Reports will constitute 20% of the final grade. These reports must demonstrate a natural progression towards successful completion of the project. They must also illustrate the weaknesses and issues that must be resolved throughout the project. These will be checked weekly, handed in bi-weekly.

- b) Log Book 15%

The log book will constitute 15 % of the final grade. The log book should have enough detail in it that will allow the student to effectively be preparing his final documentation on a continual basis. The log book should also illustrate the level of effort taken to achieve success.

- c) Class Participation 5%

Class participation and attendance will constitute 5% of the final grade. The interest in your peers efforts as well as the enthusiasm you bring towards your project will be rewarded in this area.

- d) Technical Report 50%

The final technical report for this semester will constitute 50% of the final grade. The specific contents and approach may vary per project and will be discussed with each student. However, some general guidelines will apply such as: attention to detail, projection of significant understanding of the problem by the student, proper identification of the problem, summary of findings through your research, identification of issues to be resolved at the development stage, a solid recommended approach to successful implementation of the project.

- e) Formal Presentation 10%

Formal Presentation of the results of the student's efforts your peers, faculty, instructor and guests will constitute 10% of the final grade. There will be a standard set of guidelines that all participants will use and each audience member will be part of the marking effort on this portion. Not all aspects of the project need be complete. It is not a requirement to have a completed report at the presentation stage. This exercise is to allow the student an opportunity to demonstrate confidence and a knowledge base in the topic he/she has chosen. It will also allow the audience to be confident that the student has a well thought out plan of attack on how to solve the problems he/she have encountered. It is also an opportunity for the student to listen to other suggestions and where feasible expert advice.

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Each of the above activities must be acceptable to the instructor for the successful completion of the course.

1. GRADING SCHEME

A+	90	-	100%	Outstanding achievement
A	80	-	89%	Excellent achievement
B	70	-	79%	Average Achievement
C	55	-	69%	Satisfactory Achievement
I	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.			

Where a student's overall performance has been consistently unsatisfactory in the fifth semester, an R grade may be assigned without the option to continue on into the sixth semester of the course.

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VIII. RECOMMENDED TIMETABLE

The following timetable should be kept in mind during the project. Since each project is different, some flexibility is allowed. However, no major timetable changes may be made without consultation with the instructor.

Fall 96 Semester:

<u>Date:</u>	<u>Elapsed Time</u>	<u>Stage of Completion</u>
Sep 20	2 weeks	Selection of the Project Complete
Oct 18	6 weeks	Summary of Findings, Project Proposal, Project requirements, Data flow and Block Diagrams complete.
Nov 29	12 weeks	Computer System Design Complete including all the detailed documentation such as structure charts, circuit diagrams (if applicable) and a detailed plan of activities to implement the project.
Nov 29-Dec 25		Winter Semester Report complete