

# SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

## COURSE OUTLINE

**COURSE TITLE:** HARDWARE APPLICATION DEVELOPMENT

**CODE NO. :** CST300 **SEMESTER:** 6

**PROGRAM:** COMPUTER ENGINEERING TECHNOLOGY

**AUTHOR:** MARK ALLEMANG

**DATE:** JAN, 2004 **PREVIOUS OUTLINE DATED:** JAN, 2002

**APPROVED:**

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DEAN

\_\_\_\_\_  
DATE

**TOTAL CREDITS:** 6

**PREREQUISITE(S):** CST304

**HOURS/WEEK:** 4

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*For additional information, please contact Colin, Kirkwood, Dean*

*School of Technology, Skilled Trades & Natural Resources*

*(705) 759-2554, Ext. 688*

## I. COURSE DESCRIPTION:

In this course students will study advanced hardware systems focusing on new hardware developments. This course will broaden the student's view of hardware systems by studying hardware solutions from various manufacturers. Hands on, hardware system projects will be assigned to exercise the students ability to work with reasonably complex hardware systems. This course will develop the students ability to integrate and apply various hardware/software platforms to the solution of a problem.

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

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

### A. Learning Outcomes.

1. Analyze the architecture of a typical hardware system.
2. Compare, discuss and apply recent advances in hardware/software architectures
3. Build a reasonably complex hardware system.
2. Write and present technical reports on complex hardware systems.

### B. Learning Outcomes and Elements of the Performance:

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

#### 1. Analyze the architecture of a typical hardware system.

*Potential Elements of the Performance:*

- Identify the subsystems of the handyboard
- Utilizing the schematics and a logic analyzer, describe the operation of the following subsystems of the handyboard:
  - The MCU & Memory, the BUS, address decoder, LCD display, digital Input and output ports.

#### 2. Compare, discuss and apply recent advancements in the hardware/software architectures.

*Potential Elements of the Performance:*

- Discuss various features of new hardware architectures.
- Describe in detail new architectures.

- Discuss programming environment.
- Describe its different uses.
- Describe the interfaces offered.

**3. Build a reasonably complex hardware system.**

*Potential Elements of the Performance:*

- Draw a block diagram of the proposed system.
- Build the hardware system.
- Write software to control the system.

**4. Write and present technical reports on the hardware system.**

*Potential Elements of the Performance:*

- Write technical report on the chosen hardware project.
- Present and demonstrate it to peers and panel of examiners.

**III. Possible TOPICS:**

1. The Handyboard architecture.
2. The handheld computing architecture.
3. Embedded Controllers.
4. Writing Device Drivers.
5. Writing software to control hardware under various operating systems and hardware environments.

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

1. Text Book:
  - Robotic Explorations by Fred G. Martin  
Prentice Hall isbn: 0-13-089568-7.
2. Recommended Supplementary Reading:
  - The80x86 IBM PC and Compatible Computers (Volume I & II), 2<sup>nd</sup> edition, by- Muhammad Ali Mazidi and Janice Gillispie Mazidi, Prentice Hall, 1998.
  - Microcomputer Interfacing Handbook: A/D & D/A, 1<sup>st</sup> edition, by- Joseph J. Carr, TAB Books Inc., 1980.
  - Microprocessor Interfacing Techniques, 3<sup>rd</sup> Edition, by- Rodney Zaks and Austin Lesea, Sybex, 1979.
  - Microprocessor Theory and Operation, 1<sup>st</sup> edition, by- J.A. Sam Wilson and Ron Walls, TAB Books Inc., 1998.

- The M68HC11 Microcontroller, by- Michael Kheir, Prentice Hall, 1997.

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

Attendance	20%
Assignments, Quizzes	20%
Progress reports	20%
Final presentation and demonstration (30 to 50 minutes)	20%
Project report	20%

(The percentages shown above may have to be adjusted to accurately evaluate student skills. Students will be notified of any changes made.)

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

<b>Grade</b>	<b>Definition</b>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
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:**

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 professor and/or the Special Needs office. Visit Room E1101 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.

**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.