SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: COMPUTER SYSTEMS

CODE NO.:   CET 306-6

PROGRAM: ELECTRICAL/ELECTRONIC

SEMESTER: FIVE

DATE: SEPTEMBER, 1987

TEACHING MASTER: PETER SAVICH

APPROVED:

_____   _____
          NEW   REVISION

_____   _____
CHAIRPERSON   DATE
                          8 9/09/05

CET 306

COMPUTER SYSTEMS

PHILOSOPHY / GOALS

THE OBJECTIVES OF THIS COURSE ARE TO PROVIDE THE STUDENT WITH A KNOWLEDGE OF THE PDP-11 FAMILY OF COMPUTERS AND THE PRACTICAL EXPERIENCE OF PROGRAMMING IN ASSEMBLY LANGUAGE USING THE PDP-11 COMPUTERS.

THE STUDENT WILL BECOME PROFICIENT IN WRITING ASSEMBLY PROGRAMS USING THE EDITOR AVAILABLE FOR BOTH THE MULTI-TASKING OPERATING SYSTEM CALLED RSX-11M AND THE SINGLE USER OPERATING SYSTEM CALLED RT-11. THE STUDENT SHOULD THEN BE CAPABLE OF ASSEMBLING, LINKING, RUNNING AND DEBUGGING THE PROGRAMS. UPON COMPLETION OF THE EXAMINATION OF THE VARIOUS ADDRESSING MODES; TRANSLATION OF MNEUMONICS INTO MACHINE CODE; STRUCTURING OF ALL PROGRAMS TO CONFORM TO STANDARDS; AND SUBMISSION OF SEVERAL MODULAR PROGRAMS, THE STUDENT SHOULD BE PREPARED TO DEMONSTRATE ON MORE COMPLEX BUT REALISTIC APPLICATIONS REQUIRING THE USE OF THE ASSEMBLY LANGUAGE. PERIPHERALS SUCH AS A/D, D/A, CLOCK/COUNTERS WILL BE EMPLOYED TO CONTROL SERVO-MOTORS. TRAPS, INTERRUPTS, AND POLLING TECHNIQUES FOR USE IN CONTROL OF THE PERIPHERALS WILL BE EMPLOYED.

METHOD OF ASSESSMENT

THE STUDENT WILL BE ASSESSED THROUGH A SERIES OF WRITTEN TESTS (4), QUIZZES (4), PRACTICAL DEMONSTRATIONS, ASSIGNMENTS (APPROX 10) , AND ATTENDANCE.

ALL TESTS AND ASSIGNMENTS WILL BE CONDUCTED ON A TIMELY BASIS WITH ONE WEEKS NOTICE.

ALL QUIZZES AND PRACTICAL DEMONSTRATIONS WILL BE GIVEN WITH NO ADVANCE NOTICE.

ALL ASSIGNMENTS WILL BE OF EQUIVALENT VALUE.

ATTENDANCE IN ALL LABS AND CLASSES IS EXPECTED. A STUDENT WITH LESS THAN 80% ATTENDANCE WILL RECIEVE NO MARK FOR ATTENDANCE.

RE-WRITES WILL BE AVAILABLE FOR ALL WRITTEN TESTS. THE TOP MARK AVAILABLE FROM ANY RE-WRITE IS 65%.

THE FINAL MARK WILL BE CALCULATED USING THE FOLLOWING FORMULA:

FOUR WRITTEN TESTS @ 15% EACH	60%
ASSIGNMENTS	20%
FOUR QUIZZES @ 2.5% EACH	10%
ATTENDANCE	10%
	100%

THE GRADING SYSTEM TO BE USED IS AS FOLLOWS:

PERCENTAGE MARK	GRADE MARK
90% - 100%	A+
80% - 89%	A
66% - 79%	B
55% - 65%	C
BELOW 55%	F

COURSE OBJECTIVES / OUTLINE

BLOCK I   SYSTEM ARCHITECTURE AND MACHINE LANGUAGE PROGRAMMING

AT THE END OF THIS BLOCK THE STUDENT SHOULD BE CAPABLE OF:

1.   DESCRIBING THE HARDWARE COMPONENTS OF A COMPUTER SYSTEM USING BLOCK DIAGRAMS.

2.   DISCUSSING THE ARCHITECTURE OF THE PDP-11 FAMILY OF COMPUTERS USING SCHEMATICS

3.   DESCRIBING THE OPERATION AND USE OF ALL THE ADDRESSING MODES AVAILABLE TO THE PDP-11 FAMILY OF COMPUTERS.

4.   HIGHLIGHTING THE VARIOUS OPERATING SYSTEMS DESIGNED FOR USE ON THE PDP-11 FAMILY OF COMPUTERS AND THE ADVANTAGES/DISADVANTAGES EACH HAS.

5.   WRITING AND DISCUSSING THE INTENTION OF ANY SIMPLE INSTRUCTION FROM THE MACRO-11 ASSEMBLY INSTRUCTION SET.

6.   EDITING, ASSEMBLING, LINKING, RUNNING, AND DEBUGGING SIMPLE PROGRAMS.

7.   USING THE ODT DEBUGGING TECHNIQUE TO SET BREAKPOINTS, ALTER REGISTER CONTENTS, MEMORY ADDRESS CONTENTS, SINGLE-STEP THROUGH A PROGRAM, AND UTILIZE RELOCATION REGISTERS.

8.   CONVERTING FROM MNEMONICS TO MACHINE CODE OCTAL INSTRUCTIONS.

ANTICIPATED LENGTH OF BLOCK: FIVE   WEEKS

BLOCK II   SUBROUTINES, MACROS AND LIBRARIES FOR PROGRAMMING

AT THE END OF THIS BLOCK THE STUDENT SHOULD GAIN SOME VALUABLE
EXPERIENCE IN THE FOLLOWING AREAS:

1.   USING SUBROUTINES AND MACROS TO MODULARIZE MORE COMPLEX
        PROGRAMS.

2.   LINKING AND MAPPING OF SEPARATE FILES FOR THE RUNNING OF
        PROGRAMS.

3.   USING THE LIBRARIAN TO CREATE AND MAINTAIN A LIBRARY OF
        BOTH MACRO AND OBJECT MODULES.

4.   LINKING OF SEPARATE HIGH LEVEL LANGUAGES WITH LOW LEVEL
        ASSEMBLY LANGUAGES FOR THE RUNNING OF PROGRAMS.

ANTICIPATED LENGTH OF BLOCK: FOUR   WEEKS

BLOCK III   PERIPHERALS

AT THE   END OF THIS BLOCK THE STUDENT SHOULD HAVE EXPERIENCE WITH
THE THREE MAIN PERIPHERALS: A/D; D/A; AND THE CLOCK/COUNTER.
PROPER USE OF THESE DEVICES AVAILABLE ON THE LSI-11 AND M/INC
PDP-11 COMPUTERS USING THE RT-11 OPERATING SYSTEM SHOULD ALLOW
THE STUDENT TO COMPLETE MEANINGFUL ASSIGNMENTS IN THE LABS THAT
WOULD MOST LIKELY BE REQUIRED IN INDUSTRY.

                    ANTICIPATED LENGTH OF BLOCK: FOUR WEEKS

BLOCK IV   DEC LABORATORY EQUIPMENT FAMILARIZATION

AT THE END OF THIS BLOCK THE STUDENT SHOULD HAVE EXPERIENCE WITH:

1.   PROCEDURES INVOLVED IN BOOTING THE PDP-11/73 COMPUTER

2.   DESCRIBING THE PRINCIPLES OF DATA TRANSFER BETWEEN VARIOUS
          DEVICES SUCH AS DISK DRIVE AND MAGNETIC TAPE.

3.   PRACTICE MOUNTING AND ASSIGNING VARIOUS PERIPHERAL DEVICES.

ANTICIPATED LENGTH OF BLOCK: TWO   WEEKS

BLOCK V   FLOATING POINT (ONLY IF TIME PERMITS)

AT THE END OF THIS BLOCK THE STUDENT SHOULD BE CAPABLE OF:

1.   CONVERTING BETWEEN DECIMAL REPRESENTATION OF FRACTIONS AND
          INTEGERS INTO FLOATING POINT REPRESENTATION AND VICE VERSA.

2.   USING THE FLOATING POINT INSTRUCTION SET IN SOME PROGRAMS.

TEXTBOOK FOR CET200
"COMPUTER SYSTEMS I"

NOTE:

THE TEXTBOOK FOR THE "COMPUTER SYSTEM I" (CET200) COURSE WILL
ALSO BE THE SAME TEXTBOOK FOR THE "COMPUTER IN CONTROL SYSTEMS"
(CET227) COURSE.

TEXTBOOK:

"MACRO-11 ASSEMBLY LANGUAGE ARCHITECTURE AND STRUCTURED
PROGRAMMING"

BY

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