COURSE DISCIPLINE : CS/IS

COURSE NUMBER : 166

COURSE TITLE (FULL) : Advanced Computer Architecture and Assembly Language

COURSE TITLE (SHORT) : Adv Comp Arch & Assembly Lang

CATALOG DESCRIPTION

CS/IS 166 covers the extension of basic addressing concepts to more advanced address ability such as base register and self-relative addressing, as well as comparative computer architecture focusing on such organizations as multiple register processors and stack machines. Students study the basics of virtual memory input-output and an introduction to the concept of micro programmable systems. Low-level system translation processes associated with assemblers, system functions such as relocatable loading and memory management, applications of data structures, and hashing techniques are covered.

Total Lecture Units: 3.00

Total Laboratory Units: 0.00

Total Course Units: 3.00

Total Lecture Hours: 54.00

Total Laboratory Hours: 0.00

Total Laboratory Hours To Be Arranged: 0.00

Total Contact Hours: 54.00

Total Out-of-Class Hours: 108.00

Prerequisite: CS/IS 165 or equivalent

ENTRY STANDARDS

	Subject	Number	Title	Description	Include
1	CS/IS	165	Computer Architecture And Assembly Language	Utilize assembly language to do operations such as decimal and string I/O;	No
2	CS/IS	165	Computer Architecture And Assembly Language	apply the assembly language instructions and pseudo operations to create a program;	Yes
3	CS/IS	165	Computer Architecture And Assembly Language	create assembly language programs using stacks, arrays, input and output operations and other instructions.	No

EXIT STANDARDS

1   Create a complex computer program in assembly language;
2   recognize and explain I/O codes, error-correcting, compression, and encryption;
3   explain advanced computer architecture, machine instructions and addressability.
4   explain the different levels of the computer system;
5   explain parallel computer architectures.

STUDENT LEARNING OUTCOMES

1   describe a computer system;
2   implement assembly language code for specific applications;
3   describe the design and implementation of micro-architecture systems.

COURSE CONTENT WITH INSTRUCTIONAL HOURS

	Description	Lecture	Lab	Total Hours
1	Introduction	3	0	3
2	Computer Systems Organization • Describe different levels of the machine • Describe interactions between levels	6	0	6
3	The Digital Logic Level • Transistors • Logic gates • Registers • Miscellaneous gates	7	0	7

4	The Microarchitecture Level • ALU • Data paths • Microprogram	11	0	11
5	The Instruction Set Architecture Level (machine language) • Microprogram implementation of machine language • Machine language example	6	0	6
6	The Operating System Machine Level • System commands • Language translators	8	0	8
7	The Assembly Language Level • The assembler • Assembler's translations	9	0	9
8	Parallel Computer Architectures • Multiple CPUs • Multiple memories	4	0	4
				54

OUT OF CLASS ASSIGNMENTS

1   programming assignments;

2   homework assignments (e.g. binary arithmetic, boolean algebra, design simple circuits, etc.)

METHODS OF EVALUATION

1   quizzes;

2   midterm examinations;

3   final examination.

METHODS OF INSTRUCTION

☑ Lecture

☐ Laboratory

☐ Studio

☐ Discussion

☐ Multimedia

☐ Tutorial

☐ Independent Study

☐ Collaboratory Learning

☑ Demonstration

☐ Field Activities (Trips)

☐ Guest Speakers

☐ Presentations

TEXTBOOKS

Title	Type	Publisher	Edition	Medium	Author	IBSN	Date
Structured Computer Organization	Required	Upper Saddle River: Pearson/Prentice-Hall	6		Tanenbaum, Andrew S.	0-13-291652-5	2013