



National Computing Education Accreditation Council
NCEAC



NCEAC.DOC.001-E

COURSE DESCRIPTION

NAME OF INSTITUTION	Lahore Garrison University
PROGRAM (S) TO BE EVALUATED	Computer Science , Spring 2023

Course Description :

Course Code	CSC346															
Course Title	Comp Organization & Assembly Lang															
Credit Hours	3+1															
Prerequisites by Course(s) and Topics	Digital logic design and Object oriented programming															
Assessment Instruments with Weights (homework, quizzes, midterms, final, programming assignments, lab work, etc.)	SESSIONAL (Quizzes, Assignments, Presentations) =25 % Midterm Exam =25 % Final Exam = 50%															
Course Coordinator	Muhammad Daniyal Baig															
URL (if any)																
Current Catalog Description																
Textbook (or Laboratory Manual for Laboratory Courses)	1. Computer Systems: A Programmer's Perspective, 3/E (CS:APP3e), Randal E. Bryant and David R.O' Hallaron, Carnegie Mellon University															
Reference Material	https://www.tutorialspoint.com/assembly_programming/index.htm https://emu8086-microprocessor-emulator.en.softonic.com/															
Course Goals	Computer technology requires professionals of every computing specialty to understand both hardware (HW) and software (SW). The interaction between HW and SW also offers a framework for understanding the fundamentals of computing. In this course students will study topics such as Instruction Set Architecture, Basic Assembly Instructions, Addressing Modes, Computer Performance evaluation, Floating Point Data, Data Path Design for Single Cycle and Multiple Cycle Computers, Pipelined Data Path Basics, Hazards in Pipelining, Memory hierarchy design, storage and I/O															
Course Learning Outcomes (CLOs):	<table><tr><td>At the end of the course the students will be able to:</td><td>Domain</td><td>BT Level*</td></tr><tr><td>Analyze and demonstrate the in depth knowledge and core concept of the Computer organization and assembly language.</td><td>C</td><td>3,4</td></tr><tr><td>Explain and adapt strategies using assembly language for error detection and fault tolerance.</td><td>C</td><td>1,3</td></tr><tr><td>Construct application level programs using assembly language and assemble all the modules to develop a final product.</td><td>P</td><td>4</td></tr><tr><td colspan="3">* BT= Bloom's Taxonomy, C=Cognitive domain, P=Psychomotor domain, A= Affective domain</td></tr></table>	At the end of the course the students will be able to:	Domain	BT Level*	Analyze and demonstrate the in depth knowledge and core concept of the Computer organization and assembly language.	C	3,4	Explain and adapt strategies using assembly language for error detection and fault tolerance.	C	1,3	Construct application level programs using assembly language and assemble all the modules to develop a final product.	P	4	* BT= Bloom's Taxonomy, C=Cognitive domain, P=Psychomotor domain, A= Affective domain		
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Topics Covered in the Course, with Number of Lectures on Each Topic (assume 15-week instruction and one-hour lectures)	Week	Lecture	Topics Covered
	Week 1	1	Introduction to computer systems
		2	Information is bits + context, programs are translated by other programs into different forms, processors read interpret instructions
	Week 2	3	Caches matter ,Storage devices form a hierarchy
		4	Representing and manipulating information
	Week 3	5	Operating system manages the hardware, systems communicate with other systems using networks
		6	Integer representations
	Week 4	7	Integer arithmetic
		8	Floating point
	Week 5	9	Machine-level representation of programs
		10	Understanding pointers
	Week 6	11	Using the gdb debugger
		12	Out-of-bounds memory references
	Week 7	13	Buffer overflow
		14	x86-64: extending ia32 to 64 bits
	Week 8	1 hours	Mid Term
	Week 9	15	Machine-level representations of floating-point programs
		16	Processor architecture: the Y86 instruction set architecture
	Week 10	17	Logic design and the Hardware Control Language (HCL)
		18	Sequential Y86 implementations
	Week 11	19	Pipelined Y86 implementations
		20	Processor architecture
	Week 12	21	Assembly Language Forms
		22	Instruction set architecture
	Week 13	23	Assembly Instructions
		24	Assembly Instructions (contd.)
	Week 14	25	Extending ia32 to 64 bit
		26	Hardware control language
	Week 15	27	Assembly Language directives
		28	Pipelining introduction
	Week 16	29	Pipelining using y86 Architecture
		30	Pipelining using sequential instructions
	Week 17	2 hours	Final Term
Laboratory Projects/Experiments Done in the Course			
Programming Assignments Done in the Course	4 programming assignments		

Instructor Name	Muhammad Daniyal Baig
Instructor Signature	
Date	