

# National Computer Education Accreditation Council NCEAC

NCEAC . FORM . 001-C

**INSTITUTION** **University of Malakand**

**PROGRAM (S) TO BE EVALUATED** **BS(Hons) Computer Science**

## A. Course Description

(Fill out the following table for each course in your computer science curriculum. A filled out form should not be more than 2-3 pages.)

<b>Course Code</b>	BCS243
<b>Course Title</b>	Computer Organization and Assembly Language
<b>Credit Hours</b>	4(3-1)
<b>Prerequisites by Course(s) and Topics</b>	Digital Logic Design: Overview of Binary Numbers, Boolean Algebra, Logic gates, NAND/NOR/XOR Operations.
<b>Assessment Instruments with Weights</b> (homework, quizzes, midterms, final, programming assignments, lab work, etc.)	<b>Internal</b> (homework, quizzes, programming assignments, lab work, etc) 20 %. <b>Mid Term</b> 30%. <b>Final Term</b> 50 %
<b>Course Coordinator</b>	Dr. Muhammad Zahid Khan
<b>URL (if any)</b>	N/A
<b>Current Catalog Description</b>	N/A
<b>Textbook (or Laboratory Manual for Laboratory Courses)</b>	Assembly Language for Intel-Based Computer, Fifth Edition, by Kip R. Irvine. Prentice-Hall Publishing,
<b>Reference Material</b>	1. Computer Organization and Architecture, William Stallings 2. Principles of Computer Organization and Assembly Language, , Patrick Juola. 2. Internet Resources
<b>Course Goals</b>	The main objective of this course is to introduce the organization of computer systems and usage of assembly language for optimization and control. Emphasis should be given to expose the low-level logic employed for problem solving while using assembly language as a tool. At the end of the course the students should be capable of writing moderately complex assembly language subroutines and interfacing them to any high level language.
<b>Topics Covered in the Course, with Number of Lectures on Each</b>	<b>Weak 1 &amp; 2: Introduction to Assembly Language</b> Basic Computer Architecture, Registers, Instruction Groups, Intel IAPx88

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<b>Topic</b> (assume 15-week instruction and one-hour lectures)	Architecture, History, Register Architecture, Our First Program, Segmented Memory Model <b>Weak 3&amp;4: Addressing Modes</b> Data Declaration, Direct Addressing, Size Mismatch Error, Register Indirect Addressing, Register + Offset Addressing, Segment Association, Address Wraparound, Addressing Modes Summary <b>Weak 5&amp;6: Branching</b> Comparison and Conditions, Conditional Jumps, Unconditional Jumps, Relative Addressing, Types of Jumps, Sorting Examples <b>Weak 7&amp;8: Bit Manipulation</b> Multiplication Algorithm, Shifting and Rotations, Multiplication in Assembly Language, Extended Operation, Bitwise Logical Operations, Masking Operation <b>Weak 9&amp;10: Subroutines</b> Program Flow, Our first subroutine, Stack, Saving and Restoring Registers, Parameter Passing Through Stack, Local Variables <b>Weak 11&amp;12: Display Memory</b> ASCII Codes, Display Memory Formation, Hello World in Assembly Language, Number Printing in Assembly, Screen Location Calculation <b>Weak 13: String Instruction</b> String Processing, STOS Example – Clearing the Screen, LODS Example – String Printing ,SCAS Example – String Length ,LES and LDS Example, MOVS Example – Screen Scrolling ,CMPS Example – String Comparison <b>Weak 14: Peripheral Control Interrupts</b> <b>Weak 15: Interfacing with high level languages</b> <b>Weak 16: Real-time applications</b>								
<b>Laboratory Projects/Experiments Done in the Course</b>	Exercises covering different aspects of Assembly Language Programming on the Intel IAPx88 Architecture								
<b>Programming Assignments Done in the Course</b>	Implementation of concepts studied in the course								
<b>Class Time Spent on</b> (in credit hours)	<table border="1" style="width: 100%; border-collapse: collapse; margin: 0 auto;"> <thead> <tr> <th style="width: 25%;">Theory</th> <th style="width: 25%;">Problem Analysis</th> <th style="width: 25%;">Solution Design</th> <th style="width: 25%;">Social and Ethical Issues</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">40%</td> <td style="text-align: center;">20%</td> <td style="text-align: center;">30%</td> <td style="text-align: center;">10%</td> </tr> </tbody> </table>	Theory	Problem Analysis	Solution Design	Social and Ethical Issues	40%	20%	30%	10%
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<b>Oral and Written Communications</b>	Every student is required to submit at least <u>3</u> written reports of typically <u>5-8</u> pages and to make <u>1</u> oral presentations of typically <u>20</u> minute's duration. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy.								

**Instructor Name:** Aftab Alam

**Instructor Signature:**



**Date:** 29/03/2017

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