National University

of Computer & Emerging Sciences

Course Outline of BS (CS) Degree Program

Instructor(s): Dr. Muhammad Nouman Durrani, Muhammad Danish Khan, Syed Zain-ul-Hassan

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| **Course Title** | | Computer Organization and Assembly Language | | **Course Code** | EE 213 |
| **Pre-Requisites** | | Digital Logic Design | | **Credit Hours** | 3 |
| **Text Book** | **Title** | Assembly Language for Intel-Based Computers (7th Ed) | | | |
| **Author** | Kip R. Irvine | | | |
| **Publisher** | Pearson Education Inc. (*ISBN 978-0-07-338065-0*) | | | |
| **Reference Book** | **Title** | | Assembly Language Programming and Org. of the IBM PC | | |
| **Author** | | Ytha Yu, Charles Marut | | |
| **Publisher** | | McGraw Hill | | |
| **Softcopies of text books/lecture slides/reference material:** <http://slate.nu.edu.pk/portal/site/KHIEE229FALL2019CS/tool/KHIEE229FALL2019CS1310>  (Login Required) | | | | | |

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| **Week** | **Course Contents/Topics** | **Chapter** |
|  | Class Introduction, Course Introduction, Introduction to Assembly Language and Computer Organization, Computer Architecture vs Computer Organization, Introduction To Basic Concepts | **BOOK I**  **CH 1** |
|  | x86 Processor Architecture: Basic Microcomputer Design, Instruction Execution Cycle, Loading and Executing a Program, Reading from Memory, Loading and Executing a Program x86 Processors, 32-Bit x86 Processor | **BOOK I**  **CH 2**  **BOOK 2**  **CH3** |
|  | Assembly Language Fundamentals: Basic Language Elements, Assembling Linking and Running Programs | **BOOK I**  **CH3** |
|  | Defining Data, Symbolic Constants  Data Transfer, Addressing and Arithmetic: Data Transfer Instructions, Addition and Subtraction, Data Related Operators and Directives, Indirect Addressing, JMP and LOOP Instructions | **BOOK I**  **CH3, CH4** |
|  | Procedures: Stack, Stack, PUSH and POP Operations, Defining and Using Procedures, Nested Procedure Calls and their Stack Implementation, CALL and RET Instructions | **BOOK I**  **CH5** |
|  | **MID I** |  |
|  | Procedure, Conditional Processing: Conditional Branching, Conditional Jumps | **BOOK I**  **CH5, CH6** |
|  | Conditional Loop Instructions  Integer Arithmetic: SHIFT and ROTATE Instructions, | **BOOK I**  **CH6, CH7** |
|  | Multiplication and Division Instructions: MUL, IMUL, DIV, IDIV  Advanced Procedures: Introduction, Stack Frames | **BOOK I**  **CH7, CH8** |
|  | Stack Frames, Recursion, INVOKE, ADDR, PROC, PROTO Directives, Strings and Arrays: 2D Arrays | **BOOK I**  **CH8, CH9** |
|  | High Level Language Interface: Introduction, .model directive, Inline Assembly Code |  |
|  | **MID II** |  |
|  | Machine Language Translation/ x86 Instruction Encoding | **BOOK I**  **CH17**  **+ Reference Material** |
|  | x86 Instruction Encoding, 16-Bits MS DOS Programming : Interrupts and Related Topics | **BOOK I**  **CH9** |
|  | CISC VS RISC, MIPS Programming | **Reference Material** |
|  | MIPS Programming, Course Review, Projects’ Evaluations | **BOOK I CH12 + Reference Material** |

Pre-Requisites:

Students enrolled in this course are expected to have completed following courses:

1. Introduction to Computer Science, Digital Logic Design
2. Fundamental programming skills (Computer Programming)

Marks Distribution (Theory 75%, Lab 25%):

Mid Terms (1 & 2) ……………….….……. 30% Project …… 10%

3 Quizzes ….................................................. 10% Assignment ……………………….. 5%

Final Examination …………....…………… 45%

Websites related to this course:

1. Slate Website: <http://slate.nu.edu.pk/portal/site/KHIEE229FALL2019CS/tool/KHIEE229FALL2019CS1310> (Login Required)
2. Course material: <http://slate.nu.edu.pk/portal/site/KHIEE229FALL2019CS/tool/KHIEE229FALL2019CS1310> (Login Required)

Plagiarism:

Marks will be deducted and the case shall be reported to the HOD and/or DC.

Rules & Regulation:

Rules and regulations related to attendance, all type of exams, class work, homework and others shall be observed as issued by the HOD CS department or in absence of the same as communicated by the course instructor during the semester.