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| Course Name | Computer Structure and Machine Language |
| Prerequisite course | Basics of programming, logic circuits |
| Corequisite course | - |
| References | 1. J. L. Antonakos.The 68000 Microprocessor: Hardware and Software Principles and Applications. Prentice Hall, 2004.<br>2. M. A. Mazidi, et al. The x86 PC: Assembly Language, Design, and Interfacin. Prentice Hall, 2010.<br>3. G. Struble. Assembler Language Programming: The IBM System/360. Addison-Wesley, 1971.<br>4. D. A. Patterson and J. L. Hennessey. Computer Organization and Design MIPS Edition: The Hardware/Software Interface. 5th Edition, Elsevier (Morgan Kaufmann), 2013. |
| Course instructor | Dr. Mohammadhadi Alaeiyan |
| Syllabus | 1. Computer History<br>2. Introduction to computer generations and its types<br>3. Von Neumann model<br>4. Stored Data<br>5. Numbers: integer / decimal, unmarked / with sign, fixed point / floating point, binary / decimal,…<br>6. Characters: 7 and 8 bit basic codes, 16 and 32 bit comprehensive codes<br>7. Computer structure<br>8. Central Processing Unit (CPU), Computing and Logic Unit (ALU), Registers, Control Unit (CU), Main Memory<br>9. Common Bus, Fetch-Execute Cycle<br>10. Types of data blocks<br>11. Addressing modes: instantaneous (attached to operand), direct (absolute), indirect, relative, implicit, index, fragment, page<br>12. Programming in assembly language and translating it into machine language on a few simple computers<br>13. Assembler and Debugger, Compiler, Linker and Loader.<br>14. Familiarity with the instruction set of at least one CISC computer<br>15. Introduce the structure of the computer and its methods of addressing<br>16. Introducing instructions and programming in the assembly language of the desired computer<br>17. Introduction of conventional structures of structural planning<br>18. Interrupt and managements<br>19. Familiarity with the instruction set of at least one RISC computer<br>20. Introduce the structure of the computer and its methods of addressing<br>21. Introducing instructions and programming in the assembly language of the desired computer<br>22. Introduction of conventional structures of structural planning<br>23. Interrupt and managements |