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| المملكة العربية السعودية  وزارة التعليم العالي  **جامعة أم القرى**  الكلية الجامعية بالجموم – قسم الحاسب الآلي |  | Kingdom of Saudi Arabia  Ministry of Higher Education  **Umm Al-Qura University**  University College in Al-Jamoum  Computer Dept. |

Course Specification

1. **Course number and name:** (2316214-3) Computer Organization & Assembly Programming
2. **Credits and contact hours:** 3 Credits

(Lecture: 3/week – Practical Session: Non)

1. **Instructor’s or course coordinator’s name:** Dr. Hesham Hamed
2. **Text books**
3. **Main Text book:** D. Patterson and J. Hennessy, Computer Organization & Design: The Hardware/Software Interface, Morgan Kaufmann, (4th edition), 2008.
4. **Reference:** C. Hamacher, Z. Vranesic, and S. Zaky, Computer Organization and Embedded Systems, McGraw-Hill, (5th edition), 2001.
5. **Specific course information**
6. **brief description of the content of the course (Catalog Description):**

Students will learn about the differences in instruction sets, processor design, and memory hierarchy, and their benefits and drawbacks. Students will also learn how the hardware interacts with software, and learn basic assembly language programming.

1. **prerequisites or co-requisites:** Logic Design & Analysis (1401213-3)
2. **indicate whether a required, elective, or selected elective course in the program:** required
3. **Specific goals for the course**

The student will be able to:

1. Students will be familiar with, and appreciate the trade-offs of, different instruction sets, addressing modes, address translation schemes, and processor designs.
2. Students will become familiar with various hardware/software interfaces
3. Students will gain basic assembly language programming skills.

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| *Course*  *Goals* | *Program Outcomes* | | | | | | | | | | |
| SOa | SOb | SOc | SOd | SOe | SOf | SOg | SOh | SOi | SOj | SOk |
| 1 | ✓ |  | ✓ | ✓ |  |  |  |  |  |  |  |
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| **Relationship of Course Goals to the Program Student Outcomes** | |
| **SOa** | An ability to apply knowledge of computing and mathematics appropriate to the discipline   * *Students apply knowledge of computer organization and assembly language to a project.* |
| **SOc** | An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.   * *Students are required design and implement a software project to meet a specification.* |
| **SOd** | An ability to function effectively on teams to accomplish a common goal.   * *Projects are implemented in teams.* |
| **SOf** | An ability to communicate effectively with a range of audiences.   * *In this course students understand the trade-offs between timing and cost when minimizing digital circuits (using Karnaugh maps and Quine–McCluskey techniques).* |
| **SOj** | An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.   * *Students are required to apply their knowledge of computing to design a solution to a problem using the assembly language.* |

1. **Brief list of topics to be covered**

* Machine organization
* Instruction sets
* Addressing modes
* Instruction encoding
* Data path and control
* Memory organization