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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:** (2316410-3) Compiler Construction
2. **Credits and contact hours:** 3Credits

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

1. **Instructor’s or course coordinator’s name:** Dr. Abdel-Rahman Hedar
2. **Text books**
3. **Main Text book:** Alfred V. Aho, Monica S. Lam, Ravi Sethi, and Jeffrey D. Ullman, Compilers: Principles, Techniques & Tools, Addison Wesley, 2nd Edition, 2007.
4. **Reference:** Keith Cooper, Linda Torczon, Engineering a Compiler, Morgan Kaufmann, 2nd Edition, 2011.
5. **Specific course information**
6. **brief description of the content of the course (Catalog Description):**

Students should learn the basic techniques that underlie the practice of compiler construction, and its phases. Moreover, they should be able to deal with compiler techniques and problems such as; ambiguous grammar, parsing types, and generating target codes, etc.

1. **prerequisites or co-requisites:** Programming Languages (2316331-4)
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. Recognize and use terminology and formalisms related to grammars for programming languages and compiler construction.
2. Understand the intermediate code representation, symbol tables, run-time structures, code generation, and compiler construction tools.
3. Identify and describe the concepts underlying the components of a compiler including a scanner, parser, and code generator.
4. Construct the basic components of a compiler including the scanner, parser, code generator, and symbol table.

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| *Course*  *Goals* | *Program Outcomes* | | | | | | | | | | |
| SOa | SOb | SOc | SOd | SOe | SOf | SOg | SOh | SOi | SOj | SOk |
| 1 |  |  | ✓ |  |  |  |  |  | ✓ |  |  |
| 2 |  |  | ✓ |  |  |  |  |  | ✓ |  |  |
| 3 |  |  | ✓ |  |  |  |  |  | ✓ |  |  |
| 4 |  |  | ✓ | ✓ |  | ✓ |  |  | ✓ |  |  |

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| **Relationship of Course Goals to the Program Student Outcomes** | |
| **SOc** | An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.   * *Students are required to implement a simple compiler to translate infix code representation to postfix representation.* |
| **SOd** | An ability to function effectively on teams to accomplish a common goal.   * *Students works in team to accomplish projects.* |
| **SOf** | An ability to communicate effectively with a range of audiences.   * *The assigned project and assignments and presentation at the end of course enable students to communicate effectively.* |
| **SOi** | An ability to use current techniques, skills, and tools necessary for computing practices.   * *Student*s used the current tools and technologies in developing their projects. |

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

* Overview of Compilation
* Scanners
* Parsers
* Code generations
* Runtime environments
* Register allocation
* Code optimization