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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: (**2316317-3**)** Logic Programming
2. **Credits and contact hours:** 3 Credits

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

1. **Instructor’s or course coordinator’s name:** Dr. Wael Deabes
2. **Text books**
3. **Main Text book:** F. H.-Snyder, D. Howard-Snyder, R. Wasserman, The Power of Logic, 5th Edition, McGraw-Hill, 2012.
4. **Reference:** J. Farrell, Programming Logic and Design – Comprehensive, 6th Edition, Cengage Learning, 2010.
5. **Specific course information**
6. **brief description of the content of the course (Catalog Description):**

This course introduces the meta-theory of elementary logic. Following by the basics of notation and the use of classical logic as a representation language, we concentrate on the twin notions of models and proof. An axiomatic system of first order logic is introduced and proved complete for the standard semantics, and then we give a very brief overview of the basic concepts of proof theory.

This course deals with logic programming paradigm and Prolog. We discuss the syntax and the semantics of Prolog, the working of a Prolog interpreter and various applications of Prolog.

1. **prerequisites or co-requisites:** Structured Programming (2316210-3)
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. Understand the syntax of Logic, the purpose of unification, resolution, negation, the potential applications of Logic programming.
2. Translate English sentences in logic, apply unification, resolution, and negation in programs to solve search problems.
3. Use Logic programming to implement real deductive databases, show the completeness of the resolution procedure, apply Logic programming and implement efficiently in Logic Programming to solve real life search problems.

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

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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 learn to apply declarative programming to solve problems.* |
| **SOi** | An ability to use current techniques, skills, and tools necessary for computing practices.   * *Students learn to use Prolog, a popular tool for logic programming.* |

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

* Logic and Argument
* Propositional Logic
* Propositional Logic: Truth table
* Propositional Logic: Logical Inference
* Propositional Logic: Conditional Proof
* Predicate Logic : Predicates and Variables
* Predicate Logic : Quantifiers
* First order logic
* Prolog: Introduction
* Prolog: Terms and unification
* Prolog: proof search