Course specifications

Programme(s) on which the course is given **B.Sc. of Pure Mathematics and Computer Science, Physics and CS**

Major or minor element of programs **Major**

Department offering the program **Mathematics**

Department offering the course **Mathematics**

Academic year / Level **First (4)**

Date of specification approval **September 2012**

A- Basic Information

Title: Logic in compute science **Code: M4316**

Credit Hours: 4 hr. **Lecture: 3 hr.**

Tutorial: 0 hr. **Practical: 2** **Total: 4 hr.**

Teaching Staff

B- Professional Information

1 – Overall aims of course

The course is intended as an introductory logic course in computer science. No previous experience with computer logic is required. Students are expected to be capable of understanding the logic of program evaluation. They will learn computational proofs with satisfiability problems.

2 – Intended learning outcomes of course (ILOs)

- **Knowledge and understanding:**

The student should be able to;

a1. Know and understand, analysis, and prove the efficiency of a program,

a2- Explain the meaning of be able to use predicate logic in defining an algorithm

a3. Recognize how to parse program logic tree and evaluate its efficiency.

- **Intellectual skills**

  The student should be able to;

  b1- Construct a program in predicate

  .logic

  .b2- Develop programs according to their efficiency

  b3- Apply appropriate different methods introduced in the course for suitable use in dealing with different

  . problems

- **Professional and practical skills**

  The student should be able to;

  c1- Specify definition of algorithms in predicate logic.

  c2- Develop a rang of algorithms and prove its satisfiability.

  c3- Specify the outcomes of the course through its use in practical application in different scientific fields.

- **General and transferable skills**

  The student should be able to:

  d1- Use with logic problems related to the topics covered in the course.

  d2- Employ an extend and modification of the methods of the course for more complicated problems in program evaluation.

3- Contents

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to Propositional logic: declarative statements, natural deduction; Parse trees and truth tables	**11**	**3**	**2**

Propositional logic as a formal language. Semantics of propositional logic, and mathematics induction, Normal forms	**11**	**3**	**2**
Verification by model checking: what is verification, syntax of computation tree logic, and semantics of CTL	**11**	**3**	**2**
Examples of CLTs as mutual exclusion … etc; model checking algorithms	**11**	**3**	**2**
SMV system: modules, fairness and alternatives to CTL	**8**	**2**	**2**

4– Teaching and learning methods

4.1 -Lectures

4.2 -Working on hand in assignments

4.3 -Attending practical classes

5- Student assessment methods

5.1 Mid term written exam to assess understanding competencies

5.2 Mid term practical Exam to assess programming skills

Oral Exam to assess 5.3
.attendance and interesting
Semester hand in assignments to assess 5.4
.understanding professionalism
Final lap exam to assess a whole 5.5
lap skills
Final term written Exam to assess 5.6
.comprehension

Assessment schedule

Assessment 1 Mid term + practical Week 7
Assessment 2 semester activities Week 5 and 8
Assessment 3 Final term oral exam + lap Week 13
Assessment 4 final term written exam Week 14

Weighting of assessments

Mid-Term Examination
20%
Semester Work (homework assignments + oral tests)
20 %
Other types of assessment
00%
Final-term written Examination
60%
Total
100%

Any formative only assessments

6- List of references

6.1- Course notes

Collected and prepared notes that cover the main topics in the course content

6.2- Essential books (text books)

Elementary text books under the title : *Logic in Computer Science Modeling and Reasoning About Systems*

6.3- Recommended books :

6.4- Periodicals, Web sites, … etc

Non.

7- Facilities required for teaching and learning

Lecture: PC's - packages for ready made scientific programs. - Data Show

Lap: lap contains all the tools, instrumentation, and packages.

Course coordinator:

Head of Department: Prof. Dr. Mohamed A. Ramadan

Date: / /