Course specifications

Programme(s) on which the course is given   B.Sc. of Pure Mathematics & Computer
    Science, Physics and computer science
 Major or minor element of programs   Major in
 B.Sc. of Pure Mathematics & Computer

                                     Minor in physics
 and computer science
 Department offering the program   Mathematics
 Department offering the course   Mathematics
 Academic year / Level   Level three & four
(3-4)
 Date of specification revision   September 2012
 Date of specification approval   September 2012
A- Basic Information
   Title: Computation   Code: M438
   theory
   Credit Hours: 2   Total: 2 hr.

   Lecture: 2   Tutorial: - Practical: -   Other: -

B- Professional Information
   ### 1 – Overall aims of course
 The aim of this course is that student learns formal
 languages , formal models of computation, such as finite
 state automata, pushdown automata, and Turing
 machines, and their corresponding elements in formal
 languages (regular, context-free, recursively enumerable).
 Also, they learn the complexity hierarchy, Church's thesis
 and undecidability, and NP completeness. Students
 should practice theoretical basis of design and compiler
 construction.

2 – Intended learning outcomes of course (ILOs)
  The student should be able to;
  a- **Knowledge and understanding:**
   a1- Know and Understand the relation between sets and languages.
   a2- demonstrate the concept of grammars.
   a3- Recognize models of computations.
   a4- Explain the meaning of deterministic and non-deterministic finite automata, Push down automata
  b- **Intellectual skills**
   b1-Employ and Recognize some patterns by finite automata.
   b2- Construct a grammars for some languages .
   b3- Apply and Test a Turing machine for some computable function.

  c- **Professional and practical skills**
   c1- Design a lexical analyzer as a finite automata for certain pattern.
   c2- Design a grammar for certain syntax of programming languages.
   c3- Choose and apply some well-kown NP-complete problems.

  d- **General and transferable skills**
   d1-Exhabite appropriate implementation for finite automata and grammars .
   d2- Think independently in Solvable and unsolvable problems of grammars and Turing machines

3- Contents

Topic	No. of hours	Lecture	Tutorial/ Practical
Finite automata and regulare expression	**4**	**2**	**-**

Context free grammar	4	2	-
Understand formal language elements	4	2	-
models of computation	4	2	-
Compatible function	4	2	-
Church's thesis	4	2	-
Interdiction to complexity theorry.	4	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 Term project to assess programming skills

   5.3 Oral Exam to assess attendance and interesting.

   5.4 Semester hand in assignments to assess understanding professionalism.

   5.5 Final term written Exam to assess comprehension.

Assessment schedule

   Assessment 1   Mid term + project   Week 7

   Assessment 2   semester activities   Week 5 and 8

   Assessment 3   Final term oral exam   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) Sud amep" Languages and Machines " Addition Wesely 1998

      Elementary text books under the title:

  6.3- Recommended lewis , pwpudinitrion books: " Elementy of the theory of computation" prentice-Hall,Inc,1997

  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

Course coordinator: D/ Mohamed Amin

Head of Department: D/ Mohamed Abd EL-lateef

 Date: /   /