Course Specifications

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

Major or minor element of programs Major
Department offering the program Mathematics
Department offering the course Mathematics
Academic year / Level Third level (3)
Date of specification revision September 2012
Date of specification approval September 2012

A- Basic Information

Title: Design and Analysis of Algorithms **Code: M339**
Credit Hours: 4 **Total: 4 hr.**

Lecture: 3 **Tutorial: -** **Practical: 2** **Other: -**

B- Professional Information

1 – Overall Aims of Course

- Give the student an introduction to system analysis and design concepts.
- Understanding the software development life cycle (SDLC), specification, analysis, design, implementation and testing
- Build of Modular top-down analysis, design and testing, CASE tools for system analysis and design .
- Understanding the requirements of I/O design, input validation and user interface design (GUI) .

2 – Intended Learning Outcomes of Course (ILOs)

The student should be able to

a- Knowledge and Understanding:

a. **Identify techniques to analyze, design, develop, implement, and evaluate computer information systems.**
b. **Recognize knowledge and theory of systems concepts to computer information systems.**
c. **Recognize the difference between data and information, data analysis and retrieval and the principles of knowledge discovery and mining.**
d. **Understand and apply a wide range of principles and tools available to the software engineer, such as mathematical tools, design methodologies, choice of algorithm, language, software libraries and user interface technique.**
e. **Specify social concerns related to the introduction of new automated systems.**

b- Intellectual Skills

b1- Solve a wide range of problems related to the analysis, design and construction of computer systems.

b2-Analyze the methods of parameters estimation, the method of hypothesis testing, the methods used for data analysis to any quantitative data,

b3- formulate and abstract real life systems and obtain appropriate solutions.

b4- Select appropriate design techniques and tools to model and analyze computer systems.

c- Professional and Practical Skills

c1- Improving the skills of developing information systems.

c2- Employ skills of system analysis and design.

c3- Practice skills of documenting and defining the development of the information system.

c4- Implement professional and ethical responsibilities while acquiring information for real life problems.

d- General and Transferable Skills

d1- Exhibit an ability to achieve of self development locally and internationally

d2- Identify problem solving techniques and methodology

d3- Improving the skills of logical thinking and system developments

d4- Manage group working and time management in project development.

d5- Demonstrate reporting and presentation skills to a wide range of audience.

3- Contents

Topic	No. of Hours	Lecture	Tutorial / Practice
Introduction to Systems Analysis and Design	4	1	1
Information Systems Building Blocks	4	1	1
Information System Development (System Development Life Cycle) (SDLC)	12	3	3
System Analysis, structured analysis, prototyping, JAD, and OOA	4	1	1
Introduction to CASE tools	4	1	1
Rapid Application Development (RAD) Tools (Visual Basic Programming)	4	1	1

Data Modeling (Entity Relationship Modeling)	**4**	**1**	**1**
Process Modeling, Data Flow Diagrams, functional decomposition, Object Modeling	**4**	**1**	**1**
Database Design (Data Analysis, intro to normalization)	**8**	**2**	**2**
Input and Output Design	**4**	**1**	**1**
User interface Design	**4**	**1**	**1**

4– Teaching and learning methods

4.1- Lectures

4.2- Working on hand in assignments

4.3- Project and report knowledge collection.

5- Student assessment methods

5.1 Mid term written exam to assess understanding competencies

5.2 Programming 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**	**Week 7**
Assessment 2	**semester activities**	**Week 5 and 8**
Assessment 3	**Final Project/report**	**Week 13**
Assessment 4	**Final term written exam**	**Week 14**

Weighting of assessments

Mid-Term Examination

20%

Semester Work (homework assignments + quizzes) 10%

Project 10%

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 : K. Kendall and J Kendall. *System Analysis and Design,* global ed. Pearson

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: Advanced lap contains Visio and Project Management

Course coordinator: Dr. Passent El-Kafrawy

Head of Department: Prof. Mohamed A. RAmadan

Date: / /