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Quality Assurance and Accreditation Project



مشروع توكيد الجودة والاعتماد



# **QUALITY ASSURANCE AND ACCREDITATION PROJECT**

**FACULTY OF COMPUTERS AND INFORMATION**

**OPERATIONS RESEARCH AND DECISION SUPPORT  
DEPARTMENT**

**MENOUFIA UNIVERSITY**

**BACHELOR OF COMPUTERS AND INFORMATION  
(OPERATIONS RESEARCH AND DECISION SUPPORT)**

**Program Specification**

**Nov 2006-Nov 2007**



# **QUALITY ASSURANCE AND ACCREDITATION PROJECT**

## **FACULTY OF COMPUTERS AND INFORMATION OPERATIONS RESEARCH AND DECISION SUPPORT**

### **MENOUFIA UNIVERSITY**

#### **BACHELOR OF COMPUTERS AND INFORMATION (OPERATIONS RESEARCH AND DECISION SUPPORT)**

#### **CONTENTS**

| <b>Topic</b>                  | <b>Page</b> |
|-------------------------------|-------------|
| <b>Program Specification</b>  | <b>1</b>    |
| <b>Courses Specifications</b> | <b>19</b>   |

**Nov 2006-Nov 2007**



**FACULTY OF COMPUTERS AND INFORMATION  
MENOUFIA UNIVERSITY**

**QUALITY ASSURANCE AND ACCREDITATION  
PROJECT**

**BACHELOR OF COMPUTERS AND INFORMATION  
(OPERATIONS RESEARCH AND DECISION SUPPORT)**

**Teaching Institution:** Faculty of Computers and Information  
Menoufia University, Menoufia, Egypt

**Awarding Institution:** Menoufia University

**Degree Award:** Bachelor of Computers and Information  
(Operations Research and Decision support)

**Length and Mode:** 4 years/ Full semester time

**Program Coordinator:** Prof. Dr. Waiel F. Abd-El-Wahed  
Vice Deans, the head of Operations  
Research and Decision support Dept.

**Assistant Coordinator:** Eng. Ahmed kafafy

# Program Specification

## A- Basic Information

- 1 **Program Title**                      **Operations Research and Decision Support**
- 2 **Program Type**                      **Single**
- 3 **Department(s):**                      **Operations Research and Decision Support**
- 4 **Coordinator:**                      **Dr. Waiel F. Abd-El-Wahed**  
**Assistant Coordinator:**      **Eng. Ahmed kafafy**
- 5 **External Evaluator:**              **Prof Mohammed Osman Prof Hassan Rasmy**
- 6 **Last date of program specifications approval:**      **2007**

## B- Professional Information

### 1- Program aims

- 1 Enable graduates to exhibit a high level of practical and theoretical skills in operations Research & Decision Support with knowledge of currently available techniques and technologies.
- 2 Explore the principles that support developments in a rapidly changing subject.
- 3 Provide opportunities for students to understand the wide range of research challenges facing in operations Research & Decision Support.
- 4 Develop competent professionals able to play a leading part in many different commercial, Industrial and academic activities and adapt rapidly to changing technology.
- 5 Prepare students for the social, organizational and professional context in which they will be working.

### 2- Intended learning outcomes (ILOs)

#### A-Knowledge and understanding:

- A1 Knowing and understanding the essential principals of decision making problems.
- A2 recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A3 Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A4 Demonstrating the principles of decision support tools and its implementation in developing the intelligent decision systems.

- A5 Knowing and understanding the mathematical background of operations research and its related topics.
- A6 Recognizing the different mathematical approaches that solve the decision making problems in different fields
- A7 Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

**B- Intellectual skills**

- B1 Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B2 Learning principles of modeling decision making problems as well as things to be avoided.
- B3 Training on measuring efficiencies of the system units w. r. t. the whole system.
- B4 Implementing the system life cycle in handling different problems of organizations.
- B5 Analyzing the right modeling process to emulate the real life problems
- B6 Learning how to design the Decision Support Systems that will support the decision makers.

**C- Professional and practical skills**

- C1 Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C2 Examine examples and case studies that documenting computer support for organizational decision making.
- C3 Learn how to understand the features of the available decision making packages.
- C4 Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C5 Be familiar with techniques that can be used in the field of decision making based computer technologies.
- C6 Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.
- C7 Learn how the student manages himself during the decision making process

**D- General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D2** Enabling the students to gain knowledge about the tools for measuring systems' efficiency.
- D3** Recognizing and understanding the available packages that are available in modeling and simulation Lab and training on working within the Platform of the available packages
- D4** Learning how to deal with the uncertain decision making problems.
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.
- D7** Write up in an accurate, coherent and logical manner solutions to a range of mathematical programming problems.
- D8** Teaching the students how to optimize the cost of the decision making processes and how to finance the projects.

### **3- Academic standards**

#### **3a External references for standards (Benchmarks)**

We referred to ACM and IEEE Computing curricula recommendations

#### **3b Comparison of provision to external references**

Owing to lack of national academic reference standards, we referred to ACM and IEEE Computing curricula recommendations. These standards include several knowledge and understanding, intellectual, professional, practical skills and general and transferable skills besides different methods of teaching and learning of student assessment. This section provides a comparative view of the performance capabilities expected of the graduates of each degree program. Tables H1, H.2 in annex (A) list nearly 60 performance capabilities across 11 categories. For each capability, each discipline is assigned a value from 0 to 5. The value 0 represents no expectation whatsoever, while 5 represents the highest relative expectation. As with the values of Tables H.1 and H.2 in annex (A), these values are fuzzy numbers. Table H.3 in annex (A) shows that Operations Research and decision support should be able to properly perform and manage activities at every stage of the life cycle of large-scale software systems and decision making

and modeling skills. As we have seen, Operation research and decision support has its own character.

Any reputable computing degree program should include each of the following elements.

1) Essential and foundational underpinnings of its discipline. These may be abstract, for example, formal theory rooted in mathematics, or they may address professional values and principles. Regardless of their form or focus, the underpinnings must highlight those essential aspects of the discipline that remain unaltered in the face of technological change. The discipline's foundation provides a touchstone that transcends time and circumstance, giving a sense of permanence and stability to its educational mission. Students must have a thorough grounding in that foundation.

2) A foundation in the concepts and skills of computer programming. The foundation has five layers:

- a) an intellectual understanding of, and an appreciation for, the central role of algorithms and data structures;
- b) an understanding of computer hardware from a software perspective, for example, use of the processor, memory, disk drives, display, etc.
- c) fundamental programming skills to permit the implementation of algorithms and data structures in software;
- d) skills that are required to design and implement larger structural units that utilize algorithms and data structures and the interfaces through which these units communicate;
- e) software engineering principles and technologies to ensure that software implementations are robust, reliable, and appropriate for their intended audience.

3) Understanding of the possibilities and limitations of what computer technology (software, hardware, and networking) can and cannot do. There are three levels:

- a) an understanding of what current technologies can and cannot accomplish;



- b) an understanding of computing limitations, including the difference between what computing is inherently incapable of doing vs. what may be accomplished via future science and technology;
  - c) the impact on individuals, organizations, and society of deploying technological solutions and interventions.
- 4) Understanding of the concept of the lifecycle, including the significance of its phases (planning, development, deployment, and evolution), the implications for the development of all aspects of computer-related systems (including software, hardware, and human computer interface), and the relationship between quality and lifecycle management.
- 5) Understanding of the essential concept of process, in at least two meanings of the term:
- a) process as it relates to computing especially program execution and system operation;
  - b) process as it relates to professional activity especially the relationship between product quality and the deployment of appropriate human processes during product development.
- 6) Study of advanced computing topics that permit students to visit and understand the frontiers of the discipline. This is typically accomplished through inclusion of learning experiences that lead students from elementary topics to advanced topics or themes that pervade cutting-edge developments.
- 7) The identification and acquisition of skill sets that go beyond technical skills. Such skill sets include interpersonal communication skills, team skills, and management skills as appropriate to the discipline. To have value, learning experiences must build such skills (not just convey that they are important) and teach skills that are transferable to new situations.
- 8) Exposure to an appropriate range of applications and case studies that connect theory and skills learned in academia to real-world occurrences to explicate their relevance and utility.

9) Attention to professional, legal, and ethical issues so that students acquire, develop, and demonstrate attitudes and priorities that honor, protect, and enhance the profession's ethical stature and standing.

10) Demonstration that each student has integrated the various elements of the undergraduate experience by undertaking, completing, and presenting a capstone project.

- For general standards and their relationship to the reference standards. The Faculty council in accordance with QAAP management team decided to take ACM and IEEE as a reference academic standards since no national academic standards were developed yet. The general standards are attached as annex (A-2) of this report. The programme standards extracted from these reference standards with a slight modification in the non computing topics. A selection based on necessity and importance of courses to community needs was implement on computing topics to convey the available time schedule of maximum 14 weeks per semester in five topics.

#### 4- Curriculum Structure and Contents

4. a- Program duration Four Years

4. b- Program structure:

4. b.i- No. of hours/week Lectures: **119** Lab /Exe **127** Total: **246**

4. b.ii- No. of hours: Compulsory: **216** Elective: **170** Optional **-**

4. b.iii-No. of hours of basic sciences courses: No **36** % **14.6**

4. b.iv- No. of hours of courses of social No: **12** % **4.8**

##### Sciences and humanities:

4. b.v- No. of hours of specialized courses: **162** % **65.8**

4. b.vi- No. of hours of other courses: No **36** % **14.6**

4. b.vii Practical/Field Training:

##### Programming & application skills:

4. b.viii Program Levels (in credit-hours system):

## 5- Program courses

### 5.1- 1<sup>st</sup> year Semester 1

#### A. Compulsory

| Code No. | Course Title          | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered         |
|----------|-----------------------|--------------|-------------|----------|--------------|------------------------------|
| GN111    | English Language      | 6            | 3           | 2        | 1            | A2,A3,A5,B1,B3,D1, D5        |
| MA111    | Mathematics-1         | 6            | 3           | 0        | 3            | A1,A3,A5,A6,B1,B3, C6,D1,D5  |
| MA131    | Discrete Mathematics  | 6            | 3           | 0        | 3            | A2,A3,,A6,B2,C2,C4, C6,D1,D5 |
| GN121    | Arabic Language       | 6            | 3           | 0        | 3            | A1,A2,A3,B1,B4,C1, C2,D1     |
| CS101    | Computer Introduction | 6            | 3           | 2        | 1            | A2,C8,D7,D8                  |

#### B. Elective- number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     |              |              |             |          |              |                      |

#### C- Optional number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     |              |              |             |          |              |                      |

## 5.2- 1<sup>st</sup> year Semester 2

### A. Compulsory

| Code No. | Course Title               | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered               |
|----------|----------------------------|--------------|-------------|----------|--------------|------------------------------------|
| CS121    | Logic design               | 6            | 3           | 2        | 1            | B1,B2,C6,C8,D4,D8                  |
| MA112    | Mathematics-2              | 6            | 3           | 0        | 3            | A2, A3, A5, A6,B1, B3, C1,C6,D1,D5 |
| CS141    | Algorithms & Flowcharts    | 6            | 3           | 0        | 3            |                                    |
| PH111    | Physics                    | 6            | 3           | 2        | 1            |                                    |
| ST111    | Statistics & Probabilities | 6            | 3           | 0        | 3            | A2,A3,A5,A6,B1,B3,C1, C6,D1,D5     |

### B- Elective- number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     | None         |              |             |          |              |                      |

### C- Optional number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     | None         |              |             |          |              |                      |

### 5.3- 2<sup>nd</sup> year Semester 1

#### A. Compulsory

| Code No. | Course Title              | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered                                |
|----------|---------------------------|--------------|-------------|----------|--------------|---|
| CS222    | Logic Design-2            | 6            | 3           | 2        | 1            | B1,B2,C6,C8,D4,D7                                   |
| CS231    | Computer Software         | 6            | 3           | 2        | 1            | A3,B2,C8,D2   |
| CS211    | Computer Peripherals      | 6            | 3           | 2        | 1            | A3,B2,C8,D2   |
| CS241    | Data Structure            | 6            | 3           | 0        | 3            | A2,B1,B2,B6,C5,D1,D2,D3,D9                          |
| OD201    | Organization Fundamentals | 6            | 3           | 0        | 3            | A1, A2, A6, B1, B3, B4, C1, C3, C4, C6, D2, D6, D7. |

#### B- Elective- number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     |              |              |             |          |              |                      |

#### C- Optional number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     |              |              |             |          |              |                      |

## 5.4- 2nd year Semester 2

### A. Compulsory

| Code No. | Course Title          | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered                              |
|----------|-----------------------|--------------|-------------|----------|--------------|---|
| CS232    | Operating system-1    | 6            | 3           | 3        | 0            | A4,B1,B2,B7,C5,C6,C8,D1                           |
| ST221    | Statistical methods   | 6            | 3           | 0        | 3            | A1,A2, A7, A10, B1,B2,B6,C1, C3,C6,C8             |
| CS251    | File Organization     | 6            | 3           | 3        | 0            | A2,A3,B5,B6,C5,C8,D8,D9                           |
| OD211    | Operations Research-1 | 6            | 3           | 0        | 3            | A1, A2, A5,A6, B1, B2,B6, C4, C5,C6,C7, D4,D6,D7. |
| CS243    | System analysis       | 6            | 3           | 0        | 3            | A2,A3,B2,B3,B4,C1,C2,C3,C7,D1,D2,D7,D8            |

### B- Elective- number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     |              |              |             |          |              |                      |

### C- Optional number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     |              |              |             |          |              |                      |

## 5.5- 3<sup>rd</sup> year Semester 1

### A. Compulsory

| Code No. | Course Title              | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered                               |
|----------|---------------------------|--------------|-------------|----------|--------------|--|
| OD361    | Decision Supporting Tools | 6            | 3           | 0        | 3            | A3,A4,A8<br>B1,B6,B7,C1,C3,C5,C7,<br>D1,D3, D5, D6 |
| OD321    | Linear Programming        | 6            | 3           | 0        | 3            | A1,A2,A5,A6,B1,B2,B5,<br>C2,C3,C4,C7,D1,D2         |
| OD331    | Project Managing          | 6            | 3           | 0        | 3            | A3,A4,A7,B1,B4,B5,C1,<br>C5,C7,D1,D5,D7            |

### B. Elective- number required:

| Code No. | Course Title             | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered                                 |
|----------|--------------------------|--------------|-------------|----------|--------------|--|
| OD312    | Stochastic Processes     | 6            | 3           | 0        | 3            | A5,A6,B1,B2,B5,C2,C3,<br>C4,C6,C7,D1,D4,D5,D6,<br>D7 |
| OD371    | Problem solving strategy | 6            | 3           | 0        | 3            | A1,A2,A5,A7,B1,B3,B4,<br>C1,C2,C7,D5,D6              |
| OD372    | Strategic administration | 6            | 3           | 0        | 3            | A4,A7,B2,B4,B5,C1,C2,<br>C7,D5,D6                    |
| OD373    | Economy and Finance      | 6            | 3           | 0        | 3            | A1,A7,B6,C7,D8                                       |

### B. Optional number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     |              |              |             |          |              |                      |

## 5.6- 3<sup>rd</sup> year Semester 2

### A. Compulsory

| Code No. | Course Title        | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered                             |
|----------|---------------------|--------------|-------------|----------|--------------|--|
| OD361    | Integer Programming | 6            | 3           | 0        | 3            | A1,A2,A5,A6,B1,B2,B5,C2,C3,C4,C6,C7,D1,D5,D6,D7. |
| OD321    | Queuing Theory      | 6            | 3           | 0        | 3            | A1,B4,B5,B6,C1,C2,C4,C7,D1,D4,D5                 |
| OD331    | Quality Control     | 6            | 3           | 0        | 3            | A3,A4,A7,B1,B5,B6,C1,C2,C6,C7,D1,D5,D6           |
| OD3xx    | Elective-1          | 6            | 3           | 0        | 3            | As table below.                                  |

### B. Elective- number required:

| Code No. | Course Title             | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered                         |
|----------|--------------------------|--------------|-------------|----------|--------------|--|
| OD312    | Stochastic Processes     | 6            | 3           | 0        | 3            | A5,A6,B1,B2,B5,C2,C3,C4,C6,C7,D1,D4,D5,D6,D7 |
| OD371    | Problem solving strategy | 6            | 3           | 0        | 3            | A1,A2,A5,A7,B1,B3,B4,C1,C2,C7,D5,D6          |
| OD372    | Strategic administration | 6            | 3           | 0        | 3            | A4,A7,B2,B4,B5,C1,C2,C7,D5,D6                |
| OD373    | Economy and Finance      | 6            | 3           | 0        | 3            | A1,A7,B7,C7,D8                               |

### C. Optional number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     |              |              |             |          |              |                      |



## 5.7- 4<sup>th</sup> year Semester 1

### A. Compulsory

| Code No. | Course Title            | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered                          |
|----------|-------------------------|--------------|-------------|----------|--------------|---|
| OD413    | Packages for OR         | 6            | 3           | 0        | 3            | A2,A3,A7,B1,B6,C1,C3,C5,D1,D3,D5,D6           |
| OD424    | Packages for simulation | 6            | 3           | 0        | 3            | A1,A3,A4,A7,B1,B6,C1,C3,C5,D1,D3,D5,D6        |
| OD463    | Decision theory         | 6            | 3           | 0        | 3            | A1,A2,A4,B1,B2,B5,C2,C3,C4,C6,C7,D1,D5,D6,D7. |
| OD4xx    | Elective-2              | 6            | 3           | 0        | 3            | As table below.                               |
| OD481    | Project                 | 6            | 1           | 5        | 0            | A7,B1, C2, C3, C5, D1, D2, D5, D6, D8.        |

### B. Elective- number required:

| Code No. | Course Title             | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered                       |
|----------|--------------------------|--------------|-------------|----------|--------------|--|
| OD475    | AI Applications          | 6            | 3           | 0        | 3            | A4,A5,B5,B6,C1,C4,C5,D3,D5,D6              |
| OD476    | ES Applications          | 6            | 3           | 0        | 3            | A3,A4,A7,B5,B6,C1,C4,C5,D3,D5,D6.          |
| OD452    | Total Quality Management | 6            | 3           | 0        | 3            | A2,A7,B3,B5,C3,C6,C7,D2,D4,D5,D6,D7.       |
| OD482    | Selected Topics          | 6            | 3           | 0        | 3            | A1,A2,A7,B1,B3,B4,B6,C2,C3,C5,C6,D1,D5,D6. |

### C. Optional number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     |              |              |             |          |              |                      |

## 5.7- 4<sup>th</sup> year Semester 2

### A. Compulsory

| Code No. | Course Title             | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered                       |
|----------|--------------------------|--------------|-------------|----------|--------------|--|
| OD413    | None Linear Programming  | 6            | 3           | 0        | 3            | A2,A3,A7,B1,B2,B5,C2,C3,C4,C7,D1,D5,D6,D7. |
| OD424    | Crisis Managing          | 6            | 3           | 0        | 3            | A7,B4,B5,B6,C1,C2,C4,C6,D1,D4,D5.          |
| OD463    | Decision Support systems | 6            | 3           | 0        | 3            | A3,A4,B1,B6,C1,C2,C3,C4,D1,D5,D6.          |
| OD4xx    | Elective-3               | 6            | 3           | 0        | 3            | As table below                             |
| OD481    | Project                  | 6            | 1           | 5        | 0            | A7, B1, C2, C3,C5,D1,D2 ,D5, D6, D8.       |

### B. Elective- number required:

| Code No. | Course Title              | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered                       |
|----------|---------------------------|--------------|-------------|----------|--------------|--|
| OD475    | AI Applications           | 6            | 3           | 0        | 3            | A4,A5,B5,B6,C1,C4,C5,D3,D5,D6              |
| OD476    | ES Applications           | 6            | 3           | 0        | 3            | A3,A4,A7,B5,B6,C1,C4,C5,D3,D5,D6.          |
| OD452    | Total Quality. Management | 6            | 3           | 0        | 3            | A2,A7,B3,B5,C3,C6,C7,D2,D4,D5,D6,D7.       |
| OD482    | Selected Topics           | 6            | 3           | 0        | 3            | A1,A2,A7,B1,B3,B4,B6,C2,C3,C5,C6,D1,D5,D6. |

### C. Optional number required:

| Code No. | Course Title | No. of units | Lecture H/W | Lab. H/W | Exercise H/W | Program ILOs Covered |
|----------|--------------|--------------|-------------|----------|--------------|----------------------|
| None     |              |              |             |          |              |                      |

## **6- Program admission requirements**

General Secondary School Certificate with Major in Mathematics with high academic reference, at secondary school marks of > 91%, or an equivalent certificate from a foreign institute recognized by the university. The program is studied for a minimum of four years full-time.

The program is arranged normally in 8 x 14 week semesters (2 semesters per year). There are normally 28 (2 x 14) study weeks (excluding examination periods and summer session) in each year. The program is divided into 246 hours per week: 36 basic science hours per week, 162 specialized hours per week, 12 sciences and humanities hours per week, and 36 other hours per week. Currently there are no Optional courses on this program.

## **7- Regulations for progression and program completion**

(For the students to be transferred from one academic year to the next, he/she is required to have successfully passed in all subjects. However, the student may still be transferred if he/she has failed in not more than two compulsive courses from the same academic year or from previous years. In such cases, students "carrying" subjects from one year to the next should re-sit for their "failed" subjects in their proper respective semesters. Final year students who have failed in a maximum of two basic complementary ones in that year or from previous years can re-sit for their exams in those subjects in September of the same year. Should the student failed again, he/she has to re-sit for his/her exams in those subjects in their proper respective semesters thereafter as many times as necessary until he/she succeeds)

### **First Year / Semester 1 and 2**

- The student Moved to the second year Passing in all courses of the year or fail in not more than two compulsive subjects

### **Second Year Semester 1 and 2**

- Passing in all courses the year but at least two related to first and second years

### **Third Year Semester 1, and 2**

- Passing in all courses the year but at least two related to first, second, and/or third years

### **Forth Year Semester 1, and 2**

Passing in all courses or fail in not more than two compulsive subjects. In this case, the student is allowed to enter a September Exam in the same year.

**By laws and Regulations for Undergraduate Students**

**"Enrollment opportunities/or "regular" and "external" students:**

| Academic year | Enrollment opportunities |  |
|---------------|--------------------------|--|
|               | Regular students         | External students                          |
| First         | Two opportunities        | No opportunities                           |
| Second        | Two opportunities        | Two opportunities                          |
| Third         | Two opportunities        | Two opportunities                          |
| Fourth        | Two opportunities        | None limited when passes half year courses |

Once the student exceeds the number of opportunities of a being a regular" student, he/she is allowed to continue in the program as an "external" student for a certain number of times according to the table above. Once an "external" student in a certain year succeeds in his/her exams for that year to allow him/her to be transferred to the following year, he/she automatically becomes registered as a regular student again.

**8- Evaluation of program intended learning outcomes**

| Evaluator                                      | Tool  | Sample  |
|--|---|---|
| 1- Senior students                             | questionnaire                               | 1000 samples                                      |
| 2- Alumni                                      | Feed back from graduates network workgroups | <a href="http://www.mufic.net">www.mufic .net</a> |
| 3- Stakeholders ( Employers)                   | Questionnaires                              | <a href="http://www.mufic.net">www.mufic .net</a> |
| 4-External Evaluator(s) (External Examiner(s)) | Not Assigned yet                            | Not Assigned yet                                  |
| 5- Other                                       | None  | None  |

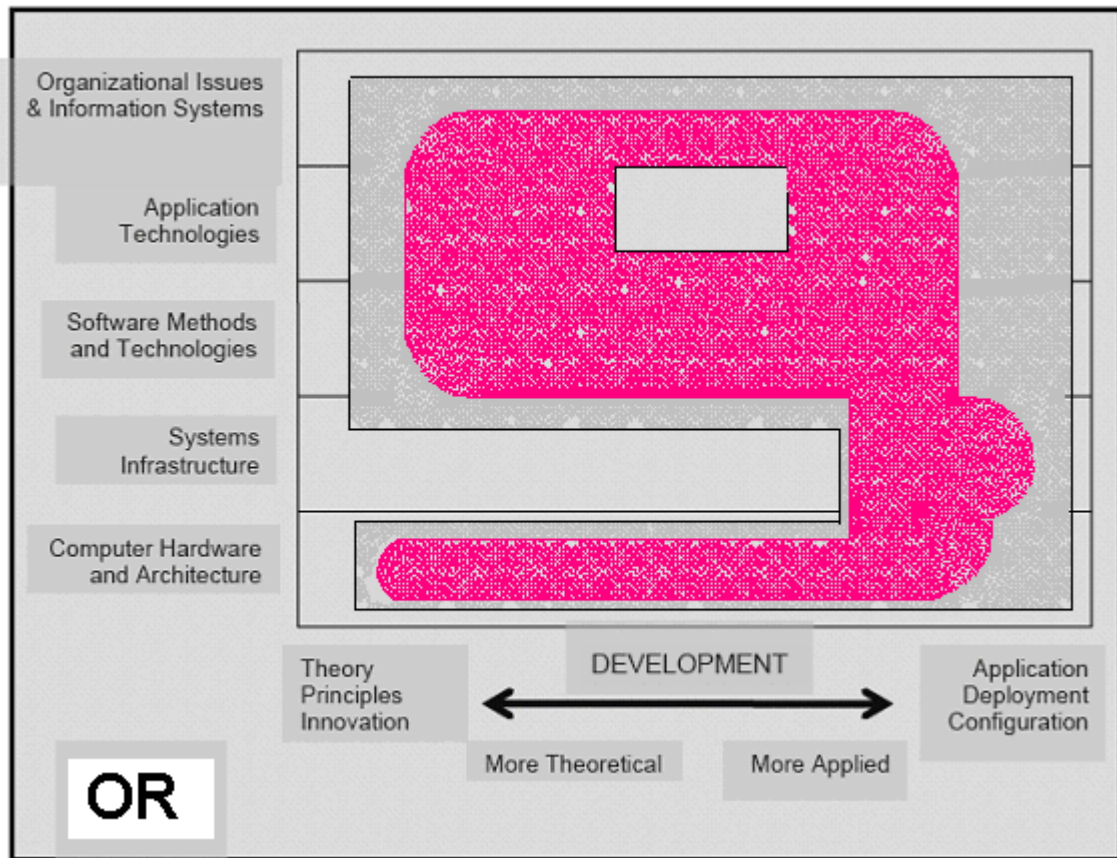
**Annex A**

**Attach course specifications**

# Annex A

## 1- Academic Standards

The following Figure Illustrates the Operation Research and Decision support programs academic Standards compared with the IEEE& ACM 2005 Reference Standards. The program Bench Marks could be concluded through the margins between both the standards



**FIGURE H-4. OPERATIONS RESEARCH PROGRAM**

- Reference standards
- Program Academic standards

**Table H.1: Comparative weight of computing topics across the five kinds of degree programs**

| <i>Knowledge Area</i>                    | <i>CS</i>  |            | <i>IS</i>  |            | <i>IT</i>  |            | <i>OR</i>  |            |
|--|------------|------------|------------|------------|------------|------------|------------|------------|
|  | <i>min</i> | <i>max</i> | <i>min</i> | <i>max</i> | <i>min</i> | <i>max</i> | <i>min</i> | <i>max</i> |
| Programming Fundamentals                 | 4          | 5          | 2          | 0          | 0          | 4          | 5          | 5          |
| Integrative Programming                  | 1          | 3          | 2          | 0          | 2          | 5          | 1          | 3          |
| Algorithms and Complexity                | 4          | 5          | 1          | 0          | 1          | 2          | 3          | 4          |
| Computer Architecture and Organization   | 2          | 4          | 1          | 0          | 0          | 2          | 2          | 4          |
| Operating Systems Principles & Design    | 3          | 5          | 1          | 0          | 2          | 2          | 3          | 4          |
| Operating Systems Configuration & Use    | 2          | 4          | 2          | 0          | 1          | 5          | 2          | 4          |
| Net Centric Principles and Design        | 2          | 4          | 1          | 0          | 0          | 4          | 2          | 4          |
| Net Centric Use and configuration        | 2          | 3          | 2          | 0          | 2          | 5          | 2          | 3          |
| Platform technologies                    | 0          | 2          | 1          | 0          | 1          | 4          | 0          | 3          |
| Theory of Programming Languages          | 3          | 5          | 0          | 0          | 0          | 1          | 2          | 4          |
| Human-Computer Interaction               | 2          | 4          | 2          | 0          | 2          | 5          | 3          | 5          |
| Graphics and Visualization               | 1          | 5          | 1          | 0          | 1          | 1          | 1          | 3          |
| Intelligent Systems (AI)                 | 2          | 5          | 1          | 0          | 0          | 0          | 0          | 0          |
| Information Management (DB) Theory       | 2          | 5          | 1          | 0          | 2          | 1          | 2          | 5          |
| Information Management (DB) Practice     | 1          | 4          | 4          | 0          | 1          | 4          | 1          | 4          |
| Scientific computing (Numerical methods) | 0          | 5          | 0          | 0          | 0          | 0          | 0          | 0          |
| Legal / Professional / Ethics / Society  | 2          | 4          | 2          | 0          | 2          | 4          | 2          | 5          |
| Information Systems Development          | 0          | 2          | 5          | 0          | 1          | 3          | 2          | 4          |
| Analysis of Business Requirements        | 0          | 1          | 5          | 0          | 0          | 2          | 1          | 3          |
| E-business                               | 0          | 0          | 4          | 0          | 2          | 2          | 0          | 3          |
| Analysis of Technical Requirements       | 2          | 4          | 2          | 0          | 1          | 5          | 3          | 5          |
| Engineering Foundations for SW           | 1          | 2          | 1          | 0          | 0          | 0          | 2          | 5          |
| Engineering Economics for SW             | 0          | 1          | 1          | 0          | 2          | 1          | 2          | 3          |
| Software Modeling and Analysis           | 2          | 3          | 3          | 0          | 1          | 3          | 4          | 5          |
| Software Design                          | 3          | 5          | 1          | 0          | 0          | 2          | 5          | 5          |
| Software Verification and Validation     | 1          | 2          | 1          | 0          | 2          | 2          | 4          | 5          |
| Software Evolution (maintenance)         | 1          | 1          | 1          | 0          | 1          | 2          | 2          | 4          |
| Software Process                         | 1          | 2          | 1          | 0          | 0          | 1          | 2          | 5          |
| Software Quality                         | 1          | 2          | 1          | 0          | 2          | 2          | 2          | 4          |
| Comp Systems Engineering                 | 1          | 2          | 0          | 0          | 1          | 0          | 2          | 3          |
| Digital logic                            | 2          | 3          | 1          | 0          | 0          | 1          | 0          | 3          |
| Embedded Systems                         | 0          | 3          | 0          | 0          | 2          | 1          | 0          | 4          |
| Distributed Systems                      | 1          | 3          | 2          | 0          | 1          | 3          | 2          | 4          |
| Security: issues and principles          | 1          | 4          | 2          | 0          | 0          | 3          | 1          | 3          |
| Security: implementation and mgt         | 1          | 3          | 1          | 0          | 2          | 5          | 1          | 3          |
| Systems administration                   | 1          | 1          | 1          | 0          | 1          | 5          | 1          | 2          |
| Optimization                             | 0          | 2          | 0          | 0          | 0          | 2          | 4          | 6          |
| Decision analysis                        | 0          | 1          | 0          | 0          | 2          | 1          | 4          | 6          |
| Support system                           | 0          | 0          | 0          | 0          | 1          | 0          | 5          | 8          |
| Simulation and modeling                  | 0          | 2          | 0          | 0          | 0          | 2          | 3          | 5          |
| Risk analysis                            | 0          | 1          | 0          | 0          | 2          | 1          | 3          | 7          |
| Multi objective decision making          | 0          | 0          | 0          | 0          | 1          | 0          | 4          | 8          |
| Management of Info Systems Org.          | 0          | 0          | 3          | 0          | 0          | 0          | 0          | 0          |
| Systems integration                      | 1          | 2          | 1          | 0          | 2          | 5          | 1          | 4          |
| Digital media development                | 0          | 1          | 1          | 0          | 1          | 5          | 0          | 1          |
| Technical support                        | 0          | 1          | 1          | 0          | 0          | 5          | 0          | 1          |

**Table H.2: Comparative weight of non-computing topics across the five kinds of degree programs**

| <i>Knowledge Area</i>                  | <i>CS</i>  |            | <i>IS</i>  |            | <i>IT</i>  |            | <i>OR</i>  |            |
|--|------------|------------|------------|------------|------------|------------|------------|------------|
|  | <i>min</i> | <i>max</i> | <i>min</i> | <i>max</i> | <i>min</i> | <i>max</i> | <i>min</i> | <i>max</i> |
| Organizational Theory                  | 0          | 0          | 1          | 4          | 1          | 2          | 0          | 0          |
| Decision Theory                        | 0          | 0          | 3          | 3          | 0          | 1          | 0          | 0          |
| Organizational Behavior                | 0          | 0          | 3          | 5          | 1          | 2          | 0          | 0          |
| Organizational Change Management       | 0          | 0          | 2          | 2          | 1          | 2          | 0          | 0          |
| General Systems Theory                 | 0          | 0          | 2          | 2          | 1          | 2          | 0          | 0          |
| Risk Management (Project, safety risk) | 1          | 1          | 2          | 3          | 1          | 4          | 2          | 4          |
| Project Management                     | 1          | 2          | 3          | 5          | 2          | 3          | 4          | 5          |
| Business Models                        | 0          | 0          | 4          | 5          | 0          | 0          | 0          | 0          |
| Functional Business Areas              | 0          | 0          | 4          | 5          | 0          | 0          | 0          | 0          |
| Evaluation of Business Performance     | 0          | 0          | 4          | 5          | 0          | 0          | 0          | 0          |
| Circuits and Systems                   | 0          | 2          | 0          | 0          | 0          | 1          | 0          | 0          |
| Electronics                            | 0          | 0          | 0          | 0          | 0          | 1          | 0          | 0          |
| Digital Signal Processing              | 0          | 2          | 0          | 0          | 0          | 0          | 0          | 2          |
| VLSI design                            | 0          | 1          | 0          | 0          | 0          | 0          | 0          | 1          |
| HW testing and fault tolerance         | 0          | 0          | 0          | 0          | 0          | 2          | 0          | 0          |
| Mathematical foundations               | 4          | 5          | 2          | 4          | 2          | 4          | 3          | 5          |
| Interpersonal communication            | 1          | 4          | 3          | 5          | 3          | 4          | 3          | 4          |

**Table H.3. Relative performance capabilities of computing graduates by discipline**

| <b>Area</b>                             | <b>Performance Capability</b>               | <b>CS</b> | <b>IS</b> | <b>IT</b> | <b>OR</b> |
|---|---|-----------|-----------|-----------|-----------|
| Algorithms                              | Prove theoretical results                   | 5         | 1         | 0         | 3         |
|   | Develop solutions to programming problems   | 5         | 1         | 1         | 3         |
|   | Develop proof-of-concept programs           | 5         | 3         | 1         | 3         |
|   | Determine if faster solutions possible      | 5         | 1         | 1         | 3         |
| Application programs                    | Design a word processor program             | 4         | 1         | 0         | 4         |
|   | Use word processor features well            | 3         | 5         | 5         | 3         |
|   | Train and support word processor users      | 2         | 4         | 5         | 2         |
|   | Design a spreadsheet program (e.g., Excel)  | 4         | 1         | 0         | 4         |
|   | Use spreadsheet features well               | 2         | 5         | 5         | 3         |
|   | Train and support spreadsheet users         | 2         | 4         | 5         | 2         |
| Computer programming                    | Do small-scale programming                  | 5         | 3         | 3         | 5         |
|   | Do large-scale programming                  | 4         | 2         | 2         | 5         |
|   | Do systems programming                      | 4         | 1         | 1         | 4         |
|   | Develop new software systems                | 4         | 3         | 1         | 5         |
|   | Create safety-critical systems              | 3         | 0         | 0         | 5         |
|   | Manage safety-critical projects             | 2         | 0         | 0         | 5         |
| Hardware and devices                    | Design embedded systems                     | 1         | 0         | 0         | 1         |
|   | Implement embedded systems                  | 2         | 1         | 1         | 3         |
|   | Design computer peripherals                 | 1         | 0         | 0         | 1         |
|   | Design complex sensor systems               | 1         | 0         | 0         | 1         |
|   | Design a chip                               | 1         | 0         | 0         | 1         |
|   | Program a chip                              | 1         | 0         | 0         | 1         |
| Human-computer interface                | Design a computer                           | 1         | 0         | 0         | 1         |
|   | Create a software user interface            | 4         | 4         | 5         | 4         |
|   | Produce graphics or game software           | 5         | 0         | 0         | 5         |
|   | Design a human-friendly device              | 2         | 0         | 1         | 3         |
|   | Define information system requirements      | 2         | 5         | 3         | 4         |
|   | Design information systems                  | 3         | 5         | 3         | 3         |
| Information systems                     | Implement information systems               | 3         | 4         | 3         | 5         |
|   | Train users to use information systems      | 1         | 4         | 5         | 1         |
|   | Maintain and modify information systems     | 3         | 5         | 4         | 3         |
|   | Design a database mgt system (e.g., Oracle) | 5         | 1         | 0         | 4         |
|   | Model and design a database                 | 2         | 5         | 5         | 2         |
|   | Implement information retrieval software    | 5         | 3         | 3         | 4         |
| Information management (Database)       | Select database products                    | 3         | 5         | 5         | 3         |
|   | Configure database products                 | 2         | 5         | 5         | 2         |
|   | Manage databases                            | 2         | 5         | 5         | 2         |
|   | Train and support database users            | 2         | 5         | 5         | 2         |
|   | Develop corporate information plan          | 0         | 5         | 3         | 0         |
|   | Develop computer resource plan              | 2         | 5         | 5         | 2         |
| IT resource planning                    | Schedule/budget resource upgrades           | 2         | 5         | 5         | 2         |
|   | Install/upgrade computers                   | 3         | 3         | 5         | 3         |
|   | Install/upgrade computer software           | 3         | 3         | 5         | 3         |
|   | Design auto-reasoning systems               | 4         | 0         | 0         | 2         |
| Intelligent systems                     | Implement intelligent systems               | 4         | 0         | 0         | 4         |
|   | Design network configuration                | 3         | 3         | 4         | 2         |
|   | Select network components                   | 2         | 4         | 5         | 2         |
|   | Install computer network                    | 1         | 3         | 5         | 2         |
| Networking and communications           | Manage computer networks                    | 3         | 3         | 5         | 3         |
|   | Implement communication software            | 4         | 1         | 1         | 4         |
|   | Manage communication resources              | 0         | 3         | 5         | 0         |
|   | Implement mobile computing system           | 3         | 0         | 1         | 3         |
|   | Manage mobile computing resources           | 2         | 2         | 4         | 2         |
|   | Manage an organization's web presence       | 2         | 4         | 5         | 2         |
| Systems Development Through Integration | Configure & integrate e-commerce software   | 3         | 4         | 5         | 4         |
|   | Develop multimedia solutions                | 3         | 4         | 5         | 3         |
|   | Configure & integrate e-learning systems    | 2         | 5         | 5         | 3         |
|   | Develop business solutions                  | 2         | 5         | 3         | 2         |
| Evaluate new forms of search engine     | 4   | 4         | 4         | 4         |           |

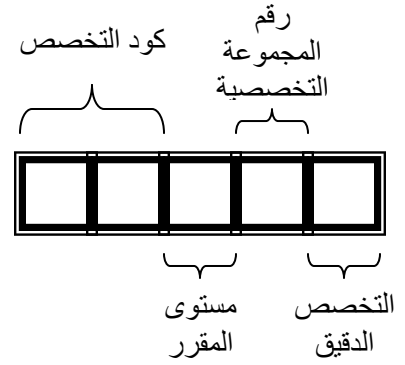


## 2- General standards

### أولاً : قواعد النظام الكودى لأرقام المقررات

يتكون كود أى مقرر (Course Code) من خمس خانات ؛ الخانتين فى أقصى اليسار يمثلان الرمز الكودى للتخصص، يلى ذلك عدد مكون من ثلاثة أرقام، تفصيلها كالتالى:

- رقم المنات يمثل مستوى المقرر. يدل الرقم ١ على الفرقة الأولى، والرقم ٢ على الفرقة الثانية، والرقم ٣ على الفرقة الثالثة، والرقم ٤ على الفرقة الرابعة، كما يدل الرقم ٥ على مقررات المستوى الأول وهى مقررات دبلوم الدراسات العليا، والرقم ٦ على مقررات المستوى الثانى والتي تضم مقررات السنة التمهيديّة للماجستير ودكتوراه الفلسفة.
- الرقم فى خانة العشرات يمثل المجموعة التخصصية للمقرر داخل التخصص العام، وجدول-١ يوضح تلك المجموعات وأرقامها المستخدمة فى الترميز.
- رقم الآحاد يمثل التخصص الدقيق للمقرر داخل المجموعة التخصصية. انظر الشكل التالى للإيضاح:



بالنسبة للمقررات التى يدرسها الطلاب ولا تقع ضمن تخصصات الكلية (أى متطلبات الجامعة) فلها جميعاً نفس الرمز الكودى GN ولها نفس القواعد المذكورة أعلاه بالنسبة للجزء الرقمى من كود المقرر الدراسى. والجدول التالى يوضح رموز التخصصات المختلفة.

### رموز التخصصات المختلفة

| الرمز | Major                                  | التخصص                    |
|-------|--|---------------------------|
| MA    | General Science:                       | العلوم الأساسية :         |
| ST    | Mathematics                            | رياضيات                   |
| PH    | Statistics                             | إحصاء                     |
|       | Physics                                | فيزياء                    |
| CS    | Computer Science                       | علوم حاسب                 |
| IS    | Information Systems                    | نظم المعلومات             |
| IT    | Information Technology                 | تكنولوجيا المعلومات       |
| OD    | Operations Research & Decision Support | بحوث العمليات ودعم القرار |

## ثانيا : جدول- ١ المجموعات التخصصية

| Major                          | رقم المجموعة | اسم المجموعة التخصصية        | التخصص                              |
|--------------------------------|--------------|------------------------------|-------------------------------------|
| Computer Science<br>(CS)       | 0            | Fundamentals of CS           | أساسيات علوم الحاسب                 |
|                                | 1            | Hardware                     | عتاد الحاسب                         |
|                                | 2            | Logic Design                 | التصميم المنطقي                     |
|                                | 3            | System Software              | برمجيات النظام                      |
|                                | 4            | Programming                  | البرمجة                             |
|                                | 5            | Software Engineering         | هندسة البرمجيات                     |
|                                | 6            | Computer Networks            | شبكات الحاسبات                      |
|                                | 7            | AI and Expert Systems        | الذكاء الاصطناعي والنظم الخبيرة     |
|                                | 8            | Selective Topics             | موضوعات مختارة في التخصص            |
| Information Systems<br>(IS)    | 0            | Fundamentals of IS           | أساسيات نظم المعلومات               |
|                                | 1            | System Analysis              | تحليل وتصميم نظم المعلومات          |
|                                | 2            | Office Automation            | ميكنة المكاتب                       |
|                                | 3            | Database Systems             | نظم قواعد البيانات                  |
|                                | 4            | Library Automation           | ميكنة المكتبات                      |
|                                | 5            | Administration of ICs        | إدارة مراكز المعلومات               |
|                                | 6            | Advanced IS                  | نظم المعلومات المتقدمة              |
|                                | 7            | IS Applications              | تطبيقات نظم المعلومات               |
|                                | 8            | Selective Topics             | موضوعات مختارة                      |
| Information Technology<br>(IT) | 0            | Fundamentals of IT           | أساسيات تكنولوجيا المعلومات         |
|                                | 1            | Pattern Recognition          | التعرف على الأنماط و الأحرف و ...   |
|                                | 2            | Signal Processing            | معالجة الإشارات الرقمية             |
|                                | 3            | Computer Vision              | الرؤية بالحاسب                      |
|                                | 4            | Data Mining                  | تنقيب البيانات                      |
|                                | 5            | Multimedia & Virtual Reality | الوسائط المتعددة و الواقع الافتراضي |
|                                | 6            | Information Networks         | شبكات المعلومات                     |
|                                | 7            | Information Engineering      | هندسة المعلومات                     |
|                                | 8            | Selective Topics             | موضوعات مختارة                      |
| OR & Decision<br>Support (OD)  | 0            | Fundamentals of Systems      | أساسيات ومفاهيم علم النظم           |
|                                | 1            | Operations Research          | بحوث العمليات                       |
|                                | 2            | Programming                  | البرمجة (خطية وغير خطية)            |
|                                | 3            | Project Planning             | تخطيط المشروعات                     |
|                                | 4            | Queuing Systems              | نظم صفوف الانتظار                   |
|                                | 5            | Quality Control              | مراقبة المخزون والإنتاج             |
|                                | 6            | Decision Support             | أدوات وأساليب دعم القرار            |
|                                | 7            | Applications                 | تطبيقات (سياسية، اجتماعية، ...)     |
|                                | 8            | Selective Topics             | موضوعات مختارة                      |

## ثالثا : مقررات مرحلة البكالوريوس

## الفرقة الأولى

### جدول - ٢ (أ)

| الفرقة: الأولى          |            |           |                               |      |        |        | الفصل الدراسي: الأول           |                              |       | التخصص: عام |  |  |
|-------------------------|------------|-----------|-------------------------------|------|--------|--------|--------------------------------|------------------------------|-------|-------------|--|--|
| النهائية العظمى للدرجات |            |           | عدد الساعات الدراسية أسبوعياً |      |        |        | اسم المقرر                     | Course Name                  |       |             |  |  |
| تحريرى                  | عملى وشفهى | أعمال فصل | مجموع                         | عملى | تمارين | محاضرة |                                |                              |       |             |  |  |
| ٦٠                      | ٢٠         | ٢٠        | ٦                             | ٢    | ١      | ٣      | English Language-1             | لغة انجليزية 1               | GN111 |             |  |  |
| ٧٠                      | -          | ٣٠        | ٦                             | -    | ٣      | ٣      | Mathematics-1                  | رياضيات-1                    | MA111 |             |  |  |
| ٧٠                      | -          | ٣٠        | ٦                             | -    | ٣      | ٣      | Discrete Mathematics           | تراكيب محددة                 | MA131 |             |  |  |
| ٧٠                      | -          | ٣٠        | ٦                             | -    | ٣      | ٣      | Arabic Language                | لغة عربية                    | GN121 |             |  |  |
| ٦٠                      | ٢٠         | ٢٠        | ٦                             | ٢    | ١      | ٣      | Computer Introduction          | مقدمة فى الحاسبات وتطبيقاتها | CS101 |             |  |  |
|                         |            |           | ٣٠                            | ٤    | ١١     | ١٥     | إجمالى عدد الساعات الأسبوعية : |                              |       |             |  |  |

### جدول - ٢ (ب)

| الفرقة: الأولى          |            |           |                               |      |        |        | الفصل الدراسي: الثانى          |                           |       | التخصص: عام |  |  |
|-------------------------|------------|-----------|-------------------------------|------|--------|--------|--------------------------------|---------------------------|-------|-------------|--|--|
| النهائية العظمى للدرجات |            |           | عدد الساعات الدراسية أسبوعياً |      |        |        | اسم المقرر                     | Course Name               |       |             |  |  |
| تحريرى                  | عملى وشفهى | أعمال فصل | مجموع                         | عملى | تمارين | محاضرة |                                |                           |       |             |  |  |
| ٦٠                      | ٢٠         | ٢٠        | ٦                             | ٢    | ١      | ٣      | Logic Design-1                 | تصميم منطقى-1             | CS121 |             |  |  |
| ٧٠                      | -          | ٣٠        | ٦                             | -    | ٣      | ٣      | Mathematics-2                  | رياضيات-2                 | MA112 |             |  |  |
| ٧٠                      | -          | ٣٠        | ٦                             | -    | ٣      | ٣      | Algorithms & Flowcharts        | الخوارزميات وخرائط التدفق | CS141 |             |  |  |
| ٦٠                      | ٢٠         | ٢٠        | ٦                             | ٢    | ١      | ٣      | Physics                        | فيزياء                    | PH111 |             |  |  |
| ٧٠                      | -          | ٣٠        | ٦                             | -    | ٣      | ٣      | Statistics & Probabilities     | إحصاء واحتمالات           | ST111 |             |  |  |
|                         |            |           | ٣٠                            | ٤    | ١١     | ١٥     | إجمالى عدد الساعات الأسبوعية : |                           |       |             |  |  |

## الفرقة الثانية

### جدول - ٣ (أ)

| التخصص : عام           |            |           | الفصل الدراسي: الأول         |      |        |        | الفرقة: الثانية                |             |
|------------------------|------------|-----------|------------------------------|------|--------|--------|--------------------------------|-------------|
| النهاية العظمى للدرجات |            |           | عدد الساعات الدراسية أسبوعيا |      |        |        | اسم المقرر                     | Course Name |
| تحريرى                 | عملى وشفهى | أعمال فصل | مجموع                        | عملى | تمارين | محاضرة |                                |             |
| ٦٠                     | ٢٠         | ٢٠        | ٦                            | ٢    | ١      | ٣      | تصميم منطقي-2                  | CS222       |
| ٦٠                     | ٢٠         | ٢٠        | ٦                            | ٣    | -      | ٣      | برمجيات الحاسب                 | CS231       |
| ٦٠                     | ٢٠         | ٢٠        | ٦                            | ٢    | ١      | ٣      | طريفات الحاسب                  | CS211       |
| ٧٠                     | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | هياكل البيانات                 | CS241       |
| ٧٠                     | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | مقدمة في علم التنظيم           | OD201       |
|                        |            |           | ٣٠                           | ٤    | ١١     | ١٥     | إجمالي عدد الساعات الأسبوعية : |             |

### جدول - ٣ (ب)

| التخصص : عام           |            |           | الفصل الدراسي: الثاني        |      |        |        | الفرقة: الثانية                |             |
|------------------------|------------|-----------|------------------------------|------|--------|--------|--------------------------------|-------------|
| النهاية العظمى للدرجات |            |           | عدد الساعات الدراسية أسبوعيا |      |        |        | اسم المقرر                     | Course Name |
| تحريرى                 | عملى وشفهى | أعمال فصل | مجموع                        | عملى | تمارين | محاضرة |                                |             |
| ٦٠                     | ٢٠         | ٢٠        | ٦                            | ٣    | -      | ٣      | نظم تشغيل-1                    | CS232       |
| ٧٠                     | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | طرق إحصائية                    | ST221       |
| ٦٠                     | ٢٠         | ٢٠        | ٦                            | ٣    | -      | ٣      | تنظيم الملفات ومعالجتها        | CS251       |
| ٧٠                     | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | بحوث العمليات-1                | OD211       |
| ٧٠                     | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | تحليل نظم-1                    | CS243       |
|                        |            |           | ٣٠                           | ٦    | ٩      | ١٥     | إجمالي عدد الساعات الأسبوعية : |             |

الفرقة الثالثة : تخصص بحوث العمليات ودعم القرار

### جدول - ١٠ (أ)

| الفرقة: الثالثة الفصل الدراسي: الأول التخصص: بحوث العمليات ودعم القرار |            |           |                              |      |        |        |                                |                           |       |
|--|------------|-----------|------------------------------|------|--------|--------|--------------------------------|---------------------------|-------|
| النهائية العظمى للدرجات  |            |           | عدد الساعات الدراسية أسبوعيا |      |        |        | اسم المقرر                     | Course Name               |       |
| تحريرى   | عملى وشفهى | أعمال فصل | مجموع                        | عملى | تمارين | محاضرة |                                |                           |       |
| ٧٠   | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | أدوات دعم القرار               | Decision Supporting Tools | OD361 |
| ٦٠   | ٢٠         | ٢٠        | ٦                            | ٣    | -      | ٣      | نظم قواعد البيانات-١           | Database Systems-1        | IS331 |
| ٧٠   | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | البرمجة الخطية                 | Linear programming        | OD321 |
| ٧٠   | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | إدارة المشروعات                | Projects Managing         | OD331 |
| ٧٠   | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | اختيارى كلية-١                 | College Elective-1        | -     |
|  |            |           | ٣٠                           | ٢    | ١٣     | ١٥     | إجمالي عدد الساعات الأسبوعية : |                           |       |

### جدول - ١٠ (ب)

| الفرقة: الثالثة الفصل الدراسي: الثانى التخصص: بحوث العمليات ودعم القرار |            |           |                              |      |        |        |                                |                       |       |
|---|------------|-----------|------------------------------|------|--------|--------|--------------------------------|-----------------------|-------|
| النهائية العظمى للدرجات   |            |           | عدد الساعات الدراسية أسبوعيا |      |        |        | اسم المقرر                     | Course Name           |       |
| تحريرى  | عملى وشفهى | أعمال فصل | مجموع                        | عملى | تمارين | محاضرة |                                |                       |       |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | النمذجة والمحاكاة              | Modeling & Simulation | IT331 |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | البرمجة العددية الصحيحة        | Integer Programming   | OD322 |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | نظرية صفوف الانتظار            | Queuing Theory        | OD341 |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | مراقبة الإنتاج                 | Quality Control       | OD351 |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | اختيارى تخصصى-١                | Elective-1            | OD3xx |
|   |            |           | ٣٠                           | -    | ١٥     | ١٥     | إجمالي عدد الساعات الأسبوعية : |                       |       |

يختار الطالب مقرر اختياري كلية من بين مقررات الأقسام الأخرى بالكلية، أما المقررات الاختيارية التخصصية فيتم اختيارها من الجدول التالي ، وقد يؤدي ذلك إلى تغيير ساعات التمارين والعملية ولكن لا يخل بإجمالي ساعات المادة ولا الساعات الأسبوعية.

### جدول - ١٠ (ج)

| النهاية العظمى للدرجات |           |        | عدد الساعات الدراسية أسبوعياً |      |        |        | اسم المقرر                    | Course Name              |       |
|------------------------|-----------|--------|-------------------------------|------|--------|--------|-------------------------------|--------------------------|-------|
| أعمال فصل              | عملي شفهي | تحريري | مجموع                         | عملي | تمارين | محاضرة |                               |                          |       |
| ٣٠                     | -         | ٧٠     | ٦                             | -    | ٣      | ٣      | العمليات التصادفية            | Stochastic Processes     | OD312 |
| ٣٠                     | -         | ٧٠     | ٦                             | -    | ٣      | ٣      | استراتيجية حل المشاكل         | Prob. Solving Strategy   | OD371 |
| ٣٠                     | -         | ٧٠     | ٦                             | -    | ٣      | ٣      | الإدارة الاستراتيجية          | Strategic Administration | OD372 |
| ٣٠                     | -         | ٧٠     | ٦                             | -    | ٣      | ٣      | النماذج الاقتصادية والتمويلية | Economy and Finance      | OD373 |

### الفرقة الرابعة : تخصص بحوث العمليات ودعم القرار

### جدول - ١١ (أ)

| النهاية العظمى للدرجات |           |        | عدد الساعات الدراسية أسبوعياً |      |        |        | اسم المقرر                     | Course Name             |       |
|------------------------|-----------|--------|-------------------------------|------|--------|--------|--------------------------------|-------------------------|-------|
| أعمال فصل              | عملي شفهي | تحريري | مجموع                         | عملي | تمارين | محاضرة |                                |                         |       |
| ٢٠                     | ٢٠        | ٦٠     | ٦                             | ٣    | -      | ٣      | حزم برامج بحوث العمليات        | Packages for OR         | OD413 |
| ٢٠                     | ٢٠        | ٦٠     | ٦                             | ٣    | -      | ٣      | حزم برامج النمذجة والمحاكاة    | Packages for Simulation | OD424 |
| ٣٠                     | -         | ٧٠     | ٦                             | -    | ٣      | ٣      | نظرية القرارات                 | Decision Theory         | OD462 |
| ٣٠                     | -         | ٧٠     | ٦                             | -    | ٣      | ٣      | اختياري تخصصي-٢                | Elective-2              | OD4xx |
| ٣٠                     | -         | ٧٠     | ٦                             | -    | ٣      | ٣      | اختياري كلية-٢                 | College Elective-2      | -     |
| -                      | -         | -      | ٦                             | ٥    | -      | ١      | المشروع                        | Project                 | OD481 |
|                        |           |        | ٣٦                            | ١١   | ٩      | ١٦     | إجمالي عدد الساعات الأسبوعية : |                         |       |

## جدول - ١١ (ب)

| الفرقة: الرابعة الفصل الدراسي: الثاني التخصص: بحوث العمليات ودعم القرار |            |           |                              |      |        |        |                                |                    |       |
|---|------------|-----------|------------------------------|------|--------|--------|--------------------------------|--------------------|-------|
| النهاية العظمى للدرجات  |            |           | عدد الساعات الدراسية أسبوعيا |      |        |        | اسم المقرر                     | Course Name        |       |
| تحريرى  | عملى وشفهى | أعمال فصل | مجموع                        | عملى | تمارين | محاضرة |                                |                    |       |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | Nonlinear programming          | البرمجة غير الخطية | OD425 |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | Crisis Managing                | إدارة الأزمات      | OD474 |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | Decision Support Systems       | نظم دعم القرار     | OD463 |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | Elective-3                     | اختيارى تخصصى-٣    | OD4xx |
| -   | ٦٠         | ٤٠        | ٦                            | ٥    | -      | ١      | Project                        | المشروع            | OD481 |
|   |            |           | ٣٠                           | ٥    | ١٢     | ١٣     | إجمالى عدد الساعات الأسبوعية : |                    |       |

يختار الطالب مقرر اختياري كلية من بين مقررات الأقسام الأخرى بالكلية، أما المقررات الاختيارية التخصصية فيتم اختيارها من الجدول التالي ، وقد يؤدي ذلك إلى تغيير ساعات التمارين والعملية ولكن لا يخل بإجمالى ساعات المادة ولا الساعات الأسبوعية.

## جدول - ١١ (ج)

| الفرقة: الرابعة الفصل الدراسي: الثاني التخصص: بحوث العمليات ودعم القرار |            |           |                              |      |        |        |                    |                          |       |
|---|------------|-----------|------------------------------|------|--------|--------|--------------------|--------------------------|-------|
| النهاية العظمى للدرجات  |            |           | عدد الساعات الدراسية أسبوعيا |      |        |        | اسم المقرر         | Course Name              |       |
| تحريرى  | عملى وشفهى | أعمال فصل | مجموع                        | عملى | تمارين | محاضرة |                    |                          |       |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | AI Applications    | تطبيقات الذكاء الاصطناعي | OD475 |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | ES Applications    | تطبيقات النظم الخبيرة    | OD476 |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | Total Q Management | إدارة الجودة الكلية      | OD452 |
| ٧٠  | -          | ٣٠        | ٦                            | -    | ٣      | ٣      | Selected Topics    | موضوعات مختارة           | OD482 |

**QUALITY ASSURANCE AND ACCREDITATION  
PROJECT**

**FACULTY OF COMPUTERS AND INFORMATION**

**OPERATIONS RESEARCH AND DECISION SUPPORT  
DEPARTMENT**

**MENOUFIA UNIVERSITY**

**BACHELOR OF COMPUTERS AND INFORMATION  
(OPERATIONS RESEARCH AND DECISION SUPPORT)**

**Courses Specifications**

**2007**



**FACULTY OF COMPUTERS AND INFORMATION  
MENOUFIA UNIVERSITY**

**QUALITY ASSURANCE AND ACCREDITATION  
PROJECT**

**BACHELOR OF COMPUTERS AND INFORMATION  
(OPERATIONS RESEARCH AND DECISION SUPPORT)**

**Teaching Institution:** Faculty of Computers and Information  
Menoufia University, Menoufia, Egypt

**Awarding Institution:** Menoufia University

**Degree Award:** Bachelor of Computers and Information  
(Operations Research and Decision support)

**Length and Mode:** 4 years/ Full semester time

**Program Coordinator:** Prof. Dr. Waiel F. Abd-El-Wahed  
Vice Deans, the head of Operations  
Research and Decision support Dept.

**Assistant Coordinator:** Eng. Osama Abdel Raouf

# CONTENTS

Courses specifications for:

| Module              | Course Name                  | Code  | Page |
|---------------------|------------------------------|-------|------|
| 1                   | <u>Mathematics-1</u>         | MA111 | 34   |
|                     | <u>Discrete Mathematics</u>  | MA131 | 38   |
|                     | <u>English Language</u>      | GN111 | 42   |
|                     | <u>Arabic Language</u>       | GN121 | 45   |
|                     | <u>Computer Introduction</u> | CS101 | 49   |
|                     | <u>Logic design</u>          | CS121 | 53   |
|                     | Algorithms & Flowcharts      | CS141 | 57   |
|                     | Physics                      | PH111 | 61   |
|                     | Mathematics-2                | MA112 | 66   |
|                     | Statistics & Probabilities   | ST111 | 70   |
| 2                   | Organization Fundamental     | OD201 | 75   |
|                     | Logic Design-2               | CS222 | 79   |
|                     | Computer software            | CS231 | 83   |
|                     | Computer Peripherals         | CS211 | 88   |
|                     | Data Structure               | CS241 | 92   |
|                     | Operating system-1           | CS232 | 96   |
|                     | Statistical methods          | ST221 | 100  |
|                     | File Organization            | CS251 | 106  |
|                     | System analysis              | CS243 | 111  |
|                     | Operations Research-1        | OD211 | 115  |
| 3                   | Decision Support Tools       | OD361 | 120  |
|                     | Linear programming           | OD321 | 125  |
|                     | Projects Managing            | OD331 | 130  |
|                     | Integer Programming          | OD322 | 135  |
|                     | Queuing Theory               | OD341 | 140  |
|                     | Quality Control              | OD351 | 144  |
|                     | Stochastic Processes         | OD312 | 148  |
|                     | Prob. Solving Strategy       | OD371 | 153  |
|                     | Strategic Administration     | OD372 | 157  |
| Economy and Finance | OD373                        | 161   |      |
| 4                   | Packages for OR              | OD413 | 165  |
|                     | Packages for Simulation      | OD424 | 167  |
|                     | Decision Theory              | OD462 | 174  |
|                     | Nonlinear programming        | OD425 | 178  |
|                     | Crisis Managing              | OD474 | 183  |
|                     | Decision Sup. Systems        | OD463 | 187  |
|                     | AI Applications              | OD475 | 192  |
|                     | ES Applications              | OD476 | 196  |
|                     | Total Q Management           | OD452 | 200  |
|                     | Selected Topics              | OD482 | 205  |
| Project             | OD481                        | 209   |      |



## MATHEMATICS-1

|   |  |
|---|--|
| Programme(s) on which the course is given | CS, IS, IT and OR                        |
| Major or Minor element of programs        | Major                                    |
| Department offering the program           | Operation Research &<br>Decision Support |
| Department offering the course            | Operation Research &<br>Decision Support |
| Academic year / Level                     | 1 <sup>st</sup> year                     |
| Date of specification approval            | 15 / 3 / 2006                            |

### A- Basic Information

|                     |                      |          |                 |             |                  |
|---------------------|----------------------|----------|-----------------|-------------|------------------|
| <b>Title</b>        | <b>Mathematics-1</b> |          |                 | <b>Code</b> | <b>MA111</b>     |
| <b>Credit Hours</b> | <b>Lecture</b>       | <b>3</b> | <b>Tutorial</b> | <b>3</b>    | <b>Practical</b> |
|                     | <b>Total</b>         |          |                 |             | <b>6</b>         |

### B- Professional Information

#### 1 – Overall aims of course

- learn the students a number of basic concepts en techniques and to learn them how to use these in a number of specific applications
- To present, after some preparation and revision, the basic mathematical methods of differential and integral calculus

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A2** Knowing and understanding the essential principals of decision making problems
- A3** Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A5** Knowing and understanding the mathematical background of operations research topics.
- A6** Recognizing the different mathematical approaches that solve the decision making problems in different fields

### 2-b- Intellectual skills

- B1 Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B2 Training on measuring efficiencies of the system units w. r. t. the whole system

### 2-c- Professional and practical skills

- C6 Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.

### 2-d- General and transferable skills

- D1- Developing computer programs based optimization to solve real life applications
- D5 Developing skills in the analysis, design and implementation of computerized Decision Support Systems.

## 3- Content

| Topic   | No of hours | Lecture | Tutorial / Practical |
|---|-------------|---------|----------------------|
| <b>1 Functions and Limits</b> <ul style="list-style-type: none"><li>• Functions and Their Graphs</li><li>• Operations on Functions</li><li>• The Trigonometric Functions</li><li>• Introduction to Limits</li><li>• Limit Theorems</li><li>• Continuity of Functions</li></ul>  | 20          | 10      | 10                   |
| <b>2 The Derivative</b> <ul style="list-style-type: none"><li>• The Derivative</li><li>• Rules for Finding Derivatives</li><li>• Derivatives of Sines and Cosines</li><li>• The Chain Rule</li><li>• Leibniz Notation</li><li>• Higher-Order Derivatives</li><li>• Implicit Differentiation</li></ul>                           | 20          | 10      | 10                   |
| <b>3 Applications of the Derivative</b> <ul style="list-style-type: none"><li>• Maxima and Minima</li><li>• Monotonic and Concavity</li><li>• Local Maxima and Minima</li><li>• Economic Applications</li><li>• Limits at Infinity, Infinite Limits</li><li>• Sophisticated Graphing</li><li>• The Mean Value Theorem</li></ul> | 20          | 10      | 10                   |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <b>4 The Integral</b> <ul style="list-style-type: none"> <li>• Ant derivatives</li> <li>• Differentials and Approximations</li> <li>• Introduction to Differential Equations</li> <li>• Integration by Substitution</li> <li>• Some Trigonometric Integrals</li> <li>• Integration by Parts</li> <li>• Applications of the Integral</li> </ul> | 24        | 12        | 12        |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

4.1 Lecture

4.2 Class activities

#### 5- Student assessment methods

##### 5-a- Methods

5.a.1 Reports, assignments, exercises, to assess knowledge and understanding

5.a.2 Regular oral and written quizzes to assess intellectual skills.

5.a.3 Practical, and Oral Exam to assess Professional skills

5.a.4 Reports, assignments, and discussions to assess general and transferable skills.

5.a.5 final written exam to assess knowledge and understanding

##### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

##### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

#### 6- List of references

##### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

##### 6-b- Essential books (text books)

[1] Zill Dennis G , Advaced Engineering mathematics , 2000

[2] Kreyszig Erwin , Advanced Engineering Mathematics, 1999

- [3] Latorre Donald , Calculus Concepts, 1998  
[4] Latorre Donald , Calculus Concepts an Informal Approach To the Math,1998

**6-c- Recommended books**

**6-d- Periodicals, Web sites, ... etc**

[www.ieee.org/web/publications/journmag](http://www.ieee.org/web/publications/journmag)

**7- Facilities required for teaching and learning**

- A lecture room equipped with Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Waiel Fathy abd Elwahed**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / /2006**



## DISCRETE MATHEMATICS

|   |                       |
|---|-----------------------|
| Programme(s) on which the course is given | CS, IS, IT and OR     |
| Major or Minor element of programs        | Major                 |
| Department offering the program           | OR & Decision Support |
| Department offering the course            | OR & Decision Support |
| Academic year / Level                     | 1 <sup>st</sup> year  |
| Date of specification approval            | 9 / 5 / 2006          |

### A- Basic Information

|              |                      |   |          |      |           |
|--------------|----------------------|---|----------|------|-----------|
| Title        | Discrete Mathematics |   |          | Code | MA131     |
| Credit Hours | Lecture              | 3 | Tutorial | 3    | Practical |
|              | Total                |   |          |      | 6         |

### B- Professional Information

#### 1 – Overall aims of course

- Understand the logic, sets, function and relations.
- Understanding and applying of mathematical reasoning.
- Using the Boolean algebra and Logic circuits.
- Perform various operations with relations and functions (congruence, methods of proof, induction, recursion, etc...).
- Explain and use the concepts of graphs and trees.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A2 Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A3 Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A6 Recognizing the different mathematical approaches that solve the decision making problems in different fields

##### 2-b- Intellectual skills

- B2 Learning principles of modeling decision making problems as well

as things to be avoided.

**2-c- Professional and practical skills**

- C2** Examine examples and case studies that documenting computer support for organizational decision making.
- C4** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C6** Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.

**2-d- General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.

**3- Content**

| Topic  | No of hours | Lecture | Tutorial/ Practical |
|--|-------------|---------|---------------------|
| <b>1 Introduction</b>  | 3           | 3       | -                   |
| <b>2 Logic, Sets and Function</b> <ul style="list-style-type: none"> <li>• Logic, propositions, and predicates.</li> <li>• Compound Statements.</li> <li>• Truth Tables</li> <li>• The Algebra of Propositions</li> <li>• Sets, Operations on Sets.</li> <li>• <b>Functions.</b></li> <li>• One-to-One, and Onto Functions</li> <li>• Inverses and Composition of functions</li> <li>• One-to-One Correspondence</li> <li>• Sequences and summations.</li> <li>• Mapping.</li> </ul> | 18          | 9       | 9                   |
| <b>3 Mathematical Reasoning</b> <ul style="list-style-type: none"> <li>• Rules of inference.</li> <li>• Methods of proofs,</li> <li>• Mathematical induction.</li> <li>• Recursive definitions,</li> <li>• recursive Algorithms</li> <li>• Proof by contradiction</li> <li>• Program correctness.</li> </ul>   | 12          | 6       | 6                   |
| <b>4 Relations</b> <ul style="list-style-type: none"> <li>• Relations and properties</li> <li>• representing relations</li> <li>• closures of relations,</li> <li>• equivalence of relations</li> <li>• Partial ordering.</li> </ul>   | 12          | 6       | 6                   |
| <b>5 Graphs</b> <ul style="list-style-type: none"> <li>• Introduction to graphs</li> </ul>   | 18          | 9       | 9                   |



|   |           |           |           |
|---|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>Directed and undirected graphs</li> <li>graph terminology,</li> <li>representing graphs,</li> <li>Connectivity.</li> <li>Graph Isomorphism</li> <li>Euler and Hamilton paths,</li> <li>shortest path problems</li> <li>Traveling Salesperson problems</li> <li>CPM(Critical Path Method)</li> <li>Planar graph.</li> </ul> |           |           |           |
| <b>6 Trees</b> <ul style="list-style-type: none"> <li>Introduction to trees.</li> <li>Application of trees.</li> <li>Tree traversal.</li> <li>Trees and sorting.</li> <li>Spanning trees.</li> <li>Minimum spanning trees.</li> </ul>   | 12        | 6         | 6         |
| <b>7 Boolean Algebra</b> <ul style="list-style-type: none"> <li>Boolean functions</li> <li>representing Boolean functions</li> <li>Logic gates</li> <li>Simplification</li> <li>Half ,and full adders.</li> </ul>   | 9         | 3         | 6         |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study
- 4.7 Exercises and tutorials.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Practical, and Oral Exam to assess Professional skills
- 5.a.4 Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5 final written exam to assess knowledge and understanding

##### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### 6-b- Essential books (text books)

None

### 6-c- Recommended books

- [1] Dossey, John A. et al, Discrete Mathematics, 3rd edition, Addison-Wesley, Reading, MA.
- [2] Johnsonbaugh, Richard, Essential Discrete Mathematics, MacMillan Publishing Co., NY.
- [3] Roman, Steven. An Introduction to Discrete Mathematics, 2nd edition, Saunders, NY.
- [4] Rosen, Kenneth h. Discrete Mathematics and Its Applications, 2 ed, McGraw/Hill
- [5] Barnett, Steven. Discrete Mathematics, Addison Wesley, Reading, MA .
- [6].Discrete Mathematics and its Application, Kenneth H. Rosen, McGraw-Hill International Edition,1981. 6.4- Periodicals, Web Sites, ... etc

### 6-d- Periodicals, Web sites, ... etc

IEEE transactions on Mathematics

## 7- Facilities required for teaching and learning

- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Waiel Fathy abd Elwahed**

**Head of Department:**

**Prof. Dr. Waiel Fathy abd-elwahed**

Date: / / 2006



## ENGLISH LANGUAGE

|  |   |
|--|---|
| Program (s) on which the course is given | CS, IS, IT and OR                               |
| Major or Minor element of programs       | Minor   |
| Department offering the program          | Faculty of Arts                                 |
| Department offering the course           | Faculty of Arts                                 |
| Academic year / Level                    | 1 <sup>st</sup> year / 1 <sup>st</sup> Semester |
| Date of specification approval           | 9 / 5 / 2006                                    |

### A- Basic Information

|              |                    |   |          |      |           |   |
|--------------|--------------------|---|----------|------|-----------|---|
| Title        | English Language-1 |   |          | Code | GN111     |   |
| Credit Hours | Lecture            | 3 | Tutorial | 2    | Practical | 1 |
|              | Total              |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Reading comprehensin and structure.
- Making conversation and writing.
- Can translate.
- Explain the basic english language grammar.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding

- A3** Demonstrate a grasp of the principles of computer systems, including architecture, networks and communication
- A5** Recognize and appreciate the professional and ethical responsibilities of the practicing computer professional including understanding the need for quality.

##### 2-b- Intellectual skills

- B2** Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by society, organizations, and technology.

##### 2-c- Professional and practical skills

- C1** Plan and undertake a major individual project.
- C2** Prepare and deliver coherent and structured verbal and written technical reports.
- C3** Give technical presentations suitable for the time, place and audience.

**2-d- General and transferable skills**

- D1** Display an integrated approach to the deployment of communication skills.
- D2** Use IT skills and display mature computer literacy.

**3- Content**

| Topic   | No of hours | Lecture   | Tutorial/Practical |
|---|-------------|-----------|--------------------|
| <b>1 Introduction</b>   | 6           | 3         | 3                  |
| <b>2 Reading comprehension and structure</b> <ul style="list-style-type: none"> <li>• A Blind Boy.</li> <li>• Omar Ibn Abdul-Aziz.</li> <li>• Saladin.</li> <li>• World History:Hiroshima.</li> <li>• American History.</li> <li>• Philosophy History.</li> <li>• Conservation.</li> <li>• College Library.</li> <li>• The computer Revolution.</li> <li>• Books and Newspapers.</li> </ul> | 60          | 30        | 30                 |
| <b>3 Conversation and Writing</b> <ul style="list-style-type: none"> <li>• Conversation Basics.</li> <li>• Writing Basics.</li> </ul>   | 12          | 6         | 6                  |
| <b>4 Translation</b> <ul style="list-style-type: none"> <li>• Translation Basics.</li> </ul>  | 6           | 3         | 3                  |
| <b>Total sum</b>  | <b>84</b>   | <b>42</b> | <b>42</b>          |

**4– Teaching and learning methods**

- 4.1** Lecture
- 4.2** Case study
- 4.3** Exercises.
- 4.4** Class activities

**5- Student assessment methods**

**5-a- Methods**

- 5.a.1** Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2** Regular oral and written quizzes to assess intellectual skills.
- 5.a.3** Practical, and Oral Exam to assess Professional skills

**5.a.4** Reports, assignments, and discussions to assess general and transferable skills.

**5.a.5** final written exam to assess knowledge and understanding

**5-b- Assessment schedule**

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

**5-c- Weighting of assessments**

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

**6- List of references**

**6-a- Course notes**

There are lectures notes prepared in the form of a book authorized by the department

**6-b- Essential books (text books)**

None

**6-c- Recommended books**

None

**6-d- Periodicals, Web sites, ... etc**

None

**7- Facilities required for teaching and learning**

- Datashow, screen, and laptop computer.
- White board and colored pens.

**Course coordinator:**

**Prof. Mohammed Ashmawy**

**Head of Department:**

**From faculty of Arts**

**Date:     /     / 2006**



## ARABIC LANGUAGE

|   |                      |
|---|----------------------|
| Programme(s) on which the course is given | CS, IS, IT and OR    |
| Major or Minor element of programs        | Minor                |
| Department offering the program           | Faculty of arts      |
| Department offering the course            | Faculty of arts      |
| Academic year / Level                     | 1 <sup>st</sup> year |
| Date of specification approval            | 9 /5 / 2006          |

### A- Basic Information

|              |                 |   |          |      |           |   |
|--------------|-----------------|---|----------|------|-----------|---|
| Title        | Arabic language |   |          | Code | GN121     |   |
| Credit Hours | Lecture         | 3 | Tutorial | 3    | Practical | - |
|              | Total           |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Help students who are not specialists in Arabic language to know the true expression.
- Understand sentence structure.
- Understand grammar and morphology.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding

- A3 Demonstrate a grasp of the principles of computer systems, including architecture, networks and communication
- A5 Recognize and appreciate the professional and ethical responsibilities of the practicing computer professional including understanding the need for quality.
- A7 Understand The basics of the software life cycle, from requirements definition to development and evaluation.

##### 2-b- Intellectual skills

**B2** Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by society, organizations, and technology.

**2-c- Professional and practical skills**

**C1** Plan and undertake a major individual project.

**C2** Prepare and deliver coherent and structured verbal and written technical reports.

**C3** Give technical presentations suitable for the time, place and audience.

**2-d- General and transferable skills**

**D1** Display an integrated approach to the deployment of communication skills .

**D2** Use IT skills and display mature computer literacy.

**3- Content**

| Topic  | No of hours | Lecture   | Tutorial/Practical |
|--|-------------|-----------|--------------------|
| <b>1 Introduction</b>  | 4           | 2         | 2                  |
| <b>2 Holy Quran</b> <ul style="list-style-type: none"> <li>• Chapter of Al Rahman</li> <li>• Interpretation of Al Rahman chapter</li> <li>• Issues from Al Nour chapter               <ul style="list-style-type: none"> <li>○ Rules of the crime of adultery</li> <li>○ Rules of the crime of cursing</li> <li>○ Rules of controlling eye contact</li> <li>○ Rules of marriage</li> </ul> </li> </ul> | 15          | 8         | 7                  |
| <b>3 The Prophet's saying</b> <ul style="list-style-type: none"> <li>• First saying</li> <li>• Second saying</li> <li>• Third saying</li> <li>• Fourth saying</li> </ul>   | 10          | 5         | 5                  |
| <b>4 Grammar</b> <ul style="list-style-type: none"> <li>• Sentence structure               <ul style="list-style-type: none"> <li>○ Noun</li> <li>○ Verb</li> <li>○ Letter</li> </ul> </li> <li>• Parsing</li> <li>• Structure</li> <li>• Definite and indefinite</li> </ul>   | 15          | 7         | 8                  |
| <b>5 Morphology</b> <ul style="list-style-type: none"> <li>• Morphological meter</li> <li>• Roots and affixes</li> <li>• Transitive and intransitive</li> <li>• Active and passive</li> </ul>  | 10          | 5         | 5                  |
| <b>6 Linguistic Studies</b> <ul style="list-style-type: none"> <li>• Dictionary (expression and concept)</li> <li>• The classical Arabic is based on the Holy Quran.</li> <li>• Criteria of Lexicography</li> </ul>  | 10          | 5         | 5                  |
| <b>7 Common Errors</b>   | 10          | 5         | 5                  |
| <b>8 Poetry</b>  | 10          | 5         | 5                  |
| <b>Total sum</b>   | <b>84</b>   | <b>42</b> | <b>42</b>          |

## 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities

## 5- Student assessment methods

### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Practical, and Oral Exam to assess Professional skills
- 5.a.4 Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5 final written exam to assess knowledge and understanding

### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### 6-b- Essential books (text books)

None



**6-c- Recommended books**

[1] book prepared and edited by the lecturer, and approved by the department council

**6-d- Periodicals, Web sites, ... etc**

None

**7- Facilities required for teaching and learning**

- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Osama Mousa**

**Head of Department:**

**From Faculty of arts**

**Date: / / 2006**



## COMPUTER INTRODUCTION

|   |                      |
|---|----------------------|
| Programme(s) on which the course is given | CS, IS, IT and OR    |
| Major or Minor element of programs        | Major                |
| Department offering the program           | Computer science     |
| Department offering the course            | Computer science     |
| Academic year / Level                     | 1 <sup>st</sup> year |
| Date of specification approval            | 9 / 5 /2006          |

### A- Basic Information

|              |                       |   |          |      |           |   |
|--------------|-----------------------|---|----------|------|-----------|---|
| Title        | Computer Introduction |   |          | Code | CS101     |   |
| Credit Hours | Lecture               | 3 | Tutorial | 1    | Practical | 2 |
|              | Total                 |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Understand the computer generations and categories.
- Understand the computer software.
- Understand the main components inside the computer.
- Understand the storage technologies and the types of files.
- Understand Java computer language.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding

A2 Understand and apply a wide range of principles and tools available to the software engineer, such as design methodologies, choice of algorithm, language, software libraries and user interface technique.

##### 2-b- Intellectual skills

B5 | Integrate and evaluate information and data from Varsity sources.

##### 2-c- Professional and practical skills

C8 Appreciate the features of complex computing hardware and software and operate them effectively

## 2-d- General and transferable skills

D7 Demonstrate significantly enhanced group working abilities.

D8 Retrieve information from a variety of sources such as libraries, printed or electronic sources.

## 3- Content

| Topic   | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 Computer Essentials</b> <ul style="list-style-type: none"><li>• Basic terms and definitions.</li><li>• Categories of computers.</li><li>• Computer software.</li><li>• PC configuration.</li><li>• Computer operations.</li><li>• Computer applications.</li></ul>                           | 12          | 6       | 6                  |
| <b>2 Inside the Computer</b> <ul style="list-style-type: none"><li>• Digitization.</li><li>• Computer Units.</li><li>• Computer work.</li><li>• The processor descriptions.</li><li>• The processor design.</li><li>• Input and output devices.</li></ul>   | 12          | 6       | 6                  |
| <b>3 Mass Storage and Files</b> <ul style="list-style-type: none"><li>• Storage technologies.</li><li>• Magnetic disks.</li><li>• Computer viruses.</li><li>• Backup.</li><li>• Optical laser disks.</li><li>• Storage forecast.</li></ul>  | 12          | 6       | 6                  |
| <b>4 Using the PC: Popular Application Software</b> <ul style="list-style-type: none"><li>• Personal computing with popular productivity packages.</li><li>• Word processing.</li><li>• Desktop publishing.</li><li>• Presentation software.</li><li>• Spreadsheet.</li><li>• Database.</li></ul> | 18          | 9       | 9                  |
| <b>5 Java Programming Language</b> <ul style="list-style-type: none"><li>• Introduction.</li><li>• Java programming structure.</li><li>• The basic elements of programming.</li><li>• Data types.</li><li>• Input and output functions.</li></ul>   | 6           | 3       | 3                  |
| <b>6 Java Operators, Expressions, and Statements</b>  | 12          | 6       | 6                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Operators.</li> <li>• Relational, equality, and logical expressions.</li> <li>• Branching control statements.</li> <li>• The loop and its types.</li> </ul> |           |           |           |
| <b>7 Java Methods and Arrays</b> <ul style="list-style-type: none"> <li>• Methods.</li> <li>• Arrays.</li> </ul>   | 12        | 6         | 6         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Practical, and Oral Exam to assess Professional skills
- 5.a.4 Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5 final written exam to assess knowledge and understanding

##### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

##### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

#### 6- List of references

##### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### **6-b- Essential books (text books)**

None

### **6-c- Recommended books**

[1] Kamin Samuel N, An Introduction to Computer Science Using Java, New Jersey: Prentice Hall, 1998.

[2] Microsoft, Getting Started Microsoft Windows 98, 2nd Edition, Turkey: Arkadas, 1999.

[3] E. Turban, R. Rainer and R. Potter, Introduction to Information Technology, USA: John Wiley, 2001.

A book prepared and edited by the lecturer, and approved by the department council.

### **6-d- Periodicals, Web sites, ... etc**

IEEE transactions on computers, software,

## **7- Facilities required for teaching and learning**

- Teaching rooms with equipments.
- Laboratory equipments, apparatus, and kits.
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Nabil Abd El-Wahed**

**Head of Department:**

**Prof. Nabil Abd El-Wahed**

**Date: / / 2006**



## LOGIC DESIGN-1

|   |   |
|---|---|
| Program(s) on which the course is given | CS, IS, IT and OR                               |
| Major or Minor element of programs      | Major   |
| Department offering the program         | Computer Science                                |
| Department offering the course          | Computer Science                                |
| Academic year / Level                   | 1 <sup>st</sup> year / 2 <sup>nd</sup> semester |
| Date of specification approval          | 9/5/2006  |

### A- Basic Information

|              |                |   |          |       |           |
|--------------|----------------|---|----------|-------|-----------|
| Title        | Logic Design-1 |   | Code     | CS121 |           |
| Credit Hours | Lecture        | 3 | Tutorial | 1     | Practical |
|              | Total          |   |          |       | 2         |
|              |                |   |          |       | 6         |

### B- Professional Information

#### 1 – Overall aims of course

- Understand the principles and operations of combinational circuits, starting from gates till complete combinational circuits.
- Understand the design of decoders, encoders, multiplexer, demultiplexer, and their applications
- Understand the digital electronics and logic families.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding

- A5 | Recognize and appreciate the professional and ethical responsibilities of the practicing computer professional including understanding the need for quality.

##### 2-b- Intellectual skills

- B1 | Solve a wide range of problems related to the analysis, design and construction of computer systems
- B2 | Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by

society, organizations, and technology.

### 2-c- Professional and practical skills

- C6 Use appropriate computer-based design support tools  
 C8 Appreciate the features of complex computing hardware and software and operate them effectively

### 2-d- General and transferable skills

- D4 Strike the balance between self-reliance and seeking help when necessary in new situations.  
 D8 Retrieve information from a variety of sources such as libraries, printed or electronic sources.

## 3- Content

| Topic  | No of hours | Lecture | Tutorial/ Practical |
|--|-------------|---------|---------------------|
| <b>1 Introduction</b>  | 3           | 3       | -                   |
| <b>2 Number systems and Codes</b> <ul style="list-style-type: none"> <li>• Binary, Octal and Hex Number Systems</li> <li>• Number Systems Conversions.</li> <li>• BCD, Gray and Alphanumeric Codes.</li> <li>• Error Detection.</li> </ul>   | 12          | 6       | 6                   |
| <b>3 Digital Arithmetic</b> <ul style="list-style-type: none"> <li>• Binary addition and Subtraction.</li> <li>• Binary Multiplication and Division.</li> <li>• BCD Addition and Hex. Arithmetic</li> </ul>  | 6           | 3       | 3                   |
| <b>4 Logic Gates</b> <ul style="list-style-type: none"> <li>• Boolean Constants and Variables.</li> <li>• Truth Tables.</li> <li>• OR, AND, and NOT Operations.</li> <li>• Logic Algebra and Logic Implementation.</li> <li>• NOR and NAND Gates.</li> </ul>   | 9           | 6       | 3                   |
| <b>5 Boolean Algebra and Logic Simplification</b> <ul style="list-style-type: none"> <li>• Boolean and Demorgan's Theorems.</li> <li>• Universality of NAND and NOR Gates.</li> <li>• Alternative Representations.</li> <li>• Labeling Logic Signals.</li> <li>• SOP and POS Forms.</li> <li>• Simplifying Logic Circuits using algebra and K-maps.</li> </ul> | 15          | 9       | 6                   |
| <b>6 Combinational Logic</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Basic Circuits and Design Procedure.</li> <li>• Using NAND and NOR gates in Design.</li> <li>• Display Devices</li> </ul>  | 6           | 3       | 3                   |

|   |           |           |           |
|---|-----------|-----------|-----------|
| <b>7 Programmable Logic</b>   |           |           |           |
| <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Programmable arrays</li> <li>• Programmable Array logic</li> <li>• Generic Array Logic</li> <li>• The GALs 22V10 and 16V8</li> <li>• Introduction to CPLDs and FPGAs</li> </ul>  | 6         | 3         | 3         |
| <b>8 Combinational Circuits</b>   |           |           |           |
| <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Arithmetic Circuits and Comparators.</li> <li>• Decoders, and Encoders.</li> <li>• Multiplexers and Demultiplexers.</li> </ul>  | 12        | 6         | 6         |
| <b>9 Combinational Logic Programming.</b>   |           |           |           |
| <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Describing Logic circuits</li> <li>• Development Software</li> <li>• Description languages and Programming Languages</li> <li>• Implementing Logic Circuits using PLDs</li> <li>• VHDL Format and Syntax</li> <li>• Intermediate signals in VHDL</li> <li>• Representing Data in VHDL</li> <li>• Truth Tables using VHDL</li> <li>• Decision Control Structures</li> <li>• Implementing Adders, Decoders, Encoders, Multiplexers, Demultiplexers, Magnitude Comparators, Code Converters.</li> </ul> | 12        | -         | 12        |
| <b>10 Logic Families</b>  |           |           |           |
| <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Diode, RTL, DTL, ECL, and TTL Logic .</li> <li>• CMOS Logic.</li> </ul>   | 3         | 3         | -         |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Lectures.
- 4.2 Practical experiments in the laboratory.
- 4.3 Exercises and tutorials.
- 4.4 Research assignments.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1** Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2** Regular oral and written quizzes to assess intellectual skills.
- 5.a.3** Practical, and Oral Exam to assess Professional skills



**5.a.4** Reports, assignments, and discussions to assess general and transferable skills.

**5.a.5** final written exam to assess knowledge and understanding

**5-b- Assessment schedule**

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

**5-c- Weighting of assessments**

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

**6- List of references**

**6-a- Course notes**

There are lectures notes prepared in the form of a book authorized by the department

**6-b- Essential books (text books)**

None

**6-c- Recommended books**

- [1] R. Tocci, Digital Systems Principles and Applications, six edition, 1991, Prentice-Hall, Inc.
- [2] B. Holdsworth, Digital Logic Design, Third edition, 1993, Butterworth-Heinemann Ltd.
- [3] R. Tocci, Digital Circuits, Prentice-Hall Inc., 2001.
- [4] A book prepared and edited by the lecturer, and approved by the department council.

**6-d- Periodicals, Web sites, ... etc**

IEEE transactions on computers and software.

**7- Facilities required for teaching and learning**

- Digital Design and logic programming laboratories.
- Laboratory equipments, apparatus and kits.
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Fawzy Aly Torky**

**Head of Department:**

**Prof. Nabil Abd El-Wahed**

**Date: / / 2006**



## ALGORITHMS AND FLOWCHART

|   |  |
|---|--|
| Programme(s) on which the course is given | CS, IS, IT and OR                                |
| Major or Minor element of programs        | Major  |
| Department offering the program           | Computer Science                                 |
| Department offering the course            | Computer Science                                 |
| Academic year / Level                     | 1 <sup>st</sup> year / 2 <sup>nd</sup> semesterr |
| Date of specification approval            | 9/5/2006   |

### A- Basic Information

|                     |                                    |          |                 |             |                  |          |
|---------------------|------------------------------------|----------|-----------------|-------------|------------------|----------|
| <b>Title</b>        | <b>Algorithms &amp; Flowcharts</b> |          |                 | <b>Code</b> | <b>CS141</b>     |          |
| <b>Credit Hours</b> | <b>Lecture</b>                     | <b>3</b> | <b>Tutorial</b> | <b>3</b>    | <b>Practical</b> | <b>0</b> |
|                     | <b>Total</b>                       |          |                 |             |                  | <b>6</b> |

### B- Professional Information

#### 1 – Overall aims of course

- Understand the principles of algorithms, flowcharts and pseudocode.
- Understand the modules
- Understand how to design a complete program

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding

- A2** Understand and apply a wide range of principles and tools available to the software engineer, such as design methodologies, choice of algorithm, language, software libraries and user interface technique.
- A4** Know and understand the fundamental concepts, principles and theories of computing and computer science covering topics such as algorithms, operating system, programming languages and artificial intelligence

##### 2-b- Intellectual skills

- B2** Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by society, organizations, and technology.
- B7** Work with and model computer systems at different and appropriate levels of abstraction

##### 2-c- Professional and practical skills

**C5** Design, write and debug computer programs in appropriate languages.

**2-d- General and transferable skills**

**D1** Display an integrated approach to the deployment of communication skills.

**D2** Use IT skills and display mature computer literacy.

**D3** Work effectively with and for others.

**D6** Employ discrete mathematical skills as appropriate.

**D7** Demonstrate significantly enhanced group working abilities

**3- Content**

| Topic   | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 computers and flowcharts</b> <ul style="list-style-type: none"> <li>• algorithms</li> <li>• program design</li> <li>• flowcharts</li> <li>• data memory</li> <li>• error messages</li> </ul>   | 6           | 3       | 3                  |
| <b>2 understanding structure</b> <ul style="list-style-type: none"> <li>• understanding unstructure code</li> <li>• using the priming read</li> <li>• recognizing structure               <ul style="list-style-type: none"> <li>• printing tables</li> </ul> </li> </ul> | 6           | 3       | 3                  |
| <b>3 modules and hierarchy charts</b> <ul style="list-style-type: none"> <li>• modularizing a program</li> <li>• modules calling other modules.</li> <li>• Understanding documentation</li> </ul>   | 6           | 3       | 3                  |
| <b>4 desgning a complete program</b> <ul style="list-style-type: none"> <li>• Mainline logial flow of aprogram</li> <li>• Housekeeping tasks</li> <li>• Main loop</li> <li>• End of job task</li> </ul>   | 12          | 6       | 6                  |
| <b>5 reading data from input file</b> <ul style="list-style-type: none"> <li>• File input</li> <li>• Accumulating totals</li> </ul>   | 6           | 3       | 3                  |
| <b>6 decision and looping</b> <ul style="list-style-type: none"> <li>• Making decision</li> <li>• Using logical comparison operators</li> <li>• Using decision tables</li> <li>• looping</li> </ul>   | 12          | 6       | 6                  |
| <b>7 arrays manipulation</b> <ul style="list-style-type: none"> <li>• manipulating an array</li> <li>• run time and compile time arrays</li> <li>• Loading array</li> <li>• Searching in array</li> </ul>   | 12          | 6       | 6                  |
| <b>8 object-oriented approach</b> <ul style="list-style-type: none"> <li>• Defining classes</li> <li>• Using objects</li> </ul>   | 12          | 6       | 6                  |

|   |           |           |           |
|---|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• inheritance.</li> <li>• Polymorphism</li> </ul>  |           |           |           |
| <b>9 event-driven approach with graphical user interfaces.</b> <ul style="list-style-type: none"> <li>• Event driven programming</li> <li>• GUI components.</li> <li>• Designing GUI</li> <li>• Planning the logic</li> </ul> | 12        | 6         | 6         |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4- Teaching and learning methods

- 4.1 Lectures.
- 4.2 Experiments in the laboratory.
- 4.3 Exercises and tutorials.
- 4.4 Research assignments.

#### 5- Student assessment methods

##### 5-a- Methods

**5.a.1** Reports, assignments, exercises, to assess knowledge and understanding

**5.a.2** Regular oral and written quizzes to assess intellectual skills.

**5.a.3** Practical, and Oral Exam to assess Professional skills

**5.a.4** Reports, assignments, and discussions to assess general and transferable skills.

**5.a.5** final written exam to assess knowledge and understanding

##### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

##### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

## **6- List of references**

### **6-a- Course notes**

There are lectures notes prepared in the form of a book authorized by the department

### **6-b- Essential books (text books)**

None

### **6-c- Recommended books**

[1] algorithms and flowcharts prof nabil ismail.

### **6-d- Periodicals, Web sites, ... etc**

IEEE transactions on computers and software.

## **7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- Software programs specified in system analysis and design
- Datashow, screen, and laptop computer

### **Course coordinator:**

**Prof. Nabil Abd-El-Wahid Ismail**

### **Head of Department:**

**Prof. Nabil Abd El-Wahed Ismail**

**Date: / / 2006**



## PHYSICS

|   |                        |
|---|------------------------|
| Programme(s) on which the course is given | CS, IS, IT and OR      |
| Major or Minor element of programs        | Major                  |
| Department offering the program           | Information technology |
| Department offering the course            | Information Technology |
| Academic year / Level                     | 1 <sup>st</sup> year   |
| Date of specification approval            | 9/5/2006               |

### A- Basic Information

|                     |                |          |                 |             |                  |          |
|---------------------|----------------|----------|-----------------|-------------|------------------|----------|
| <b>Title</b>        | <b>Physics</b> |          |                 | <b>Code</b> | <b>PH111</b>     |          |
| <b>Credit Hours</b> | <b>Lecture</b> | <b>3</b> | <b>Tutorial</b> | <b>1</b>    | <b>Practical</b> | <b>2</b> |
|                     | <b>Total</b>   |          |                 |             |                  | <b>6</b> |

### B- Professional Information

#### 1 – Overall aims of course

- Understand the electronic properties of semiconductors and other materials used in optoelectronic devices.
- Give a first acquaintance with the analysis and design of active electronic circuits.
- Illustrate the importance of power electronic devices in electrical systems by studying their characteristics, operation and application.
- Explain the single and simple multistage linear circuits using bipolar transistors.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a-Knowledge and understanding:

- A1- Students will demonstrate knowledge and understanding of the essential core content of the discipline of Information technology, and demonstrate the ability to apply content-knowledge in the specification, analysis, design, implementation

and testing of a software solution.

- A2- Students will demonstrate the ability to effectively communicate Information technology concepts both orally and in writing or as members of a project team, Students will demonstrate an acceptance of the ethical standards
- A3- The student will understand and differentiate methods of data analysis, parameters estimation, and testing.
- A4- Students will exhibit and demonstrate abilities in the fields of computer networks, Multimedia, and computer processing.
- A5- Students will demonstrate the operation and maintenance of components of a standard PC and PC peripherals.
- A6- The student will know and understand the basic definitions and components of computer networks, network evaluation, and security.
- A7- The student will be able to explain the fundamentals of digital networks and telecommunications systems.
- A8- Understanding the principles of multimedia, signal and image processing and applications.
- A9- The student will understand the application of the basic computer graphics and animation techniques.
- A10 The student will be able to distinguish between data and information, data analysis and retrieval and the principles of knowledge discovery and mining, The student will demonstrate a clear understanding of Artificial Intelligence

### 2-b- Intellectual skills

- B1- Analyze the methods of parameters estimation, the method of hypothesis testing, the methods used for data analysis to any statistical data, Solve the problem of analyzing and interpreting random variables.
- B2- Analyze different information technology problems and be able to implement algorithms to solve the problems.
- B9 Students will exhibit the ability to learn and understand new technologies as they are developed.

### 2-c- Professional and practical skills

|     |  |
|-----|--|
| C1- | Students will demonstrate the ability to effectively manage Information technology problems and solutions and apply content-knowledge in the specification, analysis, design, implementation and testing of a software solution. |
| C3- | Analyze and interpret statistical data, Apply methods of parameter estimation and implement method o hypothesis testing, design and implement practical programs to estimate   |

|  |   |
|--|---|
|  | statistical parameters and apply different analysis techniques. |
|--|---|

## 2-d- General and transferable skills

|     |  |
|-----|--|
| D1- | Explain the IT problems and their solutions, and effective skills in management of IT projects. Demonstrate a range of basic skills required to work effectively in communications and IT industry, understand the need for continuing professional development and lifelong learning in order to cope with rapidly changing communications technology |
| D2- | Provide effective technology explanations for audio/visual, computer, multimedia, voice, video, and web based applications and services to all areas of the college,   |
| D3- | Explain the use of mathematical modeling to predict the behavior of a physical system, develop an analytical approach to understanding complex systems   |

## 3- Content

| Topic  | No Of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1 Introduction</b>  | 6           | 3       | 3                  |
| <b>2 Diode Circuits</b> <ul style="list-style-type: none"> <li>• Characteristics of Germanium – and Silicon Diodes</li> <li>• Peak and Average Values</li> <li>Rectification</li> <li>• Amplitude Limiting with Zener diodes</li> <li>• Variable peak Limiting (Clipping) with Diodes</li> <li>• Voltage Doubling Connections</li> <li>• Voltage Multiplier Connections according to Greinacher</li> </ul> | 12          | 6       | 6                  |
| <b>3 Zener Diode</b> <ul style="list-style-type: none"> <li>• Characteristics of Zener-Diodes</li> <li>• Voltage Stabilization With Zener-Diodes</li> </ul>  | 6           | 3       | 3                  |
| <b>4 Bipolar Transistors</b> <ul style="list-style-type: none"> <li>• Bipolar Junction Transistors</li> <li>• Output Characteristics of Transistors</li> <li>• AF Amplifier in Emitter circuits</li> </ul>   | 6           | 3       | 3                  |
| <b>5 Large-Signal Analysis of Bipolar Transistor Circuits</b> <ul style="list-style-type: none"> <li>• Voltage Stabilizing With Series Pass Transistor I</li> <li>• Differential Amplifier</li> </ul>  | 6           | 3       | 3                  |



|   |           |           |           |
|---|-----------|-----------|-----------|
| <b>6 Multivibrator</b> <ul style="list-style-type: none"> <li>• A stable Multivibrator</li> <li>• Bistable Multivibrator</li> </ul>   | 6         | 3         | 3         |
| <b>7 Wien Bridge</b> <ul style="list-style-type: none"> <li>• Wien Bridge</li> <li>• Sine-Oscillator With Wine Bridge</li> <li>• Colpitts Oscillator</li> </ul>   | 6         | 3         | 3         |
| <b>8 Photo Transistor</b> <ul style="list-style-type: none"> <li>• Characteristics of LDR</li> <li>• Photo Transistor</li> </ul>  | 6         | 3         | 3         |
| <b>9 Field Effect Transistor Amplifier Circuits</b> <ul style="list-style-type: none"> <li>• Control Characteristic Of FETS</li> <li>• Output Characteristics Of FETS</li> <li>• Source Basic Circuit LH 11.2</li> <li>• Monostable Multivibrator With FET</li> </ul>   | 12        | 6         | 6         |
| <b>10 Logic Electronic Devices</b> <ul style="list-style-type: none"> <li>• MOSFETs</li> <li>• Enhancement</li> </ul>   | 6         | 3         | 3         |
| <b>11 Electronic Devices for AC/DC control systems</b> <ul style="list-style-type: none"> <li>• Operational Behavior Of Thyristors</li> <li>• Thyristor In A Dc-Circuit</li> <li>• Sawtooth Generator With UJT</li> <li>• Operational Behavior Of Triacs</li> <li>• Phase-Angle Control with UJT and Triac</li> </ul> | 12        | 6         | 6         |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Lectures
- 4.2 Practical experiments in the laboratory.
- 4.3 Exercises and tutorials.
- 4.4 Research assignments.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Practical, and Oral Exam to assess Professional skills
- 5.a.4 Reports, assignments, and discussions to assess general and transferable

skills.

**5.a.5** final written exam to assess knowledge and understanding

#### **5-b- Assessment schedule**

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

#### **5-c- Weighting of assessments**

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

### **6- List of references**

#### **6-a- Course notes**

There are lectures notes prepared in the form of a book authorized by the department

#### **6-b- Essential books (text books)**

[1] Jan Ogborn, Advancing physics A2 studios

#### **6-c- Recommended books**

[1] A book prepared and edited by the lecturer, and approved by the department council

#### **6-d- Periodicals, Web sites, etc**

It is recommended for students to search for similar courses in other universities.

### **7- Facilities required for teaching and learning**

- Electronics laboratory.
- Software programs specified in physics.
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Dr. kamel Mostafa**

**Head of Department:**

**Prof. Mohiy M. Hadhoud**

**Date: / / 2006**



## MATHEMATICS-2

|   |                      |
|---|----------------------|
| Programme(s) on which the course is given | CS, IS, IT and OR    |
| Major or Minor element of programs        | Major                |
| Department offering the program           | Operations Research  |
| Department offering the course            | Operations Research  |
| Academic year / Level                     | 1 <sup>st</sup> year |
| Date of specification approval            | 9/5/2006             |

### A- Basic Information

|                     |                      |          |                 |             |                  |          |
|---------------------|----------------------|----------|-----------------|-------------|------------------|----------|
| <b>Title</b>        | <b>Mathematics-2</b> |          |                 | <b>Code</b> | <b>MA112</b>     |          |
| <b>Credit Hours</b> | <b>Lecture</b>       | <b>3</b> | <b>Tutorial</b> | <b>3</b>    | <b>Practical</b> | <b>0</b> |
|                     | <b>Total</b>         |          |                 |             |                  | <b>6</b> |

### B- Professional Information

#### 1 – Overall aims of course

- Solve ordinary differential equation
- Find the Laplace transform, inverse Laplace transform or Fourier series of a given function
- Use Laplace transforms to solve ODE's
- Understand the basic knowledge of the rules of matrix algebra
- Solve a system of linear equation

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A2** Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A3** Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A5** Knowing and understanding the mathematical background of operations research and its related topics topics.
- A6** Recognizing the different mathematical approaches that solve the decision making problems in different fields

## 2-b- Intellectual skills

- B1** Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B3** Training on measuring efficiencies of the system units w. r. t. the whole system.

## 2-c- Professional and practical skills

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C6** Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.

## 2-d- General and transferable skills

- D1** Developing computer programs based optimization to solve real life applications
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.

## 3- Content

| Topic   | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 Introduction</b>   | 3           | 3       | 3                  |
| <b>2 Ordinary differential equations</b> <ul style="list-style-type: none"><li>• First order Separable DE's.</li><li>• First order homogeneous DE's.</li><li>• First order exact DE's.</li><li>• First order DE's with linear coefficients.</li><li>• Non exact DE's.</li><li>• Second order first degree DE's.</li><li>• Homogeneous Equations with Constant Coefficients.</li></ul> | 18          | 9       | 9                  |
| <b>3 Laplace transforms</b> <ul style="list-style-type: none"><li>• Transforms of standard functions.</li><li>• Transforms of periodic functions.</li><li>• Laplace transforms of some further special functions</li><li>• Theorems relating to inversion.</li><li>• Use of Laplace transforms in solving ODE's.</li><li>• Applications</li></ul>                                     | 12          | 6       | 6                  |

|   |           |           |           |
|---|-----------|-----------|-----------|
| <b>4 Fourier series</b> <ul style="list-style-type: none"> <li>• Periodic functions.</li> <li>• Fourier Theorem.</li> <li>• Calculating coefficients of Fourier series.</li> <li>• Even and odd functions.</li> <li>• Change of Interval.</li> </ul>  | 12        | 6         | 6         |
| <b>5 Z Transforms</b> <ul style="list-style-type: none"> <li>• Definition of the Z-transform.</li> <li>• Transforms of simple sequences.</li> <li>• Solution of difference equations.</li> <li>• Relation between Laplace and Z transforms.</li> </ul>  | 12        | 6         | 6         |
| <b>6 Matrices Algebra</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Special matrices.</li> <li>• Elementary operation for matrices.</li> <li>• Properties of determinant.</li> <li>• Inverse of matrices</li> <li>• Application of determinant to systems( Cramer's Rule)</li> </ul>   | 12        | 6         | 6         |
| <b>7 Applications of matrices algebra</b> <ul style="list-style-type: none"> <li>• Matrix representation of a linear system.</li> <li>• System of Linear Equations: Gaussian Elimination.</li> <li>• System of equation in two variables.</li> <li>• System of equation in three variables.</li> <li>• Computation of eigenvalues</li> <li>• Computation of eigenvectors</li> <li>• Digitalization.</li> <li>• Matrices of power n</li> </ul> | 12        | 6         | 6         |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Exercises and tutorials

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Practical, and Oral Exam to assess Professional skills

**5.a.4** Reports, assignments, and discussions to assess general and transferable skills.

**5.a.5** final written exam to assess knowledge and understanding

**5-b- Assessment schedule**

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

**5-c- Weighting of assessments**

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

**6- List of references**

**6-a- Course notes**

There are lectures notes prepared in the form of a book authorized by the department

**6-b- Essential books (text books)**

None

**6-c- Recommended books**

None

**6-d- Periodicals, Web sites, ... etc**

<http://archives.math.utk.edu>

<http://www.scottlan.edu/lriddle/women/>

**7- Facilities required for teaching and learning**

- Matlab Software.
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Wael Fathy**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**



## STATISTICS AND PROBABILITY

|   |   |
|---|---|
| Programme(s) on which the course is given | CS, IS, IT and OR                               |
| Major or Minor element of programs        | Major   |
| Department offering the program           | Information technology                          |
| Department offering the course            | Information technology                          |
| Academic year / Level                     | 1 <sup>st</sup> year / 2 <sup>nd</sup> Semester |
| Date of specification approval            | 9/5/2006  |

### A- Basic Information

| Title        | Statistics and Probability |   |          | Code | ST111     |   |
|--------------|----------------------------|---|----------|------|-----------|---|
| Credit Hours | Lecture                    | 3 | Tutorial | 3    | Practical | - |
|              | Total                      |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- 1 • Understand the principles and theories probability theories and basics of statistics
- 2 • Understand methods of processing statistical data
- 3 • Understand and application of statistical data.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A2 Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A3 Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A4 Demonstrating the principles of decision support tools and its implementation in developing the intelligent decision systems.
- A6 Recognizing the different mathematical approaches that solve the decision making problems in different fields

## 2-b- Intellectual skills

**B1** Improving skills as a modeler by formulating problems by implementing several modeling languages.

## 2-c- Professional and practical skills

**C4** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.

**C5** Be familiar with techniques that can be used in the field of decision making based computer technologies.

**C6** Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.

## 2-d- General and transferable skills

**D1** Developing computer programs based optimization to solve real life applications

**D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.

## 3- Content

| Topic   | No of hours | Lecture  | Tutorial/ Practical |
|---|-------------|----------|---------------------|
| <b>1 ELEMENTARY PROBABILITY AND THE BINOMIAL DISTRIBUTION</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Probabilities of Simple Events</li><li>• Probabilities of Two Events</li><li>• Probabilities for Combinations of Three or More Events</li><li>• Permutations and Combinations</li><li>• More Probability</li><li>• The Binomial Distribution</li><li>• The Theoretical Mean of the Binomial Distribution</li><li>• The Theoretical Variance of the Binomial Distribution</li><li>• Exercises</li></ul> | <b>9</b>    | <b>9</b> | <b>18</b>           |
| <b>2 THE NORMAL DISTRIBUTION</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• The Normal Distribution</li><li>• Use of Standard Normal Tables</li><li>• More Normal Probabilities</li><li>• The Normal Approximation to the Binomial Theorem</li><li>• Exercises</li></ul>  | <b>6</b>    | <b>6</b> | <b>12</b>           |



|   |          |          |           |
|---|----------|----------|-----------|
|   |          |          |           |
| <b>3 STATISTICS</b> <ul style="list-style-type: none"> <li>• The Present Importance of Statistics</li> <li>• Two Kinds of Statistics</li> <li>• Description of data.</li> <li>• Selecting a Random Sample</li> <li>• Classification of Data</li> <li>• Frequency Distributions and Cumulative Frequency Distributions</li> <li>• Graphical Representation of Data</li> <li>• Exercises</li> </ul> | <b>6</b> | <b>6</b> | <b>12</b> |
| <b>4 MEASURES OF LOCATION</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• The Mid-range</li> <li>• The Mode</li> <li>• The Median</li> <li>• The Arithmetic Mean</li> <li>• The Median of Classified Data</li> <li>• Summation Notation</li> <li>• The Mean of Classified Data</li> <li>• Exercises</li> </ul>   | <b>6</b> | <b>6</b> | <b>12</b> |
| <b>5 MEASURES OF VARIATION</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• The Range</li> <li>• The Mean Absolute Deviation</li> <li>• The Variance and the Standard Deviation</li> <li>• The Variance and Standard Deviation of Classified Data</li> <li>• Exercises</li> </ul>   | <b>3</b> | <b>3</b> | <b>6</b>  |
| <b>SOME TESTS OF STATISTICAL HYPOTHESES</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• The Nature of a Statistical Hypothesis—Two Types Error</li> <li>• Test of <math>H_0: \pi = \pi_0</math> versus a Specified Alternative</li> <li>• Tests about the Mean of a</li> </ul>   | <b>6</b> | <b>6</b> | <b>12</b> |

|   |           |           |           |
|---|-----------|-----------|-----------|
| Normal Distribution <ul style="list-style-type: none"> <li>Exercises</li> </ul>   |           |           |           |
| <b>Confidence LIMITS</b> <ul style="list-style-type: none"> <li>Introduction</li> <li>A Note on Inequalities</li> <li>Confidence Intervals for <math>\mu</math></li> <li>Confidence Interval for <math>\pi</math></li> <li>Exercises</li> </ul> | <b>6</b>  | <b>6</b>  | <b>12</b> |
| <b>APPENDIX: TABLES</b> <ol style="list-style-type: none"> <li>Area of the Standard Normal Distribution</li> <li><math>\chi^2</math>-Distribution,</li> <li><math>t</math>-Distribution, and</li> <li><math>F</math>-Distribution</li> </ol>    | -         | -         | -         |
| Total number of Hours for the course  | <b>42</b> | <b>42</b> | <b>84</b> |

#### 4– Teaching and learning methods

- 4.1** Reports, assignments, exercises, and final written exam to assess knowledge and understanding.
- 4.2** Regular oral , practical and written quizzes to assess intellectual skills.
- 4.3** Reports, assignments, and discussions to assess general and transferable skills
- 4.4** Reports, assignments, exercises, and final written exam to assess knowledge and understanding.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1** Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2** Regular oral and written quizzes to assess intellectual skills.
- 5.a.3** Practical, and Oral Exam to assess Professional skills
- 5.a.4** Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5** final written exam to assess knowledge and understanding

##### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.                              | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.                              |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks                             |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams). |                |

|                     |  |
|---------------------|--|
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |
|---------------------|--|

### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### 6-b- Essential books (text books)

None

### 6-c- Recommended books

1. Advanced Engineering Mathematics, 8<sup>th</sup> edition, Erwin kreyszig, © 1999 by John wiley & sons, Inc., 0-471-33328-x
2. Engineering Statistics, Second edition, Douglas C. Montgomery, George C. Runger, Norma F. Hubele, © 2001 by John wiley & sons, Inc., 0-471-38879-3
3. Elementary Probability, David Stirzaker, © Cambridge Universty Press, 1994, 0-521-56694-0

## 4. Periodicals, Web sites, ... etc

None

## 7- Facilities required for teaching and learning

Computer Lab  
Datashow, screen, and laptop computer.  
White board and colored pens

**Course coordinator:**

**Prof. Mohiy M. Hadhoud**

**Head of Department:**

**Prof. Waiel Fathy Abd El Wahed**

Date: / / 2006



## ORGANIZATION FUNDAMENTALS

|   |   |
|---|---|
| Programme(s) on which the course is given | CS, IS, IT and OR                               |
| Major or Minor element of programs        | Major   |
| Department offering the program           | OR & Decision Support                           |
| Department offering the course            | OR & Decision Support                           |
| Academic year / Level                     | 2 <sup>nd</sup> year / 1 <sup>st</sup> Semester |
| Date of specification approval            | 9/5/2006  |

### A- Basic Information

|                     |                                  |          |                 |             |                    |
|---------------------|----------------------------------|----------|-----------------|-------------|--------------------|
| <b>Title</b>        | <b>Organization Fundamentals</b> |          |                 | <b>Code</b> | <b>OD201</b>       |
| <b>Credit Hours</b> | <b>Lecture</b>                   | <b>3</b> | <b>Tutorial</b> | <b>3</b>    | <b>Practical</b> - |
|                     | <b>Total</b>                     |          |                 |             | <b>6</b>           |

### B- Professional Information

#### 1 – Overall aims of course

- Explain and apply the principles and theories of organization
- Define the Quantitative analysis
- Explain the linear programming.
- Differentiate between the linear and goal programming.
- Describe the DEA

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A1- Knowing and understanding the essential principals of decision making problems.
- A2- Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A6- Recognizing the different mathematical approaches that solve the decision making problems in different fields.

##### 2-b- Intellectual skills

- B1- Improving skills as a modeler by formulating problems by implementing several modeling languages

- B3-** Training on measuring efficiencies of the system units w. r. t. the whole system.
- B4-** Implementing the system life cycle in handling different problems of organizations.

**2-c- Professional and practical skills**

- C1-** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C3-** Learn how to understand the features of the available decision making packages.
- C4-** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C6-** Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.

**2-d- General and transferable skills**

- D2-** Enabling the students to gain knowledge about the tools for measuring systems' efficiency.
- D6-** Providing the students with knowledge about the classical and modern tools for modeling process.
- D7-** Write up in an accurate, coherent and logical manner solutions to a range of mathematical programming problems.

**3- Content**

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1 Introduction to Quantitative Analysis</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• What is Quantitative analysis.</li> <li>• The Quantitative analysis approach.</li> <li>• Possible problem in QA approach.</li> <li>• Development of QA within an organization.</li> </ul>             | 12          | 6       | 6                  |
| <b>2 linear Programming</b> <ul style="list-style-type: none"> <li>• History of linear programming.</li> <li>• Model formulation and examples.</li> <li>• The generalized linear programming model.</li> <li>• Graphical interpretation of linear programming.</li> <li>• Special cases</li> <li>• Summary.</li> </ul> | 18          | 9       | 9                  |
| <b>3 Analytic Hierarchy Process</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• The principle of identity and decomposition.</li> <li>• The principle of discrimination and comparative judgment.</li> </ul>   | 18          | 9       | 9                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Synthesis of priorities.</li> <li>• Hierarchies as representations of complexity.</li> <li>• Comments on dependence.</li> <li>• Summary.</li> </ul>   |           |           |           |
| <b>4 Data Envelopment Analysis</b> <ul style="list-style-type: none"> <li>• Definitions &amp; Notation.</li> <li>• Nonlinear programming model.</li> <li>• DEA LP model.</li> <li>• DEA Dual LP model.</li> <li>• Examples.</li> <li>• Summary of strengths &amp; weaknesses.</li> </ul> | 18        | 9         | 9         |
| <b>5 Goal Programming</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Modified simplex method of goal programming.</li> <li>• Computer based solutions of goal programming.</li> <li>• Advanced topics in goal programming.</li> <li>• Summary.</li> </ul>         | 18        | 9         | 9         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Research assignment
- 4.2 Lecture
- 4.3 Class activities
- 4.4 Sections

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Practical, and Oral Exam to assess Professional skills
- 5.a.4 Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5 final written exam to assess knowledge and understanding

##### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

##### 5-c- Weighting of assessments

|                               |     |
|-------------------------------|-----|
| <b>Semester work</b>          | 10% |
| <b>Mid-term examination</b>   | 10% |
| <b>Oral examination.</b>      | 10% |
| <b>Final-term examination</b> | 70% |

|              |      |
|--------------|------|
| <b>Total</b> | 100% |
|--------------|------|

## **6- List of references**

### **6-a- Course notes**

There are lectures notes prepared in the form of a book authorized by the department

### **6-b- Essential books (text books)**

None

### **6-c- Recommended books**

None

### **6-d- Periodicals, Web sites, ... etc**

None

## **7- Facilities required for teaching and learning**

- Software program.
- White board and colored pens.
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Wael Fathy abd Elwahed**

**Head of Department:**

**Prof. Wael Fathy abd Elwahed**

**Date: / / 2006**



## LOGIC DESIGN-2

|   |   |
|---|---|
| Programme(s) on which the course is given | All   |
| Major or Minor element of programs        | Major   |
| Department offering the program           | Computer Science                                |
| Department offering the course            | Computer Science                                |
| Academic year / Level                     | 2 <sup>nd</sup> year / 1 <sup>st</sup> semester |
| Date of specification approval            | 9/5/2006  |

### A- Basic Information

|              |                |   |          |       |           |
|--------------|----------------|---|----------|-------|-----------|
| Title        | Logic Design-2 |   | Code     | CS222 |           |
| Credit Hours | Lecture        | 3 | Tutorial | 1     | Practical |
|              | Total          |   |          |       | 2         |
|              |                |   |          |       | 6         |

### B- Professional Information

#### 1 – Overall aims of course

- Understand the principles and operations of sequential circuits, starting from Flip flops till complete sequential circuits.
- Understand the principles and operations of sequential circuits, starting from Flip flops till complete sequential circuits.
- Understand the principles and operations of sequential circuits, starting from Flip flops till complete sequential circuits.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2a- Knowledge and understanding

A5 Recognize and appreciate the professional and ethical responsibilities of the practicing computer professional including understanding the need for quality.

##### 2b- Intellectual skills

- B1 Solve a wide range of problems related to the analysis, design and construction of computer systems
- B2 Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by society, organizations, and technology.

##### 2-c- Professional and practical skills



- C6 Use appropriate computer-based design support tools  
 C8 Appreciate the features of complex computing hardware and software and operate them effectively

**2-d- General and transferable skills**

- D4 Strike the balance between self-reliance and seeking help when necessary in new situations.  
 D7 Demonstrate significantly enhanced group working abilities.

**3- Content**

| Topic   | No of hours | Lecture | Tutorial/ Practical |
|---|-------------|---------|---------------------|
| <b>1 Introduction</b> <ul style="list-style-type: none"> <li>• Combinational and Sequential Circuits.</li> <li>• Synchronous and asynchronous Sequential Circuits.</li> <li>• State Diagram and State Variables.</li> </ul>   | 3           | 3       | -                   |
| <b>2 Flip Flops</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• The Bistable Element</li> <li>• The SR Flip-Flop</li> <li>• The Clocked SR Latch</li> <li>• The D-Type Latch</li> <li>• The JK Flip-Flop</li> <li>• Triggering the Flip-flops</li> </ul>   | 15          | 9       | 6                   |
| <b>3 Counters</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Asynchronous Ripple Counters</li> <li>• Arbitrary Count Asynchronous Counters</li> <li>• Synchronous Counters</li> <li>• Arbitrary Count Synchronous Counters</li> <li>• IC Synchronous Counters</li> <li>• Up/Down Synchronous Counters</li> <li>• Cascaded Counters</li> <li>• Counter Decoding</li> <li>• Counter Applications</li> </ul> | 12          | 6       | 6                   |
| <b>4 Registers</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Shift Register</li> <li>• Bidirectional Shift Registers</li> <li>• The Universal Shifts Counters</li> <li>• The use of Shift Registers as Counters</li> <li>• Sequence Generators</li> <li>• The Ring Counter</li> <li>• The Johnson Counter</li> <li>• MLS Shift Registers</li> </ul>  | 15          | 9       | 6                   |
| <b>5 Synchronous Sequential Circuits</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Analysis Procedure</li> <li>• Design Examples</li> <li>• Design Procedure</li> </ul>  | 15          | 9       | 6                   |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <b>6 Sequential Logic Programming</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• The FPGA and sequential programming</li> <li>• Implementing counters and registers</li> <li>• Using the VHDL language to implement a general sequential circuit.</li> </ul> |           | -         | 18        |
| <b>7 The Main Memory</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Read Only Memory</li> <li>• Programmable ROMs</li> <li>• ROM Applications</li> <li>• Read Write Memories</li> <li>• Dynamic RAMs</li> <li>• Memory Expansion</li> </ul>                  | 6         | 6         | -         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Lectures.
- 4.2 Practical experiments in the laboratory.
- 4.3 Exercises and tutorials.
- 4.4 Research assignments.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1** Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2** Regular oral and written quizzes to assess intellectual skills.
- 5.a.3** Practical, and Oral Exam to assess Professional skills
- 5.a.4** Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5** final written exam to assess knowledge and understanding

##### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

##### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

## **6- List of references**

### **6-a- Course notes**

There are lectures notes prepared in the form of a book authorized by the department

### **6-b- Essential books (text books)**

[1] R. Tocci, Digital Systems Principles and Applications, six edition, 1991, Prentice-Hall, Inc.

### **6-c- Recommended books**

[1] B. Holdsworth, Digital Logic Design, Third edition, 1993, Butterworth-Heinemann Ltd.

[2] R. Tocci, Digital Circuits, Prentice-Hall Inc., 2001.

[3] A book prepared and edited by the lecturer, and approved by the department council.

### **6-d- Periodicals, Web sites, ... etc**

IEEE transactions on computers and software.

## **7- Facilities required for teaching and learning**

- Digital Design and logic programming laboratories.
- Laboratory equipments, apparatus and kits.
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Fawzy Aly Torkey**

**Head of Department:**

**Prof. Nabil Abd Elwahed Ismail**

**Date: / / 2006**



## COMPUTER SOFTWARE

|   |                      |
|---|----------------------|
| Programme(s) on which the course is given | CS, IS, IT and OR    |
| Major or Minor element of programs        | Major                |
| Department offering the program           | Computer Science     |
| Department offering the course            | Computer Science     |
| Academic year / Level                     | 2 <sup>nd</sup> year |
| Date of specification approval            | 9/5/2006             |

### A- Basic Information

|              |                   |   |          |      |           |   |
|--------------|-------------------|---|----------|------|-----------|---|
| Title        | Computer Software |   |          | Code | CS231     |   |
| Credit Hours | Lecture           | 3 | Tutorial | -    | Practical | 3 |
|              | Total             |   |          |      |           | 6 |

### B- Professional Information

#### 1 – Overall aims of course

- Understand the concepts of Programming Techniques.
- Understand the Object-oriented programming.
- Know the primitives data types of Java Language.
- Understand the concepts of inheritance and polymorphism.
- Implement the graphical user interface programming.
- Implement the Abstract classes, Interfaces and OO Model.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding

**A3** Demonstrate a grasp of the principles of computer systems, including architecture, networks and communication

##### 2-b- Intellectual skills

**B2** Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by society, organizations, and technology.

##### 2-c- Professional and practical skills

**C8** Appreciate the features of complex computing hardware and software and operate them effectively

##### 2-d- General and transferable skills

**D2** Use IT skills and display mature computer literacy.

### 3- Content

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1 A Survey of Programming Techniques</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Unstructured Programming.</li> <li>• Procedural Programming.</li> <li>• Structured Programming.</li> <li>• Modular Programming.</li> <li>• Modular Programming Problems.</li> <li>• Java.</li> <li>• Visual Basic, Visual C++ and C#.</li> <li>• Other High-Level Languages.</li> <li>• Object-Oriented Programming.</li> <li>• Object-Oriented Concepts.</li> </ul>   | 12          | 6       | 6                  |
| <b>2 Primitives Data Types and Operations</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Writing Simple Programs.</li> <li>• Identifiers.</li> <li>• Variables.</li> <li>• Assignment Statements and Assignment Expressions.</li> <li>• Constants.</li> <li>• Numeric Data Types and Operations.</li> <li>• Characters Data Types and Operations.</li> <li>• Boolean Data Types and Operations.</li> <li>• Operator Precedence.</li> <li>• Getting Input From Input Dialogs.</li> <li>• Case Study.</li> <li>• Formatting Output.</li> <li>• Programming Errors.</li> </ul> | 12          | 6       | 6                  |
| <b>3 Methods</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Creating a Methods.</li> <li>• Calling a Methods.</li> <li>• Passing Parameters by Values.</li> <li>• Overloading Methods.</li> <li>• The Scope of Local Variables.</li> <li>• Method Abstraction.</li> <li>• The Math Class.</li> <li>• Case Study: Generating Random Characters.</li> <li>• Recursion.</li> </ul>   | 12          | 6       | 6                  |
| <b>4 Objects and classes</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Defining Classes for objects.</li> <li>• Constructing Objects using Constructors.</li> <li>• Accessing Objects via Reference Variables.</li> <li>• Visibility Modifiers, Accessors and Mutators.</li> </ul>   | 6           | 3       | 3                  |

|   |    |   |   |
|---|----|---|---|
| <ul style="list-style-type: none"> <li>• Passing Objects to Methods.</li> <li>• Static Variables, Constants and Methods.</li> <li>• The Scope of variables.</li> <li>• The this keyword.</li> <li>• Array of Objects.</li> <li>• Case Study: The Loan class.</li> <li>• Inner Classes.</li> </ul>   |    |   |   |
| <b>5 Arrays</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Array Basic.</li> <li>• Copying Arrays.</li> <li>• Passing Arrays to Methods.</li> <li>• Returning an Array from a Method.</li> <li>• Sorting Arrays.</li> <li>• Multidimensional Arrays.</li> </ul>  | 6  | 3 | 3 |
| <b>6 Strings</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• The String Class.</li> <li>• The Character Class.</li> <li>• The StringBuffer Class.</li> <li>• The StringTokenizer Class.</li> <li>• The Scanner Class.</li> <li>• Implementing MyInput using Scanner.</li> <li>• Command-Line Arguments.</li> </ul>  | 6  | 3 | 3 |
| <b>7 Inheritance and Polymorphism</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Super classes and Subclasses.</li> <li>• Using the keyword super.</li> <li>• Overriding Methods.</li> <li>• Polymorphism, Dynamic Binding and Generic Programming.</li> <li>• Casting Objects and instanceof Operator.</li> <li>• The protected Data and Methods.</li> <li>• The final Classes, Methods and variables.</li> </ul> | 6  | 3 | 3 |
| <b>8 Getting Started with GUI Programming</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• GUI Components.</li> <li>• The Java GUI API.</li> <li>• Frames.</li> <li>• Layout Managers.</li> <li>• The Color Class.</li> <li>• The Font Class.</li> <li>• Drawing Graphics on Panels.</li> <li>• Case Study: MessagePanel Class.</li> <li>• Case Study: The StillClock Class.</li> </ul>                               | 12 | 6 | 6 |
| <b>9 Abstract Classes and Interfaces</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Abstract Classes.</li> <li>• Interfaces.</li> <li>• Processing Primitives Data Type Values as Objects.</li> <li>• Automatic Conversion Between Primitives Types and Wrapper Class Types.</li> </ul>  | 6  | 3 | 3 |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <b>10 Object-Oriented Modeling</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• The software Development Process.</li> <li>• Discovering Relationships among Classes.</li> <li>• Case Study: A Class Design Example.</li> <li>• Case Study: The Rational Class.</li> <li>• Framework-Based Programming using Java</li> </ul> | 6         | 3         | 3         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Lecture
- 4.2 Programs and Tutorials.
- 4.3 Research Assignments.
- 4.4 Cases Study in the Laboratory.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Practical, and Oral Exam to assess Professional skills
- 5.a.4 Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5 final written exam to assess knowledge and understanding

##### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

##### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

#### 6- List of references

##### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

##### 6-b- Essential books (text books)

None

### **6-c- Recommended books**

- [1] Liang, Y. Daniel, Introduction to Java Programming, Comprehensive version, Fifth Edition, 2005, Pearson Education Inc.
- [2] H. M. Deitel and P. J. Deitel , Java: How to Program, Fifth Edition, 2003 , Pearson Education Inc.
- [3] A book prepared and edited by the lecturer, and approved by the department council.

### **6-d- Periodicals, Web sites, ... etc**

IEEE transactions.

## **7- Facilities required for teaching and learning**

- Personal Computers Laboratories.
- Software programs specified in Java Programming Language.
- Data Show, Screen, and Laptop Computer.

**Course coordinator:**

**Prof. Dr. Nabil Abd-El-Wahid Ismail**

**Head of Department:**

**Prof. Nabil Abd-El-Wahid Ismail**

**Date: / / 2006**





## COMPUTER PERIPHERALS

|   |  |
|---|--|
| Programme(s) on which the course is given | CS, IS, IT and OR                              |
| Major or Minor element of programs        | Major  |
| Department offering the program           | Computer science                               |
| Department offering the course            | Computer science                               |
| Academic year / Level                     | 2 <sup>nd</sup> year/ 1 <sup>st</sup> semester |
| Date of specification approval            | 9/5/2006                                       |

### A- Basic Information

|                     |                             |          |                 |             |                           |
|---------------------|-----------------------------|----------|-----------------|-------------|---------------------------|
| <b>Title</b>        | <b>Computer peripherals</b> |          |                 | <b>Code</b> | <b>CS211</b>              |
| <b>Credit Hours</b> | <b>Lecture</b>              | <b>3</b> | <b>Tutorial</b> | <b>1</b>    | <b>Practical</b> <b>2</b> |
|                     | <b>Total</b>                |          |                 |             | <b>6</b>                  |

### B- Professional Information

#### 1 – Overall aims of course

- Know about range of technologies available for peripheral design.
- Explain and demonstrate the basic use of input and output devices.
- Explain and demonstrate the use of external and internal storage devices.
- Identify the major factors to be considered in the purchase of a computer system
- Ability to install and configure add-on items such as CD-ROM drives, tape backup units, scanners, sound cards, digital camera.
- Diagnose hardware problems and provide simple maintenance.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding

A3 Demonstrate a grasp of the principles of computer systems, including architecture, networks and communication

##### 2-b- Intellectual skills

B2 Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by

society, organizations, and technology.

**2-c- Professional and practical skills**

C8 Appreciate the features of complex computing hardware and software and operate them effectively

**2-d- General and transferable skills**

D2 Use IT skills and display mature computer literacy.

**3- Content**

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1 Personal Computers</b> <ul style="list-style-type: none"> <li>The main components of a typical desktop computer</li> <li>Defining a PC</li> <li>Ports</li> <li>Internet/network connection</li> </ul>   | 6           | 3       | 3                  |
| <b>2 Motherboards</b> <ul style="list-style-type: none"> <li>Background</li> <li>Content of the motherboard</li> <li>BIOS Chip</li> </ul>  | 6           | 3       | 3                  |
| <b>3 Basic Input/Output System (BIOS)</b> <ul style="list-style-type: none"> <li>The Function of BIOS</li> <li>Booting the Computer</li> </ul>   | 6           | 3       | 3                  |
| <b>4 Interface Buses</b> <ul style="list-style-type: none"> <li>Pc Bus</li> <li>Industry Standard Architecture (ISA) Bus</li> <li>Other types of Buses</li> <li>Summary of Interface Bus types</li> <li>The Integrated Drive Electronics interface (IDE) Bus</li> </ul>  | 6           | 3       | 3                  |
| <b>5 Microprocessors</b> <ul style="list-style-type: none"> <li>Microprocessor History</li> <li>Inside a Microprocessor</li> <li>RAM and ROM</li> <li>Microprocessor Instructions</li> <li>Microprocessor Performance</li> </ul>   | 6           | 3       | 3                  |
| <b>6 CMOS and Memories</b> <ul style="list-style-type: none"> <li>CMOS</li> <li>Memory</li> <li>Read-Only-Memory (ROM)</li> <li>Dynamic random access memory (DRAM)</li> <li>Static RAMs (SRAM)</li> <li>Dynamic RAMs (DRAM)</li> <li>Random Access Memory (RAM)</li> <li>Other types of Memories</li> <li>Memory Modules</li> <li>Memory Cache</li> </ul> | 6           | 3       | 3                  |
| <b>7 PC Power Supplies</b> <ul style="list-style-type: none"> <li>Power Supply</li> <li>Power Supply Standardization</li> <li>Advanced Power Management</li> </ul>   | 6           | 3       | 3                  |

|   |           |           |           |
|---|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Power Supply Wattage</li> <li>• Power Supply Problems</li> <li>• Power Supply Improvements</li> </ul>  |           |           |           |
| <b>8 Inputs Devices</b> <ul style="list-style-type: none"> <li>• Computer Keyboards</li> <li>• Computer Mice</li> <li>• Scanners</li> <li>• Power Supply Wattage</li> <li>• Power Supply Problems</li> <li>Power Supply Improvements</li> </ul> | 6         | 3         | 3         |
| <b>9 Outputs Devices</b> <ul style="list-style-type: none"> <li>• Computer Monitors</li> <li>• Liquid Crystal Displays (LCDs)</li> <li>• Laser Printers</li> </ul>  | 6         | 3         | 3         |
| <b>10 Storage Devices</b> <ul style="list-style-type: none"> <li>• The Hard Disks</li> <li>• Floppy disk drives</li> <li>• Compact disk drives</li> <li>• DVD and DVD players</li> </ul>  | 6         | 3         | 3         |
| <b>11 Graphics Cards</b> <ul style="list-style-type: none"> <li>• Graphics card Basics</li> <li>• Graphics card components</li> <li>• Graphics card History and Standards</li> </ul>  | 6         | 3         | 3         |
| <b>12 Sound Cards</b> <ul style="list-style-type: none"> <li>• Anatomy of a Sound card</li> <li>• Producing sound</li> <li>• Sound Card Upgrades</li> <li>• Graphics card components</li> </ul>   | 6         | 3         | 3         |
| <b>13 Modems</b> <ul style="list-style-type: none"> <li>• The Origin of Modems</li> <li>• Faster Modems</li> </ul>  | 6         | 3         | 3         |
| <b>14 Computer Networking</b> <ul style="list-style-type: none"> <li>• Networking Basics</li> <li>• Routers and Firewalls</li> <li>• Ethernet Networking</li> <li>• Other Types of Networks</li> </ul>  | 6         | 3         | 3         |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1- Lectures
- 4.2- Practical experiments in the laboratory.
- 4.3- Exercises and tutorials.
- 4.4- Research assignments.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Practical, and Oral Exam to assess Professional skills
- 5.a.4 Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5 final written exam to assess knowledge and understanding

### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

## 6- List of references

### 6-a- Course notes

[1] Kamel Ali Arram, Computer Peripherals, 2005/2006

### 6-b- Essential books (text books)

[1] William Buchanan, and Austin Wilson, Advanced PC Architecture, Sixth Edition, 2003.

### 6-c- Recommended books

[1] John L. Hennessy, David A. Patterson, Computer Architecture, A Quantitative Approach, Third Edition 2003.

[2] William Stallings, Computer Organization & Architecture, Sixth Edition, 2003.

### 6-d- Periodicals, Web sites, ... etc

IEEE transactions on computer software

## 7- Facilities required for teaching and learning

- Peripherals Laboratory.
- Software programs specified in Peripherals. Data show, screen, and laptop computer.

**Course coordinator:**

**DR. KAMEL MOSTAFA MORSY**

**Head of Department:**

**Prof. Mohiy M. Hadhoud**

**Date:** / /2006



## DATA STRUCTURE

|   |   |
|---|---|
| Programme(s) on which the course is given | CS, IS, IT and OR                               |
| Major or Minor element of programs        | Major   |
| Department offering the program           | Computer Science                                |
| Department offering the course            | Computer Science                                |
| Academic year / Level                     | 2 <sup>nd</sup> year / 1 <sup>st</sup> semester |
| Date of specification approval            | 9/5/2006  |

### A- Basic Information

|              |                |   |          |      |           |   |
|--------------|----------------|---|----------|------|-----------|---|
| Title        | Data Structure |   |          | Code | CS241     |   |
| Credit Hours | Lecture        | 3 | Tutorial | 3    | Practical | - |
|              | Total          |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

Understand the concepts of data representation  
Design different algorithms for data structure

- Understand arrays, stacks and queues
- Understand linked lists and trees.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding

A2 Understand and apply a wide range of principles and tools available to the software engineer, such as design methodologies, choice of algorithm, language, software libraries and user interface technique.

##### 2-b- Intellectual skills

B1 Solve a wide range of problems related to the analysis, design and construction of computer systems

B2 Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by society, organizations, and technology.

B6 Be creative in the solution of problems and in the development of designs.

##### 2-c- Professional and practical skills

C5 Design, write and debug computer programs in appropriate languages.

## 2-d- General and transferable skills

- D1** Display an integrated approach to the deployment of communication skills .
- D2** Use IT skills and display mature computer literacy.
- D3** Work effectively with and for others.
- D9** Choose and formulate suitable strategies to accomplish well-defined goals.

## 3- Contents

| Topic   | No. of hours | Lecture | Tutorial /Practical |
|---|--------------|---------|---------------------|
| <b>1. Introduction and Overview</b>   | 6            | 3       | 3                   |
| <b>2. Arrays, Record and Pointers</b> <ul style="list-style-type: none"><li>• Linear Arrays</li><li>• Control Structures.</li><li>• Sub-algorithms.</li><li>• Linear Arrays in Memory.</li></ul>  | 6            | 3       | 3                   |
| <b>3. Basic Operations Done on Linear Arrays</b> <ul style="list-style-type: none"><li>• Traversing Linear Arrays.</li><li>• Inserting and Deleting.</li><li>• Sorting</li><li>• Linear Search</li><li>• Binary Search</li></ul>  | 12           | 6       | 6                   |
| <b>4. Multidimensional Arrays</b> <ul style="list-style-type: none"><li>• Two Dimensional (2D) Arrays.</li><li>• Representation 2D Arrays in Memory.</li><li>• Pointer Arrays.</li><li>• Record Structures.</li><li>• Parallel Arrays.</li></ul>  | 6            | 3       | 3                   |
| <b>5. Stacks and Queues</b> <ul style="list-style-type: none"><li>• Stacks.</li><li>• Array Representation of Stacks.</li><li>• The Stack Abstract Data Type.</li><li>• Queues and Priority Queues.</li><li>• Array Representation of Priority Queues.</li><li>• The Queue Abstract Data Type.</li><li>• Multiple Stacks and Queues</li></ul> | 12           | 6       | 6                   |
| <b>6. Linked Lists</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Linked Lists in Memory</li><li>• Basic Operations on Linked Lists</li><li>• Traversing A Linked List</li></ul>  | 6            | 3       | 3                   |
| <b>7. Linked Lists Operation</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Searching A Linked List</li><li>• Memory Allocation</li><li>• Insertion into A Linked Lists</li><li>• Deletion from A Linked Lists</li><li>• Header Linked Lists</li></ul>  | 12           | 6       | 6                   |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <b>8. A Linked Lists Abstract Data Types</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Pointers.</li> <li>• Singly Linked Lists.</li> <li>• Case Studies.</li> <li>• Doubly Linked Lists</li> </ul>  | 6         | 3         | 3         |
| <b>9. Mathematical Functions and Trees</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Performance Analysis</li> <li>• Complexity of Algorithms</li> <li>• Performance Measurement</li> <li>• Binary Trees</li> <li>• Representing Binary Trees in Memory</li> <li>• Traversing Binary Trees</li> <li>• Traversal Algorithms Using Stacks</li> <li>• Path Lengths</li> <li>• General Trees</li> </ul> | 12        | 6         | 6         |
| <b>10 Trees Abstract Data Structure</b> <ul style="list-style-type: none"> <li>• Introduction and Terminology.</li> <li>• The Abstract Data Type of Binary Trees.</li> <li>• Binary Tree Representations.</li> <li>• Binary Tree Operations</li> </ul>   | 6         | 3         | 3         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 5.a.1** Reports, assignments, exercises, and final written exam to assess knowledge and understanding.
- 5.a.2** Regular oral, practical and written quizzes to assess intellectual skills.
- 5.a.3** Practical projects, final practical and oral exams to assess professional skills.
- 5.a.4** Reports, assignments, and discussions to assess general and transferable skills.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1** Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2** Regular oral and written quizzes to assess intellectual skills.
- 5.a.3** Practical, and Oral Exam to assess Professional skills
- 5.a.4** Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5** final written exam to assess knowledge and understanding

##### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.                              | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.                              |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks                             |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams). |                |

|                     |  |
|---------------------|--|
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |
|---------------------|--|

### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared in the form of a book given by the Lecturer

### 6-b- Essential books (text books)

[1] Robert Lafore, Data Structures and Algorithms, SAMS,2000

### 6-c- Recommended books

Aron M. Tennen-Baum & others, Data Structure using C, Prentice Hall, 1992

### 6-d- Periodicals, Web sites, ... etc

IEEE transactions on computers software

## 7- Facilities required for teaching and learning

- Peripherals Laboratory.
- Software programs specified in Peripherals. Data show, screen, and laptop computer.

**Course coordinator:**

**DR. Wail Shawky El-Kelany**

**Head of Department:**

**Prof. Nabil abd Elwahed Ismail**

**Date:** / /2006





## OPERATING SYSTEM-1

|   |   |
|---|---|
| Programme(s) on which the course is given | CS, IS, IT and OR                               |
| Major or Minor element of programs        | Major   |
| Department offering the program           | Computer Science                                |
| Department offering the course            | Computer Science                                |
| Academic year / Level                     | 2 <sup>nd</sup> year / 2 <sup>nd</sup> Semester |
| Date of specification approval            | 9/5/2006  |

### A- Basic Information

|              |                     |   |          |      |           |   |
|--------------|---------------------|---|----------|------|-----------|---|
| Title        | Operating Systems-1 |   |          | Code | CS232     |   |
| Credit Hours | Lecture             | 3 | Tutorial | -    | Practical | 3 |
|              | Total               |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall Aims of Course

- Understand the principles and operations of operating systems.
- Understand the design goals for systems and users.
- Understand the different methods for building operating systems.

#### 2 – Intended Learning Outcomes of Course (ILOs)

##### 2-a- Knowledge and Understanding:

**A1-** Understand the basic operating system abstractions of process, thread, virtual Address space

**A2-** Understand concurrence issues

**A3-** Describe input and output at the hardware level and the role of an operating system in I/O.

**A4-** Understanding memory hierarchies, both hardware aspects and the role of an operating system.

##### 2-b- Intellectual Skills

**B1-** Analyze different existing operating systems.

**B2-**Develop the simulation programs from the general understanding of the operating systems.

**B3-** Implement different scheduling algorithms for operating systems

**2-c- Professional and Practical Skills**

**C1-** Identify the different approaches of operating systems.

**C2-** Design and implement simple programs related to basic operation of operating systems.

**2-d- General and Transferable Skills**

**D1-** Describe how an operating system operates.

**D2-** Set up platform for available an operating system in laboratory

**D3-** Development the ability to change the different setting of operating system to get best performance.

**3- Contents**

| Topic   | No. of hours | Lecture | Tutorial/Practical |
|---|--------------|---------|--------------------|
| <b>Introduction</b>   | 3            | 3       | -                  |
| <b>Computer System Structures</b> <ul style="list-style-type: none"> <li>• Computer System Operation.</li> <li>• I/O Structure</li> <li>• Storage Hierarchy.</li> <li>• Hardware Protection.</li> <li>• General System Architecture</li> </ul>                                | 6            | 3       | 3                  |
| <b>Operating System Structures</b> <ul style="list-style-type: none"> <li>• System Components.</li> <li>• Operating System Services.</li> <li>• System Calls.</li> <li>• System Structure.</li> <li>• Virtual Machine.</li> <li>• System Design and Implementation</li> </ul> | 6            | 3       | 3                  |
| <b>Processes</b> <ul style="list-style-type: none"> <li>• Process Concept.</li> <li>• Process Scheduling.</li> <li>• Operation in Process.</li> <li>• Cooperating Process.</li> <li>• Threads.</li> <li>• Interprocess Communication</li> </ul>                               | 12           | 6       | 6                  |
| <b>Threads</b> <ul style="list-style-type: none"> <li>• Overview.</li> <li>• Multithreading Models.</li> <li>• Threading Issues.</li> <li>• Pthreads.</li> <li>• Windows XP Threads.</li> <li>• Linux Threads.</li> <li>• Java Threads.</li> </ul>                            | 12           | 6       | 6                  |
| <b>CPU Scheduling</b> <ul style="list-style-type: none"> <li>• Basic Concepts.</li> <li>• Scheduling Criteria.</li> <li>• Scheduling Algorithms.</li> <li>• Multiple-Processor Scheduling.</li> <li>• Real-Time Scheduling.</li> <li>• Thread Scheduling.</li> </ul>          | 12           | 6       | 6                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Operating Systems Examples.</li> <li>• Java Thread Scheduling.</li> <li>• Algorithm Evaluation.</li> </ul>  |           |           |           |
| <b>Synchronization</b> <ul style="list-style-type: none"> <li>• Background.</li> <li>• The Critical-Section Problem.</li> <li>• Synchronization Hardware.</li> <li>• Semaphores.</li> <li>• Classical Problems of Synchronization.</li> <li>• Monitors.</li> </ul>                                     | 12        | 6         | 6         |
| <b>Memory Management</b> <ul style="list-style-type: none"> <li>• Background.</li> <li>• Swapping .</li> <li>• Contiguous Allocation.</li> <li>• Paging.</li> <li>• Segmentation.</li> <li>• Segmentation with Paging.</li> </ul>  | 6         | 3         | 3         |
| <b>Virtual Memory</b> <ul style="list-style-type: none"> <li>• Background.</li> <li>• Demand Paging.</li> <li>• Process Creation.</li> <li>• Page Replacement.</li> <li>• Allocation of Frames .</li> <li>• Thrashing.</li> <li>• Demand Segmentation.</li> <li>• Operating System Examples</li> </ul> | 12        | 6         | 6         |
| <b>Total sum</b>   | <b>81</b> | <b>42</b> | <b>39</b> |

#### 4– Teaching and Learning Methods

- 4.1- Lectures
- 4.2- Practical experiments in the laboratory
- 4.3- Exercises and tutorials
- 4.4- Research assignments

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Practical, and Oral Exam to assess Professional skills
- 5.a.4 Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5 final written exam to assess knowledge and understanding

##### 5-b- Assessment schedule

|                     |                       |                |
|---------------------|-----------------------|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week. | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week. |                |

|                     |  |  |
|---------------------|--|--|
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |  |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |  |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |  |

### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

## 6- List of References

### 6.1- Course Notes

"Lectures in operating systems", selected by A. Elsis, 2<sup>nd</sup> Semester 2006.

### 6.2- Essential Books (Text Books)

- [1] S. Abraham, Operating system concepts, fifth edition, 1998, Addison Wesley, Inc.
- [2] MCSE Training Kit\_Microsoft Windows 2000 Professional.

### 6.3- Recommended Books

- [1] William Stallings, "Operating Systems: Internals and Design Principles", Fourth Edition Prentice Hall, 2001
- [2] Andrew Tanenbaum; Modern Operating Systems (Second Edition); Prentice Hall; 2001.

### 6.4- Periodicals, Web Sites, ... etc

IEEE transactions on computers and software,

## 7- Facilities Required for Teaching and Learning

- PC laboratory.
- Data show, screen, and laptop computer

**Course coordinator:**

**Dr. arabi keshek**

**Head of Department:**

**Prof. Nabil Abdelwahed Ismail**

**Date: / / 2006**



## STATISTICAL METHODS

|   |                        |
|---|------------------------|
| Programme(s) on which the course is given | CS, IS, IT and OR      |
| Major or Minor element of programs        | Major                  |
| Department offering the program           | Information technology |
| Department offering the course            | Information technology |
| Academic year / Level                     | 2 <sup>nd</sup> year   |
| Date of specification approval            | 9/5/2006               |

### A- Basic Information

|              |                     |   |          |      |           |   |
|--------------|---------------------|---|----------|------|-----------|---|
| Title        | Statistical Methods |   |          | Code | ST221     |   |
| Credit Hours | Lecture             | 3 | Tutorial | 3    | Practical | - |
|              | Total               |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Understand apply the principles of methods used to analyze and interpret data
- Understand and apply the methods of parameter estimation and testing hypothesis about these parameters
- Understand the principles of testing the goodness of fit.
- Understand and apply the principles of calculating and testing multiple regression.
- Understand and apply the principles of random variables and how to calculate their parameters

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a-Knowledge and understanding:

- A1 Students will demonstrate knowledge and understanding of the essential core content of the discipline of Information technology, and demonstrate the ability to apply content-knowledge in the specification, analysis, design, implementation and testing of a software solution.
- A2 Students will demonstrate the ability to effectively communicate Information technology concepts both orally and in writing or as

members of a project team, Students will demonstrate an acceptance of the ethical standards

- A7 The student will be able to explain the fundamentals of digital networks and telecommunications systems.
- A10 The student will be able to distinguish between data and information, data analysis and retrieval and the principles of knowledge discovery and mining, The student will demonstrate a clear understanding of Artificial Intelligence

### **2-b- Intellectual skills**

- B1 Analyze the methods of parameters estimation, the method of hypothesis testing, the methods used for data analysis to any statistical data, Solve the problem of analyzing and interpreting random variables.
- B2 Analyze different information technology problems and be able to implement algorithms to solve the problems.
- B6 will demonstrate creative thinking in preprocessing the data, analysis, generalize and summarize the data, analyze and contrast different mining association rules, able to mine complex types of data, data and information retrieval.

### **2-c- Professional and practical skills**

- C1 Students will demonstrate the ability to effectively manage Information technology problems and solutions and apply content-knowledge in the specification, analysis, design, implementation and testing of a software solution.
- C3 Analyze and interpret statistical data, Apply methods of parameter estimation and implement method o hypothesis testing, design and implement practical programs to estimate statistical parameters and apply different analysis techniques.
- C6 Facilitate the collection, storage, security and integrity of electronic, apply a data mining methodology to real data, ability to retrieve and presenting information, programming Intelligence Searching techniques.
- C8 Programming Intelligence Searching techniques, Design and building Intelligent Agent applications, Analysis Neural, fuzzy and Genetic systems as a new intelligent paradigms.

### **2-d- General and transferable skills**

- D1 Explain the IT problems and their solutions, and effective skills in management of IT projects. Demonstrate a range of basic skills required to work effectively in communications and IT industry, understand the need for continuing professional development and lifelong learning in order to

- cope with rapidly changing communications technology
- D2** Provide effective technology explanations for audio/visual, computer, multimedia, voice, video, and web based applications and services to all areas of the college,
- D3** Explain the use of mathematical modeling to predict the behavior of a physical system, develop an analytical approach to understanding complex systems
- D4** Describe how computer vision is implemented, Explain the characteristics of signal and image processing algorithms, computer animation, the ability to apply algorithms and approaches of pattern recognition for real application
- D5** Explain the qualities of the software and software documentation
- D6** Describe the computer network structures, protocols and services, traffic analysis,
- D7** Describe the explain the digital network structure and services,
- D8** Describe and explain how parameters of statistical data are calculated and tested, the methods of statistical data analysis, solving problems associated with statistical data.
- D9** Group working to apply data mining techniques to simple and complex problems, Use of technological tool to preprocess and prepare data for knowledge discovery, Use of technological tool to clean, integrate, transform, and reduce data, Use of technological tool to design graphical user interfaces based on a data mining query language
- D1** Demonstrate and explain concepts of Artificial Intelligence, analysis of searching techniques , basic knowledge of genetic algorithms and neural networks basic idea.
- 0

### 3- Content

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| 1 Estimation <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Estimation of a population mean: Large-sample case</li> <li>• Estimation of a population mean: small sample case</li> <li>• Estimation of a population proportion</li> <li>• Estimation of the difference between two population means: Independent samples</li> <li>• Estimation of the difference between two population means: Matched pairs</li> </ul> | 18          | 9       | 9                  |

|   |    |   |   |
|---|----|---|---|
| <ul style="list-style-type: none"> <li>• Estimation of the difference between two population proportions</li> <li>• Choosing the sample size</li> <li>• Estimation of a population variance</li> <li>• Exercises</li> </ul>   |    |   |   |
| <p>2 Nonparametric statistics</p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• The sign test for a single population</li> <li>• Comparing two populations based on independent random samples: Wilcoxon rank sum test</li> <li>• Comparing two populations based on matched pairs: the Wilcoxon signed ranks test</li> <li>• Rank Correlation: Spearman's <math>r_s</math> statistic</li> <li>• Exercises</li> </ul>  | 12 | 6 | 6 |
| <p>3 Applications of Hypothesis Testing</p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Hypothesis test about a population mean</li> <li>• Hypothesis tests of population proportions</li> <li>• Hypothesis tests about the difference between two population means</li> <li>• Hypothesis tests about the difference between two proportions</li> <li>• Hypothesis test about a population variance</li> <li>• Hypothesis test about the ratio of two population variances</li> <li>• Exercises</li> </ul> | 12 | 6 | 6 |



|  |           |           |           |
|--|-----------|-----------|-----------|
| <p>4 Categorical data analysis and analysis of variance</p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Tests of goodness of fit</li> <li>• The analysis of contingency tables</li> <br/> <li>• Contingency tables in statistical software packages</li> <li>• Design of experiments</li> <li>• Completely randomized designs</li> <li>• Randomized block designs</li> <li>• Multiple comparisons of means and confidence regions</li> <li>• Exercises</li> </ul>   | 12        | 6         | 6         |
| <p>5 Multiple regression</p> <ul style="list-style-type: none"> <li>• Introduction: the general linear model</li> <li>• Model assumptions</li> <li>• Fitting the model: the method of least squares</li> <li>• Estimating <math>\sigma^2</math></li> <li>• Estimating and testing hypotheses about the B parameters</li> <li>• Checking the utility of a model</li> <li>• Using the model for estimating and prediction</li> <li>• Multiple linear regression: An overview example</li> <li>• Model building: interaction models</li> <li>• Model building: quadratic models</li> <li>• Exercises</li> </ul> | 18        | 9         | 9         |
| <p>6 Random Variables</p> <ul style="list-style-type: none"> <li>• Continuous Random Variables and Histograms</li> <li>• Probability Density Functions: Uniform, Exponential, and Normal.</li> <li>• Mean, Median, Variance, and Standard Deviation</li> </ul>   | 12        | 6         | 6         |
| <p>APPENDIX: TABLES</p> <ul style="list-style-type: none"> <li>• Area of the Standard Normal Distribution</li> <li>• <math>\chi^2</math>-Distribution,</li> <li>• <math>t</math>-Distribution, and</li> <li>• <math>F</math>-Distribution</li> </ul>   |           |           |           |
| <b>total number of Hours for the course</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

## 4– Teaching and learning methods

- 4.1 Research assignment
- 4.2 Lecture
- 4.3 Class activities
- 4.4 Sections.

## 5- Student assessment methods

### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Practical, and Oral Exam to assess Professional skills
- 5.a.4 Reports, assignments, and discussions to assess general and transferable skills.
- 5.a.5 final written exam to assess knowledge and understanding

### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### 6-b- Essential books (text books)

None

### 6-c- Recommended books

None

### 6-d- Periodicals, Web sites, ... etc

None

## **7- Facilities required for teaching and learning**

- Software program.
- White board and colored pens.
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Mohiy Mohamed Hadhoud**

**Head of Department:**

**Prof. Mohiy Mohamed Hadhoud**

**Date:    /    / 2006**



## FILE ORGANIZATION

|   |  |
|---|--|
| Programme(s) on which the course is given | CS, IS, IT and OR                              |
| Major or Minor element of programs        | Major  |
| Department offering the program           | Computer science                               |
| Department offering the course            | Computer science                               |
| Academic year / Level                     | 2 <sup>nd</sup> year/ 2 <sup>nd</sup> semester |
| Date of specification approval            | 9/5/2006                                       |

### A- Basic Information

| Title        | File Organization |   |          | Code | CS251     |   |
|--------------|-------------------|---|----------|------|-----------|---|
| Credit Hours | Lecture           | 3 | Tutorial | -    | Practical | 3 |
|              | Total             |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Design Internal File Structures and Formats.
- Use Modern Keyed Access Methods, Indexes & Hashing..
- Build the Structure, Retrieve Selected Data, Update and Maintain the Structure.  
Understand the storage data in memory & media storage..  
Reduce the access time as much as possible.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding

- A2** Understand and apply a wide range of principles and tools available to the software engineer, such as design methodologies, choice of algorithm, language, software libraries and user interface technique.
- A3** Demonstrate a grasp of the principles of computer systems, including architecture, networks and communication

## 2-b- Intellectual skills

B5 Integrate and evaluate information and data from a variety of sources.

B6 Be creative in the solution of problems and in the development of designs.

## 2-c- Professional and practical skills

C5 Design, write and debug computer programs in appropriate languages.

C8 Appreciate the features of complex computing hardware and software and operate them effectively

## 2-d- General and transferable skills

D8 Retrieve information from a variety of sources such as libraries, printed or electronic sources.

D9 Choose and formulate suitable strategies to accomplish well-defined goals.

## 3- Contents

| Topics  | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 Introduction</b>   | 6           | 3       | 3                  |
| <b>2 Fundamental of file processing</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Physical &amp; Logical Files.</li><li>• File Opening, Reading and Writing.</li><li>• Seeking</li></ul>   | 6           | 3       | 3                  |
| <b>3 Secondary Storage and System Software</b> <ul style="list-style-type: none"><li>• Disks.</li><li>• Magnetic Tape.</li><li>• Disk versus Tape.</li><li>• Physical Organization of CD-ROM</li></ul>  | 6           | 3       | 3                  |
| <b>4 Fundamental File Structure Concepts</b> <ul style="list-style-type: none"><li>• Field and Record Organization.</li><li>• Using Classes to Manipulate Buffers.</li><li>• Managing Fixed-Length Buffers.</li><li>• An Object-Oriented Class for Record Files</li></ul> | 12          | 6       | 6                  |
| <b>5 Managing Files of Records</b> <ul style="list-style-type: none"><li>• Record Access.</li><li>• More about Record Structures.</li><li>• File Access and File Organization.</li><li>• Beyond Record Structures</li><li>• Portability and Standardization.</li></ul>    | 6           | 3       | 3                  |
| <b>6 Organizing Files for Performance</b>   | 12          | 6       | 6                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Reclaiming Space in Files</li> <li>• Internal Sorting and Binary Searching.</li> <li>• Key Sorting.</li> </ul>  |           |           |           |
| <b>7 Indexing</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• A Simple Index for Entry-Sequential Files</li> <li>• Large Indexes to Hold in Memory</li> <li>• Indexes Access by Multiple Keys</li> <li>• Improving The Secondary Index Structure</li> <li>• Selective Indexes</li> <li>• Binding</li> </ul> | 6         | 3         | 3         |
| <b>8 Consequential Processing &amp; the Sorting</b> <ul style="list-style-type: none"> <li>• Implementing Consequential Process.</li> <li>• Extension the Model by Multiway Merging.</li> <li>• A Second Look at Sorting in Memory.</li> <li>• Merging for Sorting Large Files on Disk.</li> </ul>                               | 6         | 3         | 3         |
| <b>9 Multilevel Indexing, B-Trees and B+ Trees</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Statement of the Problems.</li> <li>• Indexing with Binary Search Trees.</li> <li>• Multilevel Indexing.</li> <li>• B-Trees and B+ Trees.</li> <li>• B-Trees and B+ Trees Methods Search.</li> </ul>        | 12        | 6         | 6         |
| <b>10 Hashing</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• A simple Hashing Algorithm.</li> <li>• Hashing Functions and Record Distributions.</li> <li>• Collision Resolution</li> <li>• Buckets</li> <li>• Making Deletions</li> </ul>   | 12        | 6         | 6         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Lectures
- 4.2 Practical programs in the laboratory.
- 4.3 Exercises and tutorials.
- 4.4 Research assignments

#### 5- Student assessment methods

### 5-a- Methods

**5.a.1** Reports, assignments, exercises, to assess knowledge and understanding

**5.a.2** Regular oral and written quizzes to assess intellectual skills.

**5.a.3** Practical, and Oral Exam to assess Professional skills

**5.a.4** Reports, assignments, and discussions to assess general and transferable skills.

**5.a.5** final written exam to assess knowledge and understanding

### 5-b- Assessment schedule

|                     |  |                |
|---------------------|--|----------------|
| <b>Assessment 1</b> | 5 <sup>th</sup> week.  | Mid term Exams |
| <b>Assessment 2</b> | 8 <sup>th</sup> week.  |                |
| <b>Assessment 3</b> | 10 <sup>th</sup> weeks   |                |
| <b>Assessment 4</b> | 16 <sup>th</sup> weeks (Oral and Practical Exams).             |                |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |                |

### 5-c- Weighting of assessments

|                               |      |
|-------------------------------|------|
| <b>Semester work</b>          | 10%  |
| <b>Mid-term examination</b>   | 10%  |
| <b>Oral examination.</b>      | 10%  |
| <b>Final-term examination</b> | 70%  |
| <b>Total</b>                  | 100% |

## 6- List of references

### 6-a- Course notes

There are an electronics lectures notes given by the Lecturer.

### 6-b- Essential books (text books)

[1] File Structures, An object oriented approach with C++ by Folk, Zoellick, Riccardi.

### 6-c- Recommended books

None

### 6-d- Periodicals, Web sites, ... etc

IEEE transactions on computers software.

## 7- Facilities required for teaching and learning

- Computer laboratories.
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Arabi keshk**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**



## SYSTEM ANALYSIS-1

|   |  |
|---|--|
| Programme(s) on which the course is given | ALL                                    |
| Major or Minor element of programs        | Major                                  |
| Department offering the program           | Computer Science                       |
| Department offering the course            | Computer Science                       |
| Academic year / Level                     | Second Year / 2 <sup>nd</sup> Semester |
| Date of specification approval            | 9/5/2006                               |

### A- Basic Information

|              |                  |   |          |      |           |   |
|--------------|------------------|---|----------|------|-----------|---|
| Title        | System Analsis-1 |   |          | Code | CS243     |   |
| Credit Hours | Lecture          | 3 | Tutorial | 3    | Practical | - |
|              | Total            |   |          |      | 6         |   |

### 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)

##### 2-a- Knowledge and understanding

- A2** Understand and apply a wide range of principles and tools available to the software engineer, such as design methodologies, choice of algorithm, language, software libraries and user interface technique.
- A3** Demonstrate a grasp of the principles of computer systems, including architecture, networks and communication

##### 2-b- Intellectual skills

- B2** Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by society, organizations, and technology.



**B3** Identify a range of solutions and critically evaluate and justify proposed design solutions.

**B4** Solve computer science problems with pressing commercial or industrial constraints.

**2-c- Professional and practical skills**

**C1** Plan and undertake a major individual project.

**C2** Prepare and deliver coherent and structured verbal and written technical reports.

**C3** Give technical presentations suitable for the time, place and audience.

**C7** Apply computer science skills in a commercial or industrial environment.

**2-d- General and transferable skills**

**D1** Display an integrated approach to the deployment of communication skills .

**D2** Use IT skills and display mature computer literacy.

**D7** Demonstrate significantly enhanced group working abilities.

**D8** Retrieve information from a variety of sources such as libraries, printed or electronic sources.

**3- Content**

| Topic  | No. of hours | Lecture | Tutorial/Practical |
|--|--------------|---------|--------------------|
| 1- Introduction to Systems Analysis and Design                                     | 6            | 3       | 3                  |
| 2- Information Systems Building Blocks   | 6            | 3       | 3                  |
| 3- Information System Development (System Development Life Cycle) (SDLC)           | 12           | 6       | 6                  |
| 4- System Analysis, structured analysis, prototyping, JAD, and OOA                 | 12           | 6       | 6                  |
| 5- Introduction to CASE tools  | 6            | 3       | 3                  |
| 6- Rapid Application Development (RAD) Tools (Visual Basic Programming)            | 6            | 3       | 3                  |
| 5- Data Modeling (Entity Relationship Modeling)                                    | 6            | 3       | 3                  |
| 6- Process Modeling, Data Flow Diagrams, functional decomposition, Object Modeling | 6            | 3       | 3                  |
| 7- Database Design (Data Analysis, intro to normalization)                         | 6            | 3       | 3                  |
| 8- Introduction to MS-ACCESS   | 6            | 4       | 2                  |
| 9- Input and Output Design   | 6            | 3       | 3                  |
| 10- User interface Design  | 6            | 3       | 3                  |
| <b>Total sum</b>   | 84           | 43      | 41                 |

**4- Teaching and learning methods**

**4.1** Information collection

**4.2** Lecture

**4.3** Class activities

**4.4** Practical training / lab

**4.5** Case study

## 5- Student assessment methods

### 5-a- Methods

- 5.a.1 Case Study . to assess ... Fundamental concepts gained  
5.a.2 Project ..... to assess ... Understanding...  
5.a.3 Mid term..... to assess Understanding the Cases studies  
5.a.4 Final Exam ... to assess course outcomes

### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral )  |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

### 5-c- Weighting of assessments

|                                    |      |
|------------------------------------|------|
| <b>Mid-term examination</b>        | 10%  |
| <b>Final-term examination</b>      | 70%  |
| <b>Oral examination (project).</b> | 10%  |
| <b>Practical examination</b>       | -    |
| <b>Semester work</b>               | 10%  |
| <b>Other types of assessment</b>   | -    |
| <b>Total</b>                       | 100% |

## 6- List of references

### 6-a- Course notes

None

### 6-b- Essential books (text books)

Jeffrey A. Hoffer, et. al. *Modern Systems Analysis and Design, 3rd Edition*.  
Prentice Hall. 2002

### 6-c- Recommended books

- [1] Kenneth E. Kendall, " Systems Analysis & Design", Prentice Hall PTR,  
2002.  
[2] Systems Analysis & Design Methods Jeffrey L. Whitten System Analysis  
2000 McGraw Hill

### 6-d- Periodicals, Web sites, ... etc

IEEE transactions on computers and software,

## 7- Facilities required for teaching and learning

- Modeling and simulation laboratories.
- Software programs specified in system analysis and design
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Dr. Hatem Mohammed Said Ahmed**

**Head of Department:**

**Prof. Nabil Abdelwahed Ismail**

**Date: / / 2006**



## OPERATIONS RESEARCH\_1

|   |                       |
|---|-----------------------|
| Programme(s) on which the course is given | CS, IS, IT and OR     |
| Major or Minor element of programs        | Major                 |
| Department offering the program           | OR & Decision Support |
| Department offering the course            | OR & Decision Support |
| Academic year / Level                     | 2 <sup>nd</sup> year  |
| Date of specification approval            | 9/5/2006              |

### A- Basic Information

|              |                       |   |          |      |           |
|--------------|-----------------------|---|----------|------|-----------|
| Title        | Operations Research_1 |   |          | Code | OD211     |
| Credit Hours | Lecture               | 3 | Tutorial | 3    | Practical |
|              | Total                 |   |          |      | 6         |

### B- Professional Information

#### 1 – Overall aims of course

- Should have a working knowledge of the principle techniques and methods of operations research.
- Understand how to formulate problems, construct and solve mathematical models, and apply the systems approach to problem solving.
- Should be able to apply the general concepts of optimization to solve these models.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A1 Knowing and understanding the essential principals of decision making problems.
- A2 Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A5 Knowing and understanding the mathematical background of operations research and its related topics topics.

**A6** Recognizing the different mathematical approaches that solve the decision making problems in different fields

**2-b- Intellectual skills**

- B1** Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B2** Learning principles of modeling decision making problems as well as things to be avoided.
- B6** Implementing the simulation and modeling software in solving real life decision making problems.
- B7** Learning how to design the Decision Support Systems that will support the decision makers.

**2-c- Professional and practical skills**

- C4** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C5** Be familiar with techniques that can be used in the field of decision making based computer technologies.
- C7** Learn how the student manages himself during the decision making process

**2-d- General and transferable skills**

- D4-** Learning how to deal with the uncertain decision making problems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.
- D7** Write up in an accurate, coherent and logical manner solutions to a range of mathematical programming problems.

**3- Content**

| Topic  | No of hours | Lecture  | Tutorial/Practical |
|--|-------------|----------|--------------------|
| <b>1 Introduction to Operations Research</b> <ul style="list-style-type: none"> <li>• Definition and History.</li> <li>• Theoretical Underpinnings</li> <li>• The Interdisciplinary nature of OR.</li> <li>• Introduction to Optimization Models</li> <li>• The nature of LP problems.</li> <li>• Problem formulation.</li> <li>• Advantages, limitations, and solution methods.</li> <li>• The graphical method of solution.</li> </ul> | <b>9</b>    | <b>6</b> | <b>3</b>           |
| <b>2 LP Applications</b> <ul style="list-style-type: none"> <li>• Agriculture.</li> <li>• Paper manufacturing.</li> <li>• Finance.</li> <li>• Marketing.</li> <li>• Hospital schedule.</li> </ul>  | <b>6</b>    | <b>3</b> | <b>3</b>           |
| <b>3 LP Solution Methods and Duality.</b> <ul style="list-style-type: none"> <li>• Preview of the Simplex method.</li> </ul>   | <b>12</b>   | <b>6</b> | <b>6</b>           |

|   |           |          |          |
|---|-----------|----------|----------|
| <ul style="list-style-type: none"> <li>• Formulating problems as mathematical programs.</li> <li>• Problem standardization.</li> <li>• Simplex method for LPs.</li> <li>• Simplex, special cases algorithms.</li> <li>• Duality: motivation, formulation</li> <li>• Strong duality theorem for LPs.</li> <li>• Complementary slackness conditions.</li> <li>• Economic interpretation.</li> <li>• Sensitivity analysis.</li> <li>• Relationship to duality theory.</li> <li>• Dual simplex method.</li> </ul> |           |          |          |
| <b>4 Network models</b> <ul style="list-style-type: none"> <li>• Transportation problems.</li> <li>• Assignment Problems.</li> <li>• Transshipment problems.</li> <li>• Shortest paths</li> <li>• Spanning trees</li> <li>• Max flows.</li> <li>• Min. cost flows.</li> <li>• Cycle canceling algorithm.</li> <li>• Network simplex algorithm.</li> </ul>   | <b>12</b> | <b>6</b> | <b>6</b> |
| <b>5 Integer programming and extensions.</b> <ul style="list-style-type: none"> <li>• formulation techniques, examples</li> <li>• cutting-plane methods, related topics</li> <li>• branch-and-bound, related topics</li> </ul>  | <b>9</b>  | <b>3</b> | <b>6</b> |
| <b>6 forecasting</b> <ul style="list-style-type: none"> <li>• The forecasting situation.</li> <li>• Judgmental Forecasting Methods.</li> <li>• Counting methods.</li> <li>• Moving average and Exponential smoothing</li> <li>• Forecasting Errors.</li> </ul>  | <b>9</b>  | <b>3</b> | <b>6</b> |
| <b>7 Inventory Models</b> <ul style="list-style-type: none"> <li>• Inventory systems and their structure.</li> <li>• Inventory costs.</li> <li>• The Economic Order Quantity (EOQ) Model and its application.</li> <li>• Material Requirement Planning (MRP).</li> </ul>  | <b>9</b>  | <b>3</b> | <b>6</b> |
| <b>8 Simulation</b> <ul style="list-style-type: none"> <li>• The nature of simulation.</li> <li>• The Methodology of simulation.</li> <li>• Types of simulation.</li> <li>• The Monte Carlo methodology.</li> <li>• Time independent, discrete simulation.</li> <li>• Time dependent, discrete simulation.</li> <li>• Risk analysis.</li> <li>• The role of computers in simulation.</li> </ul>   | <b>6</b>  | <b>3</b> | <b>3</b> |
| <b>10 Nonlinear programming, Special topics</b> <ul style="list-style-type: none"> <li>• Basic Notations.</li> <li>• Unconstrained Optimization.</li> </ul>   | <b>6</b>  | <b>3</b> | <b>3</b> |

|                                   |           |           |           |
|-----------------------------------|-----------|-----------|-----------|
| • Some search Techniques.         |           |           |           |
| <b>11 Dynamic programming(DP)</b> |           |           |           |
| • The nature of DP.               | <b>6</b>  | <b>3</b>  | <b>3</b>  |
| • The sage coach problem.         |           |           |           |
| • Terminology and structure.      |           |           |           |
| <b>Total sum</b>                  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study.
- 4.7 Exercises and tutorials
- 4,8 Group work with negotiable group revisions.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, and final written exam ... *to assess* knowledge and understanding.
- 5.a.2 Regular oral and written quizzes ..... *to assess* ...intellectual skills.
- 5.a.3 Practical projects, final practical and oral exams .... *to assess* professional skills.
- 5.a.4 Reports, assignments, and discussions .... *to assess* general and transferable skills.

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 70%  |
| <b>Oral examination.</b>         | 0%   |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

## **6- List of references**

### **6-a- Course notes**

There are lectures notes prepared in the form of a book authorized by the department

### **6-b- Essential books (text books)**

None

### **6-c- Recommended books**

- [1] An Introduction to Management Science: Quantitative Approaches to Decision Making (7<sup>th</sup> edition), David R. Anderson, Dennis J. Sweeney, and Thomas A. Williams, West Publishing Co., 1994.
- [2] Taha A. H., Operations Research, an Introduction, Macmillan, 1992.
- [3] Winston W., Operations Research: Applications and Algorithms, Duxbury Press, 1997.
- [4] A book prepared and edited by the lecturer, and approved by the department council.

### **6-d- Periodicals, Web sites, ... etc**

None

## **7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- Software programs specified in operations research.
- Datashow, screen, and laptop computer.

### **Course coordinator:**

**Prof. Waiel F. Abd El Wahed**

### **Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**





## DECISION SUPPORTING TOOLS

|   |   |
|---|---|
| Programme(s) on which the course is given | OR & Decision Support                           |
| Major or Minor element of programs        | Major   |
| Department offering the program           | OR & Decision Support                           |
| Department offering the course            | OR & Decision Support                           |
| Academic year / Level                     | 3 <sup>rd</sup> year / 1 <sup>st</sup> Semester |
| Date of specification approval            | 9/5/2006  |

### A- Basic Information

| Title        | Decision Supporting Tools |   |          | Code | OD361     |   |
|--------------|---------------------------|---|----------|------|-----------|---|
| Credit Hours | Lecture                   | 3 | Tutorial | 3    | Practical | - |
|              | Total                     |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Study the tools for Decision support
- Developing the sense for

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A3** Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A4** Demonstrating the principles of decision support tools and its implementation in developing the intelligent decision systems.
- A7** Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

##### 2-b- Intellectual skills

- B1** Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B6** Implementing the simulation and modeling software in solving real

life decision making problems.

- B7** Learning how to design the Decision Support Systems that will support the decision makers.

**2-c- Professional and practical skills**

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C3** Learn how to understand the features of the available decision making packages.
- C5** Be familiar with techniques that can be used in the field of decision making based computer technologies.
- C7** Learn how the student manages himself during the decision making process

**2-d- General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D3** Recognizing and understanding the available packages that are available in modeling and simulation Lab and training on working within the Platform of the available packages
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.

**3- Content**

| Topic   | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 Introduction</b>   | 4           | 2       | 2                  |
| <b>2 Supporting Business Decision Making</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• A Brief History of Decision Support Systems.</li> <li>• A Conceptual Perspective.</li> <li>• Decision Support vs. Transaction Processing Systems.</li> <li>• An Expanded Decision Support System Framework.</li> <li>• Building Decision Support Systems.</li> </ul> | 8           | 4       | 4                  |
| <b>3 Expert Choice</b> <ul style="list-style-type: none"> <li>• Introduction to AHP</li> <li>• Creating an expert choice Model.</li> <li>• Decision Evaluation using Expert choice</li> <li>• Developing different application in Computers &amp; Information</li> </ul>  | 10          | 6       | 6                  |
| <b>4 Statistical Packages.</b> <ul style="list-style-type: none"> <li>• Training on Forecasting analysis</li> </ul>   | 8           | 6       | 6                  |

|  |    |   |   |
|--|----|---|---|
| <ul style="list-style-type: none"> <li>• Training on different statistical models</li> <li>• Statistical data analysis</li> <li>• Developing Practical statistical models.</li> <li>• Network and Optimization Models.</li> <li>• Simulation Models.</li> </ul>  |    |   |   |
| <b>5 Programming Languages</b> <ul style="list-style-type: none"> <li>• Specialized Modelling Languages</li> <li>• third generation programming languages.</li> <li>• fourth generation programming languages.</li> <li>• graphing packages.</li> </ul>  | 15 | 5 | 5 |
| <b>6DSS HARDWARE AND OPERATING SYSTEM PLATFORMS.</b> <ul style="list-style-type: none"> <li>• dss on the central corporate system.</li> <li>• popular mainframe systems.</li> <li>• dss with an information base on a separate system</li> <li>• dss and client / server computing</li> <li>• popular local area network systems.</li> <li>• choosing a dss hardware environment</li> </ul>  | 8  | 4 | 4 |
| <b>7 Implementing Communications-Driven and Group Decision Support Systems</b> <ul style="list-style-type: none"> <li>• Key Terms.</li> <li>• Group Decision Support Situations.</li> <li>• Communication and Group Support tools.</li> <li>• A Managerial Perspective on Communications-Driven DSS.</li> <li>• A Contingency Theory.</li> <li>• Group Decision Support Systems Benefits.</li> <li>• Virtual Organizations.</li> <li>• Evaluating Communications and Group Support Tools.</li> </ul> | 10 | 5 | 5 |
| <b>8 Dss Tools for Building Equations</b> <ul style="list-style-type: none"> <li>• Mathematica</li> <li>• LINGO</li> <li>• EXCEL Solver</li> <li>• Intelligent search Methods.</li> </ul>  | 10 | 5 | 5 |

|   |           |           |           |
|---|-----------|-----------|-----------|
| <b>9 Group decision support Tools</b><br><ul style="list-style-type: none"> <li>• Define group decision support system (GDSS)</li> <li>• Developing GDSS with conflict objectives</li> <li>• Using DECISIONPRO to develop GDSS</li> </ul> | 10        | 5         | 5         |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Reports, assignments, exercises, and final written exam to assess knowledge and understanding.
- 4.2 Regular oral , practical and written quizzes to assess intellectual skills.
- 4.3 Reports, assignments, and discussions to assess general and transferable skills
- 4.4 Reports, assignments, exercises, and final written exam to assess knowledge and understanding.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....

##### 5-b- Assessment schedule

|              |  |
|--------------|--|
| Assessment 1 | 5th week.  |
| Assessment 2 | 8th week.  |
| Assessment 3 | 10th week.   |
| Assessment 4 | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                           |      |
|---------------------------|------|
| Final-term examination    | 70%  |
| Mid-term examination      | 20%  |
| Semester practical work   | 10%  |
| Other types of assessment | -    |
| Total                     | 100% |

#### 6- List of references

##### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

##### 6-b- Essential books (text books)

None

##### 6-c- Recommended books

5. Advanced Engineering Mathematics, 8<sup>th</sup> edition, Erwin kreyszig, © 1999 by John wiley & sons, Inc., 0-471-33328-x
6. Engineering Statistics, Second edition, Douglas C. Montgomery, George C. Runger, Norma F. Hubele, © 2001 by John wiley & sons, Inc., 0-471-38879-3
7. Elementary Probability, David Stirzaker, © Cambridge Universty Press, 1994, 0-521-56694-0

#### **8. Periodicals, Web sites, ... etc**

None

#### **7- Facilities required for teaching and learning**

Computer Lab  
Datashow, screen, and laptop computer.  
White board and colored pens

**Course coordinator:**

**Prof. Waiel F. Abd-El Wahid**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date:** / /2006



## LINEAR PROGRAMMING

|   |  |
|---|--|
| Programme(s) on which the course is given | OR & Decision support                          |
| Major or Minor element of programs        | Major  |
| Department offering the program           | OR & Decision support                          |
| Department offering the course            | OR & Decision support                          |
| Academic year / Level                     | 3 <sup>rd</sup> year /1 <sup>st</sup> Semester |
| Date of specification approval            | 9/5/2006                                       |

### A- Basic Information

|              |                    |   |          |      |             |
|--------------|--------------------|---|----------|------|-------------|
| Title        | Linear programming |   |          | Code | OD321       |
| Credit Hours | Lecture            | 3 | Tutorial | 3    | Practical - |
|              | Total              |   |          |      | 6           |

### B- Professional Information

#### 1 – Overall aims of course

- To present the basic mathematics and models in linear programming
- To study and understand the various linear programming methods and algorithms.
- To deal with linear models through formulation, analysis, and solving at end.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A1- Knowing and understanding the essential principals of decision making problems.
- A2- Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A5- Knowing and understanding the mathematical background of operations research topics.
- A6- Recognizing the different mathematical approaches that solve the decision making problems in different fields

## 2-b- Intellectual skills

- B1- Improving skills as a modeler by formulating problems by implementing several modeling languages
- B2- Learning principles of modeling decision making problems as well as things to be avoided.
- B5- Analyzing the right modeling process to emulate the real life problems

## 2-c- Professional and practical skills

- C2- Examine examples and case studies that documenting computer support for organizational decision making.
- C3- Learn how to understand the features of the available decision making packages.
- C4- Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C7- Learn how the student manages himself during the decision making process

## 2-d- General and transferable skills

- D1- Developing computer programs based optimization to solve real life applications
- D2- Enabling the students to gain knowledge about the tools for measuring systems' efficiency

## 3- Content

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1 Introduction to linear programming</b> <ul style="list-style-type: none"><li>• Examples of linear programs</li><li>• Linear programs vs. nonlinear programs</li><li>• Feasibility and optimality</li><li>• Global vs. local solutions</li><li>• The general structure of optimization algorithms</li></ul>  | 6           | 3       | 3                  |
| <b>2 Geometry of linear programming</b> <ul style="list-style-type: none"><li>• Polyhedral, convexity, and extreme points</li><li>• The basic idea of the simplex method</li><li>• The standard form of linear programs</li><li>• Representation of linear constraints</li><li>• Null and range spaces</li><li>• Variable reduction and null space bases</li><li>• Basic solutions and extreme points</li><li>• Representations of solutions and</li></ul> | 12          | 6       | 6                  |

|   |           |           |           |
|---|-----------|-----------|-----------|
| optimality conditions   |           |           |           |
| <b>3 Introduction to linear programming software</b> <ul style="list-style-type: none"> <li>Modeling and solving LP with AMPL, MINOS, and CPLEX LINDO, LINGO.</li> </ul>  | 9         | 3         | 6         |
| <b>4 The simplex method</b> <ul style="list-style-type: none"> <li>The basic algorithm</li> <li>Unbounded and infeasible problems</li> <li>Initialization</li> <li>The two-phase method</li> <li>The big-M method</li> <li>The problem of degeneracy</li> <li>The simplex method from the perspective of nonlinear programming</li> </ul> | 12        | 6         | 6         |
| <b>5 Duality</b> <ul style="list-style-type: none"> <li>The dual problem and its interpretation</li> <li>Duality theory</li> <li>The dual simplex method</li> </ul>   | 6         | 3         | 3         |
| <b>6 Sensitivity analysis</b> <ul style="list-style-type: none"> <li>Shadow costs and Lagrange multipliers</li> <li>Post-optimality sensitivity analysis</li> </ul>   | 6         | 3         | 3         |
| <b>7 Elaborations of the simplex method</b> <ul style="list-style-type: none"> <li>The product form of the inverse of the basis</li> <li>Problems with bounds</li> <li>Column generation</li> <li>Numerical stability and computation efficiency</li> </ul>   | 9         | 6         | 3         |
| <b>8 Applications</b> <ul style="list-style-type: none"> <li>Resource allocation problems</li> <li>Scheduling problems</li> <li>Network models</li> <li>Transportation problems</li> <li>Assignment problems</li> <li>Minimum-cost flows</li> <li>Dynamic problems</li> </ul>   | 12        | 6         | 6         |
| <b>9 Computational complexity of the simplex method</b> <ul style="list-style-type: none"> <li>Introduction to complexity</li> <li>Worst-case behavior of the simplex method</li> <li>Average behavior of the simplex method</li> <li>The ellipsoid method and interior point methods for linear programming</li> </ul>                   | 12        | 6         | 6         |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |



## 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study
- 4.7 Exercises and tutorials.

## 5- Student assessment methods

### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, and final written exam .... *to assess* knowledge and understanding.
- 5.a.2 5.2 Regular oral, practical and written quizzes .... *to assess* intellectual skills.
- 5.a.3 5.3 Practical projects, final practical and oral exams ... *to assess* ...professional skills.
- 5.a.4 5.4. Reports, assignments, and discussions ..... *to assess* ...general and transferable skills.

### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 70%  |
| <b>Oral examination.</b>         | -    |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### 6-b- Essential books (text books)

None

### 6-c- Recommended books

- [1] Williams H P, Model Solving in Mathematical Programming
- [2] George Dantzig and Mukund Thapa, Linear Programming 1 and 2. Springer.

1997 Alexamder

[3] Schrijver, Theory of Linear and Integer Programming, John Wiley and Sons, Chichester, 1986

[4] Michel Sakarovitch, Linear Programming, Springer-Verlag, 1983

[5] Winston W L, Operations Research: Applications and Algorithms

[6] A book prepared and edited by the lecturer, and approved by the department council.

#### **6-d- Periodicals, Web sites, ... etc**

IEEE transactions on operation research

#### **7- Facilities required for teaching and learning**

- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Waiel F. Abd-El Wahid**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date:** / /2006



## PROJECT MANAGING

|   |   |
|---|---|
| Programme(s) on which the course is given | OR & Decision Support                           |
| Major or Minor element of programs        | Major   |
| Department offering the program           | OR & Decision Support                           |
| Department offering the course            | OR & Decision Support                           |
| Academic year / Level                     | 3 <sup>rd</sup> year / 1 <sup>st</sup> Semester |
| Date of specification approval            | 9/5/2006  |

### A- Basic Information

|              |                  |   |          |      |           |   |
|--------------|------------------|---|----------|------|-----------|---|
| Title        | Project Managing |   |          | Code | OD331     |   |
| Credit Hours | Lecture          | 3 | Tutorial | 2    | Practical | 1 |
|              | Total            |   |          |      |           | 6 |

### B- Professional Information

#### 1 – Overall aims of course

- To instill an appreciation of the principles of project management
- To provide an understanding of project management processes
- To develop a critical awareness of project management constraints
- To develop the ability to formulate effective project management strategies

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A3 Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A4 Demonstrating the principles of decision support tools and its implementation in developing the intelligent decision systems.
- A7 Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

##### 2-b- Intellectual skills

- B1 Improving skills as a modeler by formulating problems by implementing several modeling languages.

- B4** Implementing the system life cycle in handling different problems of organizations.
- B5** Analyzing the right modeling process to emulate the real life problems

**2-c- Professional and practical skills**

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C5** Be familiar with techniques that can be used in the field of decision making based computer technologies.
- C7** Learn how the student manages himself during the decision making process

**2-d- General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D7** Write up in an accurate, coherent and logical manner solutions to a range of mathematical programming problems.

**3- Content**

| Topic   | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 Introduction</b>   | 3           | 3       | -                  |
| <b>2 Development of the Network</b> <ul style="list-style-type: none"> <li>• Preparation for Networking</li> <li>• Basic Terms.</li> <li>• Network Rules.</li> <li>• Emphasis on Logic.</li> <li>• Interpretation of Rules.</li> <li>• Using Dummies Efficiently.</li> <li>• Activity Descriptions.</li> <li>• Natural of Resource Dependencies.</li> <li>• Time scaled Networks.</li> <li>• Activity-on-Node Scheme.</li> <li>• Basic Node Scheme.</li> <li>• Precedence Diagramming.</li> </ul> | 12          | 6       | 6                  |
| <b>3 Time estimation and Level of Detail</b> <ul style="list-style-type: none"> <li>• Estimation Methods.</li> <li>• Activity Redefinition.</li> <li>• Network Condensation.</li> <li>• Arrow versus Precedence Method.</li> </ul>  | 6           | 3       | 3                  |

|  |    |   |   |
|--|----|---|---|
| <p><b>4 Basic scheduling Computations</b></p> <ul style="list-style-type: none"> <li>• Forward Pass Computations.</li> <li>• Backward Pass Computations.</li> <li>• Definition and interpretation of slack.</li> <li>• Critical Path identification.</li> <li>• Types of Float.</li> <li>• Use of special symbols in scheduling computation.</li> <li>• Illustrative network employing Special Symbols.</li> <li>• Critical path from Forward Pass only.</li> <li>• Variation of basic scheduling computations.</li> <li>• Illustrative network with Multiple Initial and terminal events.</li> <li>• Activity-on-node Scheduling Computations.</li> <li>• Precedence Diagram.</li> <li>• Precedence Diagram Computational procedure.</li> </ul> | 18 | 9 | 9 |
| <p><b>5 Project cost control</b></p> <ul style="list-style-type: none"> <li>• Basic Problems in Network-Based Cost control.</li> <li>• History of PERT/COST</li> <li>• Developing of C/SCSC.</li> <li>• Monitoring Project cost.</li> </ul>  | 12 | 6 | 6 |
| <p><b>6 Resource Constraints in project Scheduling</b></p> <ul style="list-style-type: none"> <li>• Multiproject Scheduling</li> <li>• Resource loading.</li> <li>• Use of heuristics in scheduling</li> <li>• Parallel vs. serial Methods.</li> <li>• Resource leveling.</li> <li>• Fixed Resource limits Scheduling.</li> </ul>  | 12 | 6 | 6 |
| <p><b>7 Time cost tradeoff</b></p> <ul style="list-style-type: none"> <li>• The Critical path method of time cost Tradeoff.</li> <li>• Activity time-cost Trade-offs Inputs for the CPM procedure.</li> <li>• Hand computation Procedure.</li> <li>• Economic implications of project Time-cost Trade-off.</li> </ul>  | 12 | 6 | 6 |
| <p><b>8 the PERT statistical approach</b></p> <ul style="list-style-type: none"> <li>• Overview of PERT</li> </ul>   | 9  | 3 | 6 |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Basic Probability theory</li> <li>• PERT system of Three Time Estimates.</li> <li>• Probability of Meeting a scheduled date.</li> <li>• Monitoring Activity Time Estimates and Performance</li> </ul> |           |           |           |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4- Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, and final written exam *to assess* knowledge and understanding.
- 5.a.2 Regular oral and written quizzes *to assess* intellectual skills.
- 5.a.3 Practical projects, final practical and oral exams *to assess* professional skills.

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 70%  |
| <b>Oral examination.</b>         | -    |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

#### 6- List of references

##### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

**6-b- Essential books (text books)**

None

**6-c- Recommended books**

- [1] PMI, A Guide to the Project Management Body of Knowledge, PMI, 1996, Y
- [2] BSI, BS6079 Guide to Project Management, BSI, 1996, Y
- [3] Smith N.J., Engineering Project Management, Blackwell Science, 2002, 0632057378, Y
- [4] Lewis, J.P., Mastering Project Management, McGraw-Hill, 1998, Y
- [5] Harrison, F.L., Advanced Project Management, Gower, 1999, Y
- [6] PMI, A Guide to the Project Management Body of Knowledge, PMI, 1996, Y

**6-d- Periodicals, Web sites, ... etc**

IEEE transactions on Operation Research

**7- Facilities required for teaching and learning**

- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Waiel F. Abd-El Wahid**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date:** / /2006



## INTEGER PROGRAMMING

|   |   |
|---|---|
| Programme(s) on which the course is given | OR & Decision support                           |
| Major or Minor element of programs        | Major   |
| Department offering the program           | OR & Decision support                           |
| Department offering the course            | OR & Decision support                           |
| Academic year / Level                     | 3 <sup>rd</sup> year / 2 <sup>nd</sup> Semester |
| Date of specification approval            | 9/5/2006  |

### A- Basic Information

|              |                     |   |          |      |             |
|--------------|---------------------|---|----------|------|-------------|
| Title        | Integer Programming |   |          | Code | OD322       |
| Credit Hours | Lecture             | 3 | Tutorial | 3    | Practical - |
|              | Total               |   |          |      | 6           |

### B- Professional Information

#### 1 – Overall aims of course

- To present the basic mathematics and models in integer programming
- To study and understand the various integer programming methods and algorithms.
- To deal with, integer, and mixed integer models through formulation, analysis, and solving at end.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A1 Knowing and understanding the essential principals of decision making problems.
- A2 Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A5 Knowing and understanding the mathematical background of operations research and its related topics topics.
- A6 Recognizing the different mathematical approaches that solve the decision making problems in different fields



## 2-b- Intellectual skills

- B1 Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B2 Learning principles of modeling decision making problems as well as things to be avoided.
- B5 Analyzing the right modeling process to emulate the real life problems

## 2-c- Professional and practical skills

- C2 Examine examples and case studies that documenting computer support for organizational decision making.
- C3 Learn how to understand the features of the available decision making packages.
- C4 Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C6 Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.
- C7 Learn how the student manages himself during the decision making process

## 2-d- General and transferable skills

- D1 Developing computer programs based optimization to solve real life applications
- D5 Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6 Providing the students with knowledge about the classical and modern tools for modeling process.
- D7 Write up in an accurate, coherent and logical manner solutions to a range of mathematical programming problems.

## 3- Content

| Topic   | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 Introduction.</b>  | 3           | 3       |                    |
| <b>2 Integer programming (IP)</b> <ul style="list-style-type: none"><li>• Examples of integer programs</li><li>• integer programs vs. linear programs</li><li>• Modeling with Integer Variables</li><li>• The general structure of optimization algorithms.</li></ul> | 12          | 6       | 6                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <p><b>3 Some of the most popular IP problems</b></p> <ul style="list-style-type: none"> <li>• The knapsack problems</li> <li>• Set covering, set backing, and set partitioning problems.</li> <li>• The plant location problems.</li> <li>• The Lockbox Problems</li> <li>• Batch Size Problems</li> <li>• Other (either, or) Constraints.</li> <li>• The Discrete Valued Variables</li> <li>• The Traveling salesman Problems.</li> </ul>   | 12        | 6         | 6         |
| <p><b>4 The Integer Linear Programming</b></p> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Illustrated applications.</li> <li>• Integer programming algorithms.</li> </ul>   | 6         | 3         | 3         |
| <p><b>5 The Branch and Bound Approach</b></p> <ul style="list-style-type: none"> <li>• The Difference Between linear and integer programming models</li> <li>• The three main tools in the Branch and bound approach.</li> <li>• The strategies needed to apply the branch and bound Approach.</li> <li>• The 0-1 Knapsack problem.</li> <li>• Special procedure for solving the Linear Programming relaxation of the 0-1 knapsack problem.</li> <li>• Branch and Bound Approach for the general mixed integer programming.</li> <li>• Branch and bound for Pure 0-1 Integer programming problems.</li> <li>• Advantages and limitations of the Branch and Bound Approach</li> <li>• Solved problems.</li> </ul> | 18        | 9         | 9         |
| <p><b>6 Zero-One implicit Enumeration</b></p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Zero one Equivalence of the integer problem</li> <li>• Concept of implicit enumeration.</li> <li>• Enumeration Scheme.</li> <li>• Fathoming Tests</li> <li>• Nonlinear Zero one problem.</li> <li>• Mixed zero one problem.</li> </ul>  | 15        | 6         | 9         |
| <p><b>7 Cutting plane methods.</b></p> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Dual cutting methods.</li> <li>• Fractional cut.</li> <li>• All-Integer cut.</li> <li>• Mixed cut.</li> <li>• Bound Escalation Cut</li> <li>• Convexity cut.</li> <li>• Primal cutting methods.</li> <li>• Almost dual cut.</li> <li>• Primal cuts.</li> <li>• Comments on computational</li> </ul>   | 18        | 9         | 9         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

## 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study
- 4.7 Exercises and tutorials

## 5- Student assessment methods

### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, and final written exam ..... *to assess* ...knowledge and understanding.
- 5.a.2 Regular oral, and written quizzes ..... *to assess* ...intellectual skills.
- 5.a.3 Reports, assignments, and discussions ..... *to assess* ...general and transferable skills.

### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 70%  |
| <b>Oral examination.</b>         | -    |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### 6-b- Essential books (text books)

None

### **6-c- Recommended books**

- [1] Williams H P, Model Solving in Mathematical Programming
- [2] Schrijver, Theory of Linear and Integer Programming, John Wiley and Sons, Chichester, 1986
- [3] Winston W L, Operations Research: Applications and Algorithms
- [4] A book prepared and edited by the lecturer, and approved by the department council.

### **6-d- Periodicals, Web sites, ... etc**

IEEE transactions on Operation Research

## **7- Facilities required for teaching and learning**

- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Waiel F. Abd-El Wahid**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date:** / /2006



## QUEUING THEORY

|  |   |
|--|---|
| <b>Programme(s) on which the course is given</b> | OR & Decision Support Dep.                    |
| <b>Major or Minor element of programs</b>        | Major   |
| <b>Department offering the program</b>           | OR & Decision Support Dep.                    |
| <b>Department offering the course</b>            | OR & Decision Support Dep.                    |
| <b>Academic year / Level</b>                     | 3 <sup>rd</sup> year/2 <sup>nd</sup> semester |
| <b>Date of specification approval</b>            | 9/5/2006                                      |

### A- Basic Information

|                     |                       |          |                 |             |                  |          |
|---------------------|-----------------------|----------|-----------------|-------------|------------------|----------|
| <b>Title</b>        | <b>Queuing Theory</b> |          |                 | <b>Code</b> | <b>OD341</b>     |          |
| <b>Credit Hours</b> | <b>Lecture</b>        | <b>3</b> | <b>Tutorial</b> | <b>2</b>    | <b>Practical</b> | <b>1</b> |
|                     | <b>Total</b>          |          |                 |             |                  | <b>6</b> |

### B- Professional Information

#### 1 – Overall aims of course

- Understanding the fundamental relations for queuing systems
- Recognizing the advanced queuing models (M/G/1 and variants with batches and interruptions; waiting times for the GI/G/1 systems)
- Studying the networks of queues,
- Developing applications to computer, communication and production systems

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A1** Knowing and understanding the essential principals of decision making problems.

##### 2-b-Intellectual skills

- B4** Implementing the system life cycle in handling different problems of organizations.
- B5** Analyzing the right modeling process to emulate the real life

problems

**B7** Learning how to design the Decision Support Systems that will support the decision makers.

**2-c-Professional and practical skills**

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C2** Examine examples and case studies that documenting computer support for organizational decision making.
- C4** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C7** Learn how the student manages himself during the decision making process

**2-d-General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D4** Learning how to deal with the uncertain decision making problems.
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.

**3- Content**

| Topic   | No of hours | Lecture | Tutorial/ Practical |
|---|-------------|---------|---------------------|
| <b>1 Introduction</b> <ul style="list-style-type: none"> <li>• Stochastic Processes</li> <li>• Markov Chains</li> </ul>   | 10          | 5       | 5                   |
| <b>2 Basic theory of Queuing theory</b> <ul style="list-style-type: none"> <li>• Basic Queuing Theory - I (Analysis of M/M/-/- Type Queues)</li> <li>• Analysis of the simple M/G/1 Queue (Residual Life, Imbedded Markov Chain)</li> <li>• Method of Supplementary Variables for the M/G/1 Queue</li> </ul>  | 15          | 9       | 6                   |
| <b>3 Queuing Models</b> <ul style="list-style-type: none"> <li>• M/G/1 Queue with Vacations and Exceptional First Service</li> <li>• M/G/1 Queue with Batch Arrivals</li> <li>• Priority Operation of the M/G/1 Queue</li> <li>• Analysis of M/M/n/K Queue with Multiple Priorities</li> <li>• Basic Model of Finite Capacity Single Server M/G/1/K Queue</li> <li>• The G/M/1, G/G/1, G/G/m, and M/G/m/m Queues .</li> </ul> | 32          | 18      | 14                  |
| <b>4 Queuing Networks</b>   | 28          | 14      | 14                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Classification and Basic Concepts)</li> <li>• Open and Closed Jackson Networks</li> <li>• Analysis of Closed Networks</li> <li>• Simulation of Queues and Queuing Networks</li> <li>• Discrete Time Queues</li> </ul> |           |           |           |
| <b>Total sum</b>   | <b>85</b> | <b>46</b> | <b>39</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 40%  |
| <b>Final-term examination</b>    | 40%  |
| <b>Oral examination.</b>         | -    |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

#### 6- List of references

##### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

##### 6-b- Essential books (text books)

None

**6-c- Recommended books**

**6-d- Periodicals, Web sites, ... etc**

- 1- European Journal of operational research
- 2- Management science: International journal

**7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- Software programs specified in queuing simulation and analysis
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Waiel F. Abd EL-Wahed**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date:    /    / 2006**





## QUALITY CONTROL

|   |  |
|---|--|
| Programme(s) on which the course is given | OR & Decision Support Dep.                     |
| Major or Minor element of programs        | Major  |
| Department offering the program           | OR & Decision Support Dep.                     |
| Department offering the course            | OR & Decision Support Dep.                     |
| Academic year / Level                     | 3 <sup>rd</sup> year /2 <sup>nd</sup> Semester |
| Date of specification approval            | 9/5/2006                                       |

### A- Basic Information

|              |                 |   |          |      |           |  |
|--------------|-----------------|---|----------|------|-----------|--|
| Title        | Quality control |   |          | Code | OD351     |  |
| Credit Hours | Lecture         | 3 | Tutorial | 3    | Practical |  |
|              | Total           |   |          |      | 6         |  |

### B- Professional Information

#### 1 – Overall aims of course

- Understand the principles and operations of quality control
- Understanding Methods and philosophy of statistical process control
- Understanding Process and measurement system capability analysis

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A3 Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A4 Demonstrating the principles of decision support tools and its implementation in developing the intelligent decision systems.
- A7 Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

##### 2-b- Intellectual skills

- B1 Improving skills as a modeler by formulating problems by implementing several modeling languages.

- B5** Analyzing the right modeling process to emulate the real life problems
- B6** Implementing the simulation and modeling software in solving real life decision making problems.

**2-c- Professional and practical skills**

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C2** Examine examples and case studies that documenting computer support for organizational decision making.
- C6** Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.
- C7** Learn how the student manages himself during the decision making process

**2-d- General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.

**3- Content**

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1 Introduction</b>  | 6           | 3       | 3                  |
| <b>2 Quality improvement in the modern business environment</b> <ul style="list-style-type: none"> <li>• The meaning of quality</li> <li>• A brief history of quality control</li> <li>• Statistical method of quality control</li> <li>• Management aspects of quality Improvement</li> <li>• Problems</li> </ul> | 12          | 6       | 6                  |
| <b>3 Modeling process quality</b> <ul style="list-style-type: none"> <li>• Describing variation</li> <li>• Important discrete distribution</li> <li>• Important continuous distribution</li> <li>• Probability plots</li> <li>• Some useful approximation</li> <li>• Problems</li> </ul>                           | 12          | 6       | 6                  |
| <b>4 Inference about process quality</b> <ul style="list-style-type: none"> <li>• Statistics and sampling distribution</li> <li>• Point estimation of process parameters</li> <li>• Statistical inference for a single sample</li> <li>• Statistical inference for two samples</li> </ul>                          | 6           | 3       | 3                  |

|   |           |           |           |
|---|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>•</li> <li>• Problems</li> </ul>   |           |           |           |
| <p><b>5 Methods and philosophy of statistical process control</b></p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Chance and assignable cause of quality variation</li> <li>• Statistical basis of the control chart</li> <li>• The rest of the magnification seven</li> <li>• Problems</li> </ul>   | 12        | 6         | 6         |
| <p><b>6 Control charts for variables</b></p> <ul style="list-style-type: none"> <li>• Control charts for X and R</li> <li>• The shewhart control chart for individual measurement</li> <li>• Application of variable control chart</li> <li>• Problems</li> </ul>   | 12        | 6         | 6         |
| <p><b>7 Process and measurement system capability analysis</b></p> <ul style="list-style-type: none"> <li>• Process capability analysis using a histogram or a probability</li> <li>• Process quality ratios</li> <li>• Process capability analysis using a control charts</li> <li>• Process capability analysis using designed experiments</li> <li>• Setting aspecification limits on disceret components</li> <li>• Problems</li> </ul> | 12        | 6         | 6         |
| <p><b>8 Cumulative sum and exponentially moving average control charts</b></p> <ul style="list-style-type: none"> <li>• The cumulative sum control charts</li> <li>• The exponentially weighted moving average control chart</li> <li>• The moving average control chart</li> <li>• Problems</li> </ul>   | 12        | 6         | 6         |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports ..... *to assess* Problem Solving  
 5.a.2 Mid term exam ... *to assess* Understanding  
 5.a.3 final exam ... *to assess* gains of completed topics  
 5.a.4  
 5.a.5

**5-b- Assessment schedule**

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | all week.  |
| <b>Assessment 2</b> | 8th week (Mid term exam)   |
| <b>Assessment 3</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |
| <b>Assessment 4</b> |  |
| <b>Assessment 5</b> |  |

**5-c- Weighting of assessments**

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 70%  |
| <b>Oral examination.</b>         | -    |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

**6- List of references**

**6-a- Course notes**

There are lectures notes prepared in the form of a book authorized by the department

**6-b- Essential books (text books)**

None

**6-c- Recommended books**

- [1] Introduction to statistical quality control by Douglas C.Montgomery  
 [2] Statistical Quality Control solutions  
 [3] ULLS-A SCP 6 AUTOMATED QUALITY CONTROL

**6-d- Periodicals, Web sites, ... etc**

IEEE transactions on operation research

**7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- The lecturer
- Software programs specified
- Data show, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Waiel F. Abd EL-Wahed**  
**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date:** / /2006



## STOCHASTIC PROCESSES

|   |                                 |
|---|---------------------------------|
| Programme(s) on which the course is given | OR & Decision Support           |
| Major or Minor element of programs        | Major                           |
| Department offering the program           | OR & Decision Support           |
| Department offering the course            | OR & Decision Support           |
| Academic year / Level                     | 3 <sup>rd</sup> year / Elective |
| Date of specification approval            | 9/5/2006                        |

### A- Basic Information

|              |                      |   |          |      |           |
|--------------|----------------------|---|----------|------|-----------|
| Title        | Stochastic processes |   |          | Code | OD312     |
| Credit Hours | Lecture              | 3 | Tutorial | 3    | Practical |
|              | Total                |   |          |      | 6         |

### B- Professional Information

#### 1 – Overall aims of course

- Understand the principles of stochastic processes
- Understand the Background in Probability
- Understand the Reliability, Renewal and Markov Chains
- Understand of Some Gambling Problems

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A5- Knowing and understanding the mathematical background of operations research topics
- A6- Recognizing the different mathematical approaches that solve the decision making problems in different fields

##### 2-b- Intellectual skills

- B1- Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B2- Learning principles of modeling decision making problems as well as things to be avoided.
- B5- Analyzing the right modeling process to emulate the real life

problems

**2-c- Professional and practical skills**

- C2-** - Examine examples and case studies that documenting computer support for organizational decision making.
- C3** - Learn how to understand the features of the available decision making packages.
- C4** - Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C6** - Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.  
- Learn how the student manages himself during the decision making process
- C7**

**2-d- General and transferable skills**

- D1-** Developing computer programs based optimization to solve real life applications
- D4-** Learning how to deal with the uncertain decision making problems.
- D5-** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6-** Providing the students with knowledge about the classical and modern tools for modeling process.
- D7-** Learning the students how to optimize the cost of the decision making processes and how to finance the projects.

**3- Content**

| Topic   | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 Some Background in Probability</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Probability</li> <li>• Conditional probability and independence</li> <li>• Discrete random variables</li> <li>• Conditional expectation</li> <li>• Problems</li> </ul>   | 12          | 6       | 6                  |
| <b>2 Some Gambling Problems</b> <ul style="list-style-type: none"> <li>• Gambler's ruin</li> <li>• Probability of ruin</li> <li>• Some numerical simulations</li> <li>• Expected duration of the game</li> <li>• Some variations of gambler's ruin</li> <li>• Problems</li> </ul> | 12          | 6       | 6                  |
| <b>3 Random Walks</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Unrestricted random walks</li> <li>• Probability distribution after n steps</li> </ul>   | 6           | 3       | 3                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• First returns of the symmetric random walk</li> <li>• Other random walks</li> <li>• Problems</li> </ul>   |           |           |           |
| <b>4 Markov Chains</b> <ul style="list-style-type: none"> <li>• States and transitions</li> <li>• Transition probabilities</li> <li>• General two-state Markov chain</li> <li>• Powers of the transition matrix for the m-state chain</li> <li>• Gambler's ruin as a Markov chain</li> <li>• Classification of states</li> <li>• Classification of chains</li> <li>• Problems</li> </ul> | 12        | 6         | 6         |
| <b>5 Poisson Processes</b> <ul style="list-style-type: none"> <li>• Partition theorem approach</li> <li>• The Poisson process</li> <li>• Iterative method</li> <li>• The generating function</li> <li>• Variance for the Poisson process</li> <li>• Arrival times</li> <li>• Problems</li> </ul>   | 12        | 6         | 6         |
| <b>6 Birth and Death Processes</b> <ul style="list-style-type: none"> <li>• The birth process</li> <li>• Birth process: generating function equation</li> <li>• The death process</li> <li>• The combined birth and death process</li> <li>• Problems</li> </ul>   | 6         | 3         | 3         |
| <b>7 Queues</b> <ul style="list-style-type: none"> <li>• The single server queue</li> <li>• The stationary process</li> <li>• Classification of queues</li> <li>• Problems</li> </ul>  | 6         | 3         | 3         |
| <b>8 Reliability and Renewal</b> <ul style="list-style-type: none"> <li>• The reliability function</li> <li>• The exponential distribution and reliability</li> <li>• Expected number of renewals</li> <li>• Problems</li> </ul>   | 6         | 3         | 3         |
| <b>9 Branching and Other Random Processes</b> <ul style="list-style-type: none"> <li>• Generational growth</li> <li>• Mean and variance</li> <li>• Probability of extinction</li> <li>• Branching processes and martingales</li> <li>• Problems</li> </ul>   | 6         | 3         | 3         |
| <b>10 Computer Simulations and Projects</b>  | 6         | 3         | 3         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

## 4- Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study

## 5- Student assessment methods

### 5-a- Methods

- 5.a.1 Reports ..... *to assess* Problem Solving
- 5.a.2 Mid term exam ... *to assess* Understanding
- 5.a.3 final exam ... *to assess* gains of completed topics

### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | all week.  |
| <b>Assessment 2</b> | 8th week (Mid term exam)   |
| <b>Assessment 3</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Final-term examination</b>    | 70%  |
| <b>mid-term examination</b>      | 20%  |
| <b>Other types of assessment</b> | 10%  |
| <b>Total</b>                     | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### 6-b- Essential books (text books)

None

### 6-c- Recommended books

- [1] Stochastic Processes: An Introduction P W Jones and P Smith
- [2] ISO Standards Handbook: Statistical methods for quality control
- [3] Lectures on the Theory of Stochastic Processes
- [4] Stochastic Processes with Focus in Petroleum Applications

### 6-d- Periodicals, Web sites, ... etc

IEEE transactions on operation research



## **7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- The lecturer
- Software programs specified
- Data show, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Waiel F. Abd EL-Wahed**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date:    /    / 2006**



## PROBLEM SOLVING STRATEGY

|   |                                 |
|---|---------------------------------|
| Programme(s) on which the course is given | OR & Decision Support Dep.      |
| Major or Minor element of programs        | Major                           |
| Department offering the program           | OR & Decision Support Dep.      |
| Department offering the course            | OR & Decision Support Dep.      |
| Academic year / Level                     | 3 <sup>rd</sup> year / Elective |
| Date of specification approval            | 9/5/2006                        |

### A- Basic Information

|              |                          |   |          |      |           |   |
|--------------|--------------------------|---|----------|------|-----------|---|
| Title        | Problem Solving Strategy |   |          | Code | OD371     |   |
| Credit Hours | Lecture                  | 3 | Tutorial | 2    | Practical | 1 |
|              | Total                    |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Identify, develop, and learn to apply general problem solving strategies that are effective in analyzing a wide variety of mathematical problems.
- Set strategies for specific problems in elementary mathematics and logic
- Understand strategies that assist students in problem solving.
- Demonstrate an understanding of differences between solving strategies..

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A1 Knowing and understanding the essential principals of decision making problems
- A2 Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A5 Knowing and understanding the mathematical background of operations research and its related topics topics.
- A7 Knowing and understanding the important role of operations research topics and economic tools in solving real life problems

## 2-b- Intellectual skills

- B1** Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B3** Training on measuring efficiencies of the system units w. r. t. the whole system.
- B4** Implementing the system life cycle in handling different problems of organizations

## 2-c- Professional and practical skills

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C2** Examine examples and case studies that documenting computer support for organizational decision making.
- C7** Learn how the student manages himself during the decision making process

## 2-d- General and transferable skills

- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.

## 3- Content

| Topic   | No of hours | Lecture | Tutorial /Practical |
|---|-------------|---------|---------------------|
| <b>1 Introduction to Problem Solving</b>  | 9           | 6       | 4                   |
| <b>2- Solving strategies</b> <ul style="list-style-type: none"><li>• Problem solving strategies</li><li>• Problem identification</li><li>• Problem understanding</li><li>• Algorithm development</li><li>• Solution planning (flowcharts, pseudo-code, etc.)</li><li>• Modular programming design</li></ul> | 14          | 8       | 6                   |
| <b>3- program solving Concepts</b> <ul style="list-style-type: none"><li>• Constants and variables.</li><li>• Variable types.</li><li>• Operators.</li><li>• Data and file types.</li><li>• Statements.</li><li>• Programming constructs.</li><li>• Arrays.</li><li>• Linked list concepts.</li></ul>       | 26          | 16      | 10                  |
| <b>4- Modeling/Using Tables</b> <ul style="list-style-type: none"><li>• Table worksheets from problem solving strategy</li><li>• life size Venn diagram</li><li>• Introduction to algebraic expressions, worksheets on algebraic expressions</li></ul>  |             |         |                     |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>Solving problems with algebra</li> </ul>  |           |           |           |
| <b>5- Modeling</b> <ul style="list-style-type: none"> <li>Count-off problem,</li> <li>different modeling problems at different stations,</li> </ul>  |           |           |           |
| <b>6- Integration and Application</b> <ul style="list-style-type: none"> <li>Calculating how fast we can run.</li> <li>Various problems at stations.</li> <li>Treasure hunt with math problem clues</li> </ul> |           |           |           |
| <b>7 Application of Strategies</b> <ul style="list-style-type: none"> <li>Test your process chart</li> <li>Problem solving review</li> <li>Writing your own problems assignment</li> </ul>                     | 28        | 14        | 14        |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4- Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....
- 5.a.5 final term exam ... *to assess* gains of course topics....

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 16th week (Oral and practical)   |
| <b>Assessment 4</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 60%  |
| <b>Oral examination.</b>         | 10%  |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

## **6- List of references**

### **6-a- Course notes**

None

### **6-b- Essential books (text books)**

None

### **6-c- Recommended books**

- [1] Lester, and Raymond , Mathematics for Elementary Teachers via Problem Solving by Masinglila, , (2000).American Management Association;  
[2] Ken Johnson and Ted Herr, Problem Solving Strategies (2006), Key Curriculum Press

### **6-d- Periodicals, Web sites, ... etc**

IEEE transactions on operation research

## **7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- Software programs specified in worksheet analysis
- Datashow, screen, and laptop computer.

### **Course coordinator:**

**Prof. Waiel F. Abd-El Wahid**

### **Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**



## STRATEGIC ADMINISTRATION

|   |                                 |
|---|---------------------------------|
| Programme(s) on which the course is given | OR & Decision Support           |
| Major or Minor element of programs        | Major                           |
| Department offering the program           | OR & Decision Support           |
| Department offering the course            | OR & Decision Support           |
| Academic year / Level                     | 3 <sup>rd</sup> year / Elective |
| Date of specification approval            | 9/5/2006                        |

### A- Basic Information

|              |                          |   |          |      |           |   |
|--------------|--------------------------|---|----------|------|-----------|---|
| Title        | Strategic Administration |   |          | Code | OD372     |   |
| Credit Hours | Lecture                  | 3 | Tutorial | 2    | Practical | 1 |
|              | Total                    |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Instill knowledge and key skills in handling the responsibilities of corporate administration in both the strategic and functional contexts.
- Develop competence in advising the Board and leading teams in administrative
- Ensure compliance with external regulation and internal procedures

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A4** Demonstrating the principles of decision support tools and its implementation in developing the intelligent decision systems.
- A7** Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

## 2-b- Intellectual skills

- B2** Learning principles of modeling decision making problems as well as things to be avoided.
- B4** Implementing the system life cycle in handling different problems of organizations.
- B5** Analyzing the right modeling process to emulate the real life problems

## 2-c- Professional and practical skills

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C2** Examine examples and case studies that documenting computer support for organizational decision making.
- C7** Learn how the student manages himself during the decision making process

## 2-d- General and transferable skills

- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.

## 3- Content

| Topic   | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 Overview for the course</b>  | 10          | 6       | 4                  |
| <b>2 Strategic Planning Mission and Vision</b> <ul style="list-style-type: none"><li>• Planning and Managing Strategically</li><li>• Internship agency's mission and vision statements and strategic plan.</li></ul>  | 14          | 8       | 6                  |
| <b>3 Organizational Change</b> <ul style="list-style-type: none"><li>• Essential Elements for Managing Complex Change</li><li>• Force Field Analysis Example</li><li>• Change Technologies</li><li>• Organization Development</li><li>• Employee Attitude Surveys as an Action Research Tool</li><li>• Problem Solving Groups for Organizational Change</li><li>• Team Building</li></ul> | 16          | 10      | 6                  |
| <b>4 Strategy Formation</b> <ul style="list-style-type: none"><li>• Idea Generation</li><li>• Nurturing of Strategies</li><li>• Definition of Option.</li></ul>   | 16          | 10      | 6                  |
| <b>5 Strategy Implementation</b> <ul style="list-style-type: none"><li>• Analysis of Options</li><li>• Changes to the Organization</li><li>• Training and Resource Development</li><li>• Instrumentation, Implantation and</li></ul>  | 28          | 14      | 14                 |

|                  |           |           |           |
|------------------|-----------|-----------|-----------|
| Leadership       |           |           |           |
| <b>Total sum</b> | <b>84</b> | <b>48</b> | <b>36</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....
- 5.a.5 final term exam ... *to assess* gains of course topics....

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 60%  |
| <b>Oral examination.</b>         | 10%  |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

#### 6- List of references

##### 6-a- Course notes

None

##### 6-b- Essential books (text books)

None



### **6-c- Recommended books**

- [1] Allison, M. & Kaye, J.. Strategic Planning for Nonprofit Organizations, 2nd ed. New York: John Wiley & Sons. (2005)
- [2] Proehl, R.. Organizational Change in the Human Services. Thousand Oaks, CA: Sage Publications. (2001)
- [3] Carlson, M. & Donohoe, M.. The executive director's survival guide: Thriving as a nonprofit leader. San Francisco: Jossey-Bass. (2003)
- [4] Austin, M. and Hopkins, K., Eds.. Supervision as Collaboration in the Human Services. Thousand Oaks, CA: Sage Publications. (2004)
- Edwards, R., Yankey, J., & Altpeter, M. (Eds.),. Skills for Effective Management of Nonprofit Organizations. Washington, DC: NASW Press. (1998)

### **6-d- Periodicals, Web sites, ... etc**

Electronic Journal of Business Administration

## **7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- Software programs specified in crises simulation and analysis
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Waiel F. Abd-El Wahid**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date:    /    / 2006**



## ECONOMY AND FINANCE

|   |                                 |
|---|---------------------------------|
| Programme(s) on which the course is given | OR & Decision support           |
| Major or Minor element of programs        | Major                           |
| Department offering the program           | OR & Decision support           |
| Department offering the course            | OR & Decision support           |
| Academic year / Level                     | 3 <sup>rd</sup> year / Elective |
| Date of specification approval            | 9/5/2006                        |

### A- Basic Information

|              |                     |   |          |      |           |   |
|--------------|---------------------|---|----------|------|-----------|---|
| Title        | Economy and Finance |   |          | Code | OD373     |   |
| Credit Hours | Lecture             | 3 | Tutorial | 2    | Practical | 1 |
|              | Total               |   |          |      |           | 6 |

### B- Professional Information

#### 1 – Overall aims of course

- Understand of the foundations of International Finance by using a blend of theoretical concepts and empirical evidence.
- Be familiar with the evolution of, and the experience with, global exchange rate regimes.
- Be able to understand rigorous analysis of open economy models
- Be able to apply the analysis to address key policy issues.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A1 Knowing and understanding the essential principals of decision making problems
- A7 Knowing and understanding the important role of operations research topics and economic tools in solving real life problems

**2-b- Intellectual skills**

**B7** Learning how to design the Decision Support Systems that will support the decision makers.

**2-c- Professional and practical skills**

**C7** Learn how the student manages himself during the decision making process

**2-d- General and transferable skills**

**D8-** Learning the students how to optimize the cost of the decision making processes and how to finance the projects

**3- Content**

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1 Introduction to Economics</b>   | 10          | 6       | 4                  |
| <b>2 Pricing</b> <ul style="list-style-type: none"> <li>• Single-Period Consumption, Portfolio Choice, and Asset Pricing</li> <li>• Expected Utility and Risk Aversion</li> <li>• Mean-Variance Analysis</li> <li>• Capital Asset Pricing Model (CAPM), Arbitrage, and Linear Factor Models</li> <li>• Consumption-Savings and Asset Pricing</li> </ul>  | 14          | 8       | 6                  |
| <b>3 Economics Models</b> <ul style="list-style-type: none"> <li>• Multi-Period Consumption, Portfolio Choice, and Asset Pricing</li> <li>• Multi-Period Discrete-Time Models of Consumption and Portfolio Choice</li> <li>• Multi-Period Market Equilibrium</li> </ul>  | 26          | 16      | 10                 |
| <b>4 Economics Processes</b> <ul style="list-style-type: none"> <li>• Pricing of Contingent Claims</li> <li>• Basics of Derivative Pricing – Binomial Model</li> <li>• Essentials of Diffusion Processes and Itô's Lemma</li> <li>• Dynamic Hedging and Equilibrium Partial Differential Equations</li> <li>• Arbitrage, Martingales, and Pricing Kernels</li> <li>• Jump Processes</li> </ul> | 14          | 7       | 7                  |
| <b>5 Economic Model and Structure</b> <ul style="list-style-type: none"> <li>• Valuation Under Asymmetric Information</li> <li>• Equilibrium with Private Information</li> <li>• Asymmetric Information, Trading,</li> </ul>   | 14          | 7       | 7                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• and Markets</li> <li>• Bond Pricing</li> <li>• Models of the Term Structure of Interest Rates</li> <li>• Models of Credit Risk</li> </ul> |           |           |           |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....
- 5.a.4 final term exam ... *to assess* gains of course topics....

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 60%  |
| <b>Oral examination.</b>         | 10%  |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

#### 6- List of references

##### 6-a- Course notes

None

##### 6-b- Essential books (text books)

None

## Recommended books

- [1] De Grauwe, P, Economics of Monetary Union, 5th edition, OUP, 2003.;
- [2] Hallwood, P, and MacDonald, R, International Money and Finance, 3rd edition, Blackwell, 2000
- [3] Pilbeam, K, International Finance, MacMillan Press Inc, 1992.
- [4] Copeland, L S, Exchange Rates and International Finance, Addison-Wesley, 1994
- [5] Dufey, G and Giddy, I H, The international Money Market, Prentice Hall Int, 1994

### **6-c- Periodicals, Web sites, ... etc**

IEEE transactions on operation research

## **7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- Software programs specified in crises simulation and analysis
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Waiel F. Abd-El Wahid**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**



## PACKAGES OF OR

|   |                       |
|---|-----------------------|
| Programme(s) on which the course is given | OR & Decision Support |
| Major or Minor element of programs        | Major                 |
| Department offering the program           | OR & Decision Support |
| Department offering the course            | OR & Decision Support |
| Academic year / Level                     | 3 <sup>rd</sup> year  |
| Date of specification approval            | 9/5/2006              |

### A- Basic Information

|              |                |   |          |      |           |   |
|--------------|----------------|---|----------|------|-----------|---|
| Title        | Packages of OR |   |          | Code | OD413     |   |
| Credit Hours | Lecture        | 3 | Tutorial | 2    | Practical | 1 |
|              | Total          |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Demonstrate and understanding of the available OR packages and their use.
- Teaching the students how to handle OR packages to solve different decision making problems
- Identified the applicability of OR packages to solve such problem.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A2** Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A3** Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A7** Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

## 2-b- Intellectual skills

- B1 Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B6 Implementing the simulation and modeling software in solving real life decision making problems.
- B7 Learning how to design the Decision Support Systems that will support the decision makers.

## 2-c- Professional and practical skills

- C1 Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C3 Learn how to understand the features of the available decision making packages.
- C5 Be familiar with techniques that can be used in the field of decision making based computer technologies.

## 2-d- General and transferable skills

- D1 Developing computer programs based optimization to solve real life applications
- D3 Recognizing and understanding the available packages that are available in modeling and simulation Lab and training on working within the Platform of the available packages
- D5 Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6 Providing the students with knowledge about the classical and modern tools for modeling process.

## 3- Content

| Topic   | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 Introduction to MATLAB, LINGO and EXEL Solver</b>  | 10          | 6       | 4                  |
| <b>2 MATLAB optimization Tool box</b> <ul style="list-style-type: none"><li>• Solving constrained optimization problems</li><li>• Solving unconstrained problems</li><li>• Solving Quadratic Assignment Problem</li><li>• Solving Multi-objective optimization problems</li></ul> | 14          | 8       | 6                  |
| <b>3 LINGO software</b> <ul style="list-style-type: none"><li>• Solving linear programming problem</li><li>• Solving non-linear programming problems</li><li>• Case studies</li></ul>   | 26          | 16      | 10                 |

|   |           |           |           |
|---|-----------|-----------|-----------|
| <b>4 EXEL Solver</b>  |           |           |           |
| <ul style="list-style-type: none"> <li>• Implementing the solver to linear programming problems</li> <li>• Applying the solver to solve non-linear real life problems</li> <li>• Solving fuzzy optimization problems</li> </ul> | 28        | 14        | 14        |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Power point presentation
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 25%  |
| <b>Final-term examination</b>    | 50%  |
| <b>Oral examination.</b>         | -    |
| <b>Practical examination</b>     | 15%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

#### 6- List of references

- 6-d- Course notes



There are lectures notes prepared in the form of a book authorized by the department

**6-e- Essential books (text books)**

None

**6-f- Recommended books**

- 1- MATLAB Manual
- 2- LINGO Manual
- 3- EXEL Solver Manual

**6-g- Periodicals, Web sites, ... etc**

None

**7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- Software programs specified in crises simulation and analysis
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Waiel F. Abd EL-Wahed**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**



## PACKAGES FOR SIMULATION

|   |   |
|---|---|
| Programme(s) on which the course is given | OR & Decision Support                         |
| Major or Minor element of programs        | Major   |
| Department offering the program           | OR & Decision Support                         |
| Department offering the course            | OR & Decision Support                         |
| Academic year / Level                     | 4 <sup>th</sup> year/1 <sup>st</sup> Semester |
| Date of specification approval            | 9/5/2006                                      |

### A- Basic Information

| Title        | Packages for simulation |   |          | Code | OD424     |   |
|--------------|-------------------------|---|----------|------|-----------|---|
| Credit Hours | Lecture                 | 3 | Tutorial | -    | Practical | 3 |
|              | Total                   |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- explain simulation and the steps in a simulation study
- design models of systems studied
- implement models using the SIMAN language
- collect data collect for the system studied and perform input data analysis
- analyze simulation output data statistically and make valid conclusions about the system studied
- Document simulation studies in the form of a technical report.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A1** Knowing and understanding the essential principals of decision making problems.
- A3** Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A4** Demonstrating the principles of decision support tools and its implementation in developing the intelligent decision systems.

**A7** Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

**2-b- Intellectual skills**

- B1** Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B6** Implementing the simulation and modeling software in solving real life decision making problems.
- B7** Learning how to design the Decision Support Systems that will support the decision makers.

**2-c- Professional and practical skills**

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C3** Learn how to understand the features of the available decision making packages.
- C5** Be familiar with techniques that can be used in the field of decision making based computer technologies.

**2-d- General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D3** Recognizing and understanding the available packages that are available in modeling and simulation Lab and training on working within the Platform of the available packages
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.

**3- Content**

| <i>Topic</i>   | No of hours | Lecture | Tutorial/ Practical |
|--|-------------|---------|---------------------|
| <b>1- Introduction (Chapter 1, 2, and Class Notes)</b> <ul style="list-style-type: none"> <li>• Model and Types of Models.</li> <li>• Simulation and Types of Simulation.</li> <li>• Steps in a Simulation Study.</li> <li>• Simulation World Views.</li> <li>• Simulation Languages.</li> </ul> | 4           | 2       | 2                   |
| <b>2-Statistical Aspects of Simulation (Chapter 1 and Class Notes)</b> <ul style="list-style-type: none"> <li>• Monte Carlo Simulation</li> </ul>  | 8           | 4       | 4                   |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Random Number and Random</li> <li>• Variate Generation</li> <li>• Simulation Examples</li> </ul>  |           |           |           |
| <b>3- Input Data Analysis (Chapter 2 and Class Notes)</b> <ul style="list-style-type: none"> <li>• Distribution Identification</li> <li>• Parameter Estimation</li> <li>• Chi-Square Test</li> <li>• Kolmogorov-Smirnov Test</li> </ul>  | <b>8</b>  | <b>4</b>  | <b>4</b>  |
| <b>4- Simulation Modeling in SIMAN (Chapter 3, 4, and 8, SIMAN Notes)</b> <ul style="list-style-type: none"> <li>• Model and Experiment Frames</li> <li>• SIMAN Blocks</li> <li>• SIMAN Elements</li> <li>• Model Execution</li> <li>• Model Verification and Validation</li> <li>• Advanced SIMAN Concepts</li> </ul> | <b>8</b>  | <b>4</b>  | <b>4</b>  |
| <b>5- Output Analysis (Chapter 5, Class Notes)</b> <ul style="list-style-type: none"> <li>• SIMAN Output Processor</li> <li>• Measures of Performance</li> <li>• Statistical Analysis for Terminating Simulations</li> <li>• Statistical Analysis for Non-Terminating Simulations</li> </ul>                           | <b>8</b>  | <b>4</b>  | <b>4</b>  |
| <b>6- Ethical Issues in Modeling and Simulation (Supplementary Notes, web links)</b>   | <b>4</b>  | <b>2</b>  | <b>2</b>  |
| <b>7- Simulation languages</b> <ul style="list-style-type: none"> <li>• <a href="#">Simscrip II.5</a></li> </ul>   | <b>34</b> | <b>17</b> | <b>17</b> |
| <b>8- Simulation based on the World Dynamics approach</b> <ul style="list-style-type: none"> <li>• <a href="#">Powersim</a></li> </ul>   | <b>10</b> | <b>5</b>  | <b>5</b>  |
| <b>Total number of Hours for the course</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

4.1 Reports, assignments, exercises, and final written exam to assess knowledge

and understanding.

- 4.2 Regular oral , practical and written quizzes to assess intellectual skills.
- 4.3 Reports, assignments, and discussions to assess general and transferable skills
- 4.4 Reports, assignments, exercises, and final written exam to assess knowledge and understanding.

## 5- Student assessment methods

### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....

### 5-b- Assessment schedule

|              |  |
|--------------|--|
| Assessment 1 | 5th week.  |
| Assessment 2 | 8th week.  |
| Assessment 3 | 10th week.   |
| Assessment 4 | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

### 5-c- Weighting of assessments

|                           |      |
|---------------------------|------|
| Final-term examination    | 70%  |
| Mid-term examination      | 20%  |
| Semester practical work   | 10%  |
| Other types of assessment | -    |
| Total                     | 100% |

## 6- List of references

### 6-h- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### 6-i-Essential books (text books)

None

### 6-j-Recommended books

[1] Kelton, Sadowski, and Sadowski "*Simulation wiht Arena (second edition)*" McGraw Hill, 2002.

[2] Michael Tiller "*Introduction to Physical Modeling with Modelica*" Kluwer Academic Publishers, 2001.

## 9. Periodicals, Web sites, ... etc

None

## **7- Facilities required for teaching and learning**

Computer Lab  
Datashow, screen, and laptop computer.  
White board and colored pens

**Course coordinator:**

**Prof. Waiel F. Abd El Wahed**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**



## DECISION THEORY

|  |  |
|--|--|
| <b>Programme(s) on which the course is given</b> | OR & Decision support                          |
| <b>Major or Minor element of programs</b>        | Major  |
| <b>Department offering the program</b>           | OR & Decision support                          |
| <b>Department offering the course</b>            | OR & Decision support                          |
| <b>Academic year / Level</b>                     | 4 <sup>th</sup> year/ 1 <sup>st</sup> Semester |
| <b>Date of specification approval</b>            | 9/5/2006                                       |

### A- Basic Information

|                     |                        |          |                 |             |                  |          |
|---------------------|------------------------|----------|-----------------|-------------|------------------|----------|
| <b>Title</b>        | <b>Decision Theory</b> |          |                 | <b>Code</b> | <b>OD462</b>     |          |
| <b>Credit Hours</b> | <b>Lecture</b>         | <b>3</b> | <b>Tutorial</b> | <b>2</b>    | <b>Practical</b> | <b>1</b> |
|                     | <b>Total</b>           |          |                 |             |                  | <b>6</b> |

### B- Professional Information

#### 1 – Overall aims of course

- Provide the students with a broad and comprehensive perspective on different theoretical approaches to the study of individual, group, and organizational decision making.
- Discuss various kinds of Decision making techniques
- Discuss conceptual and methodological problems related to research in decision making, as well as to the development of theories in the area of decision making
- Demonstrate issues related specifically to leadership and decision making will also be included.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A1** Knowing and understanding the essential principals of decision making problems.
- A2** Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A4** Demonstrating the principles of decision support tools and its

implementation in developing the intelligent decision systems.

**2-b- Intellectual skills**

- B1** Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B2** Learning principles of modeling decision making problems as well as things to be avoided.
- B5** Analyzing the right modeling process to emulate the real life problems

**2-c- Professional and practical skills**

- C2** Examine examples and case studies that documenting computer support for organizational decision making.
- C3** Learn how to understand the features of the available decision making packages.
- C4** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C6** Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.
- C7** Learn how the student manages himself during the decision making process

**2-d- General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.
- D7** Write up in an accurate, coherent and logical manner solutions to a range of mathematical programming problems.

**3- Content**

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1- Overview of normative and descriptive decision</b>   | 10          | 6       | 4                  |
| <b>2- Different phases of decision making</b> <ul style="list-style-type: none"> <li>• Preference formation</li> <li>• Information processing</li> <li>• The role of beliefs in decision making and choice</li> <li>• Implementation of decisions</li> <li>• Issues involved in learning from decisions</li> </ul> | 14          | 8       | 6                  |



|   |           |           |           |
|---|-----------|-----------|-----------|
| <b>3 managerial decision making and risk</b> <ul style="list-style-type: none"> <li>• The concept of rationality</li> <li>• cognitive decision theory at the individual level</li> <li>• heuristics and biases, risk, models of choice, and learning</li> <li>• Methods of improving decision making</li> </ul>                                     | 26        | 16        | 10        |
| <b>4- What kinds of decisions need a theory?</b> <ul style="list-style-type: none"> <li>• Choice between incommensurable commodities</li> <li>• Choice under uncertainty</li> <li>• Pascal's Wager of choice under uncertainty</li> <li>• Alternatives to probability theory</li> <li>• Intertemporal choice</li> <li>• Social decisions</li> </ul> | 28        | 14        | 14        |
| <b>Total sum</b>  | <b>84</b> | <b>44</b> | <b>40</b> |

### – Teaching and learning methods

- 4.1 Information collection and participate actively
- 4.2 Give presentations
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Deliver a term paper
- 4.6 Case study

### 5- Student assessment methods

#### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....

#### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

#### 5-c- Weighting of assessments

|                               |     |
|-------------------------------|-----|
| <b>Mid-term examination</b>   | 20% |
| <b>Final-term examination</b> | 70% |
| <b>Oral examination.</b>      |     |
| <b>Practical examination</b>  |     |

|                                  |      |
|----------------------------------|------|
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### 6-b- Essential books (text books)

None

### 6-c- Recommended books

### 6-d- Periodicals, Web sites, ... etc

- Paul Goodwin and George Wright, *Decision Analysis for Management Judgment*, 3rd edition. Chichester: Wiley, 2004 ISBN 0-470-86108-8 (covers both normative and descriptive theory)
- Robert Clemen. *Making Hard Decisions: An Introduction to Decision Analysis*, 2nd edition. Belmont CA: Duxbury Press, 1996. (covers normative decision theory)
- Howard Raiffa *Decision Analysis: Introductory Readings on Choices Under Uncertainty*. McGraw Hill. 1997. ISBN 0-07-052579-X

## 7- Facilities required for teaching and learning

- Modeling and simulation laboratories.
- Software programs specified in crises simulation and analysis
- Datashow, screen, and laptop computer.

### Course coordinator:

**Prof. Dr. Waiel F. Abd El-Wahed**

### Head of Department:

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**



## NONLINEAR PROGRAMMING

|   |                       |
|---|-----------------------|
| Programme(s) on which the course is given | OR & Decision Support |
| Major or Minor element of programs        | Major                 |
| Department offering the program           | OR & Decision Support |
| Department offering the course            | OR & Decision Support |
| Academic year / Level                     | 4 <sup>th</sup> year  |
| Date of specification approval            | 9/5/2006              |

### A- Basic Information

|              |                       |   |          |      |             |
|--------------|-----------------------|---|----------|------|-------------|
| Title        | Nonlinear programming |   |          | Code | OD425       |
| Credit Hours | Lecture               | 3 | Tutorial | 3    | Practical - |
|              | Total                 |   |          |      | 6           |

### B- Professional Information

#### 1 – Overall aims of course

- Obtain a firm background in the theory of nonlinear programming both constrained and unconstrained.
- Implement knowledge of the theory by solving many different instances with algorithms of a variety of classes.
- Gain Experience in presenting difficult technical material to others
- Cultivate the ability to assess the accuracy of your own work and the work of others

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A2 Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A3 Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A7 Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

## 2-b- Intellectual skills

- B1 Improving skills as a modeler by formulating problems by implementing several modeling languages
- B2 Learning principles of modeling decision making problems as well as things to be avoided.
- B5 Analyzing the right modeling process to emulate the real life problems

## 2-c- Professional and practical skills

- C2 Examine examples and case studies that documenting computer support for organizational decision making.
- C3 Learn how to understand the features of the available decision making packages.
- C4 Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C7 Learn how the student manages himself during the decision making process

## 2-d- General and transferable skills

- D1 Developing computer programs based optimization to solve real life applications
- D5 Developing skills in the analysis, design and implementation of computerized Decision Support Systems
- D6 Providing the students with knowledge about the classical and modern tools for modeling process
- D7 Write up in an accurate, coherent and logical manner solutions to a range of mathematical programming problems

## 3- Content

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1 Introduction to NLP</b> <ul style="list-style-type: none"><li>• Problem Statement and Basic Definitions</li><li>• Convexity and concavity.</li><li>• Basic NLP theory.</li><li>• Convergence and convergence rate.</li></ul>  | 6           | 3       | 3                  |
| <b>2 Unconstrained Optimization.</b> <ul style="list-style-type: none"><li>• Newton's method.</li><li>• Line search techniques.</li><li>• Line Search Without Using Derivatives</li><li>• Line Search Using Derivatives</li><li>• Some Practical Line Search Methods</li><li>• Trust region methods to ensure convergence.</li><li>• Steepest descent.</li></ul> | 12          | 6       | 6                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Quasi-Newton and conjugate gradient methods</li> </ul>  |           |           |           |
| <b>3 Use of C GRG solver,</b> <ul style="list-style-type: none"> <li>• Finite difference derivatives.</li> <li>• Automatic differentiation.</li> </ul>   | 6         | 3         | 3         |
| <b>4 Computerization</b> <ul style="list-style-type: none"> <li>• Use of Excel Solver.</li> <li>• Use Matlab software</li> </ul>   | 6         | 3         | 3         |
| <b>5 Constrained problems</b> <ul style="list-style-type: none"> <li>• Necessary and sufficient conditions</li> <li>• The Lagrangian Dual Problem.</li> <li>• Saddle points conditions.</li> <li>• Duality.</li> <li>• Formulating and Solving the Dual Problem</li> <li>• Getting the Primal Solution</li> <li>• Lagrangian relaxation</li> </ul> | 12        | 6         | 6         |
| <b>6 NLP applications.</b>   | 6         | 3         | 3         |
| <b>7. Reduced gradient methods</b>   | 6         | 3         | 3         |
| <b>8 Penalty and Barrier methods</b> <ul style="list-style-type: none"> <li>• Concept of Penalty Functions</li> <li>• Exterior Penalty Function Methods</li> <li>• Exact Absolute Value and Augmented Lagrangian Penalty Methods</li> <li>• Barrier Function Methods.</li> </ul>   | 12        | 6         | 6         |
| <b>9 Successive quadratic programming (SQP)</b>  | 6         | 3         | 3         |
| <b>10 Successive linear programming (SLP), algorithm.</b>  | 6         | 3         | 3         |
| <b>13 Interior point methods</b>   | 6         | 3         | 3         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study
- 4.7 Exercise and tutorial.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...

- 5.a.3 Reports ..... to assess Problem Solving  
 5.a.4 Mid term exam ... to assess gains of completed topics....

**5-b- Assessment schedule**

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

**5-c- Weighting of assessments**

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 70%  |
| <b>Oral examination.</b>         | -    |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

**6- List of references**

**6-a- Course notes**

There are lectures notes prepared in the form of a book authorized by the department

**6-b- Essential books (text books)**

None

**6-c- Recommended books**

- [1] LINEAR and NONLINEAR PROGRAMMING by S. Nash and A. Sofer, McGraw-Hill, 1996.
- [2] Nonlinear Programming Theory & Algorithms by Mokhtar S. Bazaraa, Hanif D. Sherali, C.M. Shetty, Wiley & Sons.
- [3] A book prepared and edited by the lecturer, and approved by the department council

**6-d- Periodicals, Web sites, ... etc**

None

## **7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- Software programs specified in nonlinear optimization
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Waiel F. Abd El-Wahed**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date:    /    / 2006**



## CRISIS MANAGING

|   |  |
|---|--|
| Programme(s) on which the course is given | OR & Decision Support                          |
| Major or Minor element of programs        | Major  |
| Department offering the program           | OR & Decision Support                          |
| Department offering the course            | OR & Decision Support                          |
| Academic year / Level                     | 4 <sup>th</sup> year /2 <sup>nd</sup> Semester |
| Date of specification approval            | 9/5/2006                                       |

### A- Basic Information

|                     |                        |          |                 |             |                  |          |
|---------------------|------------------------|----------|-----------------|-------------|------------------|----------|
| <b>Title</b>        | <b>Crisis Managing</b> |          |                 | <b>Code</b> | <b>OD474</b>     |          |
| <b>Credit Hours</b> | <b>Lecture</b>         | <b>3</b> | <b>Tutorial</b> | <b>2</b>    | <b>Practical</b> | <b>1</b> |
|                     | <b>Total</b>           |          |                 |             |                  | <b>6</b> |

### B- Professional Information

#### 1 – Overall aims of course

- Demonstrate an understanding of the approaches to managing a crisis situation.
- Discuss various kinds of intervention techniques
- Identified the obstacles that complicate the task of managing a crisis
- Demonstrate an understanding of the players involved in a crisis.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A7** Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

##### 2-b- Intellectual skills

- B4** Implementing the system life cycle in handling different problems of organizations.
- B5** Analyzing the right modeling process to emulate the real life problems
- B7** Learning how to design the Decision Support Systems that will support the decision makers.



**2-c- Professional and practical skills**

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C2** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C4** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C6** Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.

**2-d- General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D4** Learning how to deal with the uncertain decision making problems.
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.

**3- Content**

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1- Introduction</b>   | 10          | 6       | 4                  |
| <b>2 Recognizing a crisis situation</b> <ul style="list-style-type: none"> <li>• The Strategy of Crisis Management: A Team Approach</li> <li>• Senior Administration</li> <li>• Technical Operations</li> <li>• Public Affairs</li> <li>• Public Relations</li> <li>• Consumer Affairs</li> </ul>  | 14          | 8       | 6                  |
| <b>3 Case studies</b> <ul style="list-style-type: none"> <li>• Case Study: Three Mile Island: The Impossible Accident Becomes Possible</li> <li>• Case Study: A White House in Disarray</li> <li>• Case Study: Exxon: No One Is in Control</li> </ul>  | 26          | 16      | 10                 |
| <b>4 Anticipating crisis is a tool of smart management</b> <ul style="list-style-type: none"> <li>• Assessing Risk</li> <li>• Who's Ready for Crisis</li> <li>• Assessing Crisis Preparedness</li> <li>• Private Companies: Different Risks</li> <li>• Warning Signals</li> <li>• Who Owns the Radar</li> <li>• Communications Channels</li> <li>• Risk Associated with the Product</li> </ul> | 14          | 7       | 7                  |
| <b>5 Crises and community</b> <ul style="list-style-type: none"> <li>• Historical perspectives of crisis communications literature</li> <li>• Life cycle of various crisis efforts</li> </ul>  | 14          | 7       | 7                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Role of relationships in crisis management</li> <li>• Comparison between various attitudes toward issues/risk</li> <li>• To assess how different organizations view the competitive</li> <li>• Factor in the multicultural dimension</li> <li>• Role of technology in crisis</li> </ul> |           |           |           |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab
- 4.6 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....
- 5.a.5 final term exam ... *to assess* gains of course topics....

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 60%  |
| <b>Oral examination.</b>         | 10%  |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

#### 6- List of references

##### 6-a- Course notes

None

**6-b- Essential books (text books)**

None

**6-c- Recommended books**

[1] Ian I. Mitroff, Gus Anagnos, Managing Crises Before They Happen: What Every Executive Needs to Know About Crisis Management, January (2000).American Management Association;

[2] Steven Fink, Crisis Management: Planning for the Inevitable (April 2000),Backinprint.com

[3] Douglas Henderson] Crisis Management and Emergency Management , Rothstein Associates Inc., 2004.

[4] A book prepared and edited by the lecturer, and approved by the department council

**6-d- Periodicals, Web sites, ... etc**

Journal Of Contingencies And Crisis Management

**7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- Software programs specified in crises simulation and analysis
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Waiel F. Abd-El Wahid**

**Head of Department:**

**Prof. Waiel F. Abd-El Wahid**

**Date: / / 2006**



## DECISION SUPPORT SYSTEMS

|   |  |
|---|--|
| Programme(s) on which the course is given | OR & Decision Support                          |
| Major or Minor element of programs        | Major  |
| Department offering the program           | OR & Decision Support                          |
| Department offering the course            | OR & Decision Support                          |
| Academic year / Level                     | 4 <sup>th</sup> year /2 <sup>nd</sup> Semester |
| Date of specification approval            | 9/5/2006                                       |

### A- Basic Information

|              |                          |   |          |      |             |
|--------------|--------------------------|---|----------|------|-------------|
| Title        | Decision Support Systems |   |          | Code | OD463       |
| Credit Hours | Lecture                  | 3 | Tutorial | 3    | Practical - |
|              | Total                    |   |          |      | 6           |

### B- Professional Information

#### 1 – Overall aims of course

- Understand decision support framework.
- Understand decision processes.
- Understand designing and developing decision support.
- Understand DSS architecture, networking, and security issues.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A3 Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A4 Demonstrating the principles of decision support tools and its implementation in developing the intelligent decision systems.

##### 2-b- Intellectual skills

- B1 Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B6 Implementing the simulation and modeling software in solving real life decision making problems.
- B7 Learning how to design the Decision Support Systems that will

support the decision makers.

**2-c- Professional and practical skills**

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C2** Examine examples and case studies that documenting computer support for organizational decision making.
- C3** Learn how to understand the features of the available decision making packages.
- C4** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.

**2-d- General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.

**3- Content**

| Topic   | No of hours | Lecture | Tutorial/Practical |
|---|-------------|---------|--------------------|
| <b>1 Introduction</b>   | 4           | 2       | 2                  |
| <b>2 Supporting Business Decision Making</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• A Brief History of Decision Support Systems.</li> <li>• A Conceptual Perspective.</li> <li>• Decision Support vs. Transaction Processing Systems.</li> <li>• An Expanded Decision Support System Framework.</li> <li>• Building Decision Support Systems.</li> </ul>               | 8           | 4       | 4                  |
| <b>3 Gaining Competitive Advantage with Decision Support Systems</b> <ul style="list-style-type: none"> <li>• Technology Trends.</li> <li>• Gaining Competitive Advantage.</li> <li>• How Can DSS Provide a Competitive Advantage?</li> <li>• Some Example of Strategic DSS.</li> <li>• DSS Benefits, Limitations, and Risks.</li> <li>• Resistance to Using Decision Support Systems.</li> </ul> | 8           | 4       | 4                  |
| <b>4 Analyzing Business Decision Processes</b> <ul style="list-style-type: none"> <li>• Managerial Decisions.</li> <li>• Decision-Making Context.</li> </ul>  | 8           | 4       | 4                  |

|   |    |   |   |
|---|----|---|---|
| <ul style="list-style-type: none"> <li>• Decision-Making Processes.</li> <li>• "Good" Decision Making.</li> <li>• Redesigning Decision Processes.</li> </ul>  |    |   |   |
| <p><b>5 Designing and Developing Decision Support</b></p> <ul style="list-style-type: none"> <li>• Overview of Design and Development Issues.</li> <li>• Decision-Oriented Diagnosis.</li> <li>• Prepare a feasibility Study.</li> <li>• Choose a Development Approach.</li> <li>• DSS Project Management.</li> <li>• DSS Project Participants.</li> </ul>  | 8  | 4 | 4 |
| <p><b>6 Understanding DSS Architecture, Networking, And Security Issues</b></p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• DSS Architecture and IS/IT Infrastructure.</li> <li>• Networking Issues.</li> <li>• Improving Security for Decision Support Systems.</li> </ul>  | 8  | 4 | 4 |
| <p><b>7 Implementing Communications-Driven and Group Decision Support Systems</b></p> <ul style="list-style-type: none"> <li>• Key Terms.</li> <li>• Group Decision Support Situations.</li> <li>• Communication and Group Support tools.</li> <li>• A Managerial Perspective on Communications-Driven DSS.</li> <li>• A Contingency Theory.</li> <li>• Group Decision Support Systems Benefits.</li> <li>• Virtual Organizations.</li> <li>• Evaluating Communications and Group Support Tools.</li> </ul> | 10 | 5 | 5 |
| <p><b>8 Building Data And Document-Driven Decision</b></p> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Comparing Data and Document-Driven DSS.</li> <li>• Data-Driven DSS Subcategories.</li> <li>• Comparing DSS Data and Operating Data.</li> <li>• An Interconnected Data-Driven DSS Architecture.</li> <li>• Implementing a Data-Driven DSS.</li> </ul>   | 10 | 5 | 5 |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Finding Success.</li> </ul>   |           |           |           |
| <b>9 Building Knowledge-Driven DSS and Mining Data</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Key Terms and Concepts.</li> <li>• Characteristics of Knowledge-Driven DSS Projects.</li> <li>• Knowledge-Driven DSS Examples.</li> <li>• Data Mining and Creating Knowledge.</li> <li>• Data Mining Examples.</li> <li>• Evaluating Development Packages.</li> </ul>  | 10        | 5         | 5         |
| <b>10 Building Model-Driven Decision Support Systems</b> <ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Modeling Decision Situations.</li> <li>• Accounting and Financial Models.</li> <li>• Decision Analysis Models.</li> <li>• Forecasting Models.</li> <li>• Network and Optimization Models.</li> <li>• Simulation Models.</li> <li>• Modeling Languages and Spreadsheets.</li> <li>• Model-Driven DSS Airline Industry Examples.</li> </ul> | 10        | 5         | 5         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....

##### 5-b- Assessment schedule

|                     |           |
|---------------------|-----------|
| <b>Assessment 1</b> | 5th week. |
| <b>Assessment 2</b> | 8th week. |

|                     |  |
|---------------------|--|
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 20%  |
| <b>Final-term examination</b>    | 70%  |
| <b>Oral examination.</b>         | -    |
| <b>Practical examination</b>     | -    |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

### 6-b- Essential books (text books)

None

### 6-c- Recommended books

[1] W.J Fabrycky, *Economic Decision Analysis*, 1998.

[2] Power, D. J. *Decision Support Systems: Concepts and Resources for Managers*.

[3] Parsons, J., D. Oja, R. Ageloff and P. Carey, *New Perspectives on Microsoft Excel 2000 - Comprehensive Enhanced*.

[4] A book prepared and edited by the lecturer, and approved by the department council.

### 6-d- Periodicals, Web sites, ... etc

IEEE transactions on operation research

## 7- Facilities required for teaching and learning

- Software programs specified in DSS such as Microsoft Excel 2000.
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Waiel F. Abd-El Wahid**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / /**





## AI APPLICATIONS

|   |                                    |
|---|------------------------------------|
| Programme(s) on which the course is given | OR& Decision Support               |
| Major or Minor element of programs        |                                    |
| Department offering the program           | OR& Decision Support               |
| Department offering the course            | OR& Decision Support               |
| Academic year / Level                     | 4 <sup>th</sup> year, 2nd Semester |
| Date of specification approval            | 9/5/2006                           |

### A- Basic Information

|              |                 |   |          |      |           |   |
|--------------|-----------------|---|----------|------|-----------|---|
| Title        | AI Applications |   |          | Code | OD475     |   |
| Credit Hours | Lecture         | 3 | Tutorial | 3    | Practical |   |
|              | Total           |   |          |      |           | 6 |

### B- Professional Information

#### 1 – Overall aims of course

- gain an understanding of the field of Artificial Intelligence (AI) by surveying the fundamental concepts and techniques underlying the various types of AI applications
- explore approaches for solving problems typically thought to require human intelligence
- implement a variety of AI techniques using the LISP programming language
- explore the relationships between AI and other disciplines including Philosophy, Mathematics, Biology, and Psychology

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A4 Demonstrating the principles of decision support tools and its implementation in developing the intelligent decision systems.
- A5 Knowing and understanding the mathematical background of operations research and its related topics.

##### 2-b- Intellectual skills

- B5 Analyzing the right modeling process to emulate the real life

- problems
- B6** Implementing the simulation and modeling software in solving real life decision making problems.
  - B7** Learning how to design the Decision Support Systems that will support the decision makers.

**2-c- Professional and practical skills**

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C4** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C5** Be familiar with techniques that can be used in the field of decision making based computer technologies.

**2-d- General and transferable skills**

- D3-** Recognizing and understanding the available packages that are available in modeling and simulation Lab and training on working within the Platform of the available packages
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.

**3- Content**

| Topic   | No of hours | Lecture | Tutorial / Practical |
|---|-------------|---------|----------------------|
| <b>1 Introduction to AI</b> <ul style="list-style-type: none"> <li>• Acting humanly</li> <li>• Thinking and acting rationally</li> <li>• Historical perspective</li> </ul>        | 12          | 6       | 6                    |
| <b>3 Intelligent Agents</b> <ul style="list-style-type: none"> <li>• Agents</li> <li>• Agent programs</li> <li>• Environments</li> </ul>  | 12          | 6       | 6                    |
| <b>Solving Problems by Searching</b> <ul style="list-style-type: none"> <li>• Problem formulation</li> <li>• Search Strategies</li> </ul>   | 12          | 6       | 6                    |
| <b>5 Informed Search Methods</b> <ul style="list-style-type: none"> <li>• Best-first search</li> <li>• Heuristic functions</li> <li>• Iterative improvement algorithms</li> </ul> | 12          | 6       | 6                    |

|   |           |           |           |
|---|-----------|-----------|-----------|
| <b>6 Game Playing</b><br><ul style="list-style-type: none"> <li>• Games as search problems</li> <li>• Decisions in 2-person games</li> <li>• Alpha-beta pruning</li> </ul>  | 12        | 6         | 6         |
| <b>7 Agents that Reason Logically</b><br><ul style="list-style-type: none"> <li>• Knowledge-based agents</li> <li>• Knowledge representation</li> <li>• Propositional logic</li> <li>• First-order logic</li> </ul> | 12        | 6         | 6         |
| <b>8 Inference in First-Order Logic</b>   | 12        | 6         | 6         |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4- Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, and final written exam to assess knowledge and understanding
- 5.a.2 Regular oral and written quizzes to assess intellectual skills.
- 5.a.3 Reports, assignments, and discussions to assess general and transferable skills.

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 8 <sup>th</sup> week.  |
| <b>Assessment 2</b> | 12 <sup>th</sup> week.   |
| <b>Assessment 3</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks (final written exam). |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 20%  |
| <b>Final-term examination</b>    | 60%  |
| <b>Oral examination.</b>         | 10%  |
| <b>Practical examination</b>     | -    |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

#### 6- List of references

##### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

**6-b- Essential books (text books)**

- [1] Knapik Michael , Development Intelligent Agent for Distributed Systems, 1998 Han,Simon , Neural Networks, 1999

**6-c- Recommended books**

- [2] R. Tocci, Digital Systems Principles and Applications, six edition, 1991, Prentice-Hall, Inc.
- [3] B. Holdsworth, Digital Logic Design, Third edition, 1993, Butterworth-Heinemann Ltd.
- [4] R. Tocci, Digital Circuits, Prentice-Hall Inc., 2001.
- [5] A book prepared and edited by the lecturer, and approved by the department council

**6-d- Periodicals, Web sites, ... etc**

IEEE transactions on operation research

**7- Facilities required for teaching and learning**

Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Waiel F. Abd El-Wahed**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**



## EXPERT SYSTEMS APPLICATIONS

|   |                                 |
|---|---------------------------------|
| Programme(s) on which the course is given | OR & Decision support           |
| Major or Minor element of programs        | None                            |
| Department offering the program           | OR & Decision support           |
| Department offering the course            | OR & Decision support           |
| Academic year / Level                     | 4 <sup>th</sup> year / Elective |
| Date of specification approval            | 9/5/2006                        |

### A- Basic Information

|              |                             |   |          |      |           |   |
|--------------|-----------------------------|---|----------|------|-----------|---|
| Title        | Expert Systems Applications |   |          | Code | OD476     |   |
| Credit Hours | Lecture                     | 3 | Tutorial | 2    | Practical | 1 |
|              | Total                       |   |          |      |           | 6 |

### B- Professional Information

#### 1 – Overall aims of course

- Ability to use basic expert system shell.
- Understand expert systems as a sub-set of Artificial Intelligence.
- Ability to choose proper software environment for ES.
- Ability to work with and motivate a domain expert..

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A3 Understanding the mutual effects of the computer science role in supporting the decision making processes.
- A4 Demonstrating the principles of decision support tools and its implementation in developing the intelligent decision systems
- A7 Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

##### 2-b- Intellectual skills

- B5 Analyzing the right modeling process to emulate the real life problems
- B6 Implementing the simulation and modeling software in solving real

- life decision making problems.
- B7** Learning how to design the Decision Support Systems that will support the decision makers.

**2-c- Professional and practical skills**

- C1** Learn how to evaluate the validity of using simulation tools for simulating ill-structured problems
- C4** Showing logical thinking in problem solving strategies and classifying the problems from its structure point of view.
- C5** Be familiar with techniques that can be used in the field of decision making based computer technologies.

**2-d- General and transferable skills**

- D3** Recognizing and understanding the available packages that are available in modeling and simulation Lab and training on working within the Platform of the available packages
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.

**3- Content**

| Topic  | No of hours | Lecture | Tutorial/Practical |
|--|-------------|---------|--------------------|
| <b>1 Introduction to expert system</b>   | 10          | 6       | 4                  |
| <b>2 Expert System application</b> <ul style="list-style-type: none"> <li>• Finance</li> <li>• Information Systems</li> <li>• Marketing/Transactions</li> <li>• International Business</li> <li>• Human Resources</li> </ul>   | 14          | 8       | 6                  |
| <b>3 Components of Expert system</b> <ul style="list-style-type: none"> <li>• Structure</li> <li>• Knowledge base</li> <li>• Inference engine</li> <li>• Certainty factors</li> <li>• Dempster-Shafer theory</li> <li>• Bayesian network</li> <li>• Fuzzy logic</li> </ul> | 13          | 8       | 5                  |
| <b>4 Eexpert system and DSS</b> <ul style="list-style-type: none"> <li>• Planning and Scheduling</li> <li>• Configuration of Manufactured Objects from Subassemblies</li> <li>• Financial Decision Making</li> <li>• Knowledge Publishing</li> </ul>                       | 13          | 8       | 5                  |

|   |           |           |           |
|---|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>• Process Monitoring and Control</li> <li>• Design and Manufacturing</li> </ul>  |           |           |           |
| <b>5 Building an Expert System</b> <ul style="list-style-type: none"> <li>• Analysis</li> <li>• Specification</li> <li>• Development</li> <li>• Deployment</li> </ul> | 28        | 14        | 14        |
| <b>Total sum</b>  | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.5 Practical training / lab

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Final-term exam *to assess* gains of completed topics....
- 5.a.5 Mid term exam ... *to assess* gains of course topics....

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 60%  |
| <b>Oral examination.</b>         | 10%  |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

#### 6- List of references

##### 6-a- Course notes

None

##### 6-b- Essential books (text books)

None

### **6-c- Recommended books**

- [1] James P. Ignizio, Introduction to Expert Systems: The Development and Implementation of Rule-Based Expert Systems, , McGraw-Hill, Inc., 1991.
- [2] Joseph Giarratano and Gary Riley, Expert Systems: Principles and Programming, PWS-Kent Publishing Co, 1989.
- [3] Douglas Henderson, Crisis Management and Emergency Management , Rothstein Associates Inc., 2004.
- [4] A book prepared and edited by the lecturer, and approved by the department council

### **6-d- Periodicals, Web sites, ... etc**

*PC-AI* is a magazine that discusses intelligent applications and solutions. Their website has a comprehensive page on expert systems, to include various vendors

## **7- Facilities required for teaching and learning**

- Modeling and simulation laboratories.
- Software programs and shells specified in artificial intelligence and expert system
- Prolog and Lisp compilers and editors
- Datashow, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Waiel F. Abd El-Wahed**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**





## TOTAL QUALITY MANAGEMENT

|   |                                 |
|---|---------------------------------|
| Programme(s) on which the course is given | OR & Decision Support           |
| Major or Minor element of programs        | Major                           |
| Department offering the program           | OR & Decision Support           |
| Department offering the course            | OR & Decision Support           |
| Academic year / Level                     | 4 <sup>th</sup> year / Elective |
| Date of specification approval            | 9/5/2006                        |

### A- Basic Information

|              |                          |   |          |      |           |   |
|--------------|--------------------------|---|----------|------|-----------|---|
| Title        | Total Quality Management |   |          | Code | OD452     |   |
| Credit Hours | Lecture                  | 3 | Tutorial | 3    | Practical | - |
|              | Total                    |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Understand the management of technical endeavors in such a way that there is continuous improvement at all levels of the enterprise.
- Learn about the history and theories of quality improvement labeled as “Total Quality Management”(TQM) and about new applications of these theories with a focus on creating greater value in an organization.
- Describe various quality models and understand how to deploy them appropriately as managers of the future.

- describe:
  - (a) The history and development of TQM.
  - (b) Models for assuring quality with consideration for :
    - Strategic planning,
    - Customer perspectives,
    - Continuous improvement,
    - Quality in the service industry,
    - Quality from Suppliers.
  - (c) The implementation of the TQM model.

## 2 – Intended learning outcomes of course (ILOs)

### 2-a- Knowledge and understanding:

- A2** Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems
- A7** Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

### 2-b- Intellectual skills

- B3** Training on measuring efficiencies of the system units w. r. t. the whole system.
- B5** Analyzing the right modeling process to emulate the real life problems
- B6** Implementing the simulation and modeling software in solving real life decision making problems.

### 2-c- Professional and practical skills

- C3** Learn how to understand the features of the available decision making packages.
- C6** Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.
- C7** Learn how the student manages himself during the decision making process

### 2-d- General and transferable skills

- D2** Enabling the students to gain knowledge about the tools for measuring systems' efficiency.
- D4** Learning how to deal with the uncertain decision making problems.
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.
- D7** Write up in an accurate, coherent and logical manner solutions to a

range of mathematical programming problems.

### 3- Content

| Topic   | No of hours | Lecture | Tutorial/ Practical |
|---|-------------|---------|---------------------|
| <b>1. The New Management model</b> <ul style="list-style-type: none"> <li>The New Management model is customer driven.</li> <li>Focusing on system thinking.</li> <li>Using the Baldrige Criteria to assess quality.</li> <li>Quality improvement increases Profitability.</li> </ul>         | 10          | 5       | 5                   |
| <b>2. Leadership</b> <ul style="list-style-type: none"> <li>Model of Excellence.</li> <li>Leading the transition.</li> <li>Expressing your company's values.</li> <li>Communicating Values throughout the Company.</li> <li>Improving as a leader.</li> <li>The shift in thinking.</li> </ul> | 14          | 7       | 7                   |
| <b>3. Customer Focus</b> <ul style="list-style-type: none"> <li>Models of Excellence.</li> <li>Identifying your customers.</li> <li>Determining customer requirements.</li> <li>Using customer satisfaction to Drive you business</li> <li>The Shift in thinking.</li> </ul>                  | 22          | 12      | 10                  |
| <b>4. Strategic planning</b> <ul style="list-style-type: none"> <li>Models of Excellence.</li> <li>Management by planning.</li> <li>Business planning process.</li> <li>Dana commercial credits: strategic planning.</li> </ul>   | 24          | 12      | 12                  |
| <b><u>5.</u> management</b> <ul style="list-style-type: none"> <li>Models of Excellence.</li> <li>Making the system Hum.</li> <li>Communicating Requirements throughout the company.</li> <li>Reviewing an Boosting performance.</li> </ul>   | 14          | 6       | 8                   |

|                          |           |           |           |
|--------------------------|-----------|-----------|-----------|
| • The shift in thinking. |           |           |           |
| <b>Total sum</b>         | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Information collection
- 4.2 Research assignment
- 4.3 Lecture
- 4.4 Class activities
- 4.6 Case study

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Class test (1) ..... *to assess* ...Understanding...
- 5.a.2 Class test (2) ..... *to assess* ...Understanding...
- 5.a.3 Reports ..... *to assess* Problem Solving
- 5.a.4 Mid term exam ... *to assess* gains of completed topics....

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 10th week.   |
| <b>Assessment 2</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 20%  |
| <b>Final-term examination</b>    | 70%  |
| <b>Oral examination.</b>         | -    |
| <b>Practical examination</b>     | -    |
| <b>Semester work</b>             | 10%  |
| <b>Other types of assessment</b> | -    |
| <b>Total</b>                     | 100% |

#### 6- List of references

##### 6-a- Course notes

There are lectures notes prepared in the form of a book authorized by the department

##### 6-b- Essential books (text books)

None

##### 6-c- Recommended books

[1] (Portable Mba Series) **Total Quality Management : Strategies and Techniques Proven at Today's Most Successful Companies**

**6-d- Periodicals, Web sites, ... etc**

IEEE transactions on Operation Research

**7- Facilities required for teaching and learning**

Data show, screen, and laptop computer.

**Course coordinator:**

**Prof. Dr. Waiel F. Abd El-Wahed**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**



## SELECTED TOPICS

|   |                                 |
|---|---------------------------------|
| Programme(s) on which the course is given | OR & Decision Support           |
| Major or Minor element of programs        | Major                           |
| Department offering the program           | OR & Decision Support           |
| Department offering the course            | OR & Decision Support           |
| Academic year / Level                     | 4 <sup>th</sup> year / Elective |
| Date of specification approval            | 9/5/2006                        |

### A- Basic Information

| Title        | Selected Topics |   |          | Code | OD482     |   |
|--------------|-----------------|---|----------|------|-----------|---|
| Credit Hours | Lecture         | 3 | Tutorial | 3    | Practical | - |
|              | Total           |   |          |      | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

- Give students a foundation for advanced study and other related applications.
- The course outlined below is designed to provide a coherent and broad-based coverage of the discipline of OR & Decision Support, giving a reasonable level of understanding in one of the following areas; operation research, programming, project planning, queuing systems, quality control, or decision support tools and other related applications.
- Creating an appreciation of the importance of the research and development in different areas of OR & Decision Support.
- Enhance thinking skills of understanding new theoretical and practical work.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A1 Knowing and understanding the essential principals of decision making problems.
- A2 Recognizing the appropriate methods and mathematical tools for modeling the different decision making problems

**A7** Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

**2-b- Intellectual skills**

- B1** Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B3** Training on measuring efficiencies of the system units w. r. t. the whole system.
- B4** Implementing the system life cycle in handling different problems of organizations.
- B6** Implementing the simulation and modeling software in solving real life decision making problems.

**2-c- Professional and practical skills**

- C2** Examine examples and case studies that documenting computer support for organizational decision making.
- C3** Learn how to understand the features of the available decision making packages.
- C5** Be familiar with techniques that can be used in the field of decision making based computer technologies.
- C6** Establishing a good recognition to the scale of quantitative and qualitative factors that affect any decision making problems.

**2-d- General and transferable skills**

- D1** Developing computer programs based optimization to solve real life applications
- D5** Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6** Providing the students with knowledge about the classical and modern tools for modeling process.

**3- Contents**

| Topic   | No. of hours | Lecture | Tutorial /Practical |
|---|--------------|---------|---------------------|
| <b>1. Introduction</b><br>• course outlines are stated.                                     | 6            | 3       | 3                   |
| <b>2. Reviewing previous work</b><br>• Contains the history of the subject under study.     | 18           | 9       | 9                   |
| <b>3. Basic concepts.</b><br>• . The basic concepts, theorems, and rules can be considered. | 18           | 9       | 9                   |
| <b>4. Core course</b>   | 24           | 12      | 12                  |

|  |           |           |           |
|--|-----------|-----------|-----------|
| <ul style="list-style-type: none"> <li>Analytical and practical implementation of recent research is considered.</li> </ul>  |           |           |           |
| <b>5. Case Studies</b> <ul style="list-style-type: none"> <li>Case study is assigned to different student groups applying verity of interlinked topics.</li> </ul> | 18        | 9         | 9         |
| <b>Total sum</b>   | <b>84</b> | <b>42</b> | <b>42</b> |

#### 4– Teaching and learning methods

- 4.1 Lectures
- 4.2 Exercises and tutorials.
- 4.3 Research assignments (case studies)

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, and final written exam to assess knowledge and understanding.
- 5.a.2 Regular oral, practical and written quizzes to assess intellectual skills.
- 5.a.3 Practical projects, final practical and oral exams to assess professional skills.
- 5.a.4 Reports, assignments, and discussions to assess general and transferable skills.

##### 5-b- Assessment schedule

|                     |  |
|---------------------|--|
| <b>Assessment 1</b> | 5th week.  |
| <b>Assessment 2</b> | 8th week.  |
| <b>Assessment 3</b> | 10th week.   |
| <b>Assessment 4</b> | 16th week (Oral and practical)   |
| <b>Assessment 5</b> | 17 <sup>th</sup> -18 <sup>th</sup> weeks ( <i>final written exam</i> ) |

##### 5-c- Weighting of assessments

|                                  |      |
|----------------------------------|------|
| <b>Mid-term examination</b>      | 10%  |
| <b>Final-term examination</b>    | 70%  |
| <b>Oral examination.</b>         | 10%  |
| <b>Practical examination</b>     | 10%  |
| <b>Semester work</b>             | -%   |
| <b>Other types of assessment</b> | -%   |
| <b>Total</b>                     | 100% |

#### 6- List of references

##### 6-a- Course notes

None

##### 6-b- Essential books (text books)

Any related books. It depends upon the field of the course



**6-c- Recommended books**

Depends upon the field of the course

**6-d- Periodicals, Web sites, ... etc**

ACM transactions on modeling and computers simulation, annals of operation research.

**7- Facilities required for teaching and learning**

- Library contains the essential references.
- Data show, screen, and laptop computer.
- PC lab connected to the Internet
- Lab equipped with programming languages.

**Course coordinator:**

**Prof. Dr. Waiel F. Abd EL-Wahed**

**Head of Department:**

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**



## PROJECT SPECIFICATION

|  |  |
|--|--|
| Programme(s) on which the project is given | OR & Decision Support Dep.   |
| Major or Minor element of programs         | Major  |
| Department offering the program            | OR & Decision Support Dep.   |
| Department offering the project            | OR & Decision Support Dep.   |
| Academic year / Level                      | 4 <sup>th</sup> year / 1 <sup>st</sup> and 2 <sup>nd</sup> semesters |
| Date of specification approval             | 9/5/2006   |

### A- Basic Information

|              |         |      |          |   |           |   |
|--------------|---------|------|----------|---|-----------|---|
| Title        | Project | Code | OD481    |   |           |   |
| Credit Hours | Lecture | 1    | Tutorial | - | Practical | 5 |
|              | Total   |      |          |   | 6         |   |

### B- Professional Information

#### 1 – Overall aims of course

By completing this project the student should able to:

- Train the students to work within a teamwork environment.
- Get some experience in implementing the theoretical theorems practically.
- Enhance practical skills of both mathematical modeling and decision making
- Apply the theoretical knowledge to build practical projects in one of the following fields; problem solving strategy, modeling, optimization, decision support, decision making strategies,...etc.

#### 2 – Intended learning outcomes of course (ILOs)

##### 2-a- Knowledge and understanding:

- A7 Knowing and understanding the important role of operations research topics and economic tools in solving real life problems.

## 2-b- Intellectual skills

- B1 Improving skills as a modeler by formulating problems by implementing several modeling languages.
- B6 Implementing the simulation and modeling software in solving real life decision making problems.

## 2-c- Professional and practical skills

- C2 Examine examples and case studies that documenting computer support for organizational decision making.
- C3 Learn how to understand the features of the available decision making packages.
- C5 Be familiar with techniques that can be used in the field of decision making based computer technologies.

## 2-d- General and transferable skills

- D1 Developing computer programs based optimization to solve real life applications
- D2 Enabling the students to gain knowledge about the tools for measuring systems' efficiency.
- D5 Developing skills in the analysis, design and implementation of computerized Decision Support Systems.
- D6 Providing the students with knowledge about the classical and modern tools for modeling process.
- D8 Teaching the students how to optimize the cost of the decision making processes and how to finance the projects.

## 3- Contents

| Topic   | No of hours | Lecture | Tutorial/ Practical |
|---|-------------|---------|---------------------|
| <p>The student must submit a project report to the department for evaluation and discussion by the oral examination committee. This committee must contain internal and external examiners. The report may include the following units:</p> <p><b>1 Introduction</b><br/>Here the goal and methodology of the project should be stated.</p> | 2           | 2       | -                   |
| <p><b>2 Previous work</b><br/>This part may contain some of the previous work (if any), to train the student to have the ability to read and understand some related material.</p>  | 4           | 4       | -                   |

|   |            |           |            |
|---|------------|-----------|------------|
| <b>3 Theoretical considerations</b><br><br>The theoretical background of the project may be considered in this part. It may include the theorems, rules and methodology for the project implementation. When using programming, this part should include the program analysis and data structure. | <b>10</b>  | <b>10</b> | <b>-</b>   |
| <b>4 Practical work</b><br><br>The software or hardware implementation of the project is considered here. It may include the program development and hardware analysis of the project. It also contains the circuit diagrams used in the implementation.  | <b>110</b> | <b>10</b> | <b>100</b> |
| <b>5 Results, Discussions,...., etc.</b><br><br>The achieved results of the project and its operation are demonstrated in this section. The results justification and discussion are also presented.  | <b>41</b>  | <b>1</b>  | <b>40</b>  |
| <b>6 Conclusions</b><br><br>This part concludes the project work and its applicability and scalability are presented.   | <b>1</b>   | <b>1</b>  | <b>-</b>   |
| <b>Total sum</b>  | <b>168</b> | <b>28</b> | <b>140</b> |

#### 4- Teaching and learning methods

**The department assigns a supervisor for each project group. External supervisor(s) may also participate in the supervision depending upon the nature of the project.**

- 4.1 Lectures.
- 4.2 Practical experiments in the laboratory.
- 4.3 Exercises and tutorials.
- 4.4 Research assignments.

#### 5- Student assessment methods

##### 5-a- Methods

- 5.a.1 Reports, assignments, exercises, and final written exam to assess knowledge and understanding.
- 5.a.2 Practical work, final practical and oral exams to assess professional skills.
- 5.a.3 Reports, assignments, and discussions to assess general and transferable skills during the project implementation.
- 5.a.4 Final dissertation (report) for the project work. This dissertation is assessed by an examination committee assigned by the department. This committee contains internal and external examiners.

##### 5-b- Assessment schedule

|              |  |
|--------------|--|
| Assessment 1 | 6 <sup>th</sup> week, 1 <sup>st</sup> semester.  |
| Assessment 2 | 12 <sup>th</sup> week, 1 <sup>st</sup> semester.   |
| Assessment 3 | 6 <sup>th</sup> week, 2 <sup>nd</sup> semester.  |
| Assessment 4 | 15-16 <sup>th</sup> week, 2 <sup>nd</sup> semester ( <i>Oral and practical final exam.</i> ) |

### 5-c- Weighting of assessments

|   |      |
|---|------|
| • Reports, practical projects, assignments, punctuality and individual activity as well as regular oral and written quizzes | 20%  |
| • Final dissertation report.  | 20%  |
| • Final practical and oral exams  | 60%  |
| Total   | 100% |

## 6- List of references

### 6-a- Course notes

There are lectures notes prepared by project advisor.

### 6-b- Essential books (text books)

Any related books. It depends upon the field of the project.

### 6-c- Recommended books

Depends upon the project field.

### 6-d- Periodicals, Web sites, ... etc

IEEE transactions on computers and software.

## 7- Facilities required for teaching and learning

- Library contains the essential references.
- Laboratory equipments, apparatus and kits.
- Datashow, screen, and laptop computer.

### Course coordinator:

**Prof. Dr. Waiel F. Abd El-Wahed**

### Head of Department:

**Prof. Waiel Fathy abd Elwahed**

**Date: / / 2006**