Menoufiya University
Faculty of Computers and Information
Department of Computer Science

جامعة المنوفية
كلية الحاسبات والمعلومات
قسم علوم الحاسب

COURSE SPECIFICATION

(OPERATING SYSTEMS-1)

Programme(s) on which the course is given	CS, IT, IS and OR
Major or Minor element of programs	Major
Department offering the program	Computer Science
Department offering the course	Computer Science
Academic year / Level	2nd Year / 2nd Semester

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)

2a- Knowledge and understanding

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.

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.

b7 Work with and model computer systems at different and appropriate levels of abstraction.

2c- Professional and practical skills

c5 Design, write and debug computer programs in appropriate languages.

c6 Use appropriate computer-based design support tools

c8 Appreciate the features of complex computing hardware and software and operate them effectively

2d- 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- Contents

Topic	No. of hours	Lecture	Tutorial/ Practical
1 Introduction	3	3	-
2 Computer System Structures • Computer System Operation. • I/O Structure • Storage Hierarchy. • Hardware Protection. • General System Architecture	6	3	3
3 Operating System Structures • System Components. • Operating System Services. • System Calls. • System Structure. • Virtual Machine. • System Design and Implementation	6	3	3
4 Processes • Process Concept. • Process Scheduling. • Operation in Process. • Cooperating Process. • Threads. • Interprocess Communication	12	6	6
5 Threads • Overview. • Multithreading Models. • Threading Issues. • Pthreads. • Windows XP Threads. • Linux Threads. • Java Threads.	12	6	6
6 CPU Scheduling • Basic Concepts. • Scheduling Criteria. • Scheduling Algorithms. • Multiple-Processor Scheduling.	12	6	6

• Real-Time Scheduling. • Thread Scheduling. • Operating Systems Examples. • Java Thread Scheduling. • Algorithm Evaluation.			
7 Synchronization • Background. • The Critical-Section Problem. • Synchronization Hardware. • Semaphores. • Classical Problems of Synchronization. • Monitors.	12	6	6
8 Memory Management • Background. • Swapping. • Contiguous Allocation. • Paging. • Segmentation. • Segmentation with Paging.	6	3	3
9 Virtual Memory • Background. • Demand Paging. • Process Creation. • Page Replacement. • Allocation of frames • Thrashing. • Demand Segmentation. • Operating System Examples	12	6	6
Total sum	**81**	**42**	**39**

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, and exercises 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.a.5 Final written exam to assess knowledge and understanding.

5-b Assessment schedule

Assessment 1	5th week.	Mid term exam
Assessment 2	8th week.	
Assessment 3	10th week.	
Assessment 4	16th week (Oral and practical)	
Assessment 5	17th -18th weeks (final written exam)	

5-c Weighting of assessments

Semester work	10%
Mid-term examination	10%
Oral / Practical examination.	20%
Final-term examination	60%
Total	100%

6- List of References

6-a Course notes

Lectures in operating systems", selected by A. Elsisi, 2nd Semester 2006.

6-b 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-c 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-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:

Dr. Ashraf Elsisi

Head of Department:

Prof. Nabil Abd El-Wahed Ismail

Date: / /