Course Specifications

Course Title:	Operating Systems
Course Code:	ICS 311
Program:	Information and Computer Science
Department:	Computer Science and Information
College:	College of Science at Az Zulfi
Institution:	Majmaah University

Table of Contents

A. Course Identification

1. Credit hours:	(3) (2 Lec + 2 lab)
2. Course type	
a.	University ☐ College ☐ Department ■ Others ☐
b.	Required ■ Elective ☐
3. Level/year at which this course is offered:	**5th Level – 3rd year**
4. Pre-requisites for this course (if any)**:**	**Computer Organization and Architecture - ICS 222**
5. Co-requisites for this course (if any)**:**	**N/A**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	48	80%
2	**Blended**	6	10%
3	**E-learning**	0	0%
4	**Correspondence**	0	0%
5	**Other**	6	10%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	30
2	**Laboratory/Studio**	15
3	**Tutorial**	15
4	**Others** (specify)	-
	Total	60
Other Learning Hours*		
1	**Study**	15
2	**Assignments**	15
3	**Library**	15
4	**Projects/Research Essays/Theses**	15
5	**Others** (video lectures)	15
	Total	75

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Operating Systems course is the study of the importance of the operating systems and their function. And it includes these topics : operating systems services and structure, Processes and Threads, Processes Synchronization, CPU scheduling, Deadlock, Memory management, File System management.

2. Course Main Objective

- To understand the services provided by and the design of an operating system.
- To understand the structure and organization of the file system.
- To understand what a process is and how processes are synchronized and scheduled.
- To understand different approaches to memory management.
- Students should be able to use system calls for managing processes, memory and the file system.
- To understand the data structures and algorithms used to implement an OS.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Describe the functions of a contemporary operating system with respect to convenience, efficiency, and the ability to evolve	a1
1.2	Describe reasons for using interrupts, dispatching, and context switching to support concurrency in an operating system.	a1
1.3	Describe the difference between processes and threads.	a1
1.4	Discuss the types of processor scheduling such as short-term, medium-term, long-term, and I/O.	a1
1.5	Discuss the need for preemption and deadline scheduling.	a1
1.6	Summarize the principles of virtual memory as applied to caching and paging.	a1
2	**Skills :**	
2.1	Choose the appropriate technologies, algorithms, and approaches for the related issues.	b2
2.2		
2.3		
2...		
3	**Competence:**	
3.1	Present a short report in a written form and orally using appropriate scientific language.	c3
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Operating systems services and structure	٨
2	Processes and Threads	٨
3	Processes Synchronization	٤
4	CPU scheduling	٨

5	Deadlock	٨
6	Main memory management	٨
7	Virtual memory management	٤
8	File System management	٨
Total		56

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1	Describe the functions of a contemporary operating system with respect to convenience, efficiency, and the ability to evolve	Lectures Lab demonstrations Case studies Individual presentations	Written Exam Homework assignments Class & Lab Activities Quizzes
1.2	Describe reasons for using interrupts, dispatching, and context switching to support concurrency in an operating system.		
1.3	Describe the difference between processes and threads.		
1.4	Discuss the types of processor scheduling such as short-term, medium-term, long-term, and I/O.		
1.5	Discuss the need for preemption and deadline scheduling.		
1.6	Summarize the principles of virtual memory as applied to caching and paging.		
2.0	**Skills**		
2.1	Choose the appropriate technologies, algorithms, and approaches for the related issues.	Lectures Lab demonstrations Case studies Individual presentations Brainstorming	Written Exam assignments Lab Activities Quizzes
2.2			
…			
3.0	**Competence**		
3.1	Present a short report in a written form and orally using appropriate scientific language.	Small group discussion Whole group discussion Brainstorming Presentation	Written Exam Homework assignments Lab assignments Class Activities Quizzes
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First written mid-term exam	6	20%
2	Second written mid-term exam	12	20%
3	Class activities, group discussions, Presentation	Every 2 weeks	5%
4	Homework + Assignments	After Every chapter	5%
5	Electronic exam	14	5%
6	Lab activities	15	5%
7	Final written exam	16	40%
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- 6-office hours per week in the lecturer schedule.
- The contact with students by e-mail, mobile, office telephone, website and BlackBoard.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts, John Wiley & Sons, 2012.
Essential References Materials	Andrew S. Tanenbaum, Modern Operating Systems, Pearson India, 2016
Electronic Materials	https://www.coursera.org/
Other Learning Materials	Videos and presentations made available on BlackBoard e-Learning platform.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms with required digital aids and to support traditional method of teaching using blackboard. Classrooms with proper lighting and air conditioning

Item	Resources
	system integrated with the sound System /audio system. Classroom with smart board interface, display screen and a computer to aid the sessions
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board with supporting software / computers with updated versions of software as required to understand the subject concepts.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	**N/A**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Strategies for Obtaining Student Feedback on Effectiveness of Teaching	Instructor	Analysis of students' results. Observation during class work. Students' evaluations. Colleagues' evaluations. Evaluation questionnaire filled by the students. Interview a sample of students enrolled in the course to solicit their opinions
Other Strategies for Evaluation of Teaching	the Department	Self-assessment. External evaluation. Periodic review of course (the Commission of study plans).
Processes for Improvement of Teaching	the Department	Taking into account the recommendations yielded from the internal review of the course. Guidelines about teaching the course provided by the study plans commission. Department guidelines pertaining the faculty member's performance acquired using direct observation. Training and development. Workshops to improve the educational process
Processes for Verifying Standards of Student Achievement	Instructor	check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution. Instructors of the course working together with Head of Department to adopt a unique process of the evaluation.
Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.	Instructor	Comparison of the course to its counterparts offered in similar departments. Periodic revision of course description by faculty member. Periodic revision of course description by the study plans and schedules Commission.

Evaluation Areas/Issues	Evaluators	Evaluation Methods
		Update learning resources related to the course to ensure that the course is up-to-date with the developments in the field. Make use of statistical analysis of course evaluation carried out by the students to improve and develop the course. Provide an opportunity to the students to express their opinions about what is taught and receive suggestions and evaluate their effectiveness.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	