Course Specifications

General Information

Course name	Operating Systems
Course number	ITCS3403
Faculty	
Department	
Course type	Major Needs
Course level	3
Credit hours (theoretical)	4
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - Understanding the tasks and components of an operating system and how they influence the operation of user-level programs, how the computer architecture and programming languages interact with the OS to manage concurrent activities, and how the OS manages resources and provides protection and security.

2 - The principles of process management and synchronization

3 - Analyzing how operating systems implement their concepts, and evaluating the advantages and disadvantages of their varying implementations

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Intended Learning Outcomes

Knowledge and Understanding	* a1. Describe fundamental principles of operating systems and how these support IT-based applications * a2. Define with process management, main memory management * a3. Identify file management, secondary storage management and I/O system management * a4. Define the main concepts of process synchronization and communication * a5. Explain practical operating systems issues * a6. Describe the challenges inherent in the maintenance and evolution of operating systems, and the techniques and best practices currently available for dealing with them * a7. Identify the methods used in defining and assessing criteria for measuring the extent to which a computer system is appropriate for its current deployment and future evolution * a8. Describe the current and underlying technologies that support computer processing and inter-computer communication
Intellectual Skills	* b1. Identify functions and structures of operating systems * b2. Perform comparisons between methods, techniques...etc * b3. Identify attributes, components, relationships, patterns, main ideas, and errors * b4. Assess criteria to measure the appropriateness of a computer system for its current deployment and future evolution, and to interpret the results thereof * b5. Reach computing judgments considering balanced costs, benefits, safety, quality, reliability, and environmental impact
Professional Skills	* c1. Master process and memory management * c2. Apply the key operating systems concepts * c3. Develop system-level programs * c4. Identify any risks or safety aspects that may be involved in the operation of computing equipment within a given context * c5. Evaluate systems in terms of their quality and possible trade-offs
General Skill	* d1. Manage tasks and resources * d2. Work as part of a development team and to recognize the different roles of its members

Course Contents

1 - Introduction to operating systems
2 - Process management and process synchronization
3 - Main memory management
4 - File management
5 - Secondary management
6 - I/O system management
7 - Deadlocks
8 - Ex Systems: MSDOS and windows

Teaching and Learning Methods

1 - Lectures
2 - Practical Exercises
3 - Projects
4 - Case Study

Teaching and Learning Methods for the Disabled Students

1 - N. A

Students Assessment

Assessment Method	TIME	MARKS
First Midterm exam	Week No. 7	20%
Second Midterm Exam	Week No. 12	20%
Project Presentation and discussion	Week No. 15	10%
Final Exam	16th week	50%

Books and References

Essential books	Abraham Silberschatz, Peter Baer Galvin and Greg Gagne: Operating System Concepts with Java, 8th edition, John Wiley & Sons, Inc., 2004. ISBN: 0-471-48905-0
Recommended books	1. William Stallings, Operating Systems Internal and Design Principles, Seventh Edition, Prentice Hall, 2012
	2. H. M. Dietel, P. J. Dietel, and D. R. Choffnes: Operating Systems, 3rd Edition, Pearson Education, 2004. ISBN: 0-13-124696-8

Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
Introduction to operating systems	1	a1, a5, a8	b1, b4	c2	d1,d2
Process management and process synchronization	2-3	a1, a2, a3, a4, a5, a6, a8	b2, b3, b5	c1, c3	d1, d2
Main memory management	4-5	a1, a2, a3, a6, a8	b2, b3, b5	c1, c3, c5	d1, d2
File management	6-7	a1, a2, a4, a6, a8	b2, b3, b5	c1, c4, c5	d1, d2
Secondary management	8-9	a1, a2, a4, a6, a8	b2, b3, b5	c1	d1, d2
I/O system management	10	a1, a2, a4, a6, a8	b2, b3, b5	c1, c4, c5	d1, d2
Deadlocks	11-13	a1, a2, a4, a6, a7, a8	b2, b3, b5	c1, c4, c5	d1, d2
Ex Systems: MSDOS and windows	14-15	a1, a2, a4, a6, a7, a8	b2, b3, b4,b5	c1, c4, c5	d1, d2