

## Course specification

(3102 Operating Systems)

<b>Faculty:</b>	<i>HICIT- Higher Institute for Computers &amp; Information Technology-El Shorouk Academy</i>
<b>Programme(s) on which the course is given:</b>	Under graduate program in Computer Science
<b>Major or minor element of programme:</b>	Compulsory
<b>Department offering the programme</b>	Department of Computer Science
<b>Department offering the course:</b>	Department of Computer Science
<b>Year / Class</b>	3 <sup>rd</sup> Year – 1 <sup>st</sup> semester
<b>Date of specification approval</b>	1/8/2022

### A- Basic Information

<b>Title:</b> Operating Systems	<b>Code:</b> 3102		
<b>Weekly Hours:</b>			
<b>Lecture :</b> 3	<b>Exercise: -</b> 1	<b>Practical :2</b>	<b>Total: 6</b>

### B- Professional Information

#### 1- Course Aims:

- Apply all the process steps of the analysis and design to have successful DB system implementation. The objective of CS3202 is to teach concepts and the fundamentals of the operating systems. The course starts with basic concepts needed to understand the objectives of the operating systems and the tools and criteria's used to meet the objectives. The processor time management, the memory managements, devices management and problems of concurrent processing are the main focus of the course.

#### 2- Program ILOs Covered by Course

<i>Program Intended Learning Outcomes</i>			
<b>Knowledge and understanding</b>	<b>Intellectual Skills</b>	<b>Professional and practical skills</b>	<b>General and Transferable skills</b>
<b>A8, A10, A18, A19,</b>	<b>B2, B4, B16</b>	<b>C6, C9, C10, C11, C14</b>	<b>D5</b>

### 3- Intended learning outcomes of course (ILOs)

#### a. Knowledge and Under-Standing:

- a1. Identifying the major functions performed by the operating systems. [A8, A10, A19]
- a2. Clarifying hardware and software concepts needed to understand operating systems design.[A8,A10, A19]
- a3. Explaining the process concept, process states and time sharing. [A8, A10,A18, A19]
- a4. Explain Memory management. [A8, A10, A18, A19]
- a5. Clarifying Virtual memory. [A8, A10, A18, A19]
- a6. Explain Job and processor Scheduling. [A8, A10, A18, A19]
- a7. Explain Deadlocks and Concurrent Update problems. [A8, A10, A18, A19]
- a8. Identifying Device Scheduling Techniques. [A8, A10, A18, A19]

#### b. Intellectual Skills:

- b1. Analyze the resources sharing concepts in time and space analysis, synthesis. [B2,B4,B16]
- b2. Analyze modes of operations and alternating in modes to deal with problems solving. [B2,B4,B16]
- b3. Illustrate Diagrams in representing and problems formulation and search for solutions. [B4]
- b4. Synthesis of clearly and precisely analysis for problems. [B2,B4,B16]
- b5. Differentiate between operating systems. [B2,B4]

#### c- Professional and practical skills

- c1- Apply virtual memory expansion in the cases in which there is a space problem. [C6, C9, C10, C11, C14]
- c2- Implement application of time sharing concept in problems with such nature. [C6, C9, C10, C11, C14]
- c3- Measure the system performance. [C6, C9, C14]
- c4- Implement producer and consumer applications. [C6, C9, C10, C11, C14]
- c5- Implement applications that can detect deadlocks in systems. [C6, C9, C10, C11, C14]

#### d- General and transferable skills

- d1. Work effectively as an individual and as a member of a team. [D5]
- d2. Write technical Report.[D5]

### 4- Contents

Topic	Hours	Lec.	Exc/Lab
Major operating systems functions	6	3	3
Hardware and software concepts	6	3	3
The process concept	12	6	6
Memory management	12	6	6
Virtual memory	12	6	6
Job and processor Scheduling	6	3	3
Deadlocks	6	3	3
Concurrent Update problems	6	3	3
Device Scheduling	6	3	3
Selected Topics	3	3	-

## 5- Teaching and learning methods

Teaching and learning methods	Used
<b>Active Learning</b>	
Lectures(blending learning – online learning using virtual classroom)	√
Tutorial Exercises (hybrid learning – online learning)	√
Practical Lab(blending learning– online learning)	√
Exercises	√
Discussions.	√
<b>Self – Learning strategy</b>	
Reading material	√
Websites search	√
Research and reporting	√
Self-studies	√
<b>Experimental strategy</b>	
Group work	-
Presentation	-
<b>Problem solving strategy</b>	
Problem solving/problem solving learning based	√
Case study	
<b>Synchronous E-Learning</b>	
Virtual lab	-
Virtual class	-
Chat Room	-
Video lectures	√
<b>Asynchronous E-Learning</b>	
E-Learning	√

## 6- Student assessment methods

Methods	Assessment	Used
Electronic Midterm Exam	To assess the knowledge and understanding achieved by the student during the previous weeks. (online on e-learning hub )	√
Pencil-to-Paper Final Exam	To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.	√
Course Project	To allow students work in team, and to evaluate	-

	knowledge, understanding, intellectual, and transferable skills. (online on e-learning hub , FTF)	
Electronic Course Work & Quizzes	To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.(online on e-learning hub)	√
Practical Exam	to measure the ability of students to design and implement a software program(FTF).	√
Participation	To assess the knowledge and understanding achieved by the student during the previous weeks.	√

### Assessment Schedule

Assessment	Week #
<b>Participation</b>	<b>3-14</b>
<b>Electronic Mid Term Exam</b>	<b>8</b>
<b>Final Exam</b>	<b>16</b>
<b>Electronic/ hard copy Course Project</b>	<b>--</b>
<b>Electronic/ hard copy Course Work &amp; Quizzes</b>	<b>2-14</b>
<b>Practical Exam</b>	<b>15</b>

### Assessment Weight

Assessment	Weight %
<b>Participation</b>	<b>5%</b>
<b>Electronic Mid Term Exam</b>	
<b>Final Exam</b>	<b>70%</b>
<b>Electronic/ hard copy Course Work &amp; Quizzes</b>	<b>5%</b>
<b>Practical Exam</b>	<b>20%</b>
<b>Total</b>	<b>100</b>

- Course Work & Quizzes:
  - o Short Exams, Assignments, Researches, Reports, Presentations on e-learning hub
  - o Class/Project discussion in a virtual classroom

## 6 -List of references

<b>Essential books (text books)</b>	<ul style="list-style-type: none"> <li>• Tomsho, Greg. <i>Guide to operating systems</i>. Cengage Learning, 2020.</li> <li>• Silberschatz, Abraham, et al. <i>Silberschatz's Operating System Concepts</i>. 2020.</li> </ul>
<b>Course notes</b>	<ul style="list-style-type: none"> <li>• <a href="https://www.geektonight.com/operating-systems-pdf-notes/">https://www.geektonight.com/operating-systems-pdf-notes/</a></li> <li>• <a href="#">Microsoft PowerPoint - OS1.pptx (uobabylon.edu.iq)</a></li> </ul>
<b>Recommended books</b>	<ul style="list-style-type: none"> <li>• Reddy, G. Sreehitha, and K. Reddy Pradeep. <i>Operating Systems: Concepts</i>. 2019.</li> </ul>
<b>Periodicals,website</b>	<ul style="list-style-type: none"> <li>• <b>Powerpoint presentations of all course materials</b></li> <li>• <b>All labs material</b></li> <li>• <b>[<a href="https://moodle.sha.edu.eg/course/view.php?id=1363">https://moodle.sha.edu.eg/course/view.php?id=1363</a>]</b></li> </ul>

## 7- Required Facilities

To assess professional and practical skills given the following facilities:

a. Tools & SW (Technologies facilities):

- **VMWare to run Ubuntu**
- **Linux Commands**
- **Python**
- **Anaconda Navigator with python 3.7**
- **Microsoft TEAMS to create virtual classrooms for lectures, discussions for project**
- **portal(MOODLE) to make electronic quizzes and electronic midterm exam**
- **portal(MOODLE) to upload project deliverable and assignment**
- **academy portal(MOODLE) to upload electronic material**

b. Teaching facilities:

	<i>Lecture</i>	<i>class</i>	<i>Lab</i>
Whiteboard	used	-	used
Pc/laptop	used	-	used
Data show	used	-	used
Webinars	MS TEAMS	-	MS TEAMS
SocialMedia	Facebook Page for 3 <sup>rd</sup> year	-	Facebook Page for 3 <sup>rd</sup> year
ChatRoom	ChatTeams	-	ChatTeams
Videos	Stream-MOODLE	-	Stream-MOODLE
Website	MOODLE	-	MOODLE

## 8- Course Matrices

### 8.1- Course Content/ILO Matrix

Course Contents	Knowledge & understanding								Intellectual skills					Professional and practical skills					General		
	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	d1	d2	
Major operating systems functions	x											x									
Hardware and software concepts			x															x			
The process concept	x																				
Memory management		x		x					x	x	x	x									
Virtual memory		x	x	x									x	x	x		x				
Job and processor Scheduling								x													
Deadlocks													x		x						
Concurrent Update problems					x																
Device Scheduling						x													x		
Selected Topics							x						x								

### 8.2- Learning Method /ILOs Matrix

Learning Methods	Knowledge and understanding								Intellectual skills					Professional and practical skills					General		
	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	d1	d2	
Lectures	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Tutorial Exercises									x	x	x	x	x	x	x	x	x	x			
Reading material	x	x	x	x					x	x	x	x		x	x	x	x				
Websites search	x	x	x	x					x	x	x	x			x				x	x	x
Research and reporting	x	x	x	x															x	x	
Problem solving/ problem solving learning based											x	x									
Group work															x	x	x	x	x	x	x
Presentations																					
Practical Lab									x	x	x	x	x	x	x	x	x	x	X		
Discussions.									x	x	x	x	x	x	x	x	x	x	x	x	x

### 8.3 Assessment Methods /ILOs Matrix

Assessment Methods	Knowledge & understanding								Intellectual skills					Professional & practical skills					General	
	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	d1	d2
Electronic Mid Term Exam	x	x	x	x	x	x	x	x	x	x	x	x	x							
Final Exam	x	x	x	x	x	x	x	x	x	x	x	x	x							
Electronic Course Work & Quizzes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Practical Exam	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		

### 9. Course ILOs Vs Program ILOs

Prog ILOS		Knowledge & understanding				Intellectual skills			Professional and practical skills					General
Course ILOS		A8	A10	A18	A19	B2	B4	B16	C6	C9	C10	C11	C14	D5
<b>k&amp;u</b>	a1	√	√		√									
	a2	√	√	√	√									
	a3	√	√	√	√									
	a4	√	√	√	√									
	a5	√	√	√	√									
	a6	√	√	√	√									
	a7	√	√	√	√									
	a8	√	√	√	√									
<b>int.</b>	b1					√	√	√						
	b2					√	√	√						
	b3						√							
	b4					√	√	√						
	b5					√	√							
<b>p. &amp; p.</b>	c1								√	√	√	√	√	
	c2								√	√	√	√	√	
	c3								√	√	√	√	√	
	c4								√	√	√	√	√	
	c5								√	√	√	√	√	
<b>general</b>	d1													√
	d2													√

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