

Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Software Engineering Department	QF01/0408-4.0E
-----------------------------------------------------------------------------------------------------------------------	----------------

Study plan No.	2022-2023		University Specialization		Artificial Intelligence
Course No.	0142314		Course name		Operation Research
Credit Hours	3		Prerequisite Co-requisite		Calculus 1
Course type	<input type="checkbox"/> MANDATORY UNIVERSITY REQUIREMENT	<input type="checkbox"/> UNIVERSITY ELECTIVE REQUIREMENTS	<input type="checkbox"/> FACULTY MANDATORY REQUIREMENT	<input type="checkbox"/> Support course family requirements	<input type="checkbox"/> Mandatory requirements <input checked="" type="checkbox"/> Elective requirements
Teaching style	<input type="checkbox"/> Full online learning		<input type="checkbox"/> Blended learning		Traditional learning
Teaching model	<input type="checkbox"/> 2 Synchronous: 1asynchronous		<input type="checkbox"/> 2 face to face : 1synchronous		3 Traditional

**Faculty member and study divisions information (to be filled in each semester by the subject instructor)**

Name	Academic rank	Office No.	Phone No.	E-mail	
Division number	Time	Place	Number of students	Teaching style	Approved model

**Brief description**

Operations research helps in solving problems in different environments that needs decisions. The module converts topics that include: linear programming, Transportation, Assignment, and CPM/MSPT techniques. Analytic techniques and computer packages will be used to solve problems facing business managers in decision environments. This module aims to introduce students to use quantitatively methods and techniques for effective decisions-making; model formulation and applications that are used in solving business decision problems.

**Learning resources**

Course book information (Title, author, date of issue, publisher ... etc)	1- Hamdy A. Taha. 2006. Operations Research: An Introduction (8th Edition). Prentice-Hall, Inc., USA.				
Supportive learning resources (Books, databases, periodicals, software, applications, others)	<ol style="list-style-type: none"> <li>Russell and Norvig, Artificial Intelligence: A Modern Approach, 3rd edition, Pearson Education, Inc., Prentice-Hall-Series, 2010.</li> <li>Jeff Heaton, Artificial Intelligence for Humans, Volume.1, Fundamental Algorithms, Kindle Edition, 2013.</li> </ol>				
Supporting websites	-				
The physical environment for teaching	<input checked="" type="checkbox"/> Class room	<input type="checkbox"/> labs	<input type="checkbox"/> Virtual educational platform	<input type="checkbox"/> Others	
Necessary equipment and software	-				
Supporting people with special needs	-				
For technical support	-				

Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Software Engineering Department	QF01/0408-4.0E
-----------------------------------------------------------------------------------------------------------------------	----------------

Course learning outcomes (S= Skills, C= Competences K= Knowledge,)

No.	Course learning outcomes	The associated program learning output code
<b>Knowledge</b>		
K1	Presenting the concepts and Benefits of OR.	MK1
K2	To be acquainted with the basics of various advanced data science topics.	MK1
K3	Describing concepts of mathematical formulation.	MK1
K4	Describing the concepts of production systems.	MK1
K5	Presenting simplex method.	MK1
K6	Describing transportation model.	MK1
<b>Skills</b>		
S1	understanding the basic concepts and techniques of the OR.	MS1
S2	Learning how to represent OR in both theory and practice with careful attention to the underlying principles of the OR	MS1
S3	Learning the main components of production systems.	MS1
S4	Learning the concepts of Big M-method.	MS1
<b>Competences</b>		
C1	use quantitatively methods and techniques for effective decisions–making; model	MC1
C2	Apply model formulation and applications that are used in solving business decision problems.	MC1

Mechanisms for direct evaluation of learning outcomes

Type of assessment/learning style	Fully electronic learning	Blended learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
First exam	0	0	0	0
Second / midterm exam	%30	%30	%30	30%
Participation / practical applications	0	0	20	30%
Asynchronous interactive activities	%30	%30	0	0
final exam	%40	%40	%50	40%

**Note:** Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.

Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Software Engineering Department	QF01/0408-4.0E
-----------------------------------------------------------------------------------------------------------------------	----------------

### Schedule of simultaneous/face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
1	What is OR	Lecture	<b>TB1:</b> 1-7
2	Modeling with leaner programming	Lecture	<b>TB1:</b> 15-20
3	Modeling with leaner programming	Lecture	<b>TB1:</b> 39-47
4	The Simplex Method	Lecture	<b>TB1:</b> 56-65
5	The Simplex Method	Lecture	<b>TB1:</b> 69-83
6	Artificial Starting Solution	Lecture	<b>TB1:</b> 95-99
7	Artificial Starting Solution	Lecture	<b>TB1:</b> 95-99
8	<b>Midterm</b>	Lecture	<b>Revision</b>
9	Special Case in Simplex Method	Lecture	<b>TB1:</b> 134-160
10	Special Case in Simplex Method	Lecture	<b>TB1:</b> 477-483
11	Sensitivity Analysis	Lecture	<b>TB1:</b> 170,171, 176, 182, 190-192
12	Sensitivity Analysis	Lecture	<b>TB1:</b> 170,171, 176, 182, 190-192
13	Transportation Model	Lecture	<b>TB1:</b> 199-202, 210- 212
14	TM	Lecture	<b>TB1:</b> 233-238
15	TM	Lecture	<b>TB1:</b> 267-270, 271, 276-277
16	<b>Final Exam</b>	Lecture	

### Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
1	To be filled by the instructor		
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

\* Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.

\*\* Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.