MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**PRINCIPLES OPERATION RESEARCH & APPLICATION QSB**			**Module Delivery**	
Module Type	**Basic اساسية**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**AC2105**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UGII		**Semester of Delivery**	3	
Administering Department	ACC		**College**	CAB	
Module Leader	Saifaldin Hashim Kamar		**e-mail**	Saifaldin.h.Kamar@aliraqia.edu.com	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Ahmed Ali Salman		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	1/10/2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Building linear programming models and methods for solving them with the QSB app. 2. Building transportation models and methods for solving them with the QSB app. 3. Building assignment models and methods for solving them with the QSB app. 4. Building business network models and methods for solving them with the QSB app.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. The ability to building Linear Programming models. 2. Solving the Linear Programming models by Graphical method. 3. Solving the Linear Programming models by Simplex method. 4. The ability to building Transportation models. 5. Solving the Transportation models by Northwest Corner method. 6. Solving the Transportation models by Least Cost method. 7. Solving the Transportation models by Vogel's approximate method. 8. The ability to building Assignment models. 9. Solving the Assignment models by Hungarian method. 10. The ability to Business Network models. 11. Solving the Business Network models by Critical Path Method. 12. Solving the Business Network models by Project Evaluation and Review Technique.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - linear programming models</u> Basic assumptions of linear programming, linear programming and some areas of its application, examples of problem formulation using linear programming models. [SSWL=3 hrs]. The general form of linear programming, the canonical form and the standard form. [SSWL=3 hrs]. Analyzing linear programming problems using the graphical method, solving various examples using the graphical method. [SSWL=3 hrs]. The general method for analyzing linear programming problems, solving examples of the general method. [SSWL=3 hrs]. Artificial variables and Big M method, solve examples of Big M method, Solve various problems. [SSWL=3 hrs] <u>Part B - transportation models</u> The general formulation of the Transportation models, northwest corner method. [SSWL=3 hrs] Least cost method, Vogel's approximate method. [SSWL=3 hrs] Examples of the previous three methods. [SSWL=3 hrs]

	Part C - Assignment models The general formulation of the Assignment problem. Methods for solving the assignment model (full enumeration method), Hungarian method. [SSWL=3 hrs] Solve examples of assignment models. [SSWL=3 hrs] Part D- Business Network models Network models: definition of basic terms, division of activities in terms of time and resources consumed in the activity, rules for building business networks, types of business network models. [SSWL=3 hrs] Critical Path Method, Project Evaluation and Review Technique. [SSWL=3 hrs] Total hrs = 45 = SSWL - (Exam hrs) = 45 - 6 = 39 hr (Time table hrs x 15 weeks)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Cooperative learning strategy: Divide students into small groups to prepare reports. 2. Face-to-face learning strategy: Traditional lectures. 3. Online learning strategy: Using e-learning platforms (Google class room). 4. Hybrid learning strategy: A combination of traditional and online education.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	102	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 to 10	LO #1 to #10
	Assignments	2	10% (10)	6 to 12	LO #1 to #12
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	12	LO #1 to #12
Summative assessment	Midterm Exam	3hr	10% (10)	10	LO #1 to #10
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Basic assumptions of linear programming, linear programming and some areas of its application, examples of problem formulation using linear programming models
Week 2	The general form of linear programming, the canonical form and the standard form
Week 3	Analyzing linear programming problems using the graphical method, solving various examples using the graphical method
Week 4	The general method for analyzing linear programming problems, solving examples of the general method
Week 5	Artificial variables and Big M method, solve examples of Big M method
Week 6	Solve various problems
Week 7	The general formulation of the Transportation models, northwest corner method
Week 8	Least cost method, Vogel's approximate method
Week 9	Examples of the previous three methods
Week 10	The general formulation of the Assignment problem. Methods for solving the assignment model (full enumeration method), Hungarian method
Week 11	Solve examples of assignment models
Week 12	**Discussing and evaluating reports**
Week 13	Network models: definition of basic terms, division of activities in terms of time and resources consumed in the activity, rules for building business networks, types of business network models.
Week 14	Critical Path Method, Project Evaluation and Review Technique
Week 15	**Mid-term Exam**

Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to the QSB program.
Week 2	Lab 2: Linear programming and some areas of its application using QSB.
Week 3	Lab 3: Graphical method by using QSB.
Week 4	Lab 3: Examples of graphical method by using QSB.
Week 5	Lab 4: General method by using QSB.
Week 6	Lab 4: Examples of general method by using QSB.
Week 7	Lab 5: Big M method by using QSB.
Week 8	Lab 6: Transportation models, northwest corner method using QSB.
Week 9	Lab 7: Transportation models, least cost method, Vogel's approximate method using QSB.
Week 10	Lab 8: Transportation models, Vogel's approximate method using QSB.
Week 11	Lab 9: Assignment problem, Hungarian method using QSB.
Week 12	Lab 10: Network models, Critical Path Method using QSB.
Week 13	Lab 11: Network models, Project Evaluation and Review Technique using QSB.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Saifaldin Hashim Kamar and Qusay Hameed Al-Salami, Quantitative methods for banking and financial sciences, Dar Alwan for printing, publishing and distribution, 2019	Yes
Recommended Texts	Hamdy A. Taha, Operations Research: An Introduction, 9th Edition, Published by Prentice Hall, 2011.	No
Websites	https://www.youtube.com/@dr.saifaldinhashimkamar2679	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.