Program Catalogue | 2023-2024 | دليل البرنامج الدراسي

University of Mosul

جامعة الموصل

Bachelor of Computer Science and Mathematics - Operations Research and Intelligent Techniques

بكالوريوس علوم الحاسوب والرياضيات - علوم في بحوث العمليات والتقنيات الذكائية

جدول المحتويات

1. Mission & Vision Statement

Vision Statement

The faculty members of the Department of Operations Research and Intelligent Techniques at the University of Mosul believe that students come to understand the discipline of Operations Research and Intelligent Techniques through a combination of course, lab, research and fieldwork. The combination of instructional methods leads students to a balanced understanding of scientific methods and develops ideas about operations research and intelligent techniques.

Mission Statement

The faculty members of the Department Operations Research and Intelligent Techniques are pursuing a multi-faceted mission at the University of Mosul. The program seeks to provide all students of Operations Research and Intelligent Techniques with a fundamental knowledge of Operations Research and Intelligent Techniques Science, as well as a deeper understanding of the chosen focus area in Operations Research and Intelligent Techniques field. The Science of Operations Research and Intelligent Techniques program also provides the necessary basic knowledge of life sciences to support companies and others in using this science in all areas of life. In addition, Operations Research and Intelligent Techniques Science courses provide essential science experience for students seeking to complete higher education requirements.

2. Program Specification

Programme code:	BSc-OR	***ECTS***	240
Duration:	4 levels, 8 Semesters	***Method of Attendance:***	Full Time

Operations Research and Intelligent Techniques is a wonderfully broad subject. The focus of the program is on specialized and essential topics in operations research, as well as mathematical and computer science and the programs associated with them in order to facilitate real-life problems, whether economic, agricultural, or medical and solve them according to advanced scientific methods, where all students have the opportunity to learn about the basics of statistics, mathematics and computer at the end of the first year.

Level 1 introduces students to operations research and intelligent techniques and it is suitable for progression in all programs within the department's suite of programs. Program-specific core topics are covered at Level 2 to prepare for the research-led specialist modules at Levels 3 and 4. The University graduate of Operations Research and Intelligence Technologies is thus trained to appreciate how research informs teaching, in accordance with the mission statements of the University and the School.

In Levels 2, 3, and 4, students gradually move into the department's subspecialty in order to obtain a degree in Operations Research and Intelligent Techniques. It allows students to broadly develop their interests in operations research and Intelligent Techniques.

The spirit of research is developed and reinforced from the outset through practical procedures, which are either integrated into lecture units or taught in dedicated practical units, research seminars and tutorials. There are tests at each level and submission of reports for materials that are approved in order for the student to move to the higher level.

Academic tutorials are held at Levels 1 and 2 with the same tutor, who is also the personal tutor, providing continuity and progressive guidance. Level 1 and 2 tutorials include a number of workshops to teach skills, e.g. library use and presentation skills, followed by assessed exercises, e.g. essays and talks, as opportunities to practice these skills in a subject-specific context.

International years and Industrial placements are also offered and individual needs are discussed with the appropriate tutor and accommodated wherever possible.

3. Program Objectives

1. To provide a comprehensive education in Operations Research and Intelligent Techniques that applies scientific methods and solves problems across the spectrum of disciplines within Operations Research.
2. To prepare students for a wide variety of post-baccalaureate paths, including graduate school, professional training programs, or entry-level jobs in any area of operations research and intelligent techniques.
3. To provide extensive hands-on training in intelligent techniques, mathematics, statistical analysis, computer, and laboratory skills.
4. To provide thorough training in written and oral communication of scientific information.
5. To enrich students with opportunities for alternative education in the area of operations research through undergraduate research, internships, and study abroad.

4. Student Learning Outcomes

Operations research is one of the modern applied sciences whose applications have achieved wide success in various fields of life. The characteristic of this science is the preparation of a scientific and practical model for a specific system that includes identifying influencing factors, forecasting, and comparing results to help management measure the accuracy of the system used and then make appropriate decisions. In order to solve real-life problems (Big Problems). Intelligent techniques are implemented in the methods of operations research to reach the optimal solution or near-optimal solution.

The department seeks to maintain a distinguished academic reputation and to ensure that its graduates possess the knowledge, skill, and ability to make optimal decisions in scientific life. Operations research is defined as the use of scientific methods to solve complex problems in managing large systems of manpower, equipment, raw materials, and money in factories, government institutions, and the armed forces. The Department of Operations Research and Intelligent Techniques is a leading center in education and scientific research and contributes to providing the community with highly qualified scientific cadres.

Outcome 1

Oral and Written Communication

Graduates through training will be able to deal with a written and oral communication of scientific information. Training students and developing their abilities to interact and communicate with others and prepare them to solve real-life problems.

Outcome 2

Optimality

Graduates will be able to use the scientific methods in order to reduce costs and achieve the greatest profit within the available resource through treatment the problems.

Outcome 3

Scientific Knowledge

Graduates will be able to demonstrate a balanced concept of how scientific knowledge develops, including the historical development of foundational theories and laws and the nature of science. Graduates will be provided with scientific and practical skills through graduation projects and field training.

Outcome 4

Data Analyses

Graduates will be able to demonstrate scientific quantitative skills, such as the ability to conduct simple data analyses.

Outcome 5

Critical Thinking

Graduates will be able to use critical thinking and problem-solving skills to develop a research project and/or paper.

Outcome 6

Postgraduate program

Graduates will be able to study postgraduate in operations research and intelligent techniques. Preparing scientific personnel specialized in the postgraduate program and interaction with other sciences.

5- Academic Staff

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6. **Grading and GPA**

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

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:				
Number 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.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

CGPA = [(1st ^{m}odule score x ECTS) + (2nd ^{m}odule score x ECTS) + ……] / 240

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
OR101	Operation research (1)	78	72	6	Core	None
OR102	Calculus (1)	78	72	6	Core	None
OR103	Programming (1)	93	107	8	Basic	None
OR104	Linear Algebra	78	72	6	Basic	None
OR105	Human Rights	32	18	2	Support	None
OR106	English Language	32	18	2	Support	None

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
OR107	Operation research (2)	78	72	6	Core	Operation research (1)
OR108	Calculus (2)	78	72	6	Core	Calculus (1)
OR109	Programming (2)	93	107	8	Basic	Programming (1)
OR110	Elementary of Statistics	48	52	4	Basic	None
OR111	Democracy	32	18	2	Support	None
OR112	Computer Applications	63	37	4	Support	None

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
OR201	Integer and Dynamic Programming	78	72	6.00	C	Operations research (2)
OR202	Probability Theory (1)	78	72	6.00	C	None
OR203	Numerical Analysis (1)	78	72	6.00	B	None
OR204	Sequencing Problems	63	62	5.00	C	None
OR205	Differential Equations	63	62	5.00	B	Calculus (2)
OR206	Arabic Language	32	18	2.00	S	None

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
OR207	Probability Theory (2)	78	72	6.00	C	Probability Theory (1)
OR208	numerical Analysis (2)	78	72	6.00	B	Numerical Analysis(1)
OR209	Assignment Problems	78	72	6.00	C	None
OR210	Reliability Theory	63	62	5.00	B	None
OR2011	Game Theory	63	62	5.00	C	None
OR212	English Language	33	17	2.00	S	None

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
OR301	Unconstrained optimization (1)	78	72	6	C	Integer and Dynamic Programming
OR302	Inventory Models (1)	78	72	6	C	None
OR303	Intelligent Techniques (1)	63	62	5	C	None
OR304	Fuzzy logic (1)	63	62	5	C	None
OR305	English Language	32	18	2	S	None
OR306	Modeling and simulation	78	72	6	B	None

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
OR307	Unconstrained optimization (2)	78	72	6	C	Unconstrained optimization(1)
OR308	Inventory Models (2)	78	72	6	C	Inventory Models(1)
OR309	Intelligent Techniques (2)	63	62	5	C	Intelligent Techniques (1)
OR310	Fuzzy logic (2)	63	62	5	C	Fuzzy logic(1)
OR311	Neural Network	48	52	4	B	None
OR312	Decision Theory	63	37	4	B	None

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
OR401	Constrained Optimization (1)	78	72	6.00	C	Unconstrained optimization(2)
OR402	Queuing Theory (1)	78	72	6.00	C	None
OR403	Stochastic Process (1)	78	72	6.00	C	None
OR404	Regression Analysis (1)	63	62	5.00	B	Elementary of Statistics
OR405	Pattern Recognition	63	62	5.00	B	None
OR406	Scientific Search Method	32	18	2.00	B	None

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
OR407	Constrained Optimization (2)	78	72	6.00	C	Constrained Optimization (1)
OR408	Queuing Theory (2)	78	72	6.00	C	Queuing Theory (1)
OR409	Stochastic Process (2)	78	72	6.00	C	Stochastic Process(1)
OR410	Regression Analysis (2)	63	62	5.00	B	Regression Analysis(1)
OR411	English Language	32	18	2.00	S	None
OR412	project	48	77	5.00	C	Scientific Search Method

8. Contact

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