وزارة التعليم العالي والبحث العلمي

جهاز الاشراف والتقويم العلمي

دائرة ضمان الجودة والاعتماد الأكاديمي

قسم الاعتماد

Academic Program Description Guide 2024-2023

University of Mosul

College of Computer Science and Mathematics / Department of Operations Research and Intelligent Techniques

Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

Academic Description Program
2023-2024

Name university: Mosul
Name collage: Computer science And Mathematic
Name of department: Operations Research and Intelligent Technologies
File filling date: 1-4-2024

Signature:
Lecturer: Salih Mooaed Shaker

Department Head

Date: 24/4/2024

Signature:

The file has already been checked by

Director of Quality Assurance and Assesment Performance of the college of computer science and mathematic
Asst. Prof. Dr. Mohammed Chachan yonnis
Date: 24/4/2024

Signature:
Associate Dean for Scientific Affairs

Prof. Dr. Safwan Omar Hasoon

Date: 24/4/2024

Signature:
Approval of the Dean
Prof. Dr. Dhuha Basheer Abdullah
Date: 24/4/2024

Academic description

Of computer science and mathematic

1 .Educational institution	Mosul
2 .Academic Description Program	Operations Research and Intelligent Technologies
3. Name of the final certificate	Bachelor of Science in Operations Research and Intelligent Technologies
4 .System	Curses
6 .Accredited accreditation program	ABET
7 .Other external influences	Central admission
8 .Date the description was prepared	2024/4/1

.9 Objectives of the academic program

1 Continuous aspiration towards cognitive excellence in education and scientific research.

2 Training students and developing their abilities to interact and communicate with others and preparing them for the labor market

3 Acquiring scientific and practical skills through graduation projects and field training.

4 .Preparing students for postgraduate studies in the field of operations research and intelligent technologies.

5 .Preparing specialized scientific staff in the graduate program and interaction with other sciences.

10. Required learning outcomes, teaching, learning and assessment methods

A-Knowledge and understanding

A1- Introducing students to the purpose of teaching this content and the evaluation methods used, why the specific technology was chosen and how it can be used efficiently and effectively. It begins the learning process from easiest to most difficult, and builds on the learner's previous knowledge.

A2- A brief description of the knowledge that should be acquired:

A3- Study and understand the algorithms and data structures that underlie the development of all software

A4- Knowledge of scientific principles that are considered essential in the fields of application of operations research and intelligent technologies

A5- Study and understand models of programming languages and study at least one language from each model

A6- Study a number of specialized fields in computers. (Artificial intelligence, compiler design, database design, computer graphics and software engineering...)

Sufficient knowledge of the theoretical background to continue developing knowledge and skills after graduation, and the ability to read literature and conduct research and graduate studies in the field of specialization.

B - Subject-specific skills

B1 - Suspense and sequence of ideas

B2 - Previous academic level

B3 - Getting to know the latest programs and algorithms

B4- Blended learning by following the YouTube channels of the department's teaching staff and some educational platforms.

C- Thinking skills

C1- Encouraging knowledge contributions to ensure continuous improvement in teaching and scientific research processes and professional performance development

C2- Motivation through financial reward

C3-Honoring

C4- Developing thinking skills by developing alternatives, summarizing, and comparing conclusions.

D- Evaluation methods

D1 - Theoretical and practical tests - Written tests - Evaluation of oral discussions - Evaluation of individual and group assignments (research - Homework - Student reports and projects) - Evaluation of ability to present and deliver.

D2- The ability to design, implement and evaluate computer systems, processes, components and programs to meet required needs.

D3- Presenting real problems, conducting scientific analysis of them, and solving them programmatically through lectures and discussions, following induction and deduction for solution methods.

D4- General and transferable skills (other skills related to employability and personal development).

Teaching and learning methods

1- identify the scientific concepts and principles that will be learned and present them in the form of a question or problem.
2- Preparing the educational materials necessary to implement the lesson.
3- Formulating the problem in the form of sub-questions so that it develops the skill of imposing assumptions among the learners.
4- Determine the activities or exploratory experiences that the learners will carry out.
5- Evaluating learners and helping them apply what they have learned in new situations.
6- Writing reports - preparing research papers

Addressing problems and developing appropriate solutions to them on sound scientific foundations

Evaluation methods

Evaluating reports and research papers - evaluating individual and group costs - practical and written tests - evaluating group discussions and research seminars

Use their mental abilities to discover scientific concepts and principles

11. Program structure

Program Structure

Bologna Pathway – Level 1

2024-2023

Level 1-1st Corce

S	Subject	Code	Kind of Subject	SSWL (hr/w)					ECTS
				Class	Lecture	Pratical	Tutorail	Total	
1	Operations research (1)	OR101	Core	2	1	2		5	6
2	Calculus (1)	OR102	Core	2	1		2	5	6
3	Programming (1)	OR103	Elective	2	1			3	8
4	Linear Algebra	OR104	Elective	2	1		2	5	6
5	Democracy & Human Rights	UOM1040	Support	1	1			2	2
6	English Language 1	UOM1021	Support	1	1			2	2
Total				10	6	2	4	22	30

Level 1-2nd Corce

S	Subject	Code	Kind of Subject	SSWL (hr/w)					ECTS
				Class	Lecture	Pratical	Tutorail	Total	
1	Operations research (2)	OR107	Core	2	1	2		5	6
2	Calculus (2)	OR108	Core	2	1		2	5	6
3	Programming (2)	OR109	Elective	2	1			3	8
4	Elementary of Statistics	OR110	Elective	2	1		2	5	5
5	Arabic Language 1	UOM1011	Support	1	1			2	2
6	Computer 1	UOM1031	Support	1	1			2	3
Total				10	6	2	4	22	30

Program Structure

Second, Third and Fourth Stages (Course System)

2024-2023

stage 2 - 1st Corce

S	Subject	Code	Kind of Subject	No. of Hours				No. of Item
				Class	Pratical	Tutorail	Total	
1	Integer and Dynamic Programming	CMOR23-F2111	Core	3	__	1	4	3
2	Probability Theory (1)	CMOR23-F2121	Core	3	__	1	4	3
3	Numerical Analysis (1)	CMOR23-F2131	Support	2	2	—	4	3
4	Differential Equations	CMOR23-F2141	Elective	3	__	1	4	3
5	Quality Control	CMOR23-F2151	Elective	2	—	1	3	2
6	Data Mining	CMOR23-F2161	Core	3	__	1	4	3
7	Sequencing Problems	CMOR23-F2171	Core	2	—	—	2	2
Total				18	2	5	25	19

stage 2-2nd Corce

S	Subject	Code	Kind of Subject	No. of Hours				No. of Item
				Class	Pratical	Tutorail	Total	
1	Probability Theory (2)	CMOR23-F2211	Core	3	__	1	4	3
2	Numerical Analysis (2)	CMOR23-F2221	Support	2	2	__	4	3
3	Assignment Problems	CMOR23-F2231	Core	3	__	1	4	3
4	Game Theory	CMOR23-F2241	Core	2	—	1	3	2
5	Time Series	CMOR23-F2251	Elective	2	—	2	4	2
6	Elementary of Economic	CMOR23-F2261	Support	2	—	__	2	2
7	English Language (2)	CMOR23-F2271	Support	2	—	—	2	2
Total				16	2	5	23	17

stage 3 - 1st Corce

S	Subject	Code	Kind of Subject	No. of Hours				No. of Item
				Class	Pratical	Tutorail	Total	
1	Unconstrained Optimization (1)	CMOR23-F3111	Core	3	__	1	4	3
2	Stochastic Processes (1)	CMOR23-F3121	Core	3	__	1	4	3
3	Fuzzy Logic (1)	CMOR23-F3131	Core	3	__	1	4	3
4	Intelligent Techniques (1)	CMOR23-F3141	Elective	2	2	—	4	3
5	Inventory Models (1)	CMOR23-F3151	Core	2	__	1	3	2
6	Regression Analysis (1)	CMOR23-F3161	Core	2	__	1	3	2
7	Decision Theory	CMOR23-F3171	Core	2	__	1	3	2
Total				17	2	6	25	18

stage 3-2nd Corce

S	Subject	Code	Kind of Subject	No. of Hours				No. of Item
				Class	Pratical	Tutorail	Total	
1	Unconstrained Optimization (2)	CMOR23-F3211	Core	3	__	1	4	3
2	Stochastic Processes (2)	CMOR23-F3221	Core	3	__	1	4	3
3	Fuzzy Logic (2)	CMOR23-F3231	Core	3	__	1	4	3
4	Intelligent Techniques (2)	CMOR23-F3241	Core	2	2	—	4	3
5	Inventory Models (2)	CMOR23-F3251	Elective	2	__	1	3	2
6	Regression Analysis (2)	CMOR23-F3261	Elective	2	__	1	3	2
7	English Language (3)	CMOR23-F3271	Support	2	__	__	2	2
Total				17	2	5	24	18

stage 4-1st Corce

S	Subject	Code	Kind of Subject	No. of Hours				No. of Item
				Class	Pratical	Tutorail	Total	
1	Constrained Optimization (1)	CMOR23-F4111	Core	3	__	1	4	3
2	Queuing Theory (1)	CMOR23-F4121	Core	3	__	1	4	3
3	Neural Networks (1)	CMOR23-F4131	Core	3	__	1	4	3
4	Modeling	CMOR23-F4141	Core	2	2	—	4	3
5	Pattern Recognition	CMOR23-F4151	Elective	2	__	1	3	2
6	Scientific Search Method	CMOR23-F4161	Support	2	__	__	2	2
Total				17	2	5	24	18

stage 4-2nd Corce

S	Subject	Code	Kind of Subject	No. of Hours				No. of Item
				Class	Pratical	Tutorail	Total	
1	Constrained Optimization (2)	CMOR23-F4211	Core	3	__	1	4	3
2	Queuing Theory (2)	CMOR23-F4221	Core	3	__	1	4	3
3	Neural Networks (2)	CMOR23-F4231	Core	3	__	1	4	3
4	Modeling	CMOR23-F4241	Core	2	2	—	4	3
5	Reliability Theory	CMOR23-F4251	Elective	2	__	1	3	2
6	Pattern Recognition	CMOR23-F4261	Core	2	__	__	2	2
7	Search Project	CMOR23-F4271	Elective	__	4	__	4	2
Total				31	6	3	23	16

Curricular Skills Mapping

Please check the boxes corresponding to the individual learning outcomes from the program that are being assessed

year / Level	Course name	Code	Program Learning Outcomes (PLOs)																	
			Knowledge and understanding						Subject-specific skills				Thinking skills				Generic and Transferable Skills			
			1A	2A	3A	4A	5A	6A	1B	2B	3B	4B	1C	2C	3C	4C	1D	2D	3D	4D
First stage, first course	OR101	Operations research (1)	√	√	√	√	√	√	√	√	√	√	√			√	√	√	√	√
	OR102	Calculus (1)	√			√	√		√	√			√	√		√	√	√	√	
First stage, first course	OR103	Programming (1)	√	√	√	√			√	√	√	√		√	√	√				√
	OR104	Linear Algebra	√		√	√	√	√			√	√	√	√	√	√			√	√
First stage, first course	UOM104	Democracy & Human Rights	√	√	√	√			√	√	√	√	√	√			√	√	√	
	UOM102	English Language	√	√	√	√	√	√	√	√	√	√			√	√	√	√	√	√

Curricular Skills Mapping																			
Please check the boxes corresponding to the individual learning outcomes from the program that are being assessed																			
			Program Learning Outcomes (PLOs)																
year / Level	Course name	Code	Knowledge and understanding						Subject-specific skills				Thinking skills				Generic and Transferable Skills			
			1A	2A	3A	4A	5A	6A	1B	2B	3B	4B	1C	2C	3C	4C	1D	2D	3D	4D
First stage Second course	Operations research (2)	OR107	√		√	√		√	√	√	√	√	√		√	√	√		√	√
	Calculus (2)	OR108	√	√	√	√	√	√		√	√	√	√		√	√	√	√		
First stage Second course	Programming (2)	OR109	√	√	√		√	√	√	√		√	√		√	√	√	√	√	√
	Elementary of Statistics	OR110	√	√	√		√	√		√	√		√	√	√		√		√	√
First stage Second course	Arabic Language	UOM101	√		√	√	√	√	√	√		√	√	√	√		√	√	√	
	Computer	UOM103	√	√	√		√		√	√	√	√		√	√		√	√	√	√

Curricular Skills Mapping																			
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			Program Learning Outcomes (PLOs)																
year / Level	Course name	Code	Knowledge and understanding						Subject-specific skills				Thinking skills				Generic and Transferable Skills			
			1A	2A	3A	4A	5A	6A	1B	2B	3B	4B	1C	2C	3C	4C	1D	2D	3D	4D
Second stage, first course	Integer and Dynamic Programming	CMOR23-F2111	√	√		√	√	√	√	√	√	√		√	√	√	√	√	√	√
	Probability Theory (1)	CMOR23-F2121	√	√	√	√	√		√	√		√	√	√	√		√		√	√
Second stage, first course	Numerical Analysis (1)	CMOR23-F2131	√	√	√	√		√	√	√		√	√	√	√		√	√	√	√
	Differential Equations	CMOR23-F2141	√		√	√	√		√	√		√	√		√	√	√		√	
Second stage, first course	Quality Control	CMOR23-F2151	√	√	√	√	√	√	√		√	√	√		√	√	√	√	√	√
	Data Mining	CMOR23-F2241	√	√		√	√		√	√	√		√	√	√		√		√	
Second stage, first course	Sequencing Problems	CMOR23-F2171	√	√		√	√	√	√		√	√		√	√	√	√	√	√	√

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			Program Learning Outcomes (PLOs)																
Year/ Level	Course name	Code	Knowledge and understanding						Subject-specific skills				Thinking skills				Generic and Transferable Skills			
			1A	2A	3A	4A	5A	6A	1B	2B	3B	4B	1C	2C	3C	4C	1D	2D	3D	4D
Second stage, second course	Probability Theory (2)	CMOR23-F2211	√	√		√	√	√	√	√	√	√	√		√	√	√	√	√	√
	Numerical Analysis (2)	CMOR23-F2221	√	√	√		√	√	√		√	√	√		√	√	√		√	√
Second stage, second course	Assignment Problems	CMOR23-F2231	√	√	√	√		√	√	√	√	√	√	√	√		√	√	√	
	Game Theory	CMOR23-F2161	√	√		√	√	√	√	√	√	√	√		√	√		√	√	√
Second stage, second course	Time Series	CMOR23-F2251	√	√		√	√		√		√	√		√	√	√		√	√	√
	Elementary of Economic	CMOR23-F2261	√	√	√	√		√	√	√	√	√		√	√	√	√	√		√
Second stage, second course	English Language (2)	CMOR23-F2271	√	√	√	√		√	√	√	√	√	√		√		√	√	√	√

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year / Level	Course name	Code	Program Learning Outcomes (PLOs)																	
			Knowledge and understanding						Subject-specific skills				Thinking skills				Generic and Transferable Skills			
			1A	2A	3A	4A	5A	6A	1B	2B	3B	4B	1C	2C	3C	4C	1D	2D	3D	4D
Third stage, first course	Unconstrained Optimization (1)	CMOR23-F3111		√	√	√	√	√	√		√	√	√		√	√	√	√	√	
	Stochastic Processes (1)	CMOR23-F3121	√	√	√		√	√	√	√		√	√	√	√	√			√	√
Third stage, first course	Fuzzy Logic (1)	CMOR23-F3131	√	√	√	√	√		√	√	√	√		√	√	√	√	√	√	√
	Intelligent Techniques (1)	CMOR23-F3141	√		√	√	√		√	√		√	√	√		√	√	√		√
Third stage, first course	Inventory Models (1)	CMOR23-F3151	√	√		√	√	√	√	√		√	√	√	√	√	√		√	√
	Regression Analysis (1)	CMOR23-F3161	√	√	√	√		√	√	√	√	√		√	√		√	√	√	
Third stage, first course	Decision Theory	CMOR23-F3171	√	√	√	√	√	√		√		√	√	√	√	√	√	√	√	√

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year / Level	Course name	Code	Program Learning Outcomes (PLOs)																
			Knowledge and understanding						Subject-specific skills				Thinking skills				Generic and Transferable Skills			
			1A	2A	3A	4A	5A	6A	1B	2B	3B	4B	1C	2C	3C	4C	1D	2D	3D	4D
Third stage, second course	Unconstrained Optimization (2)	CMOR23-F3211	√			√	√	√		√	√	√	√	√	√		√	√	√	√
	Stochastic Processes (2)	CMOR23-F3221	√	√	√	√		√	√	√	√	√	√		√	√	√		√	√
Third stage, second course	Fuzzy Logic (2)	CMOR23-F3231		√	√	√	√		√		√	√	√	√	√	√		√	√	√
	Intelligent Techniques (2)	CMOR23-F3241	√		√	√	√	√		√	√	√		√	√	√	√	√		√
Third stage, second course	Inventory Models (2)	CMOR23-F3251	√	√	√		√	√	√	√	√	√	√		√	√		√	√	√
	Regression Analysis (2)	CMOR23-F3261	√	√	√	√		√	√	√		√	√	√		√	√		√	√
Third stage, second course	لغة انكليزية (3) English Language (3)	CMOR23-F3271	√	√		√	√		√	√	√		√	√	√		√	√	√	√

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			Program Learning Outcomes (PLOs)																
year / Level	Course name	Code	Knowledge and understanding						Subject-specific skills				Thinking skills				Generic and Transferable Skills			
			1A	2A	3A	4A	5A	6A	1B	2B	3B	4B	1C	2C	3C	4C	1D	2D	3D	4D
Fourth stage, first course	Constrained Optimization (1)	CMOR23-F4111		√	√	√	√	√	√	√	√		√	√		√	√		√	√
	Queuing Theory (1)	CMOR23-F4121	√	√		√		√	√	√	√		√	√	√	√		√	√	√
Fourth stage, first course	Neural Networks (1)	CMOR23-F4131	√	√	√	√		√	√	√	√	√	√	√		√	√	√	√	√
	Modeling	CMOR23-F4141	√	√		√	√	√	√	√		√	√	√	√	√		√	√	
Fourth stage, first course	Pattern Recognition	CMOR23-F4151		√		√	√		√	√	√	√	√	√		√	√	√	√	√
	Scientific Search Method	CMOR23-F4171	√	√	√	√	√	√	√	√	√		√	√	√	√	√		√	

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			Program Learning Outcomes (PLOs)																
year / Level	Course name	Code	Knowledge and understanding						Subject-specific skills				Thinking skills				Generic and Transferable Skills			
			1A	2A	3A	4A	5A	6A	1B	2B	3B	4B	1C	2C	3C	4C	1D	2D	3D	4D
Fourth stage, second course	Constrained Optimization (2)	CMOR23-F4111		√	√	√	√	√	√	√	√		√	√		√	√		√	√
	Queuing Theory (2)	CMOR23-F4121	√	√		√		√	√	√	√		√	√	√	√		√	√	√
Fourth stage, second course	Neural Networks (2)	CMOR23-F4131	√	√	√	√		√	√	√	√	√	√	√		√	√	√	√	√
	Modeling	CMOR23-F4141	√	√		√	√	√	√	√		√	√	√	√	√		√	√	
Fourth stage, second course	Reliability Theory	CMOR23-F4161		√		√	√		√	√	√	√	√	√		√	√	√	√	√
	Pattern Recognition	CMOR23-F4151	√	√	√	√	√	√	√	√	√		√	√	√	√	√		√	
	Search Project	CMOR23-F4161	√	√		√		√	√	√	√		√	√	√	√		√	√	√