

**Ministry of Higher Education and Scientific Research**  
**Scientific Supervision and Scientific Evaluation Apparatus**  
**Directorate of Quality Assurance and Academic**  
**Accreditation**  
**Accreditation Department**



# **Academic Program and Course Description Guide**

**2024**

## Academic Program Description Form

**University Name:** University of Diyala

**Faculty/Institute:** Collage of Education for Pure Science

**Scientific Department:** Computer department

**Academic or Professional Program Name:** BSc.

**Final Certificate Name:** BSc. In Computer science

**Academic System:** Yearly

**Description Preparation Date:** 20/11/2023

**File Completion Date:** 20/2/2024

**Signature:**

**Head of Department Name:**

**Prof. Dr. Nehad Mahmoud Nasir**

**Date:**

**Signature:**

**Scientific Associate Name:**

**Prof. Dr. Khansa Farman**

**Date:**

**The file is checked by:**

**Department of Quality Assurance and University Performance**

**Director of the Quality Assurance and University Performance Department:**

**Date:**

**Signature:**

**Approval of the Dean**

## 1. Program Vision

The program vision for an operating systems course aims to develop students' understanding and ability to:

- **Grasp the core concepts:** This includes understanding the fundamental principles that govern the interaction between hardware and software, processes, memory management, file systems, security, and concurrency control.
- **Apply theoretical knowledge:** Students should be able to apply the learned concepts to solve practical problems in operating system design and configuration.

By achieving this program vision, students will gain a solid foundation for working with and potentially contributing to the development of operating systems that power today's technology.

## 2. Program Mission

The program vision describes the desired long-term outcome of the operating systems course, focusing on the knowledge and skills students will possess after completing it.

The program mission, however, would be a more specific statement outlining the key steps the course takes to achieve that vision. Here's how the program mission might be derived from the vision:

Program Mission:

- To equip students with a comprehensive understanding of operating system concepts through theoretical foundations and practical application.
- To foster critical thinking skills that allow students to analyze and compare operating system designs.
- To provide a strong foundation for further study and careers in computer science related to operating systems.

The program mission translates the vision's broad goals into actionable steps by highlighting the methods used (e.g., theoretical foundations, practical application) to achieve the desired student outcomes.

## 3. Program Objectives

Based on the program vision for the operating systems course, here are the possible Program Objectives:

- Explain the fundamental functionalities and services provided by an operating system.
- Analyze the core components of an operating system, including processes, memory

management, file systems, and security mechanisms.

- Evaluate different scheduling algorithms and their impact on system performance.
- Design and implement solutions for process synchronization and inter-process communication.
- Apply knowledge of virtual memory to analyze memory management techniques.
- Explain the structure and organization of file systems, including file access methods and directory structures.
- Discuss security principles and mechanisms employed by operating systems.
- Compare and contrast different types of operating systems (e.g., batch, multiprogramming, real-time).

These objectives translate the program vision's broad goals into more specific and measurable learning outcomes. By achieving these objectives, students will be well on their way to fulfilling the program's vision.

#### 4. Program Accreditation

No

#### 5. Other external influences

No

#### 6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	17	9.3%	
College Requirements	9	36	19.7%	
Department Requirements	20	129	69.2%	
Summer Training				
Other				

\* This can include notes whether the course is basic or optional.

#### 7. Program Description

Year/Level	Course Code	Course Name	Credit Hours
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			theoretical	practical
Year	Logical design	101CSLD	2	2
Year	Structured Programming	102CSSP	3	2
Year	Computer technique and organization	103CSCO	2	2
Year	Discrete structures	104CSDS	3	
Year	Mathematics	105CSMA	3	
Year	Educational psychology	106CESES	2	
Year	Fundamentals of Education	107CSFE	2	
Year	Arabic language	108CSAL	1	
Year	English language	109CSEL	1	
Year	Democracy and human rights	110CSHD	2	
Year	Data structures and algorithms	201CSDA	3	2
Year	Object oriented programming	202CSOP	3	2
Year	Microprocessors	203CSMP	2	2
Year	System analysis and database design	204CSSA	2	2
Year	Computational theory	205CSCT	2	
Year	Numerical analysis	206CSNA	2	2
Year	Curriculum of scientific research	207CSEL	1	
Year	English Language	208CSSR	2	
Year	Education administration and secondary education	209CSDP	2	
Year	Philosophy of Education	210CSEM	2	
Year	Artificial intelligence	301CSAI	2	2
Year	Computer graphics	302CSCG	2	2
Year	Visual basic	303CSVB	2	2
Year	Compilers	304CSCO	2	2
Year	Computer architecture	305CSCA	2	
Year	Software engineering	306CSSE	2	
Year	Advanced database design	307CSDB	1	2
Year	Curriculum and methods of teaching	308CSCT	2	
Year	Psychological counseling and psychological health	309CSAP	2	
Year	Data security	401CSDS	2	2
Year	Computer networks and Communication	402CSCN	2	2
Year	Operating systems	403CSOS	2	2
Year	Image processing	404CSIP	2	2
Year	Web design	405CSWD	2	2

<b>Year</b>	Research Project	<b>406CSP</b>	<b>2</b>	
<b>Year</b>	Measurement and evaluation	<b>407CSME</b>	<b>2</b>	
<b>Year</b>	Practicum	<b>408CSV</b>	<b>1</b>	<b>3</b>

## 8. Expected learning outcomes of the program

### Knowledge

1. Providing students with integrated scientific knowledge in the field of computer science in a high-quality manner.
2. The ability to apply the scientific knowledge he has acquired in the field of computers, mathematics, and other sciences in a way that ensures achieving cognitive communication between them and benefiting from modern developments.
3. Preparing highly qualified professionals specialized in the field of computer science in order to effectively contribute to establishing the knowledge society and achieving national development goals by preparing an optimal academic environment for developing knowledge and imparting skills in research and innovation in the field of computers.
4. Achieving exposure to the applied reality within governmental and private educational institutions by employing the techniques, skills, technical tools and modern technology required to practice the teaching profession.

### Skills

1. That the student masters the basic and advanced programming skills required to enrich their intellectual and artistic talent in this field of computer science and its various applications.
2. To master the skills required to manage information systems, databases, and design websites with high efficiency.
3. To be proficient in preparing scientific research in a manner that takes into account an integrated scientific methodology.
4. To master the correct educational and psychological method of dealing within educational institutions.
5. Possessing the required professional skills in the field of software development and projects that make them confident in developing high-quality software solutions in various application fields under different realistic constraints.

### Ethics

1. Appreciating the greatness of the Creator, Glory be to Him, in creating the human mind

and making it capable. On creativity in various fields

2. Participation and success in their professional lives through teamwork, sound ethical behavior, and effective communication among themselves.
3. Gain and understand the importance of lifelong learning through professional development and practical training.
4. Appreciating the efforts of scientists in developing software and delivering scientific knowledge in the field of computer science to the level of progress and development it has reached.

### 9. Teaching and Learning Strategies

- Traditional lectures and discussion method.
- Laboratory activities and additional exercises as assignments.
- Scientific books.
- Daily and monthly exams

### 10. Evaluation methods

- Theoretical tests
- Practical tests
- Reports and projects

### 11. Faculty

#### Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
prof	Computer science	Modelling			1	
prof	Physics	Solid			1	
prof	Psychology	Educational Philosophy			1	
An assistant professor	Computer science	Databases			1	

An assistant prof	Computer science	Image Processing			1	
An assistant prof	Computer science	Information Systems			1	
An assistant prof	Computer science	Networks			1	
An assistant prof	Computer science	Modelling			1	
An assistant prof	Mathematics	Algebra topology			1	
An assistant prof	Computer science	Data security			1	
An assistant prof	Networks	Data security			1	
An assistant prof	Computer science	Information technology			1	
An assistant prof	Computer science	Modelling			1	1
Lecture	Electronic engineering	Electronic engineering			1	
Lecture	Computer science	Networks			1	
Lecture	Computer science	Artificial Intelligence			1	
Lecture	Electrics engineering	Machine learning			1	
Lecture	Computer engineering	Computer engineering			1	
Lecture	Computer science	Information technology			1	



Assistant Lecture	Computer science	Computer science			3	
An assistant prof	Mathematics	Mathematics				

#### Professional development

##### Orienting new faculty members

1. Identifying the vision, the strategic plan, and the role of the teaching member in achieving it
2. Modern teaching methods in the field of learning (including the integration of technology)
3. Introducing methods of dealing with distinguished and creative students (developing students with talents and abilities)
4. Introduction to job performance evaluation
5. Introducing the diversity of distance learning methods and uploading files and electronic examinations
6. Clarifying quality requirements, course specifications, and training plan
7. Knowing the rights and duties of teachers

#### Professional development for faculty members

##### 1. Self-methods:

Conversations with colleagues, reading and writing about teaching, attending workshops, panel discussions, and participating in other activities provide opportunities to reflect on teaching and search for new teaching methods through personal or peer teaching.

##### 2. Professional methods:

Conferences, educational workshops, distance learning and some other methods of

professional development:

Vocational qualification, cooperation programs between colleagues, missions (scholarships), practical training

## 12. **Acceptance Criterion**

Central admission

## 13. **The most important sources of information about the program**

The college and university websites/University guide/Guidance guide for the college and department/Books and resources in the department/

## 14. **Program development plane**

Developing and creating specialized scientific laboratories such as Arduino so that students can learn about the latest modern technologies

Curriculum skills chart															
				Learning outcomes required from the programme											
Year	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First Stage	Logical design	101CSLD	Basic	X	X	X	X	X	X	X	X	X	X	X	
	Structured Programming	102CSSP	Basic	X	X	X	X	X	X	X	X	X	X	X	
	Computer technique and organization	103CSCO	Basic	X	X	X	X	X	X	X	X	X	X	X	
	Discrete structures	104CSDS	Basic	X	X	X		X	X	X	X	X	X	X	
	Mathematics	105CSMA	Basic	X	X	X	X	X	X	X		X	X	X	X
	Educational psychology	106CESES	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	Fundamentals of Education	107CSFE	Basic	X	X	X		X	X	X		X	X	X	X
	Arabic language	108CSAL	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	English language	109CSEL	Basic	X	X	X		X	X	X	X	X	X	X	
	Democracy and human rights	110CSHD	Basic	X	X	X		X	X	X		X	X	X	X
Second Stage	Data structures and algorithms	201CSDA	Basic	X	X	X		X	X	X		X	X	X	
	Object oriented programming	202CSOP	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	Microprocessors	203CSMP	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	System analysis and database design	204CSSA	Basic	X	X	X		X	X	X		X	X	X	
	Computational theory	205CSCT	Basic	X	X	X		X	X	X		X	X	X	
	Numerical analysis	206CSNA	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	Curriculum of scientific research	207CSEL	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	English Language	208CSSR	Basic	X	X	X	X	X	X	X	X	X	X	X	X
	Education administration and	209CSDP	Basic	X	X	X	X	X	X	X	X		X	X	X

	secondary education														
	Philosophy of Education	<b>210CSEM</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Third Stage</b>	Artificial intelligence	<b>301CSAI</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Computer graphics	<b>302CSCG</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Visual basic	<b>303CSVB</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Compilers	<b>304CSCO</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Computer architecture	<b>305CSCA</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Software engineering	<b>306CSSE</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Advanced database design	<b>307CSDB</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Curriculum and methods of teaching	<b>308CSCT</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Psychological counseling and psychological health	<b>309CSAP</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Fourth Stage</b>	Data security	<b>401CSDS</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Computer networks and Communication	<b>402CSCN</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Operating systems	<b>403CSOS</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>	
	Image processing	<b>404CSIP</b>	<b>Basic</b>	<b>X</b>	<b>X</b>			<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>	
	Web design	<b>405CSWD</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Research Project	<b>406CSP</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Measurement and evaluation	<b>407CSME</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
	Practicum	<b>408CSV</b>	<b>Basic</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>