

*Republic of Iraq*

*Ministry of Higher Education & Scientific Research*

*Supervision and Scientific Evaluation Directorate*

*Quality Assurance and Academic Accreditation*

*Academic Program Specification Form For The  
Academic*

*University: University of Baghdad*

*College : Al\_Khwarizmi College of Engineering*

*Number Of Departments In The College :5*

*Date Of Form Completion :11/10/2023*

*Dean's Name*

*Dean's Assistant For  
Scientific Affairs*

*The College Quality Assurance  
And University Performance  
Manager*

*Date : / /*

*Date : / /*

*Date : / /*

*Signature*

*Signature*

*Signature*

*Quality Assurance And University Performance Manager*

*Date : / /*

*Signature*

## TEMPLATE FOR PROGRAMME SPECIFICATION

### HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

#### PROGRAMME SPECIFICATION

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the programme.

1. Teaching Institution	University of Baghdad/Al_Khwarizmi College of Engineering
2. University Department/Centre	Information and Communication Engineering
3. Programme Title	Programming Paradigms / <b>ICE 213</b>
4. Title of Final Award	
5. Modes of Attendance offered	Attendance is according to the university rules in 2023-2024
6. Accreditation	Abet
7. Other external influences	
8. Date of production/revision of this specification	Oct/2023
9. Aims of the Programme	

To provide students with an understanding of various principles and paradigms in programming languages; Also develop skills in describing, analyzing, and using the features of programming languages.

## 10. Learning Outcomes, Teaching, Learning and Assessment Methods

### A. Cognitive goals

- A1. Understand the general language design principles.
- A2. Understand the control flow and execution of a programming language.
- A3. Be aware of different programming paradigms.
- A4. Evaluate the design of a given programming language for the application at hand.

### B. The skills goals special to the programme .

- B1. Distinguish between several types of Programming Language paradigms.
- B2. Recognize the basic syntax differences of common programming language types.
- B3. Discuss the scope and memory management of several programming languages paradigms.
- B4. Describe the basics of functional programming, object oriented programming, logic programming paradigms with proper examples.
- B5. Choose specific programming language for types of real life problems

### Teaching and Learning Methods

### Assessment methods

Seminar -- 5%  
Quizzes --10%  
Lab -- 20  
Midterm --15%  
Final -- 50%

### C. Affective and value goals

- C1. Think critically for a specific design and the rationale behind.
- C2. Given an algorithm a student will be able to formulate a program that correctly implements the algorithm.
- C3. Students will be able to generate different patterns and flows using control structures.
- C4. Students will implement method overloading in their code.
- C5. Students will be able to demonstrate reusability with the help of inheritance.
- C6. Students will be able to make more efficient programs.

### Teaching and Learning Methods

### Assessment methods

Seminar -- 5%  
Quizzes --10%  
Lab -- 20  
Midterm --15%  
Final -- 50%

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Ability to design and conduct experiments.

D2. Ability to design a system, component or process to meet desired needs

#### Teaching and Learning Methods

#### Assessment Methods

Seminar -- 5%

Quizzes --10%

Lab -- 20

Midterm --15%

Final -- 50%

#### 11. Programme Structure

Level/Year

Course or  
Module  
Code

Course or Module  
Title

Credit  
rating

12. Awards and Credits

second		Programming Paradigms		Bachelor Degree Requires ( 4 ) credits

### 13. Personal Development Planning

1. Provide strong foundation in mathematical, scientific and engineering fundamentals necessary to analyze, formulate and solve engineering problems in the field of Information and Communication Engineering.
2. Enhance the skills and experience in defining problems in Information and Communication Engineering design and implement, analyzing the experimental evaluations, and finally making appropriate decisions.
3. Enhance their skills and embrace new Information and Communication Engineering Technologies through self-directed professional development and post-graduate training or education.

### 14. Admission criteria .

According to the rules of Ministry of Higher Education and Scientific Research in Iraq.

#### 15. Key sources of information about the programme

1. Books
2. Trusted Internet sources related to the Program
3. Papers.





## COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad/Al_Khwarizmi College of Engineering
2. University Department/Centre	Information and Communication Engineering
3. Course title/code	Programming Paradigms / <b>ICE 232</b>
5. Modes of Attendance offered	attendance is mandatory according to the university rules
6. Semester/Year	2023-2024
7. Number of hours tuition (total)	90
8. Date of production/revision of this specification	Oct/2023
9. Aims of the Course	To provide students with an understanding of various principles and paradigms in programming languages; Also develop skills in describing, analyzing, and using the features of programming languages.

### 10. Learning Outcomes, Teaching ,Learning and Assessment Method

#### A. Cognitive goals

- A1. Understand the general language design principles.
- A2. Understand the control flow and execution of a programming language.
- A3. Be aware of different programming paradigms.
- A4. Evaluate the design of a given programming language for the application at hand.

B. The skills goals special to the programme .

B1.Distinguish between several types of Programming Language paradigms.

B2.Recognize the basic syntax differences of common programming language types.

B3.Discuss the scope and memory management of several programming languages paradigms.

B4.Describe the basics of functional programming, object oriented programming, logic programming paradigms with proper examples.

B5.Choose specific programming language for types of real life problems

Teaching and Learning Methods

Assessment methods

Seminar -- 5%

Quizzes --10%

Lab -- 20

Midterm --15%

Final -- 50%

C. Affective and value goals

C1. Think critically for a specific design and the rationale behind.

C2.Given an algorithm a student will be able to formulate a program that correctly implements the algorithm.

C3.Students will be able to generate different patterns and flows using control structures.

C4.Students will implement method overloading in their code.

C5.Students will be able to demonstrate reusability with the help of inheritance.

C6.Students will be able to make more efficient programs.

Teaching and Learning Methods

### Assessment methods

Seminar -- 5%  
Quizzes --10%  
Lab -- 20  
Midterm --15%  
Final -- 50%

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Ability to design and conduct experiments.

D2. Ability to design a system, component or process to meet desired needs

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		<b>Introduction to Programming Paradigm</b> <ul style="list-style-type: none"> <li>▪ Imperative or Procedural Programming Paradigms</li> <li>▪ Introduction to Object-Oriented Programming - Objects and classes in Java</li> <li>▪ Defining classes- Using Predefined Classes</li> <li>▪ Defining Your Own Classes</li> </ul>	Classroom with Lab	Quizzes + Assignments
2	3		<ul style="list-style-type: none"> <li>▪ Python Data Structures</li> <li>▪ Lists: creation, indexing, slicing, and manipulation</li> <li>▪ Tuples: creation, unpacking, immutability</li> </ul>	Classroom with Lab	Quizzes + Assignments
3	3		<ul style="list-style-type: none"> <li>• Dictionaries: creation, key-value pairs, dictionary methods.</li> <li>• Arrays: creation, manipulation, array operations</li> </ul>	Classroom with Lab	Quizzes + Assignments
4	3		<b>Strings and Regular Expressions</b> <ul style="list-style-type: none"> <li>▪ String operations: concatenation, formatting, slicing</li> <li>▪ Regular expressions: pattern matching, search, substitution</li> </ul>	Classroom with Lab	Quizzes + Assignments
5	3		<b>Strings and Regular Expressions</b> <ul style="list-style-type: none"> <li>▪ String operations: concatenation, formatting, slicing</li> <li>▪ Regular expressions: pattern matching, search, substitution</li> </ul>	Classroom with Lab	Quizzes + Assignments
6	3		<b>Introduction to NumPy</b> <ul style="list-style-type: none"> <li>▪ NumPy arrays: creation, indexing, slicing</li> </ul>	Classroom with Lab	Quizzes + Assignments
7	3		<ul style="list-style-type: none"> <li>▪ Array operations: arithmetic, statistical, and logical operations</li> </ul>	Classroom with Lab	Quizzes + Assignments
8	3		<b>Functional Programming</b> <ul style="list-style-type: none"> <li>• Functional programming concepts</li> </ul>	Classroom with Lab	Quizzes + Assignments

			<ul style="list-style-type: none"> <li>• Lambda functions and higher-order functions</li> </ul>		
			Iterators and generators		
9	3		<p>Object-Oriented Programming (OOP)</p> <ul style="list-style-type: none"> <li>▪ OOP principles: classes, objects, inheritance, polymorphism</li> </ul>	Classroom with Lab	Quizzes + Assignments
10	3		Encapsulation, abstraction, and data hiding	Classroom with Lab	Quizzes + Assignments
11	3		<ul style="list-style-type: none"> <li>▪ Class methods, static methods, and instance methods</li> </ul>	Classroom with Lab	Quizzes + Assignments
12	3		<ul style="list-style-type: none"> <li>▪ Exception handling and error management</li> </ul>	Classroom with Lab	Quizzes + Assignments
13	3		<p>Multithreading and Concurrency</p> <ul style="list-style-type: none"> <li>▪ Basics of multithreading</li> </ul>	Classroom with Lab	Quizzes + Assignments
14	3		<ul style="list-style-type: none"> <li>▪ Thread creation and synchronization</li> </ul>	Classroom with Lab	Quizzes + Assignments
15	3		<ul style="list-style-type: none"> <li>▪ Thread safety and race conditions</li> <li>▪ Thread pools and parallel execution</li> </ul>	Classroom with Lab	Quizzes + Assignments

11. Infrastructure	
<p>Required reading:</p> <ul style="list-style-type: none"> <li>· CORE TEXTS</li> <li>· COURSE MATERIALS</li> <li>· OTHER</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Text book 1:</b> Concept of Programming Languages, Robert W. Sebesta, Addison-Wesley (Publisher), 12th Edition, 2019..</li> <li>▪ <b>Text book 2:</b> Allen B. Tucker and Robert E. Noonan, Programming Languages: Principles and Paradigms, Second Edition, McGraw-Hill, 2007.</li> <li>▪ <b>Text book 3:</b> . John M. Zelle, Python Programming: An Introduction to Computer Science, 3rd Edition, 2016.</li> </ul>
Special requirements (include for example workshops, periodicals, IT software, websites)	<a href="https://www.youtube.com/channel/UckhIUSUR70COFhV9KT3dfQA">https://www.youtube.com/channel/UckhIUSUR70COFhV9KT3dfQA</a>
Community-based facilities (include for example, guest Lectures , internship , field studies)	Summer training, Scientific visits.