هيئة تقويم التعليم والتدريب
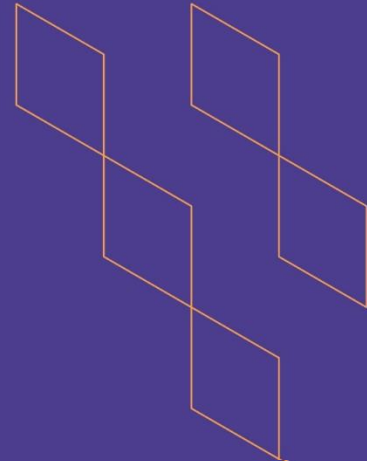Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title: **Principles of Programming Languages**

Course Code: **COMP316**

Program: **Bachelor in Computer Science**

Department: **Computer Science**

College: **College of Computer Science and Information Technology**

Institution: **Jazan University**

Version: **V2**

Last Revision Date: **12 September 2021**

Table of Contents:

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Content	Page
A. General Information about the course	3
1. Teaching mode (mark all that apply) 2. Contact Hours (based on the academic semester)	4
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	4
C. Course Content	5
D. Student Assessment Activities	6
E. Learning Resources and Facilities	6
1. References and Learning Resources	6
2. Required Facilities and Equipment	7
F. Assessment of Course Qualit	7
G. Specification Approval Data	8

A. General information about the course:

Course Identification					
1. Credit hours:	3				
2. Course type					
a.	University ☐	College ☐	Department ☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered:		Level 8/Year 3			

4. Course general Description

This course aims to introduce the basic principles of syntax, semantic, theory and computational behavior of programs in terms of investigating how the programming languages are. It discusses the concepts of datatypes, type-checking, binding and their scope in various programming languages including the concepts of subprograms. It also discusses the basic concepts of functional and logic programming languages.

5. Pre-requirements for this course (if any):
None

6. Co- requirements for this course (if any):
None

7. Course Main Objective(s)

- Analyze different data types and their abstraction level.
- Understand the various syntaxes to form expressions and other statements in programs.
- Explain the working styles of procedures, passing parameters and their pros and cons.
- Demonstrate designs of decision–making problems using different programming approach including modular, top-down, bottom-up, procedural and object-oriented.
- Describe and use the essential needs of thread and exception in programs.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	44	80%
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning (Self Learning)	11	20%

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	22
2.	Laboratory/Studio	22
3.	Field	
4.	Tutorial	
5.	Others (specify)	8
	Total	52

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recognize program forms such as control transformation, variable binding, and type checking.	K1	Lectures/Presentations Media lectures	Assignment – 1 Exam-1 Final exam
…				
2.0	Skills			
2.1	Analyze the behavior of programming languages by writing interpreters for lexically scoped language with first-class procedures and recursion.	S3	Lectures /Presentations Lab demonstration	Exam-2 Final exam Lab exam
2.2	Use data representation of different languages to explore call-by-reference, call-by-value,	S1	Lectures /Presentations Lab demonstration	Assignment – 2 Exam-2 Final exam
2.3	Apply data abstractions through interfaces and specifications to investigate implementation strategies	S2	Lectures /Presentations Lab demonstration	Exam-1 Lab exam Final exam
…				
3.0	Values, autonomy, and responsibility			
3.1	**Demonstrate** the ability to work in a group to achieve common assignments and activities for interpreter programming	V2	Group Discussion	Assignment – 2 (Group discussion in the lab)
3.2				

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
...				

C. Course Content

No	List of Topics	Contact Hours
1.	**Introduction** Introduction to study of Programming languages, Programming Domains, Language Evaluation Criteria, Language Categories, Implementation Systems, Programming Environments.	2T+ 2P
2.	**Syntax and Semantics** Describing Syntax, Context-free Grammar, BNF and Extended BNF, Describing Semantics – Static Semantics and Dynamic Semantics	4T + 4P
3.	Lexical and Syntax Analysis Lexical Analysis, Parsers, The Parsing problem, Bottom-up parsing	2T+ 2P
4.	**Names, Bindings and Scope** Names, Variables, The concept of Binding	2T+ 2P
5.	**Names, Bindings and Scope** Scope, Scope and Lifetime	2T+ 2P
6.	**Data Types** Primitive Data types, Array Types, Record Types, Type Checking, Strong Typing	2T+ 2P

7.	**Expressions and Assignment Statements** Arithmetic Expressions- Precedence, Associativity, Parentheses, Conditional Expressions, Relational and Boolean Expressions, Short-Circuit Evaluation, Assignment Statements.	2T+ 2P
8.	**Subprograms** Fundamentals of Subprograms, Design Issues, Parameter Passing Methods, Parameter passing models. Design Issues of Functions, Closures, Coroutines	3T+ 3P
9.	**Functional and Logic Programming Languages** Fundamentals of Functional language, Introduction to Lisp and Scheme Predicate Calculus, Overview of Logic Programming, Prolog Basics.	3T+ 3P
Total		22T+22P

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	6th-7th week	15%
2.	Assignment I	3rd week	10%
3.	Assignment II (Case Study/ Group assignment)	6th-7th week	15%
4.	Lab Exam + Lab Assignment	As per schedule	20%
5.	Final Theory Exam	As per schedule	40%
...			

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities
1. References and Learning Resources

Essential References	Robert W. Sebesta, "Concepts of Programming Languages", Eleventh Edition 2016, Pearson Education, ISBN: 978-0-13-394302-3
Supportive References	JAVA: The Complete Reference, Herbert Scheldt, McGraw-Hill, 10th edition 2017, ISBN: 978-1-259-58933-1
Electronic Materials	• http://hyperpolyglot.org • www.coursera.org • www.udacity.com
Other Learning Materials	Online tutorial

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	• Classroom equipped with projector, whiteboard, and sufficient seating arrangements. • Lab with software installed and individual computer terminal for each student.
Technology equipment (projector, smart board, software)	• Whiteboards and projectors for classroom and labs • Computer Lab equipped with 30 PCs having J2ME platform in Net beans 7.0 • An active internet connection.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect (Course evaluation survey form)
Effectiveness of students assessment	CRC / QAU / HoD	Direct (Course reports / result analysis)
Quality of learning resources	Track leaders / CRC	Indirect (Review, meetings and star rating with suggestions for further modification and improvements)
The extent to which CLOs have been achieved	CRC / QAU	Direct (CLO assessment template further verified at course coordinator, Track leader and QAU level)
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	
DATE	15/10/2022