2023
TP-153

Course Specification
(Bachelor)

Course Title:	Principles of Programming Languages
Course Code:	COMP 316
Program:	Bachelor in Computer Science
Department:	Computer Science
College:	College of computer Science and Information Technology
Institution:	Jazan University
Version:	1
Last Revision Date:	September 2024

Table of Contents

A. General information about the course:

1. 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 6/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. Pre-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.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	26
2.	**Laboratory/Studio**	26
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	8
Total		60

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	Identify and explain common language features, such as variables, data types, functions, bindings and objects.	K1	Lectures/Presentations Media lectures/ Lab demonstration	Assignment – 1 Lab exam/ Final exam
1.2	Describe the phases of compilation, programming language design principles, categories, and the programming environment.	K1	Lectures/Presentations Media lectures	Assignment – 1 Midterm Exam Final exam
2.0	**Skills**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Analyze the syntax and semantics of programming languages for context-free grammars and parser operations to understand formal grammars.	S1	Lectures/Presentations Media lectures	Assignment – 1 Midterm Exam Final exam
2.2	Compare different programming paradigms such as imperative, functional, logic-based, and object-oriented programming.	S1	Lectures/Presentations Media lectures	Group Assignment – 2/ Final exam
2.3	Use data representation of different languages to explore parameter passing models, methods and concepts of arithmetic expressions and assignment statements.	S4	Lectures /Presentations Lab demonstration	Group Assignment 2/ 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	Group Assignment 2 (Assessment in Lab)

C. Course Content

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

	Scope, Scope and Lifetime, Data Types Primitive Data types, Array Types, Record Types, Type Checking, Strong Typing	
6.	**Chapter 4: Expressions and Assignment Statements** Arithmetic Expressions- Precedence, Associativity, Parentheses, Conditional Expressions, Relational and Boolean Expressions, Short-Circuit Evaluation, Assignment Statements.	4T+ 4P
7.	**Chapter 5: Subprograms** Fundamentals of Subprograms, Design Issues, Parameter Passing Methods, Parameter passing models. Design Issues of Functions, Closures, Coroutines	4T+ 4P
8.	**Chapter Six: Exception Handling** Introduction to Exception Handling, Design Issues for Exception Handling,Exception Handling in C++, Exception Handling in Java	4T+ 4P
9.	**Chapter 6: Functional and Logic Programming Languages** Fundamentals of Functional language, Introduction to Lisp and Scheme Predicate Calculus, Overview of Logic Programming, Prolog Basics.	4T+ 4P
Total		**26T+26P**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	7th week	15%
2.	Assignment I	5th week	10%
3.	Assignment II (Case Study/ Group assignment)	9th 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		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL

REFERENCE NO.	
DATE	