Course Specifications

General Information

Course name	Principles of Programming Languages
Course number	ITCS4302
Faculty	
Department	
Course type	Major Needs
Course level	4
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - Read and write a formal description of programming language syntax;

2 - Identify major features of programming languages, with a particular focus on imperative language features;

3 - Understand the advantages of different language paradigms, with a particular emphasis on functional and logic programming languages;

4 - Critically evaluate the design features of common programming languages;

5 - Build simple programming language translators.

6 - Improving ability to learn new languages

7 - Improving background for choosing appropriate language

8 - Improving background for choosing appropriate language

9 - Learning the concepts of programming and better understanding of implementation

Intended Learning Outcomes

Knowledge and Understanding

* a1- Knowledge and understanding of various programming language concepts: binding, scope, lifetime, parameter passing etc.
* a2- Knowledge and understanding of sequential, concurrent and object-oriented programming paradigms.
* a3- Knowledge of the relative strengths and weaknesses of a number of commonly used programming languages.

Intellectual Skills

* b1- The ability to write programs in a standard imperative language
* b2- The ability to write programs in an object-oriented language
* b3- The ability to write programs in a logic language.
* b4- The ability to write programs in a functional language
* b5- Comparative programming experiences in procedural, nonprocedural, and functional programming obtained through programming in Scheme, Prolog and FORTRAN.
* b6- Make educated selection of programming languages, and use multiple languages in the development of software products.

Professional Skills

* c1- Enhanced knowledge and practical ability with some of the languages discussed.

General Skill

* d1- Write Essays concerning programming paradigms.
* d2- Search the Internet for up-to-date programming languages.
* d3- Prepare posters to illustrate the different paradigms.

Course Contents

1 - Classification of programming languages : - Classification of programming languages - Imperative languages - Functional languages - Logic programming languages - Object-oriented languages
2 - Describing syntax and semantic
3 - Variable declaration and scoping
4 - Datatypes (union datatypes, enumerated datatypes, pointers, references)
5 - Expressions and statements
6 - Subprograms and parameter passing
7 - Implementing subprograms
8 - Object-oriented programming
9 - Functional programming
10 - Logic programming

Teaching and Learning Methods

1 - Lectures
2 - Exercises
3 - Projects

Students Assessment

Assessment Method	TIME	MARKS
Mid-Term Exam	6th week	30
Projects and/or AssignmentP	12th week	20
Final Exam	16th week	50

Books and References

Essential books	Concepts of programming languages Tenth edition , ROBERT W. SEBESTA
Recommended books	D. A. Watt, Programming Language Design Concepts, Wiley (2004). A.B. Webber, Programming Languages: A Practical Introduction. Franklin, Beedle &Associates, 2002.

Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
Classification of programming languages	1	a1, a2	b1, b2, b3, b4	c1	d1, d3
Describing syntax and semantic	2-3	a1	b1, b4	c1	d1
Variable declaration and scoping	4-5	a1, a3	b1, b5	c1	d1
Datatypes(union datatype, enumerated datatype, pointers, references)	6-7	a1, a2	b2, b3, b6	c1	d1
Expressions and statements	8-9	a1	b4	c1	d1, d2
Subprograms and parameter passing	10-11	a2	b4, b5		d1
Implementing subprograms	12	a3	b1, b5	c1	d2
Object-oriented programming	13	a2	b2, b5	c1	d1
Functional programming	14		b2, b4	c1	d1
Logic programming	15	a1	b3		d3