



UNIVERSITI TEKNOLOGI MARA

CSC305: PROGRAMMING PARADIGMS

Course Name (English)	PROGRAMMING PARADIGMS APPROVED
Course Code	CSC305
MQF Credit	3
Course Description	This course provides students with the tools necessary for the critical evaluation of existing and future programming languages. Among fundamental concepts underlying the design, definition and implementation of contemporary programming languages that will be discussed in this course are programming languages structures, presenting a formal method of describing syntax and introducing approaches to lexical and syntactic analysis. This course also highlighted the key concepts of the most important programming paradigms; the long-established paradigm of imperative programming, the increasingly important paradigms of object-oriented, the more specialized paradigms of functional and logic programming and the paradigm of scripting.
Transferable Skills	1) Independent and critical thinker 2) Experienced collaborator 3) Expert in field 4) Balanced graduate
Teaching Methodologies	Lectures, Blended Learning, Lab Work
CLO	CLO1 Explain the principles in programming language design and concepts in programming paradigms. CLO2 Manipulate each programming paradigms using programming tools. CLO3 Explain systematically the characteristics of the programming paradigms.
Pre-Requisite Courses	No course recommendations
Topics	
1. Overview of Programming Paradigms 1.1) A Brief History 1.2) Overview of Programming Languages 1.3) Abstractions in Programming Languages 1.4) Language Definition 1.5) Compilers and Interpreters 1.6) Programming Paradigms and Application Domains	
2. Principles of Language Design 2.1) Syntax and Semantic 2.2) Lexical and Syntax Analysis 2.3) Names and Data Types 2.4) Binding, Scopes, and Lifetime 2.5) Expressions and Assignment Statements 2.6) Statement-level Control Structures 2.7) Subprograms	
3. Functional Programming 3.1) Programming Language : Scheme 3.2) Overview 3.3) Functions and Expressions 3.4) Selection 3.5) Recursion 3.6) List Operation 3.7) Applications of Functional Programming	

4. Logic Programming

- 4.1) Programming Language : Prolog
- 4.2) Overview
- 4.3) Predicate Calculus
- 4.4) Facts, Rules, and Queries
- 4.5) Backtracking
- 4.6) Applications of Logic Programming

5. Imperative Programming

- 5.1) Programming Language: C
- 5.2) Overview
- 5.3) Variables and Data Types
- 5.4) Selection and Iteration, and Array
- 5.5) Functions, Structures and Unions Data Type
- 5.6) Pointers
- 5.7) Applications of Imperative Programming

6. Object Oriented Programming

- 6.1) Programming Language: Java
- 6.2) Overview
- 6.3) Variables and Data Types
- 6.4) Class and Object
- 6.5) Selection, Iteration and Arrays
- 6.6) Inheritance, Polymorphism, Abstraction and Encapsulation
- 6.7) Applications of Object Oriented Programming

7. Scripting Programming

- 7.1) Programming Language: Python
- 7.2) Overview
- 7.3) Variables and Data Types
- 7.4) Lists
- 7.5) Selection, Iteration and Functions
- 7.6) Dictionaries
- 7.7) Applications of Scripting Programming

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assignment	20%	CLO2
	Group Project	Group Project	15%	CLO3
	Quiz	Quiz	5%	CLO1
	Test	Test	10%	CLO1

Reading List	Reference Book Resources
	<ul style="list-style-type: none"> • Sebesta, Robert W. 2015, <i>Concepts of Programming Languages</i>, 11th Edition Ed., 16, Pearson University of Colorado [ISBN: 978-01339430] • Allan B. Tucker and Robert E. Noonan 2017, <i>Programming Languages: Principles and Paradigms</i>, 2nd Edition Ed., McGraw Hill Education [ISBN: 978-007063659] • Elad Shalom 2018, <i>A Review of Programming Paradigms Throughout the History: With a Suggestion Toward a Future Approach</i> First Edition Ed., 18, Independently Published [ISBN: 9781976850912] • Seema Kedar 2014, <i>Programming Paradigms : A Conceptual Approach</i>, First Ed., Technical Publications [ISBN: 978-935099374] • Arvind Kumar Bansal 2014, <i>Introduction to Programming Languages</i>, First Ed., Chapman and Hall/CRC [ISBN: 978-146656514]

Article/Paper List	Recommended Article/Paper Resources
	<ul style="list-style-type: none"> • Igor Ivkic, Markus G. Tauber, Alexander Wöhrer 2017, Towards comparing programming paradigms, <i>IEEE Xplore</i>, 10 May 2018, 2 [ISSN: 978-1-908] https://ieeexplore.ieee.org/abstract/document/8356440

Other References
This Course does not have any other resources