UNIVERSITI TEKNOLOGI MARA

CSC750: COMPILER CONSTRUCTION

Course Name (English)	COMPILER CONSTRUCTION APPROVED
Course Code	CSC750

MQF Credit	3

Course Description	The construction of a compiler involves three important phases. The lexical analysis phase deals with the identifying of lexeme items, the syntax analysis phase determines the underlying structure of the source program and the code generation phase produces the machine code. Global and local optimizations phases are two optional phases where the compiler will be improved in space and time.

Transferable Skills	1) Demonstrate ability to identify and articulate self skills, knowledge and understanding confidently and in a variety of contexts 2) Demonstrate ability to manage personal performance to meet expectations and demonstrate drive, determination, and accountability

Teaching Methodologies	Lectures

CLO		
	CLO1	Apply the formal method concept to compiler construction.
	CLO2	Examine all phases of compiler construction that use extended formal methods and optimized algorithms
	CLO3	Build an efficient basic compiler by combining all phases of compiler construction.

Pre-Requisite Courses	No course recommendations

Topics
1. Introduction to Compiler 1.1) Phases of a Compiler 1.2) Implementation Techniques
2. Lexical Analysis and Scanner Generator 2.1) Finite Automata and Its Implementation 2.2) Regular Expressions 2.3) Lexical Analysis 2.4) Scanner Generator
3. Syntax and Semantic Analysis 3.1) Writing Grammars 3.2) Syntax Analysis 3.3) Top Down Parser (LL Grammar) 3.4) Recursive descent parsers 3.5) Semantic Analysis
4. Bottom Up Parser and Parser Generator 4.1) Bottom Up Parser (LR Grammar) 4.2) Parser generators
5. Code Generation 5.1) Converting Atoms to Instructions 5.2) Single Pass vs. Multiple Passes 5.3) Register Allocation
6. Code Optimization 6.1) Local Optimization 6.2) Global Optimization

Assessment Breakdown	%
Continuous Assessment	100.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assignment 1 (Topic 1)	2%	CLO1
	Assignment	Assignment 3 (Topic 3)	3%	CLO1
	Assignment	Assignment 2 (Topic 2)	5%	CLO1
	Assignment	Assignment 4 (Topic 3)	5%	CLO2
	Assignment	Assignment 6 (Topic 5 & 6)	5%	CLO2
	Assignment	Assignment 4 (Topic 3)	5%	CLO2
	Assignment	Assignment 5 (Topic 4)	5%	CLO2
	Group Project	2-4 members per group	10%	CLO3
	Quiz	Quiz 1 (Topic 1)	5%	CLO1
	Quiz	Quiz 2 (Topic 3)	5%	CLO2
	Test	Test 1 (Topic 1, 2 and 3)	20%	CLO1
	Test	Test 2 (Topic 3,4,5 and 6)	30%	CLO2

Reading List	Recommended Text	Aho A. F., Lam M. S., Sethi R., Ullman J. D. 2014, *Compilers Principles, Techniques, and Tools*, Second Ed., Pearson 2014
	Reference Book Resources	Torben Aegidius Mogensen 2017, *Introduction to Compiler Design*, 2 Ed., 6, Springer Denmark
		Sebastian Hack,Reinhard Wilhelm,Helmut Seidl 2016, *Compiler Design*, Springer [ISBN: 3642176372]
		Robert W. Sebesta 2015, *Concepts of Programming Languages*, 10 Ed., Addison-Wesley [ISBN: 9780133943023]
		David A. Patterson,John L. Hennessy 2013, *Computer Organization and Design*, 5 Ed., Morgan Kaufmann [ISBN: 9780124077263]
		Reis, A.,J.,D 2012, *Compiler Construction using Java, JavaCC and Yacc,*, Wiley
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	