



## UNIVERSITI TEKNOLOGI MARA

### CSC510: DISCRETE STRUCTURES

<b>Course Name (English)</b>	DISCRETE STRUCTURES <b>APPROVED</b>
<b>Course Code</b>	CSC510
<b>MQF Credit</b>	3
<b>Course Description</b>	This course discusses the basic tools of mathematics and logic to provide the logical foundation underlying the design and analysis of algorithms for problems solving in computer science. The course examines the fundamental discrete structures as sets, relations and graphs, definitions and proofs concerning boolean algebra, languages and grammar, and the verification of algorithms.
<b>Transferable Skills</b>	1. Demonstrate ability to identify and articulate self skills, knowledge and understanding confidently and in a variety of contexts. 2. Demonstrate ability to investigate problems and provide effective solutions.
<b>Teaching Methodologies</b>	Lectures, Tutorial
<b>CLO</b>	CLO1 Explain the concepts associated with formal representation and operations performed on them. CLO2 Demonstrate professionalism in selecting relevant methods and techniques associated with formal representation. CLO3 Demonstrate analytical skills in constructing formal proofs of validity
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Propositional and Predicate Logic</b> 1.1) Notation and Terminologies 1.2) Logical Connectives 1.3) Types of Propositions 1.4) Law to manipulate Logical Expressions	
<b>2. Logical Equivalence and Soundness</b> 2.1) Normal forms 2.2) Rules of inference 2.3) Logical equivalence and equality 2.4) Proof techniques	
<b>3. Set</b> 3.1) Syntactic components 3.2) Operations on set 3.3) Types of relations 3.4) Operation on relations 3.5) Types of functions	
<b>4. Language and Grammar</b> 4.1) Formal language 4.2) Types of grammars 4.3) Specification and derivation of a grammar 4.4) Finite State Automata (FSA)	
<b>5. Program Correctness</b> 5.1) Program testing 5.2) Verifying program correctness using axiomatic semantics involving composite statements, conditions and loops	

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Construction of proposition based on problem given	4%	CLO2
	Assignment	Apply the rules of inference and derivation of conclusion	4%	CLO2
	Quiz	Short answer questions on topic 1	3%	CLO1
	Quiz	Short answer questions on topic 2	3%	CLO1
	Quiz	Short answer questions on topic 3	3%	CLO3
	Quiz	Short answer questions on topic 4 and topic 5	3%	CLO3
	Test	Test 1 coverage of topic 1 until topic 3	15%	CLO1
	Test	Test 2 coverage of topic 4 and topic 5	15%	CLO3

Reading List	Recommended Text	Roshidi Din,Siti Sakira Kamaruddin,Angela Amphawan ,Mohd Nizam Omar 2015, <i>BASIC DISCRETE STRUCTURES</i> , UUM Press [ISBN: 9789670876177]
	Reference Book Resources	<ul style="list-style-type: none"> <li>• Harriet Fell,Javed a. Aslam 2016, <i>Discrete Structures</i>, 6 Ed., Cognella Academic Publishing [ISBN: 1634876466]</li> <li>• Gary M. Weiss,Damian M. Lyons,Christina Papadakis-Kanaris,Arthur G. Werschulz 2013, <i>Fundamentals of Discrete Structures</i>, 7 Ed., Pearson [ISBN: 1256389218]</li> <li>• Levasseur K. 2013, <i>Applied Discrete Structures</i>, lulu.com</li> <li>• James L. Hein 2015, <i>Discrete Structures, Logic, and Computability</i>, 2 Ed., Jones &amp; Bartlett Publishers [ISBN: 1284070409]</li> <li>• Judith L. Gersting 2014, <i>Mathematical Structures for Computer Science</i>, W. H. Freeman [ISBN: 1429215100]</li> </ul>
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	