



Ministry of Higher Education and  
Scientific Research - Iraq  
Al-Naji University  
College of Engineering  
Department of Computer Engineering



## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	BOOLEAN ALGEBRA		Module Delivery
Module Type	SUPPORT		Class Lecture + Lab
Module Code	COE105		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	1
Administering Department	Computer Engineering	College	Engineering
Module Leader	Hadi Tarish Ziboon	e-mail	hadi.tarish@alnaji-uni.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	PhD
Module Tutor	Hadi Tarish Ziboon	e-mail	hadi.tarish@alnaji-uni.edu.iq
Peer Reviewer Name		e-mail	
Review Committee Approval		Version Number	

### Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Semester

Co-requisites module		Semester	
<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
<b>Module Aims</b> أهداف المادة الدراسية	<ul style="list-style-type: none"> <li>● Understanding of Boolean variables, operators (AND, OR, NOT), and their properties.</li> <li>● Learn how to express and simplify Boolean functions.</li> <li>● Apply laws and theorems (e.g., De Morgan’s Theorems) to simplify Boolean expressions.</li> <li>● Use Karnaugh maps for simplifying Boolean expressions and designing combinational logic circuits.</li> <li>● Design and analyze combinational logic circuits based on Boolean expressions.</li> <li>● Use Boolean algebra and Karnaugh maps to minimize the number of gates and inputs required for a given logic function.</li> </ul>		
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ul style="list-style-type: none"> <li>● Clearly define and explain Boolean variables, operators, and fundamental concepts of Boolean algebra.</li> <li>● Demonstrate knowledge of key Boolean laws and theorems, such as De Morgan’s Theorems.</li> <li>● Apply Boolean algebra techniques to simplify complex Boolean expressions and functions.</li> <li>● Utilize Karnaugh maps to visually simplify Boolean expressions and to design efficient combinational logic circuits.</li> <li>● Design and implement digital circuits using basic logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR) based on Boolean expressions.</li> <li>● Analyze and design combinational logic circuits to perform specified tasks or functions.</li> <li>● Apply Boolean algebra techniques and Karnaugh maps to minimize the number of logic gates and inputs in digital circuit designs.</li> <li>● Develop optimized circuit designs that improve performance and reduce cost.</li> </ul>		
<b>Indicative Contents</b> المحتويات الإرشادية			
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم			
<b>Strategies</b>	<ul style="list-style-type: none"> <li>- Lectures.</li> <li>- Homework and Assignments.</li> </ul>		

- Tests and Exams.
- In-class questions and Discussions.
- Extracurricular Activities.
- Individual / Group Projects
- In- and Out-Class conversations.

### Student Workload (SWL)

الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

### Module Evaluation

تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>		12% (12)		
	<b>Attendance and Participation</b>		8% (8)		
	<b>Home works</b>		5% (5)		
	<b>Lab.</b>		15% (15)		
<b>Summative assessment</b>	<b>Mid Exam</b>	1	10% (10)		
	<b>Final Exam</b>	3 hrs.	50% (50)		
<b>Total assessment</b>			100% (100 Marks)		

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts		
Websites		

### APPENDIX:

## GRADING SCHEME

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work is required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.