	Ministry of Higher Education and Scientific Research – Iraq Al-Mustaqbal University College College of Sciences	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**OBJECT ORIENTED PROGRAMMING**		**Module Delivery**	
Module Type	BASIC		- **Theory Lecture** - **Lab** - **Practical Seminar**	
Module Code	**UOMU0304031**			
ECTS Credits	**8**			
SWL (hr/sem)	**200**			
Module Level	2	**Semester of Delivery**	3	
Administering Department	Department of Artificial Intelligence	**College**	College of Sciences	
Module Leader	Mustafa Mohammed	**e-mail**	mustafa.shubber@uomus.edu.iq	
Module Leader's Acad. Title	**Asst. Lec**	**Module Leader's Qualification**	**MSc.**	
Module Tutor	None	**e-mail**	None	
Peer Reviewer Name		**e-mail**		
Review Committee Approval		**Version Number**		

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	**STRUCTURED PROGRAMMING**	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Teaching the students the concept of functions and how to call and passing values to them, Function Overloading and Inline function concepts. 2. Studying the Basic of Object Oriented Programming (OOP) and its features (Encapsulation, Inheritance, Polymorphism). 3. Teaching students Constructor and Destructors, Friend Function and Friend Classes Constant Member Functions and Constant Objects, Static Data Member and Static Function, Pointer to Objects and Array of Objects. 4. Teaching students Operator Overloading (Unary and Binary Operator Overloading). 5. Teaching students Inheritance Feature with its types. 6. Teaching students Polymorphism Feature with virtual functions. 7. Teaching students Function Template and class Template.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Perform Functions Concepts such as passing parameters, Overloading and Inline. 2. Understanding the Concept of Object Oriented Programming: Object and Class, 3. Understanding the meaning of Constructor and Destructors. 4. Understanding the meaning of Friend Function and Friend Class 5. Perform Classes Constant Member Functions and Constant Objects, Static Data Member and Static Function. 6. Understanding the concept of Unary and Binary Operators Overloading. 7. Learn how to deal with types of Inheritances Single, Hierarchical, Multilevel, and Multiple Inheritance. 8. Capable of using Polymorphism and Dynamic Binding. 9. Give the student the ability of using Function Template and class Template.
Indicative Contents المحتويات الإرشادية	1. Explain how to define Overloading and Inline functions, objects with encapsulation data, Constructor and Destructors functions. 2. Explain the use of Operators Overloading with various types of Inheritances. 3. Let the students see many examples about Polymorphism and Templates.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	1	10% (10)	5	LO # 1 and 3
	Practical Seminar(Lab)	2	15% (15)	Continuous	LO # 2 , 4 and 5
Summative assessment	**Midterm Exam**	1 hr	15% (15)	14	LO # 1 to 5
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	➢ **Overview for functions and parameter transmission** • Function Overloading and Inline Function • Default Argument ,Pass by Reference and Return by Reference
Week 2	➢ **Introduction to Object Oriented Programming** • Concept of Object Oriented Programming: Object, Class, Abstraction, Encapsulation, Inheritance, Polymorphism
Week 3	• Objects and the Member Access , Defining Member Function • Object as Function Arguments and Return Type
Week 4	➢ **Constructor and Destructors**
Week 5	➢ **Friend Function and Friend Classes**
Week 6	• Constant Member Functions and Constant Objects • Static Data Member and Static Function
Week 7	➢ **Pointer to Objects and Member Access**
Week 8	➢ **Array of Objects**
Week 9	➢ **Operator Overloading** • Overloading Operators and Syntax of Operator Overloading • Unary Operator Overloading and its types
Week 10	➢ **Binary Operator Overloading**
Week 11	➢ **Inheritance** • Base and Derived Class • Derived Class Declaration • Inheritance and derived classes
Week 12	➢ **Forms of Inheritance:** • Single and Hierarchical • Multiple • Multilevel

Week 13	➢ **Polymorphism and Dynamic Binding** • Types of polymorphism , Need of Virtual Function • Pointer to Derived Class • Definition of Virtual Functions • Array of Pointers to Base Class • Pure Virtual functions and Abstract Class
Week 14	➢ **Templates** • Function Template • Overloading Function Template • Class Template ○ Function Definition of Class Template ○ Default Arguments with Class Template ○ Derived Class Template
Week 15	**Mid Term Exam and Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	➢ **Overview for functions and parameter transmission** • Function Overloading and Inline Function • Default Argument ,Pass by Reference and Return by Reference
Week 2	➢ **Introduction to Object Oriented Programming** • Concept of Object Oriented Programming: Object, Class, Abstraction, Encapsulation, Inheritance, Polymorphism
Week 3	• Objects and the Member Access , Defining Member Function • Object as Function Arguments and Return Type
Week 4	➢ **Constructor and Destructors**
Week 5	➢ **Friend Function and Friend Classes**
Week 6	• Constant Member Functions and Constant Objects • Static Data Member and Static Function
Week 7	**Pointer to Objects and Member Access**
Week 8	**Array of Objects**
Week 9	➢ **Operator Overloading** • Overloading Operators and Syntax of Operator Overloading Unary Operator Overloading and its types
Week 10	**Binary Operator Overloading**
Week 11	➢ **Inheritance** • Base and Derived Class and Derived Class Declaration • Inheritance and derived classes
Week 12	➢ **Forms of Inheritance:** • Single and Hierarchical, Multiple and Multilevel
Week 13	➢ **Polymorphism and Dynamic Binding**

	• Types of polymorphism , Need of Virtual Function • Pointer to Derived Class • Definition of Virtual Functions • Array of Pointers to Base Class • Pure Virtual functions and Abstract Class
Week 14	➢ **Templates** • Function Template • Overloading Function Template • Class Template ○ Function Definition of Class Template ○ Default Arguments with Class Template ○ Derived Class Template
Week 15	**Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Joyce Farrell, "Object-Oriented Programming Using C++", Fourth Edition, Course Technology, 2009.**	No
Recommended Texts	**Bjarne Stroustrup, "Programming Principles and Practice Using C++", Second Edition, Addison-Wesley, 2014.**	No
Websites	**https://www.w3schools.com/cpp/default.asp**	

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 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.