	Ministry of Higher Education and Scientific Research - Iraq University of Technology Department of Computer Science Information System Branch	

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** **-PracticalSeminar**	
Module Code	**OBOP211**			
ECTS Credits	**8**			
SWL (hr/sem)	**200**			
Module Level	2	**Semester of Delivery**	3	
Administering Department	Department of Computer Sciences	**College**	Computer Sciences	
Module Leader	Dr.Ekhlas Falih Naser	**e-mail**	110022@uotechnology.edu.iq	
Module Leader's Acad. Title	**Assist. Prof.**	**Module Leader's Qualification**	**PhD.**	
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 the 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 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 Inheritances 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 how to use Operators Overloading, with various types and types of Inheritances 3- Let the students see many examples about Polymorphism and Template

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.7
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** • General Format of a Function Definition , Local and Global Variables • Inline Function and Function Overloading • Passing parameters , by value and by Reference and Default Argument
Week 2	➢ **Overview of OOP** • Encapsulation and Data Hiding , Inheritance and Reuse and Polymorphism • Class Definition
Week 3	➢ **Constructor and Destructors**
Week 4	➢ **Friend Function**
Week 5	➢ **Friend Class**
Week 6	➢ **Scope Operator Resolution** ➢ **Member Initialization List** ➢ **Constant member** • Constant Function Argument and Constant Member Functions ➢ **Static Members**

Week 7	➢ ***Objects Pointers*** • This pointer and *References Members* • *Class Object Member*
Week 8	➢ **Arrays as Class Data Member** • Object Arrays • An Array of Pointers to Objects
Week 9	➢ **Operator Overloading** • Overloading Unary Operators • Operator Arguments ,Operator Return Values and Postfix Notation
Week 10	➢ **Overloading Binary Operators** • Arithmetic Operators • Comparison Operators
Week 11	➢ **Inheritance** • Derived Class and Base Class **,**Accessing Base Class Members • The protected Access Specifier and Dangers of protected • Overriding Member Functions
Week 12	➢ **Class Hierarchies** • "Abstract" Base Class , Access Combinations and Levels of Inheritance • Multiple Inheritances and Ambiguity in Multiple Inheritances
Week 13	➢ **Virtual Functions** ➢ **Polymorphism** • Polymorphism of Variables • Polymorphism of Functions • Polymorphism of Objects ➢ **Normal Member Functions Accessed with Pointers** ➢ **Virtual Member Functions Accessed with Pointers** ➢ **Abstract Classes and Pure Virtual Functions** ➢ **Virtual Base Classes**
Week 14	➢ **Templates** • Function Template and Simple Function Template • Class Template
Week 15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	➢ **Overview for functions** • Function Definition , Local and Global Variables,Inline Function and Function Overloading, Passing parameters , by value and by Reference and Default Argument
Week 2	➢ **Overview of OOP** • Class Definition
Week 3	➢ **Constructor and Destructors**
Week 4	➢ **Friend Function**
Week 5	➢ **Friend Class**
Week 6	➢ **Scope Operator Resolution** ➢ **Member Initialization List** ➢ **Constant member** • Constant Function Argument and Constant Member Functions ➢ **Static Members**
Week 7	➢ **Objects Pointers** • This pointer and References Members and Class Object Member
Week 8	➢ **Arrays as Class Data Member** • Object Arrays and an Array of Pointers to Objects
Week 9	➢ **Operator Overloading** • Overloading Unary Operators and Arguments , Return Values and Postfix Notation
Week 10	➢ **Overloading Binary Operators** • Arithmetic Operators and Comparison Operators
Week 11	➢ **Inheritance** • Derived Class and Base Class **,**Accessing Base Members and Overriding Member functions
Week 12	➢ **Class Hierarchies** • "Abstract" Base Class , Access Combinations and Levels of Inheritance • Multiple Inheritances and Ambiguity in Multiple Inheritances
Week 13	➢ **Virtual Functions** ➢ **Polymorphism** • Polymorphism of Variables ,Polymorphism of Functions, Polymorphism of Objects ➢ **Normal and Virtual Member Functions Accessed with Pointers**, **Pure Virtual Functions**
Week 14	➢ **Templates** • Function Template with Simple Function Template and Class Template
Week 15	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. **Joyce Farrell, "Object-Oriented Programming Using C++", Fourth Edition, Course Technology, 2009.**	No
Recommended Texts	1. **Bjarne Stroustrup, "Programming Principles and Practice Using C++", Second Edition, Addison-Wesley, 2014.**	No
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 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.