

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Object-Oriented Programming II		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	IT2202		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	4
Administering Department	Information Technology	College	College of Computer Science & Information Technology
Module Leader	Mohsen Hassan Hussein	e-mail	mohsin.ha@uowa.edu.iq
Module Leader's Acad. Title	Asst. Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	16/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Pre-requisite module	CS203	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none"> 1. Provide a sound knowledge of the underlying principles and experience in the practical application of this course is essential for any information technology specialist. 2. extend students with procedural programming knowledge and skills in the object-oriented paradigm and builds experience with interpreted languages to introduce compiled languages. 3. In addition to further shaping a solid development methodology, the course

	prepares students for continued investigation into advanced programming topics. 4. develop a wide range of software solutions for real-world scenarios.																
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of this course students will be able to: 1. Compare and contrast interpreted vs compiled languages; and prototype-based vs class-based languages; 2. Competently apply the concepts of polymorphism, inheritance, encapsulation, exception handling, memory management, threads, and file I/O; 3. Design, code, verify, test, document, amend and refactor moderately complex programs meeting requirements by applying object-oriented principles; 4. Contribute to reviews of own work with others through the use of collaborative tools. 5. develop programs using the C++ Standard for real-world.																
Indicative Contents المحتويات الإرشادية	<table border="1"> <thead> <tr> <th colspan="2">Topics</th> </tr> <tr> <th>Description</th> <th>Weighting (75%)</th> </tr> </thead> <tbody> <tr> <td>1. Compiled languages; imperative programming versus object orientation</td> <td>5.00</td> </tr> <tr> <td>2. Objects and classes</td> <td>10.00</td> </tr> <tr> <td>3. Inheritance</td> <td>15.00</td> </tr> <tr> <td>4. Polymorphism</td> <td>15.00</td> </tr> <tr> <td>5. Templates functions and classes</td> <td>15.00</td> </tr> <tr> <td>6. Exception handling</td> <td>15.00</td> </tr> </tbody> </table>	Topics		Description	Weighting (75%)	1. Compiled languages; imperative programming versus object orientation	5.00	2. Objects and classes	10.00	3. Inheritance	15.00	4. Polymorphism	15.00	5. Templates functions and classes	15.00	6. Exception handling	15.00
Topics																	
Description	Weighting (75%)																
1. Compiled languages; imperative programming versus object orientation	5.00																
2. Objects and classes	10.00																
3. Inheritance	15.00																
4. Polymorphism	15.00																
5. Templates functions and classes	15.00																
6. Exception handling	15.00																

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p style="text-align: center;">Overview Strategies</p> <p>Object-oriented programming is one of the principle paradigms in software development used by organisations worldwide to develop a wide range of software solutions. Sound knowledge of the underlying principles and experience in the practical application of these is essential for any information technology specialist. This intermediate programming course extends students' procedural programming knowledge and skills into the object-oriented paradigm and builds on previous experience with interpreted languages to introduce compiled languages. In addition to further shaping a solid development methodology, the course prepares students for continued investigation into advanced programming topics.</p> <p>This course extends the student's basic procedural design and programming knowledge into the object-oriented paradigm. The student will be expected to learn and apply the basic concepts of object-oriented design and programming, i.e., abstraction, inheritance, and polymorphism, in the context of the C++ language through giving lectures, practical exercises within the laboratories, assignments about some specific topics, and small projects.. Key software engineering principles such as decomposition and component re-use will also be emphasised.</p>
-------------------	---

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعاً			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	80	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	70	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
<u>Student workload expectations (SWL & USWL)</u>			
To do well in this subject, students are expected to commit approximately 10 hours per week including class contact hours, independent study, and all assessment tasks. If you are undertaking additional activities, the weekly workload hours may vary.			
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	3, ,6,9,11, 13	
	Assignments	6	10% (10)	3,5,6, 8,10,12	
	Project	1	10% (10)	Start form week 4 until week 14	
	Labs	2	10% (10)	7,13	
Summative assessment	Midterm Exam	2hr	10% (10)	7	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered	<u>Weighting</u> (30+5=35%)
Week 1	<ul style="list-style-type: none"> - The fundamental concepts of programming, including procedural and object-oriented programming will be introduced. Also, consider the basic principles behind object-oriented programming techniques, including objects, classes, inheritance, and polymorphism. Then you will get started in programming environment by applying what you have learned. 	2
Week 2	<ul style="list-style-type: none"> - Introduction about objects and classes, class declaration, Object declaration, with examples. 	2
Week 3	<p style="margin: 0;">Inheritance</p> <ul style="list-style-type: none"> - Base-Class Access Control - Inheritance and protected Members - Protected Base-Class Inheritance - Inheriting Multiple Base Classes 	2
Week 4	<p style="margin: 0;">Inheritance ...cont'd</p> <ul style="list-style-type: none"> - Constructors, Destructors, and Inheritance - When Constructor and Destructor Functions Are Executed - Passing Parameters to Base-Class Constructors 	2
Week 5	<p style="margin: 0;">Polymorphism</p> <ul style="list-style-type: none"> - Virtual Functions - A pointer of base class type - Virtual Base Classes - Calling a Virtual Function Through a Base Class Reference 	2
Week 6	<p style="margin: 0;">Polymorphism ...cont'd</p> <ul style="list-style-type: none"> - The Virtual Attribute Is Inherited - Virtual Functions Are Hierarchical - Pure Virtual Functions - Abstract Classes 	2
Week 7	Mid-Term Exam Revision	2
Week 8	<p style="margin: 0;">Templates</p> <ul style="list-style-type: none"> - Generic Function - A Simple Function Template - A function with two generic types - What the Compiler Does 	2
Week 9	<p style="margin: 0;">Templates ... cont'd</p> <ul style="list-style-type: none"> - Overloading a Function Template - Using Standard Parameters with Template Functions - Template Arguments Must Match 	2
Week 10	<p style="margin: 0;">Templates ...cont'd</p> <ul style="list-style-type: none"> - Function Templates with Multiple Arguments - Template Arguments Must Match - Syntax Variation - Class Templates - An Example with Two Generic Data Types 	2
Week 11	<p style="margin: 0;">Handling Exceptions</p> <ul style="list-style-type: none"> - Exceptions - Why Do We Need Exceptions? 	2

	<ul style="list-style-type: none"> - Exceptions Syntax - Exception Mechanism - Throwing Exceptions - Catch Base and Derived classes with Exceptions 	
Week 12	Handling Exceptions...cont'd <ul style="list-style-type: none"> - Constructor and Destructor with Exceptions - Re-thrown Exceptions - Nested Exceptions - Handling Exceptions Class Activities 	2
Week 13	Handling Exceptions...cont'd <ul style="list-style-type: none"> - Handling Exceptions inside Function - Catching All Exception - Restricting Exceptions 	2
Week 14	Handling Exceptions...cont'd <ul style="list-style-type: none"> - Using Threw()-To Restrict any types of Exceptions - Re-thrown Exception inside function - Handling Exceptions Class Activities 	2
Week 15	<ul style="list-style-type: none"> - Students course workload evaluation. 	2
Week 16	Prepare to the final Exam	3

Delivery Plan (Weekly Lab. Syllabus)		
المناهج الاسبوعي للمختبر		
	Material Covered	Weighting (45%)
Week 1 - Lab 1	<ul style="list-style-type: none"> - Prepare OOP environment, overview about unified modeling language (UML) diagram. - Access to a standard C++ or Python compiler - Linux g++ compiler and its equivalent MinGW running under windows. 	3
Week 2 - Lab 2	Introduction to Classes and Objects <ul style="list-style-type: none"> - Understand function call by value method of parameter passing - Understand Pass parameters by reference method 	3
Week 3 - Lab 3	Apply Inheritance concept using many programming codes include: <ul style="list-style-type: none"> - Base-Class Access Control - Inheritance and protected Members - Protected Base-Class Inheritance - Inheriting Multiple Base Classes 	3
Week 4 - Lab 4	<ul style="list-style-type: none"> - Implement inheritance concept using Constructors, Destructors Functions and learn how to Pass Parameters to Base-Class Constructors. 	3
Week 5 - Lab 5	Implement the Polymorphism concept using many C++ code examples which include: <ul style="list-style-type: none"> - Implement Virtual Functions - Use A pointer of base class type - Implement Virtual Base Classes - Calling a Virtual Function Through a Base Class Reference 	3
Week 6 - Lab 6	<ul style="list-style-type: none"> - Implement the Virtual Attribute and Virtual Functions 	3

	<ul style="list-style-type: none"> - Implement Pure Virtual Functions - Implement Abstract Classes 	
Week 7 - Lab 7	<ul style="list-style-type: none"> - Labs exam1 with evaluation 	3
Week 8 - Lab 8	<p>Implemented the Template concept using many examples code in C++:</p> <ul style="list-style-type: none"> - Understand the Generic Function - Implement A Simple Function Template - Implement function template with two generic types 	3
Week 9 - Lab 9	<ul style="list-style-type: none"> - Implement Overloading a Function Template - Implement Using Standard Parameters with Template Functions - Prove the Template Arguments Must be Match 	3
Week 10 - Lab 10	<p>Code examples to implement:</p> <ul style="list-style-type: none"> - Function Templates with Multiple Arguments - Class Templates - Template with Two Generic Data Types 	3
Week 11 - Lab 11	<p>Implemented the Handling Exception concept</p> <ul style="list-style-type: none"> - Basic code exception - How can Throw Exceptions - Catch Base and Derived classes with Exceptions examples 	3
Week 12 - Lab 12	<p>Code examples to implement:</p> <ul style="list-style-type: none"> - Constructor and Destructor with Exceptions - Re-thrown Exceptions - Nested Exceptions 	3
Week 13 - Lab 13	<ul style="list-style-type: none"> - Labs exam2 with evaluation 	3
Week 14 - Lab 14	<ul style="list-style-type: none"> - Code example to implement Exceptions inside Function - How to Catch All Exception? - How can Restrict Exceptions? 	3
Week 15 - Lab 15	<ul style="list-style-type: none"> - OOP II project Implementation with discussion for each student 	3

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<ol style="list-style-type: none"> 1. Malik, D.S 2018, <i>C++ Programming: Program Design Including Data Structures</i>, 8th edn, Cengage. (ISBN 978-1-337-11756-2.) 2. OOP – Learn Object Oriented Thinking and Programming, ISBN-10: 8090466184, Tomas Bruckner, 2013. 3. The student must have access to a standard C++ compiler. The only supported compilers are the Linux g++ compiler and its equivalent MinGW running under Windows. 	No

Recommended Texts	4. Object-Oriented Programming Using C++ Fourth Edition by Joyce Farrell	No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.