**Ministry Of Higher Education and Scientific Research**



**AL-Mustansaria University/College of Science /Department of CS**

( نموذج الخطة الدراسية للمساق )

***Course Plan***

***2019-2020***

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| **Course No.: Time Division:**3hr Theoretical and 2hr Practical |  |
| **Course Name:** Object Oriented Software Engineering **Academic year: 2019-2020** |  |
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# ****Course Description****

( 3 credit hours, Prerequisite [ software engineering]

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| *This course presents the concepts, methods and techniques necessary to efficiently capture software requirements in use cases and transform them into detailed designs in object orientation. It combins object oriented methodologies and the Unified Modeling Language (UML 2.0 or UML 1.0). In this course, students learn how to apply the UML notation*  **Course Intended Learning Outcomes :**  **Successful completion of this course should lead to the following learning outcomes :**  **A- Knowledge and Understanding of**  A1) the software development lifecycle;  A2) a wide range of principles and tools available to the software developer  A3) the principles of object-oriented software construction;  A4) the software-development process, including requirements analysis, design, programming, testing and maintenance;  **B- Intellectual (thinking) skills - able to**  B1) model object-oriented software systems;  B2) investigate and improve the specification of a software system;  B3) design and plan software solutions to problems using an object-oriented strategy;  B4) write and test programs using at least one object-oriented programming language;  B5) use and evaluate appropriate tools and techniques  **C- Practical skills - able to**  C1) specify, design and construct CASE tools and application software;  C3) analysis of system requirements and the production of system specifications;  C4) use appropriate computer-based design support tools.  **D- Transferable skills - able to**  D1) effectively participate in team-based activities;  D3) use IT skills and display mature computer literacy;  D4) work independently and with others; | | | | | |
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| Week | **Topics** | **Topic Details** | **Reference (chapter)** | **Assess-ment** |
| **1** | Software and software engineering | * What is software engineers * Types of software,Software Quality * Activities common to software projects . * Stakeholders in software engineering | Text book  Ch. 1 |  |
| **2** | Object Oriented Fundamentals | * OO Paradigm: Classes, objects, attributes, operations, methods, encapsulation, inheritance, polymorphism, * UML: Visualization, Specifying, constructing, Documenting, Conceptual model of UML. * Lab: implement inheritance and ploymorphic | Text book    ch. 2 |  |
| **3** | Developing requirements | * Domain analysis, Definening the problem and the scope * What is a requirement? * Types of requirements. * Use cases: describing how the user will use the system. * Some techniques for gathing requirements. * Lab: implements ATM use case model and object model. | Text book  Ch. 4 |  |
| **4** |
| **5** | Modeling with classes | * What is UML? * Essentials of UML class diagrams * Associations and multiplicity * Generalization * Object diagrams More advanced features of class diagrams * composition vs aggregation vs inheritance * polymorphism * Implementing class diagrams in Java * Lab: implement 1-many association examples | Text book  ch 5 |  |
| **6** |
| **7** |
| **8** | Modeling interactions and behavior | * Interaction diagram * Sequence diagram * State diagram * Activity diagram | Text book  Ch. 8 |  |
| **9** |
| **10** | Design | * Architectural design, examples * Subsystems, Modules and Connectors * Design pattren. * Lab : implements the class diagram of ATM with code implementation. Deployments Diagram,Sequance Diagrams. Source code. | Text Book Ch.9 |  |
| **11** |
| **12** |
| **13** | Implementation | Convert class diagrams and the relation between them (, composition ,aggregation and inheritance and polymorphism of ATM to Java code. | Reference 3 |  |
| **14** |
| **15** | Testing | * Test the application | Text Book |  |

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| ***Text Book*** | *Timothy C. Lethbridge, Robert Laganiere* “Object-Oriented Software Engineering, Practical Software Development using UML and Java” Second edition, 2005 |
| ***Other***  ***References*** | *[1] Bernd Bruegge Allen H. Dutoit “*Object-Oriented Software Engineering Using UML, Patterns, and Java” *pearson, 3rd edition ,2014*  *Third Edition*  *[2] JAVA™ FOR PROGRAMMERS SECOND EDITION,DEITEL® DEVELOPER SERIES, , Pearson Education 2012* |

**Marking:**

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| **Assessment** | **Theoretical** | **practical** | **Activity** |
| - First Exam | 10% | 5% | 5 |
| - Second Exam | 10% | 5% | 5 |
| - Final Examination | 45 | 15 | - |

**Instructor(s) informatio]**

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| **Section:**1 | | **Lecture Room: 301** | **Time: 8:30-10:10 Sun** | |
| **Instructor's Name:** ***Dr. Saad Najim Alsaad and Miss Dina Riyad***  **E-Mail**: [alsaad6060@gmail.com](mailto:alsaad6060@gmail.com)  [dr.alsaadcs@uomustansiriyah.edu.iq](mailto:dr.alsaadcs@uomustansiriyah.edu.iq) | | | | **Office No.:** 11 |
| **Office Hours:** | [11-12], [1:30-2] Sun, Mon.  [8:30-12.30]Tue, Wed  Other office hours are available by appointment.  **Lecturer Signature Chair Signature** | | | |