**Course Specification**

(CS 352 Software Engineering 2)

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| *University:* | Helwan University |
| *Faculty:* | Faculty of Computers & Information |
| *Department:* | ***Computer Science*** |

**1. Course Data**

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| --- | --- |
| **Code:** | **CS 352** |
| **Course title:** | Software Engineering 2 |
| **Level:** | 3 |
| **Specialization:** | General |
| **Credit hours:** | 3 hours |
| **Number of learning units (hours):**  | (3) theoretical (2) practical |

**2. Course Objective**

This module aims at enabling the students to understand the range of life cycle approaches, methodologies, tools and techniques available for the design of various aspects of information systems. This module builds on the module Information Systems Analysis and Design I, which would be assumed to have given the students systems analysis skills using at least one systems analysis methodology and related tools and techniques. The course content includes the architectural design (including the identification of architectural alternatives and evaluating them), software and information systems design & application architecture design; the design of IS interfaces.

**3. Intended Learning Outcomes:**

* **Knowledge and Understanding**

A19. Outline the principles of Software Engineering.

A20. Extrapolate the engineering process of software production.

A21. Apply the principles of Object-Oriented Programming.

* **Intellectual Skills**

B1. Recognize and assemble components.

B5. Collaborate Modeling and Simulation.

B10. Distinguish Diagnosis Techniques.

B11. Plan, conduct and present Software Projects.

B15. Focus, gather information, integrate, and evaluate the data for Problem Solving.

B20. Design software solutions to real world problems.

* **Professional and Practical Skills**

C1. Choose the appropriate Programming Language.

C2. Choose the appropriate Operating system.

C4. Lead a team and Work in a team.

C7. Prepare Technical Reports.

C14. Develop an effective risk management plan.

C15. Detect safety aspects.

C16. Deploy the tools for software projects documentation.

* **General and Transferable Skills**

D6. Use Modeling capability in software projects.

D8. Practice Management Skills.

D11. Clarify Ideas formulation and presentation.

D13. Practice Designing skills in software projects.

D14. Practice Engineering skills for software development.

**4. Course contents**

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **No. of hours** | **Lecture** | **Tutorial/ Practical** |
| Using UML notation | 3 | 1 | 1 |
| Review of object-oriented concepts | 3 | 1 | 1 |
| The Unified Process | 3 | 1 | 1 |
| Capturing system behavior in use cases | 3 | 1 | 1 |
| Creating the domain object model | 3 | 1 | 1 |
| Refining classes and associations | 3 | 1 | 1 |
| Achieving reusability | 3 | 1 | 1 |
| Use case realization | 3 | 1 | 1 |
| Implementing memory in objects using state machines | 3 | 1 | 1 |
| Analyzing object behavior | 3 | 1 | 1 |
| Design at the object level | 3 | 1 | 1 |
| System design | 3 | 1 | 1 |
| Component design | 3 | 1 | 1 |

**Mapping contents to ILOs**

|  |  |
| --- | --- |
| Topic | Intended Learning Outcomes (ILOs) |
| Knowledge and understanding | Intellectual Skills | Professional and practical skills | General and Transferable skills |
| Using UML notation | A19 |  | C1 |  |
| Review of object-oriented concepts | A20 | B1,b5 |  |  |
| The Unified Process | A21 | B10 | C4 | D6 |
| Capturing system behavior in use cases | A19 | B15 | C7,C2 |  |
| Creating the domain object model | A19 | B20 | C16 |  |
| Refining classes and associations | A20 | B1,B5 | C16 |  |
| Achieving reusability | A21 | B15,B20 | C16 | D14 |
| Use case realization | A20 | B1 | C14,C16 |  |
| Implementing memory in objects using state machines | A20 | B5 | C16 | D8 |
| Analyzing object behavior | A21 | B10 | C15 |  |
| Design at the object level | A19 | B20 | C15 |  |
| System design | A19 | B11 | C16,C14 | D11 |
| Component design | A19 | B11 |  | D13 |

**5. Teaching and Learning Methods**

Class Lectures

Paper readings

**6. Teaching and Learning Methods for students with limited capability**

 Using data show

 e-learning management tools

**7. Students Evaluation**

**a) Used Methods**

Assignments

 Quizzes

 Lab work and exams

**b) Time**

Assessment 1: Test 1 Week 4

Assessment 2: Test 2 Week 7

Assessment 3: Midterm Exam Week 10

Assessment 4: Practical Exam Week 14

Assessment 5: final written exam Week 16

**c) Grades Distribution**

Mid-term Examination 20 %

Final-Year Examination 50 %

Semester Work 20 %

Practical Exam 10%

 Total 100%

Any formative only assessments

**List of Books and References**

**a) Notes**

Course Notes

Handouts

**b) Mandatory Books**

R S Pressman, Software Engineering: A Practitioner's Approach - Fifth Edition (European Adaptation), McGraw-Hill (2000). ISBN 0-07-709677-0

**c) Suggested Books**

E Gamma, R Helm, R Johnson & J Vlissides, Design Patterns: Elements of Reusable Object-Oriented Software, Addison-Wesley (1995). ISBN 0-201-63361-2

 T. Lethbridge and & R. Laganiere, "Object-Oriented Software Engineering", 2nd Edition, McGraw-Hill, 2005

**d) Other publications**

[http://atlas.kennesaw.edu/~dbraun/csis4650/AHYPERLINK "http://atlas.kennesaw.edu/~dbraun/csis4650/A&D/UML\_tutorial/index.htm"&HYPERLINK "http://atlas.kennesaw.edu/~dbraun/csis4650/A&D/UML\_tutorial/index.htm"D/UML\_tutorial/index.htm](http://atlas.kennesaw.edu/~dbraun/csis4650/A%26D/UML_tutorial/index.htm)

**Course Coordinator:**  Prof. Dr. Mostafa Sami

**Chairman of the Department:** Prof. Dr. Yehia Helmy