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|---|---|
| **Faculty:** Information Technology | |
| **Department:** Software Engineering | **Program:** Master |
| **Academic year:** | **Semester:** |

# Course Plan

## First: Course Information

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|---|---|---|---|---|
| ***Course No.:*** **1503701** | ***Course Title:*** *Advanced Software Engineering* | ***Credit Hours:*** | ***Theoretical:*** | ***Practical:*** |
| ***Prerequisite No. and Title:*** | | ***Section No.:*** | ***Lecture Time:*** | |
| ***Level in JNQF*** | **9** | | | |
| ***Type Of Course:*** | ☐ ***Obligatory University Requirement*** ☐ ***Elective University Requirement*** ☐ ***Obligatory Faculty Requirement*** ☐ ***Elective Faculty Requirement*** ■ ***Obligatory Specialization Requirement*** ☐ ***Elective Specialization Requirement*** ☐ ***Ancillary course*** | | | |
| ***Type of Learning:*** | ☐ ***Face-to-Face Learning*** ■ ***Blended Learning (2 Face-to-Face + 1 Asynchronous)*** ☐ ***Online Learning (2 Synchronous + 1 Asynchronous)*** | | | |

## Second: Instructor's Information

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|---|---|---|---|
| ***Course Coordinator:*** | | | |
| ***Name:*** | ***Academic Rank:*** | | |
| ***Office Number:*** | ***Extension Number:*** | ***Email:*** | |
| ***Course Instructor:*** | | | |
| ***Name:*** | ***Academic Rank:*** | | |
| ***Office Number:*** | ***Extension Number:*** | ***Email:*** | |
| ***Office Hours:*** | ***Sunday*** ***Monday*** ***Tuesday*** ***Wednesday*** ***Thursday*** | | |

## Third: Course Description

This course introduces the advanced concepts and techniques of software engineering. It will review the fundamentals of software engineering and the process of object-oriented software development. Also, It covers advanced topics related to Rational Unified Process, Extreme Programming, Software Reuse, and Aspect-Oriented Programming

## Fourth: Course Objectives

- Demonstrate proficiency in agile methodologies to ensure quick delivery of functionality.
- Implement and optimize agile processes to respond effectively to changing product specifications.
- Understand and analyze business and user problems to create software solutions that meet their needs.
- Showcase expertise in software decomposition, client–server architecture, and addressing technology issues.
- Apply software security principles throughout the development lifecycle.
- Demonstrate effective teamwork and communication practices within a software development context.
- Stay abreast of emerging technologies in software engineering through continuous research.
- Evaluate and apply innovative technologies to enhance and streamline software development processes.

## Fifth: Learning Outcomes

| *Level descriptor according to (JNQF)* | *CILOs Code* | *CILOs* If any CLO will not be assessed in the course, mark NA. | *Associated PILOs Code* *Choose one PILO for each CILO** | *Assessment method* *Choose at least two methods* |
|---|---|---|---|---|
| **Knowledge** | **K1** | Knowledge in software engineering techniques that are used to develop software products | **PK2** | • Mid-term Exam<br>• Final Exam |
| | **K2** | Knowledge about Agile software engineering that focuses on delivering functionality quickly, responding to changing product specifications, and minimizing development. Overheads, and successful products are based on an understanding of business and user problems and user interaction | **PK2** | • Mid-term Exam<br>• Final Exam<br>• **Assignments** |
| | **K3** | Emphasizes knowledge related to the decomposition of software into components, client–server architecture, and technology issues that affect the software architecture, and use of Cloud-Based Software | **PK2** | • Mid-term Exam<br>• Final Exam |
| | **K4** | Knowledge related to software security principles, threat modeling, secure coding practices, and vulnerability mitigation. | **PK2** | • Mid-term Exam<br>• Final Exam |
| | **K5** | Knowledge related to collaboration and communication skills in a software development context, including effective teamwork and communication practices. | **PK2** | • Mid-term Exam<br>• Final Exam<br>• **Assignments** |

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|---|---|---|---|---|
| **Skills** | **S1** | Ability to researching, evaluating, and applying emerging technologies in software engineering, fostering innovation in software development as researcher | **PS3** | • Mid-term Exam<br>• Final Exam<br>• Research Paper |

*CILOs: Course Intended Learning Outcomes; PILOs: Program Intended Learning Outcomes; For each CILO, the PILO could be the same or different.

## Sixth: Learning Resources

| | | | |
|---|---|---|---|
| ***Main Reference:*** | *Engineering Software Products: An Introduction to Modern Software Engineering* | | **Pearson** |
| ***Author:*** *Sommerville, I.* | ***Issue No.:*** *illustrated* | ***Print:*** | ***Publication Year:*** *2019* |
| ***Additional Sources&Websites:*** | • *Lecture Notes*<br>• *Projects, Tasks, and Quizzes*<br>• *Self-learning materials*<br>• *Moodle* | | |
| ***Teaching Type:*** | ■ ***Classroom*** □ ***Laboratory*** □ ***Workshop*** ■ ***MS Teams*** ■ ***Moodle*** | | |

## Seventh: Course Structure

| Lecture Date | Course Intended Teaching Outcomes (CILOs) | Topics | Teaching Procedures* | Teaching Methods** | References*** |
|---|---|---|---|---|---|
| 1 | K1 | Ch1: Software Products | Face-to-Face | Lecture | Course Slides / book / External Sources |
| 2 | K1 | Product prototyping | Asynchronous | Learning activity | Course Slides / book / External Sources |
| 3 | K2 | Ch2: Agile Software Engineering | Face-to-Face | Lecture | Course Slides / book |
| 4 | K2 | Red article about Agile Software Engineering | Asynchronous | Learning activity | Course Slides / book / External Sources |
| 5 | K2 | Ch3: Features, Scenarios, and Stories | Face-to-Face | Lecture | Course Slides / book / External Sources |
| 6 | K2 | Exercises | Asynchronous | Learning activity | Course Slides / book |
| 7 | K3 | Ch4: Software Architecture | Face-to-Face | Lecture | Course Slides / book |
| 8 | K3 | Red article about "Five Things Every Developer Should Know about Software Architecture" | Asynchronous | Learning activity | Course Slides / book / External Sources |
| **Midterm Exam** | | | | | |
| 9 | K3 | Ch5: Cloud-Based Software | Face-to-Face | Lecture | Course Slides / book |
| 10 | K3 | Exercises | Asynchronous | Learning activity | Course Slides / book / External Sources |
| 11 | K4 | Ch7: Security and Privacy | Face-to-Face | Lecture | Course Slides / book |
| 12 | K4 | Common types of attack on software products are injection attacks | Asynchronous | Video for learning activity | Course Slides / book |
| 13 | K5 | Ch10: DevOps and Code Management | Face-to-Face | Lecture | Course Slides / book / External Sources |
| 14 | K5 | DevOps and Code Management | Asynchronous | Video for learning activity | Course Slides / book |

| Final Exam |
|---|

*Teaching procedures: (Face-to-Face, synchronous, asynchronous). ** Teaching methods: (Lecture, video….).
*** Reference: (Pages of the book, recorded lecture, video….)

## Eighth: Assessment Methods

| Methods | Online Learning | Blended Learning | Face-To-Face Learning | Measurable Course (CILOs); **Specific Course Output to be measured** *State the score identified for each CILO for each method of assessment out of 100 **If any CILO will not be assessed in the course, mark NA. | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | K1 | K2 | K3 | K4 | K5 | S1 |
| **First Exam** | | | | | | | | | |
| **Second Exam** | | | | | | | | | |
| **Mid-term Exam** | | **30** | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **Participation** | | **30** | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Asynchronous Activities** | | | | | | | | | |
| **Quizzes** | | | | | | | | | |
| **Assignments** | | | | | | | | | |
| **Group presentation** | | | | | | | | | |
| **Final Exam** | | **40** | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **Total out of 100** | | **100** | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## Ninth: Course Policies

- All course policies are applied on all teaching patterns (online, blended, and face-to-face Learning) as follows:
  a. Punctuality.
  b. Participation and interaction.
  c. Attendance and exams.
- Academic integrity: (cheating and plagiarism are prohibited).

| Approval | Name | Date | Signature |
|---|---|---|---|
| **Head of Department** | | | |
| **Faculty Dean** | | | |