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|---|---|
| **Faculty: Information Technology** | |
| **Department: Computer Science** | **Program: Bachelor** |
| **Academic Year:** | **Semester:** |

# Course Plan

## First: Course Information

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|---|---|---|---|---|
| ***Course No.: 1503473*** | ***Course Title:* Software Testing and Measurement** | ***Credit Hours: 3*** | ***Theoretical: 3*** | ***Practical: 0*** |
| ***Prerequisite No. and Title: 1503370*** | | ***Section No.:*** | ***Lecture Time:*** | |
| ***Level in JNQF*** | ***6*** | | | |
| ***Type Of Course:*** | ☐ ***Obligatory University Requirement*** ☐ ***Elective University Requirement***<br>☐ ***Obligatory Faculty Requirement*** ☐ ***Elective Faculty Requirement***<br>■ ***Obligatory Specialization Requirement*** ☐ ***Elective Specialization Requirement***<br>☐ ***Ancillary course*** | | | |
| ***Type of Learning:*** | ■ ***Face-to-Face Learning***<br>☐ ***Blended Learning (2 Face-to-Face + 1 Asynchronous)***<br>☐ ***Online Learning (2 Synchronous+ 1 Asynchronous)*** | | | |

## Second: Instructor's Information

| | | | | | |
|---|---|---|---|---|---|
| ***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 is providing a broad systematic study of quality assurance aspects of the software development process with an emphasis software quality, software testing, and software quality certification and standards. This Course will expose students to the principles of software quality assurance and identify the tasks that are essential for successful quality projects and discuss how tasks interact with each other. It will also present current methods, techniques and certification standards involved in software quality assurance from a practical industry implementation perspective. The specific objectives of the module are: - Understand and define the scope of the software development process from a quality perspective - Understand, design and implement procedures for developing software quality - Understand the issues and approaches involved in software quality assurance at the company practice level - Understand the main approaches to software testing - Understand and be able to implement testing solutions at code level. - Benchmark organizations against industry standards for software quality.

## Fourth: Course Objectives

1. Introducing the student to the fundamental concepts of software testing, and software quality certification and standards.
2. Developing the student's ability to implement testing solutions at code level.
3. Expanding the student's skills of applying different testing method and levels according to software development life cycle.
4. Providing the student to identify Benchmark organizations against industry standards for software quality.

## Fifth: Learning Outcomes

| *Level descriptor according to (JNQF)* | *CILOs Code* | *CILOs*<br>If any CLO will not be assessed in the course, mark NA. | *Associated PILOs Code*<br>*Choose one PILO for each CILO** | *Assessment method*<br>*Choose at least two methods* |
|---|---|---|---|---|
| **Knowledge** | **K1** | Outline the concepts of software testing and quality assurance. | **PK1** | • Mid-term Exam<br>• Final Exam |
| | **K2** | Identify important historical and current literature addressing software quality assurance | **PK1** | • Mid-term Exam<br>• Final Exam |
| | **K3** | Describe the concepts behind software testing and appraise the most appropriate testing approaches for a given situation | **PK1** | • Quizzes<br>• Mid-term Exam<br>• Final Exam |
| | **K4** | Identify and contrast the basic principles behind software process, process improvement and process standards | **PK4** | • Assignment<br>• Mid-term Exam<br>• Final Exam |
| **Skills** | **S1** | Recommend approaches in Software testing strategies. | **PS3** | • Mid-term Exam<br>• Final Exam |
| | **S2** | The ability to use Software testing method and tools | **PS4** | • Mid-term Exam<br>• Final Exam |
| | **S3** | Evaluate the concepts embodied in the most prevalent software quality assurance | **PS4** | • Mid-term Exam<br>• Final Exam |
| | **S4** | Evaluate the concepts software testing in the most prevalent software systems | **PS3** | • Quizzes<br>• Mid-term Exam<br>• Final Exam |
| | **S5** | Examine the software testing techniques and methods, including knowledge of their advantages and disadvantages, and when it may be appropriate to use each approach | **PS3** | • Quizzes<br>• Mid-term Exam<br>• Final Exam |
| **Competencies** | **C1** | Develop Software development testing skills needed for practice testing methodology. | **PC2** | • Practice |

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

## Sixth: Learning Resources

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|---|---|---|---|
| ***Main Reference:*** | ***Software Quality Engineering: testing quality assurance and quantifiable improvement.*** | | |
| ***Author: Jeff Tian*** | ***Issue No.: 3rd*** | ***Print:*** | ***Publication Year: 2020*** |
| ***Additional Sources and Websites:*** | *Foundations of Software Testing ISTQB Certification: 4th Edition*<br>***Authors: Dorothy Graham, Rex Black, Erik van Veenendaal***<br>***Publication year: 2019*** | | |
| ***Teaching Type:*** | ■ ***Classroom*** ☐ ***Laboratory*** ☐ ***Workshop*** ■ ***MS Teams*** ■ ***Moodle*** | | |

## Seventh: Course Structure

| Week | Course Intended Teaching Outcomes (CILOs) | Topics | Teaching Procedures* | Teaching Methods** | References*** |
|---|---|---|---|---|---|
| 1 | - | Syllabus Overview | Face-to-Face | - | - |
| | K1 | Introduction Software Testing | Face-to-Face | Lecture, In-class Questions | Chapter 1 |
| | K1, C1 | Introduction to Software Testing | Face-to-Face | Lecture, In-class Questions | Chapter 1 |
| 2 | K3, S1 | What is software testing | Face-to-Face | Lecture, In-class Questions | Chapter 1 |
| | K3, S1, C1 | Software testing strategies | Face-to-Face | Lecture, In-class Questions | Chapter 2 |
| | K3, S1, S2 | Black Box Testing | Face-to-Face | Lecture, In-class Questions | Chapter 2 |
| 3 | K1, K3, S1, S2, S4, S5 | Black Box Testing | Face-to-Face | Lecture, In-class Questions | Chapter 2 |
| | K1, K3, S1, S2, S5 | Black Box Testing | Face-to-Face | Lecture, In-class Questions | Chapter 2 |
| | K1, K3, S1, S3, S5 | Black Box Testing | Face-to-Face | Lecture, In-class Questions | Chapter 2 |
| 4 | K3, S1, S5 | Software Testing Implementation | Face-to-Face | Lecture, In-class Questions | Chapter 2 |
| | K3, S1, S2 | White box testing | Face-to-Face | Lecture, In-class Questions | Chapter 3 |

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|---|---|---|---|---|---|
| | K3, S1, S5 | White box testing | Face-to-Face | Lecture, In-class Questions | Chapter 3 |
| 5 | K3, S1, S2 | White box testing | Face-to-Face | Lecture, In-class Questions | Chapter 3 |
| | K3, S1, S2 | White box testing | Face-to-Face | Lecture, In-class Questions | Chapter 3 |
| | K3, S1, S4, S5, C1 | Software Testing Implementation (white box) | Face-to-Face | Lecture, In-class Questions | Chapter 3 |
| 6 | K3, S1, S4, S5 | Test levels | Face-to-Face | Lecture, In-class Questions | Chapter 3 |
| | K3, S1, S4, S5 | Integration testing | Face-to-Face | Lecture, In-class Questions | Chapter 4 |
| | K3, S1, S4, S5 | Integration testing | Face-to-Face | Lecture, In-class Questions | Chapter 4 |
| 7 | K3, S4, S5 | Integration testing | Face-to-Face | Lecture, In-class Questions | Chapter 4 |
| | K2, S1, S2, S4, S5 | Integration testing | Face-to-Face | Lecture, In-class Questions | Chapter 4 |
| | K2, S1, S2, S5 | Integration testing | Face-to-Face | Lecture, In-class Questions | Chapter 4 |
| **Midterm Exam** | | | | | |
| 8 | K2, S1, S2, S4, S5 | System testing | Face-to-Face | Lecture, In-class Questions | Chapter 5 |
| | K2, S1, S2, S4, S5 | Acceptance testing | Face-to-Face | Lecture, In-class Questions | Chapter 5 |
| 9 | K2, S1, S2, S4, S5 | Acceptance testing | Face-to-Face | Lecture, In-class Questions | Chapter 5 |
| | K2, S1, S2, S4, S5, C1 | Overview of Type of Testing (Approach of Testing) | Face-to-Face | Lecture, In-class Questions | Chapter 5 |
| | K2, S5 | Testing of function (functional testing) | Face-to-Face | Lecture, In-class Questions | Chapter 5 |
| 10 | K1, S2, S3 | Introduction: What is Software Quality? | Face-to-Face | Lecture, In-class Questions | Chapter 6 |
| | K2, S1, S2, S3, S5 | Quality Concept | Face-to-Face | Lecture, In-class Questions | Chapter 6 |

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|---|---|---|---|---|---|
| | K1, K2, S1, S2, S3, S5 | Type of errors | Face-to-Face | Lecture, In-class Questions | Chapter 6 |
| 11 | K1, K2, S2, S3S5 | Nine casing of software failure | Face-to-Face | Lecture, In-class Questions | Chapter 6 |
| | K2, S2, S3 | SQ Definition | Face-to-Face | Lecture, In-class Questions | Chapter 6 |
| | K2, S2, S3 | Software Quality Assurance | Face-to-Face | Lecture, In-class Questions | Chapter 6 |
| 12 | K1, S2, S3 | Software Quality Standards (IEEE and ISO) | Face-to-Face | Lecture, In-class Questions | Chapter 6 |
| | K1, S2, S3 | MacCall Models | Face-to-Face | Lecture, In-class Questions | Chapter 6 |
| | K1, S1, S2, S4, S5 | Model-based testing | Face-to-Face | Lecture, In-class Questions | Chapter 7 |
| 13 | K3, S5, C1 | Model-Driven Test Design | Face-to-Face | Lecture, In-class Questions | Chapter 7 |
| | K4, K3, S1, S4, S5, C1 | Model-Driven Test Design | Face-to-Face | Lecture, In-class Questions | Chapter 7 |
| | K3, K4, S1, S4, S5 | Types of testing Activities | Face-to-Face | Lecture, In-class Questions | Chapter 7 |
| 14 | K3, S1, S4, S5 | Types of testing Activities | Face-to-Face | Lecture, In-class Questions | Chapter 7 |
| | K3, K4, S1, S4, S5 | Types of testing Activities | Face-to-Face | Lecture, In-class Questions | Chapter 7 |
| | K3, S1, S4, S5 | Types of Testing Activities | Face-to-Face | Lecture, In-class Questions | Chapter 7 |
| | - | Review | Face-to-Face | Lecture, In-class Questions | Chapter 7 |
| **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 | Specific Course Output to be assessed<br>**If any CILO will not be assessed in the course, mark NA. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | K1 | K2 | K3 | K4 | S1 | S2 | S3 | S4 | S5 | C1 |
| First Exam | | | | | | | | | | | | | |
| Second Exam | | | | | | | | | | | | | |
| Mid-term Exam | | | 35 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Participation | | | | | | | | | | | | | |
| Asynchronous Activities | | | | | | | | | | | | | |
| Quizzes | | | | | | | | | | | | | |
| Assignments | | | 15 | | | ✓ | | | | | ✓ | ✓ | ✓ |
| Group presentation | | | | | | | | | | | | | |
| Final Exam | | | 50 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Total out of 100 | | | 100 | | | | | | | | | | |

## Ninth: Course Policies

- All course policies are applied to 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).