

Course Specification Document

Title	Software Quality and Testing
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Credits	2 ECTS
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Aims	<p>The course aims to familiarize the student with the standard specifications for software quality and its criteria, enabling him to build high-quality software and to evaluate software based on the recognized elements of software quality in software engineering. The course also aims to introduce the student to the importance of software testing, the strategies employed in testing and its various types and methods that vary depending on the type of software being tested. Additionally, it aims to enable the student to deal with some of the available techniques in this field.</p>
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Intended learning outcomes

On successful completion of this course, the student will be able to:

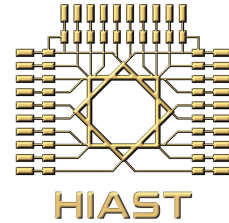
- Understand the concept of quality in software and factors and detailed characteristics of quality.
- Understand the methods for achieving the required quality level in software by applying software engineering methods, project management techniques, preparing a quality assurance plan and monitor quality.
- Familiarize himself with formal and informal technical review methods and the available metrics for quality evaluation.
- Understand the principles of software quality assurance, including its objectives, tasks, measurements and the international quality management standard ISO 9000.
- Know software testing strategies and its methods and types.
- Understand the traditional and object-oriented software testing methods, as well as web applications.
- Utilize a Unit testing environment and integration tests.
- Employ software tools to assist in web applications testing.

Syllabus

- **Quality concepts:** McCall's software quality factors, ISO 9126 quality characteristics, software quality dilemma, methods and techniques for achieving software quality.
- **Technical reviews:** Cost impact of software defects, fault amplification and removal, standards in reviews, informal and formal technical reviews.
- **Software Quality Assurance (SQA):** SQA elements, tasks, objectives, and metrics, formal SQA approaches, statistical software quality assurance, software reliability, ISO 9000 quality standards, quality plan.

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- **Software testing strategies:** Strategic approach to software testing, traditional and object-oriented software testing strategies, web application testing strategy, validation tests, system tests, code debugging tests.
- **Traditional software testing:** Internal and external testing perspectives, white-box (transparent) tests, basic path testing, control structure testing, black-box (opaque) tests, model-based testing.
- **Unit testing:** Use of JUNIT environment.
- **Object-Oriented software testing:** Object-oriented analysis and design models testing, object-oriented testing strategies and methods, class-level and interaction-level testing.
- **Web application testing:** Concepts, testing procedures, content testing, interface testing, navigation testing, configuration testing, security testing, performance testing.
- **Integration testing.**
- **Product measurements:** Measurements related to requirements, design, code, testing, maintenance and web application tests.