COURSE SYLLABUS

Software Product Quality Assurance, 9 credits

Software Product Quality Assurance, 9 högskolepoäng

Course Code:	TSPR20	**Education Cycle:**	Second-cycle level
Confirmed by:	Dean Dec 1, 2019	**Disciplinary domain:**	Technology
Valid From:	Jan 1, 2020	**Subject group:**	DT1
Version:	1	**Specialised in:**	A1N
		Main field of study:	Product Development

Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding
- display knowledge of the nature of software as a product or part of a product
- demonstrate comprehension of the different perspectives of software development
- demonstrate comprehension of the different perspectives of software quality assurance
- be familiar with the roles and professional responsibilities of the software engineer and the software quality engineer

Skills and abilities
- demonstrate skills of identifying, specifying and reviewing requirements for a software product
- demonstrate ability to develop plans for software development and quality assurance
- demonstrate skills to apply the verification and validation techniques, e.g. testing and review

Judgement and approach
- demonstrate the ability to select and apply different life cycle models and approaches of software product development
- demonstrate the ability to analyze and assess achievement of quality assurance
- demonstrate the ability to identify the opportunities for quality assurance process improvement
- demonstrate the ability to identify quality assurance challenges due to the recent development of machine learning (ML), artificial intelligence (AI), and data science

Contents

Software companies aim to deliver high quality software products. This is important for their relationships to customers, their reputations, and money. The task of producing high quality software products consistently on time is non-trivial. This course seeks to provide an overview of fundamental practices in modern software engineering to building quality into software products. The course will start with an overview of the software engineering. After studying the perspectives that apply to software engineering, the course focuses upon the elements of software quality assurance activities. Furthermore, nowadays ML, AI, and data science are

bringing new challenges to quality assurance. This course also will discuss the recent research that address these challenges.

The topics covered in the course include:
- Software engineering as a profession
- Software quality fundamentals
- Software development life cycle
- Software requirements
- Software architecture and system design decisions
- The management of software projects
- Verification and validation
- Testing and review
- Software quality measurement
- Standards of software process and process improvement
- Recent research on quality assurance challenges due to the development in the areas of ML, AI and data science

Type of instruction

The course consists of lectures, assignment and laboratory work.

The teaching is conducted in English.

Prerequisites

The applicant must hold the minimum of a bachelor's degree (i.e the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in computer engineering, electrical engineering (with relevant courses in computer engineering), or equivalent. The bachelor's degree should comprise a minimum of 15 credits in mathematics. Proof of English proficiency is required.

Examination and grades

The course is graded 5,4,3 or Fail.

The final grade for the course is based on a balanced set of assessments. The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Examination	3 credits	5/4/3/U
Project Work	3 credits	5/4/3/U
Laboratory work	1.5 credits	U/G
Assignment	1.5 credits	5/4/3/U

Course literature

Literature

The litterature list for the course will be provided one month before the course starts.

Main textbook:

Title: Software Engineering: Principles and Practice
Author: Hans van Vliet
Publisher: John Wiley & Sons, 2008, 3rd Edition

Title: Mastering Software Quality Assurance: Best Practices, Tools and Techniques for Software Developers
Author: Murali Chemuturi
Publisher: J. Ross Publishing

Additional literature:

Title: Introduction to Software Quality
Author: Gerard O'Regan
Publisher: Springer

Title: A Practitioner's Guide to Software Test Design
Author: Lee Copeland
Publisher: Artech House