Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

CORSO DI LAUREA MAGISTRALE IN INGENERIA DEL SOFTWARE

MASTER IN SOFTWARE ENGINEERING

MASTER OF SCIENCE IN SOFTWARE ENGINEERING

Contenuto degli insegnamenti
Inhalt der Lehrveranstaltungen
Content of the courses

Agile Software Engineering

M1: Agile Processes and Practices

- Origin and evolution of agile software development
- Major agile frameworks and key agile practices
- Scaling agile: distributed and/or large agile software development People-centric and teamwork in agile software development
- Continuous experimentation using agile approaches
- AI-enabled agile processes

M2: Continuous Integration and Delivery

- Configuration Management
- Containerization with Docker & Kubernetes
- Applied Microservice-oriented Software Engineering
- Monolith to Microservices Migration
- Continuous Integration & Delivery Techniques
- DevOps as a Software Development Paradigm

Advances in SE and Communication

- Sustainability in Software Engineering
- AI and Software Engineering
- Remote/Hybrid Software Engineering
- Computing Education and Training
- Communication challenges and strategies
- Creating video seminars: guidelines

Cloud Computing and Distributed Systems

- Distributed Systems Principles
- Network Technologies
- Virtualization

- Distributed Systems: Internet-of-Things, Edge Computing, Blockchain
- Cloud Systems Principles
- Cloud Security

Entrepreneurial Software Engineering

- Nature and characteristics of software startups
- Problem and solution identification and validation
- Building minimum viable products
- Lean analytics and pivoting
- Scaling software startups
- AI-supported entrepreneurial processes

Human Computer Interaction

- PACT framework: People Activities Context Technology
- Design principles
- Quality metrics: usability, user experience, engagement
- Cognitive processes: attention, perception and memory
- Evaluation and empirical user research
- Graphical User Interface Design

Intelligent Tools for Software Evolution

- Introduction to software maintenance and evolution
- Software Refactoring
- Mining software repositories
- Machine learning for software engineering
- Assessment and adaptation of intelligent tools for specific maintenance scenarios
- Limitations and risks of intelligent tools for software maintenance and their mitigation

Information Retrieval

- Web and mobile search
- Boolean and vector-space retrieval models
- Efficient document indexing, document mining and topic modelling
- Traditional and machine learning-based ranking approaches
- Foundation models
- Evaluation of Information Retrieval Systems

Research Methods and Technology Transfer

- Quantitative, qualitative, and mixed-method research
- Systematic literature review, Systematic mapping study
- Survey research
- Experimental research
- Case study

- Reporting research results

Software Design and Implementation

M1: Requirements Engineering for Dependable Systems

- Functional and Non-Functional Requirements
- Requirements Engineering Processes
- Requirements Elicitation, Analysis, Specification, Verification
- Dependability Systems Principles
- Dependability Requirements and Metrics
- Requirements Change

M2: Software Architecture

- Quality Attributes and Software Architecture Concepts
- Architecture Partitioning (layers, modules, components)
- Flexible and Adaptive Architectural Design
- Architectural Patterns and Styles
- Integrating AI Components into Architectural Designs
- Continuous Architecture

Verification and Reliability

- Dependable systems
- Verification by design
- Search Based Software Testing
- Software Reliability
- Models of reliability growth
- AI for Software verification and reliability