UNIVERSITÀ DI PISA

SOFTWARE SYSTEMS ENGINEERING

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Anno accademico	2022/23
CdS	COMPUTER ENGINEERING
Codice	911II
CFU	6

Moduli	Settore/i	Tipo	Ore	Docente/i
SOFTWARE SYSTEMS ENGINEERING	ING-INF/05	LEZIONI	60	ANTONIO LUCA ALFEO MARIO GIOVANNI COSIMO ANTONIO CIMINO

Obiettivi di apprendimento

Conoscenze

To know the different software development lifecycle phases used in developing, delivering, and maintaining software products.
To know the fundamental phases of the Software Development Lifecycle.
To know fundamental software engineering terminology and coding practices.

Modalità di verifica delle conoscenze

In the oral test, students will present and discuss their sofrtware solution developed in the team project.

Capacità

To acquire software development skills and understand common terminology used in the software engineering profession.
To learn and practice using traditional coding standards/guidelines. Python software development libraries and debugging tools are explored and used in projects.
To demonstrate key concepts using collaborative learning strategies.
To modify/build a software program that introduces to software development tools / environments
To develop an original Python software program, learning Python language syntax
To analyze the functionality and performance of software application programs
To demonstrate and communicate software engineering principles effectively through written reports and/or verbal presentations.

Modalità di verifica delle capacità

In the oral test, students will present and discuss their sofrtware solution developed in the team project.

Programma (contenuti dell'insegnamento)

Requirements engineering. Requirements specification. Use cases. Domain modeling. Object-oriented design. Service-oriented design. Process-oriented design. Unified Modeling Notation.Software Implementation. Software Testing.
Modeling enterprise systems, landscape, DevOps, toolchain, process orientation approach, Business Process Model and Notation. BPMN modeling, control flow, events, tasks, gateways, event-driven gateways, types of task.
Team projects, toolchain, python, workflow. PyCharm IDE. Data analysis in python, code quality pep8 standard, naming, automatic quality checking, plint installation. Restful api, git and github, repository, commit, branch, merge, github, fork, pull, vcs, pycharm integration with github, share a project.
Requirement: semi-formal notation, BPMN, use case, class, scenario, GUI storyboard. Design: class diagram, sequence diagram. Implementation: quality of code, JSON, JSON Schema, validation. Application domains.
Metrics: automation, responsiveness, elasticity, resiliency, interoperability. The cognitive taxonomy. Machine Learning Software pipeline: data ingestion, data preparation, data segregation, model training, candidate model evaluation, model deployment, performance monitoring.
Continuous Integration and delivery (CI/CD) with Github Actions. Git Workflow. Git Branches and Tags. Continuous Integration and Delivery. CI/CD Providers Comparison. GitHub Actions: Overview, Action, Syntax, Containers and Services, Events, Secrets, Complex Workflows, Matrix, Code Reuse.

Bibliografia e materiale didattico

I. Sommerville, *Software Engineering. 10th Edition*, Pearson Education Limited, Boston,2016.

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T. Allweyer, D. Allweyer, *BPMN 2.0, 2nd ed.*, BoD press, Norderstedt, 2010.
J. Arlow, I. Neustadt, *UML 2 and the Unified Process*, Pearson Education, 2005.
J. Rumbaugh, I. Jacobson, G. Booch, *The UML Reference Manual*, Addison-Wesley, 2004.

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Modalità d'esame

Oral test based on discussion and motivation of a software project

Pagina web del corso

http://docenti.ing.unipi.it/m.cimino/lsse/

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