GRADUATE STUDY
COMPUTING

UNIVERSITY OF ZAGREB
Faculty of Electrical Engineering and Computing

Computer Engineering

What is Computer Engineering?

Link between computer science and software engineering that connects knowledge and skills for the development of hardware and software for a wide range of computer systems: from embedded to high-performance computers.

About CE@FER

The Computer Engineering profile offers a comprehensive approach to acquiring knowledge and skills for designing hardware and software for computer systems in areas such as:

- Internet of Things and ubiquitous computing,
- embedded systems,
- high performance computers (HPC),
- data centers and cloud computing.

Engineers who graduate in Computer Engineering are expected to have the skills and knowledge necessary to connect all layers of computer systems and applications: hardware architecture, operating systems, software models, application layers, and services.

Skills

- Application of theoretical knowledge and skills in solving technical challenges in the design of hardware and software.
- Analysis, construction, implementation and maintenance of hardware and software in computer systems and computer-controlled processes.
- Connecting high-level abstractions (applications, services, data, openness, protocols) with hardware (digital hardware, architecture, operating system) using software, middleware and interfaces (operating system, drivers).

Career

Computer engineers are required in every industry that uses computer systems, such as mobile and embedded computing, ubiquitous and pervasive computing, Internet of Things, high-performance computing systems (HPC), the automotive industry, telecommunications, healthcare, web, energy, security, services and technologies of the digital society.

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Applications

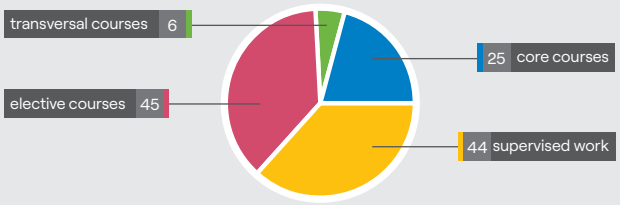
Development of hardware and software for computer systems, ranging from embedded systems to cloud computing and high performance systems:

- Internet of Things – Development of the whole stack (hardware, software, protocols, applications) in applications such as smart cities, smart offices, data processing, security, artificial intelligence, precision agriculture
- Embedded systems - Performance optimization, applications, specific accelerators (artificial intelligence, cryptography, multimedia), processor architecture, digital design of specialized hardware (ASIC, FPGA)
- High performance computing - Accelerators, software models, system architecture, operating systems, parallelism and concurrency, distributed systems, optimization of computationally demanding applications
- Cloud computing - Integrated system design, software engineering, computing as a service, open systems and technologies, open data, security, ubiquitous computing.

PLAN OF STUDY	SEMESTER	ECTS
Core courses		10
Advanced Algorithms and Data Structures	1	5
Seminar 1	1	3
Ubiquitous Computing	2	5
Seminar 2	1	3
Research seminar	3	5
Project	3	3
Diploma thesis	4	30
Core elective courses		15
Open Computing	1	5
Parallelism and Concurrency	1	5
Advanced Operating Systems	1, 3	5
High Performance Computing Applications and Architectures	2	5
Embedded Systems	2	5
Information Systems	2	5
System on Chip Platform Programming	3	5
Distributed Software Development **	3	10
Elective courses recommended for the profile	1, 2, 3	15
Elective courses	1, 2, 3	30
Transversal courses	1, 2, 3	6

* the course is also offered at the undergraduate level (if the course is passed at the undergraduate level, it can be replaced by the Elective course recommended for the profile)

** The course is worth 10 ECTS credits, 5 of which replace ECTS credits in the profile's Elective courses category.



Hardware

Computer architecture, digital design, specialized hardware (ASIC), interfaces, hardware integration, protocols, System on Chip (SoC), programmable logic (FPGA), embedded systems, high performance systems (HPC)

System

Operating system, HW/SW co-design, drivers, firmware, parallelism and concurrency, programming libraries, frameworks and APIs, performance optimization, programming models, system integration

Software

Applications, protocols, services, data, open data, system integration, software development, project management, software engineering and lifecycle