GRADUATE STUDY
ELECTRICAL ENGINEERING AND INFORMATION TECHNOLOGY

UNIVERSITY OF ZAGREB
Faculty of Electrical Engineering and Computing

Audio Technologies and Electroacoustics

Audio technology

Would you like to know how audio signals and audio information in multimedia are generated, processed, distributed, and stored? Are you interested in recording and mixing music? You will learn how to design, implement and use audio devices and audio systems, and gain knowledge and skills in the area of audio communications and audio engineering.

Electroacoustics

Would you like to know how sound is converted into electrical signal and vice versa, how to improve your acoustical environment, how to reduce noise? You will learn to: design, construct, test, use and maintain electroacoustic transducers and systems (including ultrasonic ones); investigate and design the acoustical characteristics of open and closed spaces; analyse sound with respect to the features of human hearing, and many other interesting aspects of electroacoustics.

Skills

- Measurement and analysis of sound and vibrations.
- Analysis of acoustic comfort.
- Design and testing of electroacoustic transducers and systems.
- Familiarity with the systems for sound recording, processing, storing and reproduction.
- Programing of audio effects and sound synthesis.
- Psychoacoustical sound quality analysis.
- Recording and mixing of stereo and multichannel audio.
- Analysis and diagnostics through machine learning and artificial intelligence.
- Design of sound distribution systems through network, TV and radio.

Career

The work in this field is diverse and includes career paths such as:

- designer of noise and vibration monitoring and protection systems,
- room acoustics and sound reinforcement consultant,
- designer of ultrasonic systems in industry and medicine,
- product sound quality designer (automotive, home appliances…),
- designer of audio effects, virtual instruments and game audio,
- designer of audio- and communication systems,
- audio engineer.

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EUROPSKI STRUKTURNI I INVESTICIJSKI FONDOVI
UČINKOVITI LJUDSKI POTENCIJALI

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Why choose this profile?

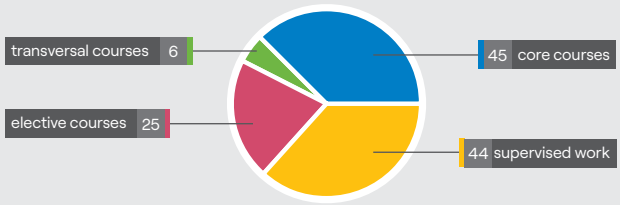
This profile focuses on sound and acoustics. Sound is all we can hear, but it goes even beyond that, to infrasound and ultrasound as well. Sound is an integral part of our lives. We use it to interact directly through speech communication. We enjoy listening to music. We can predict and avoid potentially dangerous situations simply by being able to hear and localize the source of the danger. We are annoyed by noise, etc.

Most teaching activities are organized by the Department of electroacoustics in our classrooms and laboratories. The laboratories include a small anechoic chamber, a listening room equipped with a digital mixing console and other equipment used for sound recording, mixing/processing and reproduction, the Auralization laboratory for advanced 3D spatial sound, the Ultrasonic laboratory, and several systems used in noise and vibration measurements.

The work of students with their mentors is connected with the research and industry projects the mentors are involved in, such as: the development and use of a 4D acoustic camera, binaural synthesis in virtual reality systems, characterization of ultrasonic transducers, recording and analysis of sound environments, room acoustics and sound reinforcement design, and many others.

PLAN OF STUDY	SEMESTER	ECTS
Core courses		45
Electroacoustics 1*	1	5
Room Acoustics	1	5
Sensor Technologies	1	5
Fundamentals of Power Electronics	1	5
Seminar 1	1	3
Electroacoustics 2	2	5
Audio systems	2	5
Audiotechnics*	2	5
Embedded Systems	2	5
Seminar 2	2	3
Audio production	3	5
Research seminar	3	5
Project	3	3
Diploma thesis	4	30
Elective courses	1, 2, 3	25
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)



At present, we have developed several devices that provide a function and service related to sound. The potential for development of audio technology is immense, ranging from smart homes to virtual reality. The demand for experts in this field is constantly growing.

Ivan Vican
Nanophonics

Among other things, my line of work includes the design of sound reinforcement systems in hotels, hospitals, multimedia halls, and other spaces. Besides communication skills, I need specific knowledge about audio devices and room acoustics to achieve success.

Josip Ognjenović
HUST

Audio technology and electroacoustics are important fields in scientific and professional work. Croatian Radio-Television actively applies the knowledge from these fields in designing both its audio systems, and its studios and control rooms as technological spaces.

Marko Malnar
HRT