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AURALIZE: Innovative Course in Room Acoustics and Auralization for Sound Professionals

Project No. 2024-1-IT01-KA210-VET-000245142

Program: Erasmus+ KA210-VET — Small-scale Partnerships in Vocational Education and Training

Partners:

- **Consorzio Futuro in Ricerca (CFR)** – Ferrara, Italy
- **University of Zagreb – Faculty of Electrical Engineering and Computing (UNIZG-FER)** – Zagreb, Croatia

Course Overview

AURALIZE is a multidisciplinary training program that bridges **room acoustics**, **auralization**, and **spatial sound** through an innovative blend of theory, practice, and creative experimentation.

The course provides hands-on experience in **theatre acoustics**, **virtual acoustics simulation**, and **auralization workflows**, using professional tools such as the **Eigenmike64**, ambisonic microphones, and immersive sound production software.

It is designed for professionals and students in:

- Architecture & theatre design
- Music composition & sound engineering
- Acoustics & media technology
- Game design, immersive arts, and XR development

Learning Objectives

Participants will:

- Build a foundational understanding of acoustics and auralization.
- Learn to measure, analyze, and interpret room acoustic data.
- Gain practical experience with 3D spatial recording and virtual acoustics software.
- Explore cross-disciplinary and cultural applications of sound.
- Collaborate internationally and develop documentation and presentation skills.



Course Structure

The curriculum is structured in three main modules:

Module A: Theoretical Lectures (A1–A5)

A series of five lectures combining theoretical principles with cultural and technical perspectives.

A1 – Historical Overview of Acoustics

Lecturer: Prof. Ing. Lamberto Tronchin (CFR)

Date: 21 March 2025 (Online)

- The evolution of acoustics as intangible heritage
- Historical methods and their modern relevance
- Cultural perspectives on sound and space

Resource: [YouTube Link](#)

A2 – Fundamentals of Room Acoustics

Lecturer: Prof. Kristian Jambrošić (UNIZG-FER)

Date: 14 April 2025 (Zagreb)

- Sound propagation, reflection, and reverberation
- Room response and acoustic modeling
- Practical introduction to architectural acoustics

Resource: [YouTube Link](#)

A3 – Equipment and Methods of Recording

Lecturer: Prof. Ing. Lamberto Tronchin (CFR)

Date: 14 April 2025 (Zagreb)

- Acoustic measurement equipment and setup
- Eigenmike64 calibration and ambisonic techniques
- Data capture, analysis, and interpretation

Resource: [YouTube Link](#)

A4 – Virtual Acoustics Production Workflow

Lecturer: Prof. Marko Horvat (UNIZG-FER)

Date: 5 May 2025 (Studio Room 242, Zagreb)



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- Reproduction formats: stereo, surround, VBAP, ambisonics
- Tools for spatial sound production and auralization
- Practical workflow from recording to immersive output

Resource: [YouTube Link](#)

A5 – Multi-disciplinary Uses of Virtual Acoustics

Lecturer: Dr. Cobi van Tonder (CFR)

Date: 5 May 2025 (Studio Room 242, Zagreb)

- Sonic archaeology and the preservation of acoustic heritage
- Simulation and auralization for cultural heritage, performance, and XR
- Creative and artistic applications of virtual acoustics

Resource: [YouTube Link](#)

Module B: Practical Sessions (B1–B2)

Objective: To perform hands-on theatre measurements and analyze real acoustic environments.

B1 – Theatre Measurements (Croatia)

Locations:

- Vatroslav Lisinski Small and Large Concert Halls
- National Theatre of Zagreb

Dates: 14–15 April 2025

Activities:

- Acoustic data collection and impulse response recording
- Source/listener positioning and floor plan documentation
- Data analysis and interpretation

B2 – Theatre Measurements (Italy)

Location: Teatro Masini, Faenza

Dates: 29–30 April 2025

Activities:

- Comparative measurement sessions
- Interdisciplinary collaboration between Italian and Croatian participants
- Discussion of acoustic results and theatre design implications



Module C: Creative Labs

Locations: Zagreb and Bologna

Duration: 4–6 weeks

Hands-on creative projects integrating real acoustic data with digital sound design. Participants apply measurement data to spatial sound design and artistic research.

Creative Lab 1: Equipment Setup and Measurement

Led by Prof. Tronchin — calibration, impulse response measurement, and acoustic parameter analysis.

[Watch on YouTube](#)

Creative Lab 2: Auralization Workflow in Reaper

Led by Dr. van Tonder — ambisonic encoding, convolution reverb, and immersive audio creation.

[Watch on YouTube](#)

Outcomes:

- Studio-based creative experimentation using real theatre data
- Cross-national collaboration and peer review
- Final presentation of research or creative project

Timeline Overview

Date	Activity	Location
21 March 2025	Lecture A1 – Historical Overview of Acoustics	Online
14 April 2025	Lectures A2–A3	Zagreb
15 April 2025	Theatre Measurements – B1	Zagreb
29–30 April 2025	Theatre Measurements – B2	Faenza
5 May 2025	Lectures A4–A5, Creative Labs	Zagreb
10–12 September 2025	Final Presentations at I3DA2025 Conference	Bologna

Assessment & Certification

Participants are evaluated through:



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- Active participation and collaboration
- Completion of creative lab project or research paper
- Knowledge application and documentation

Certification:

Participants receive an **Erasmus+ Certificate of Attendance** acknowledging practical and theoretical competencies in room acoustics and auralization.

Course Deliverables

- Lecture recordings and downloadable materials
 - Acoustic measurement reports (Zagreb and Faenza)
 - Participant auralization project
 - Two short videos on fieldwork
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Instructors and Coordination

Consorzio Futuro in Ricerca (CFR):

- Prof. Ing. Lamberto Tronchin
- Dr. Cobi van Tonder

University of Zagreb (UNIZG-FER):

- Prof. Kristian Jambrošić
 - Prof. Marko Horvat
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Contact and Resources

Website: <https://auralize.eu>

Coordinator: Consorzio Futuro in Ricerca (CFR)

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