MR 305 PRINCIPLES OF SOUND: RECORDING AND ROOM ACOUSTICS FOR MUSICIANS
IES Abroad Vienna

DESCRIPTION:
When performing or recording music in a space, the aural environment becomes as important as understanding one's particular instrument or voice: How do we hear and perceive sound and music? What roles can physical spaces play when practicing, performing, and recording music? What happens to one's performance once it is captured through a microphone and becomes electricity? As the times require musicians to become increasingly more self-sufficient and acquainted with various disciplines related to their professional field – fundamentals of career management, IP law and music business practices, sound and recording, etc. – Principles of Sound Recording and Acoustics for Musicians examines the fundamentals of human hearing, sound perception and localization; characteristics of sound, room acoustics, as well as basic audio signal flow, sound in electrical form, and digital audio processing. Such basic knowledge and skills are complementary in nature, helping musicians better hear themselves, understand "their voices," capture their performances and consequently help improve their own careers and musicianship.

CREDITS: 2 credits

CONTACT HOURS: 30 hours

LANGUAGE OF INSTRUCTION: English

PREREQUISITES: Priority in this course is given to students in the Music Program; European Society & Culture Program students may enroll in it when space permits.

ADDITIONAL COST: European Society and Culture students enrolled in this course will be charged an additional $100 USD. There is no additional cost for Music program students.

METHOD OF PRESENTATION:
- Lectures
- Seminars
- Case Studies
- Hands-on Lab Work
- Field Study
- Moodle Platform

REQUIRED WORK AND FORM OF ASSESSMENT:
- Professionalism and course participation - 10%
- Midterm Exam - 25%
- Final Exam (Lab Final Project) - 25%
- Writing Assignment - 20%
- Field-trip Report - 20%

Professionalism and Course Participation
Students are encouraged and expected to actively participate in class by asking questions, engaging in discussions on the topics at hand, refraining from distractions, including the use of electronic devices outside of the coursework during class.

Midterm Exam
10 questions requiring written answers

Final Exam
Final recording assignment presentation during the last week in the course (individual recording projects) as indicated in the Final Course Project Assignment Sheet

Writing Assignment
Self reflective essay on the coursework subjects and how one can apply those to her / himself. Due on the last day of class

Field-trip Report
Report on three acoustical spaces. Due on the last day of class

LEARNING OUTCOMES:
By the end of the course students will be able to:

- Articulate the human hearing process and basics of sound perception;
- Assess compare and better select performance or recording spaces;
- Identify optimum performance or recording locations (spots) within a space;
- Evaluate recording equipment options;
- Articulate how the sonic environment, available technologies, and recording techniques can affect their sound or voice;
- Execute a stereophonic acoustic recording session;
- Digitally format sound files for submissions, auditions, or competitions;
- Describe the processes of recording (production) and post-production;
- Analyze their own sound more objectively;
- Apply gained knowledge to support their performances, music-making, and artistic promotion.

ATTENDANCE POLICY:
IES Vienna requires attendance at all class sessions, including field study excursions, internship meetings, scheduled rehearsals, and all tests and exams. Attendance will be taken for every class. If a student misses more than two classes without an excuse, the final grade will be reduced by one-third of a letter grade (for example, A- to B+) for every additional unexcused absence.

Excused absences are permitted only when:

1) a student is ill (health issues),
2) when class is held on a recognized religious holiday traditionally observed by the particular student, or
3) in the case of a grave incident affecting family members;
4) Exceptions may be made for conflicting academic commitments, but only in writing and only well in advance of missed class time.

Please refer to IES Vienna Attendance Policy for details on how to get your absences excused.

CONTENT:

Week	Content	Assignments
Week 1	**Lecture and Presentation** 1. Introduction, Course Overview, and Rationale 2. One's Individual Sound or Voice, Recording for Auditions and Submissions 3. Acoustical Environment, Available Technologies, Recording Techniques The Human Auditory System, Hearing Loss and Protection, Thresholds of Hearing and Pain 4. Sound Waveforms, Sound Pressure Levels and Loudness, the Decibel (dB SPL)	• Alten, Chapt. 1, pp. 6–11; 1–6; 1- 19 • Everest/Pohlmann, Chapt. 4, pp. 39-49; 65

Week 2	**Lecture, Presentation, Demonstration** 1. Sound Velocity, Interference, Acoustic Phase, Wavelength, Frequency, Pitch, Timbre, Amplitude, Envelope, Harmonics, Random Noise, Pitched and Non Pitched Sounds	• Alten, Chapter 1, 11–18 • Everest/Pohlmann, Chapt. 1, pp. 2-17
Week 3	**Lecture and Presentation** 2. Introduction to Psychoacoustics, Sound Perception, and Localization 3. Typical Music-Oriented Acoustical Environments 4. Introduction to Room Acoustics, and Psychoacoustics	• Alten, Chapt. 2, 19-32 • Everest/Pohlmann, Chapt. 4, pp. 56-64 • Everest/Pohlmann, Chapt. 6, pp. 95-99 and 103-105; • Chapt. 7, pp. 107 – 111, 113, 115; • Chapt. 8 pp. 117, 122; • Chapt. 9 pp. 125, 129 – 133; • Chapt. 11 pp.151 - 153, 175; • Chapt. 12
Week 4	**Lecture and Presentation** 1. Continuation: Introduction to Psychoacoustics, Sound Perception, and Localization; 2. Typical Music-Oriented Acoustical Environments 3. Introduction to Room Acoustics and Psychoacoustics	• See Week 3 • Sound in Electrical Form, Introduction to Ohm's Law, Applicable Audio Electronics Concepts: Voltage, Resistance, Capacitance, Power, Impedance, Current, Audio Operating Levels. • Transducers: Introduction to Loudspeakers and Microphones. • Alten, Chapt. 1, 11; • Chapt. 3, 39-48; • Chapt. 4, 58-68; 82-90
Week 5	**Lecture and Presentation** 1. Metering, Gain Structure, Signal- to-Noise Ratio, Dynamic Range, Distortion vs. Clipping, Sound 2. Recording Source and Destinations, the Audio Path 3. Introduction to Digital Audio and DAWs (Digital Audio Workstations) Assignment: Create a Complete Flow Chart for an Acoustic Stereophonic Recording (due next class) **4. Midterm Exam**	• Alten Chapt. 5, 95-106; • Chapt. 6, 119-124; 132-134
Week 6	**Lecture** 1. Review and Round Table Discussion 2. Lab: Handling Basic Recording Equipment	
Week 7	**Field Study** 1. Acoustical Spaces 2. Lab: Recording Session Preparation	• **Assignment**: Write a succinct two-page essay summarizing your impressions and evaluation of a given acoustical space (space

		tbd) [Font 11, Times New Roman, 1.5 Spaces, A4 format]
Week 8	**Lab** 1. Recording Session Practice	
Week 9	**Lab** 1. Recording Session Practice	• **Assignment**: Final Recording Project
Week 10	**Assessment and Summary** 1. Evaluation and Group Critique 2. Course Conclusion	• **Recording Session Final Project Due**

COURSE-RELATED TRIPS:

- Possible field trips to survey acoustical spaces
- Individual student surveys of acoustical spaces

REQUIRED READINGS:

- Alten, Stanley R. Audio in Media, Eighth Edition, Thomson Wadsworth, 2008. ISBN: 978-0-495-09568-2.
- Everest, F. Alton, Pohlmann, Ken. Master Handbook of Acoustics, Fifth Edition, McGraw-Hill/TAB Electronics, 2009. ISBN: 978-0071603324.
- Custom Handout: “Principles of Sound and Acoustics Review.”

RECOMMENDED READINGS:

- Hall, Donald E. Musical Acoustics, Third Edition, Brooks/Cole, 2001. ISBN: 978-0534377281