Course Title:	**Architectural Acoustics**
Course Code:	**ENBU809**
Descriptor Start Date:	**01/01/2021**
Descriptor End Date:	**31/12/2023**
POINTS:	**15.00**
LEVEL:	**8**
PREREQUISITE/S:	**ENBU700, ENBU703, ENBU708**
COREQUISITE/S:	**None**
RESTRICTION/S:	**None**

LEARNING HOURS

Hours may include lectures, tutorials, online forums, laboratories. Refer to your timetable and course information in Canvas for detailed information.

Total learning hours: 150

PRESCRIPTOR

The acoustic performance of buildings and rooms makes a substantial contribution to the work and living environment of occupants of the built environment. This course seeks to provide architectural engineers with the tools and techniques necessary to analyse, measure and design for acoustic performance. Includes laws of sound propagation, characteristics of hearing, noise pollution and conservation of hearing (legal aspects relevant), noise control measures. Room to room calculations of intensity and measurements.

LEARNING OUTCOMES

1. Differentiate the physical laws of sound propagation
2. Differentiate the characteristics of the hearing mechanism
3. Assess the acoustic performance of different building configurations finishes
4. Critically appraise the acoustic effects of various sound sources on buildings.
5. Determine the requirements for the conservation of hearing, and noise control measures that can be introduced (understanding of the law related to same).
6. Synthesise room acoustic and room-to-room transmission calculations

CONTENT

- Physical aspects of sound propagation: pressure waves, velocity of sound, wavelength, frequency; magnitude of acoustic signals, sound pressure level, power and intensity; one dimensional plane and spherical waves, near and far field, impedance; frequency analysis; weighted sound pressure levels.
- Hearing mechanism
- Methods used to assess hearing response: BS4142, Zwicker and Stevens Methods, Noise Rating
- Transport noise: road, rail and aircraft
- Regulations: types of deafness; Noise at Work
- Room acoustics: absorption, reverberation time
- Structural sound transmission: sound reduction index
- Noise measurement: demonstrations of Sound Pressure Meter

LEARNING & TEACHING STRATEGIES

Lectures, guest speakers, tutorials, class and group discussions, case studies, on-line learning.

ASSESSMENT PLAN

Assessment Event	Weighting %	Learning Outcomes
Design Project	20.00	1,2,3,4,5,6
Problem solving questionnaire	20.00	1,2,3,4,5,6
Final Project	60.00	1,2,3,4,5,6

Grade Map **MAP1**

A+ A A- Pass with Distinction
B+ B B- Pass with Merit
C+ C C- Pass
D Fail

Overall requirement/s to pass the course:

To pass the course, the student needs to achieve a minimum overall grade of C-

LEARNING RESOURCES

Smith BJ, Peters RJ and Owen S, “Acoustics and Noise Control” (Person Longman ISBN -582-08804-6) McMullan R, “Environmental Science in Building” (Macmillan Press Ltd, London 2002 ISBN 0-333-94771-1)

For further information, contact: Te Ara Auaha - Faculty of Design & Creative Technologies

Principal Programme:	**AK3751, Bachelor of Engineering (Honours)**
Related Programme/s:	**AK1325** **AK3566** **AK1296**