

London South Bank University

UNIT GUIDE: 2003/2004

Faculty of
Engineering, Science and the Built Environment

Noise Control M

September 2003



CENTRAL TO YOUR SUCCESS

Unit Title:	Noise Control
Unit Number:	
Unit Level:	M
Unit Value:	15 CAT points
Semester:	One
Subject Area:	Acoustics
Total Study Time:	150 hours (45 class, 105 student self managed)
Prerequisites:	None
Assessment:	30% coursework, 70% formal examination
Pass Mark:	50%
Course(s):	MSc/PGD Env & Architectural Acoustics
Mode:	Weekly key lectures
Teaching Team	
Unit co-ordinator:	Stephen Dance(dances@lsbu.ac.uk)
Lecturers:	Prof. John Turner, Dr Stephen Dance

1.0 Aims and learning outcomes

To teach, at an advanced level, the physical mechanisms by which noise may be created, as well as to provide the students with the analytical and practical skills that they require to control noise from a variety of sources

The principle learning outcomes are that the student should be able to:

- Understand the physical processes involved in the production of noise by a variety of sources
- predict the sound power level radiated by idealised and practical sources of noise
- assess the noise levels produced by practical noise sources in real environments
- appreciate how noise can be controlled at source
- appreciate how noise can be controlled using absorption
- appreciate how noise can be controlled using encapsulation
- appreciate how noise can be controlled using barriers
- apply noise control techniques using computer models to estimate their cost-benefit
- appreciate how the application of careful design leads to considerably reduced costs
- understand the fundamentals of active noise control
- appreciate how noise and vibration can be controlled using damping and isolation

2.0 General Syllabus

- i) Introduction to noise and vibration control
- ii) Measurement and propagation of noise from plant and buildings

- iii) Introduction to vibration: SHM, free and forced vibrations, damping, transmissibility
- iv) Structure borne and air borne sound
- v) Strategies for noise control
- vi) Noise generating mechanisms
- vii) Diagnosis of sources and sound paths
- viii) Noise control at source, during transmission and at receiver
- ix) Noise control by barriers
- x) Computer prediction models as tool for assessing the effectiveness of noise control techniques
- xi) Vibration control
- xii) Active noise control

3.0 Teaching Methods

A balance between formal lectures, practical laboratories and student centred learning. Principles will be covered in formal lectures, while the student will be expected to address the depth of the subject areas through the assignment.

4.0 Teaching Programme

Semester 1: 9.00 to 12.30 Thursday

Teaching will be by formal lectures supported by seminars, tutorials, case studies, self-learning materials, computing classes and laboratory work. Principles will be covered in formal lectures, while the student will be expected to address the depth of the subject areas through the assignment and associated studies. The assignment will thus have a central role in directing the student to the key concepts and themes within the unit.

4.1 Teaching and Learning Programme 2003/2004

Videos, lectures and student centred workshops will look at the sections that make up the building environmental space.

Week	Date	Time	Indicative area of study	Lecturer
1	2-Oct-03	09:30 to 12:30	Introduction to course	Stephen Dance
2	9-Oct-03	09:30 to 12:30	Noise Control Strategies	Stephen Dance
3	16-Oct-03	09:30 to 12:30	Noise Control using Absorption	Stephen Dance
4	23-Oct-03	09:30 to 12:30	Noise Control using Barriers	Stephen Dance
5	30-Oct-03	09:30 to 12:30	Noise Control Prediction Software	Stephen Dance
6	6-Nov-03	09:00 to 17:00	Institute of Acoustics Conference	Stephen Dance
7	13-Nov-03	09:30 to 12:30		John Turner
8	20-Nov-03	09:30 to 12:30		John Turner
9	27-Nov-03	09:30 to 12:30		John Turner
10	4-Dec-03	09:30 to 12:30		John Turner
11	11-Dec-03	09:30 to 12:30		John Turner
12	18-Dec-03	09:30 to 12:30		John Turner
13	15-Jan-04	09:30 to 12:30	Exam Revision	John Turner
Exam	22-Jan-04	Not Known		All lecturers

5.0 Coursework Briefs

Typical areas for the assignment work would be to undertake preliminary analyse of a planned building or applying remedial action to an existing room. In both cases the required design conditions should be considered, given the internal and external noise sources and level of the investment necessary to undertake the work, using a variety of noise control techniques.

6.0 Learner Support Material

D A Bies and C H Hansen. Engineering noise control. F & N Spon, 1996
L L Beranek, I L Ver et al. Noise and vibration control engineering - principles and applications. John Wiley and Sons Inc, 1992
L E Kinsler, A R Frey et al. Fundamentals of acoustics - third edition. John Wiley and Sons Inc, 1982
W T Thompson. Theory of vibration with applications - fourth edition. Chapman and Hall, 1993
F J Fahy. Sound and structural vibration - radiation, transmission and response. Academic Press, 1985
J W S Rayleigh. The theory of sound - Unabridged second revised edition, Vol 1 and 2. Dover Publications Inc, 1945
J Roberts and D Fairhall. Noise control in the built environment. Gower 1988.
Sound Research Laboratories. Noise control in building services. Pergamon. 1988.
P A Nelson and S J Elliott. Active control of sound. Academic Press. 1992

7.0 Assessment of the Unit

The marking scheme will be as follows:

30% – 6 Coursework assignments
70% – Examination