

Objective

The course imparts fundamental understanding about architectural acoustics and environmental noise. Physics of sound and acoustical design for built spaces are covered, which enables the student to provide appropriate acoustic solutions for both indoor and outdoor spaces.

Module 1**FUNDAMENTALS OF ARCHITECTURAL ACOUSTICS**

Fundamentals: Definitions, terms related to acoustics, sound waves, frequency, amplitude, intensity, wavelength, sound pressure, measurement of sound, decibels.
Characteristics of speech, music and hearing.

Module 2**ROOM ACOUSTICS CONCEPTS**

Room Acoustics: resonance, reverberation, echo, reverberation time (Sabine's formula)
Material property: Absorption, reflection, scattering, diffusion, transmission, absorption co-efficient, Noise Reduction Coefficient (NRC),
Absorbing materials used and their choices for different acoustic treatment, Sound insulation
Simple exercises involving reverberation time and absorption

Module 3**ACOUSTICS IN BUILDING DESIGN AND TREATMENT**

Basic room acoustics concepts and design: shape, volume, defects, treatment for interior surface, basic principles in designing, cinemas, recording studios, class rooms, conference halls, Auditorium.

Module 4**ENVIRONMENTAL NOISE**

Noise and its control- Air and structure borne, sound transmission, vibration isolation, damping.
Noise source within buildings and its control (Fans, chillers, boilers, HVAC noise sources).
External noise source and its control: Open air acoustics, Free field propagation of sound, absorption from air and natural elements, Site planning, Design of open air theatres, Types and design of Noise barrier, effects of landscape elements

Module 5

Acoustic design of small spaces using innovative techniques and materials by applying manual or simulation software method, as decided by the subject teacher.

References

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5. Kang, J. (2006). Urban Sound Environment. 1st Ed. CRC Press.
6. Meyer, H. B. and Goodfriend, L. Acoustics for Architects. Reinhold.
7. Smith, B. J., Peters, R. J., and Stephanie, O. (1982). Acoustics and Noise Control. New York: Longman.