Sl. No.	Sub. Code	Theory	Contact Hours			Credit
			L	T	P/S	
4.	22AR643	Architectural Acoustics	3	0	0	3

Course Objective	The course imparts fundamental understanding about architectural acoustics and environmental noise; physics of sound and acoustical design for built spaces.
Anticipated Learning Outcomes:	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 coefficient, 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 treatment in building design	Basic room acoustics concepts and design: shape, volume, defects, treatment for interior surface, basic principles in designing, cinemas, recording studios, classrooms, 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 methods, as decided by the subject teacher.

Note: Most Architectural subjects do not have Textbooks. The Reference books mentioned below are for reference only and University question paper should be prepared from the Syllabus descriptions.

References

1. *Szokolay, S. V. (2008). Introduction to architectural science. Taylor and Francis.*
2. *Vigran, T. E. (2008). Building Acoustics. 1st Ed. Taylor and Francis.*
3. *Barron. M. (2009). Auditorium acoustics and architectural design. 2nd Ed. Taylor and Francis.*
4. *Eagan, D. Concepts in Architectural Acoustics.*
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.*