



AUBURN UNIVERSITY

SAMUEL GINN  
COLLEGE OF ENGINEERING

AEROSPACE

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**AERO 4970/7970**

**Fundamentals of Aeroacoustics  
Room Acoustics and Reverberation**

**SET VII**

1. What is a typical transmission coefficient for a sheet rock wall ( $\sigma = 21 \text{ kg/m}^2$ ) at 1 kHz. Recall that the transmission coefficient is the fraction of the incident intensity transmitted through the wall. How does this compare to a typical absorption coefficient for a room of 0.15? Compare the fraction of energy lost from the incident intensity by transmission to that lost by absorption.
2. If a typical room has an absorption coefficient of 0.15 what acoustic power is necessary to produce a reverberant sound level of 80 dB. Assume that the room is 5 m by 7 m by 2.4 m.
3. A sound source produces 0.001 W of acoustic power. If the room is 7 m by 10 m by 3 m with an absorption of 0.20 calculate the SPL at a distance of 5 meters from the source using a combined direct and reverberant field.
4. A room is 5 m by 8 m by 2.4 m high. The room has a carpet with an absorption  $\alpha = 0.37$ ; the ceiling and two walls (one 5 by 2.4 m and the second 8 by 2.4 m) are sheet rock with an  $\alpha = 0.04$ , and the remaining two walls are concrete, with  $\alpha = 0.02$ . What is the average absorption for this room? What is the reverberation time?