Oregon

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Oregon Specific Acoustical Engineering Examination Syllabus

General Description of Examination

The Oregon Specific Acoustical Engineer exam is an open-book exam that involves two, four-hour examination sessions: a four-hour morning session and a four-hour afternoon session.

The morning examination session problems cover Outdoor and Industrial Noise: Oregon DEQ, FHWA, HUD and OSHA noise compliance. The afternoon examination session problems cover Indoor Sound: small and large rooms, communication and privacy. A more detailed description of what is covered in the examination sessions is presented below.

Technical Areas Covered by Exams

Morning Session: Outdoor and Industrial Sound, DEQ and OSHA Compliance

The morning examination problems will test the ability to solve problems which may involve but is not limited to the following topics:

- C, A and un-weighted sound spectrums
- Engine enclosure design
- Fan isolation with springs and inertia blocks
- Muffler design with side branch resonators and resonant chambers
- Finite length line source calculations
- Machine sound power calculations
- Multiple sources and workers in OSHA calculations
- Insertion Loss calculations to meet DEQ and OSHA requirements
- Multiple time exposures in DEQ and OSHA calculations
- Enclosed source, mass law, absorption calculations
- Reverberant room issues in OSHA calculations
- Point source, barrier, receiver level calculations
- Statistical traffic (Lxx) levels derived from individual pass-by events
- Blower sound power level calculations
- Hand calculation of Ldn levels
- Calculation of required traffic barrier from traffic count, speed, and distance data
- DEQ compliance in rural setting

Afternoon Session: Indoor Sound: Small/Large Rooms, Communication/Privacy

The afternoon examination problems will test the ability to solve problems which may involve but is not limited to the following topics:

- Plenum attenuation
- Wall assembly, STC prediction
- Composite partition TL
- Vocal source in reverberant room, S/N
- Receiver level adjustment using Hass reflections
- Distributed sources in reverberant space, specific source/receiver S/N
- Loudspeaker power, outdoor level at distance
- Floor vibration, surface sound level, vibration exposure criteria
- Noisy environment, walk away test, SIL
- Investment, low cost high maintenance, high cost low maintenance, lifetime
- Air diffusers in semi reverberant room, adjust for PNC
- Speaker directivity, program level and placement in reverberant room
- Blower vibration isolation from structure on rooftop
- Partitioned reverberant room
- Coupled reverberant rooms with source in one room and desired level in other room
- Pure tones considered relative to DEQ compliance
- Blower, blades, rpm, cfm, power, STC, office noise levels
- STC, IIC, IOTC ratings
- Mass, strength, density and damping
- RT60, Sabines, room constant, direct to reverberant ratio
- % Alcons. RASTI