Abstract Submitted
for the APR16 Meeting of
The American Physical Society

Development of an advanced undergraduate course in acoustics
KENT L GEE, TRACIANNE B. NEILSEN, SCOTT D. SOMMERFELDT, Department of Physics and Astronomy, Brigham Young University — Within many physics undergraduate programs, acoustics is given only a cursory treatment, usually within an introductory course. Because acoustics is a natural vehicle for students to develop intuition about wave phenomena, an advanced undergraduate acoustics course has been developed at Brigham Young University. Although it remains an elective course, enrollment has increased steadily since its inception. The course has been taken by students in physics, applied physics, physics teaching, and mechanical and electrical engineering. In addition to providing training for students motivated by interest in undergraduate research, internship, employment, and graduate schooling opportunities in acoustics, the course facilitates connections between various areas of physics. Explicit connections are made to mechanics, electricity and magnetism, thermodynamics, optics, quantum mechanics, and experimental and computational laboratory courses. Active learning is emphasized through Just-in-Time-Teaching and course structure. Homework exercises are both theoretical and practical and often require making and interpreting of graphs. For example, students may model traffic noise as a series of uncorrelated monopoles or examine highway barrier effectiveness using Fresnel diffraction techniques. Additionally, students participate in resumé-building measurements and learn to report their results in the form of technical memoranda. Course evaluations and post-graduation student surveys rate it among the most valuable undergraduate student courses offered.

Kent L Gee
Brigham Young University

Date submitted: 08 Jan 2016 Electronic form version 1.4