**ME 4801 – Undergraduate Research in Mechanical Engineering (URME) for 1 credit**

Instructor: **Dr. Richard Ruhala**, *Associate Professor of Mechanical Engineering*

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Meeting times: TBA

Office Hours: 

**Wednesday** 1:30-4:30 pm

**Thursday** 2:00-3:00 pm & 7:30-8:30 pm

or by appointment

Recommended Material Lab/engineering notebook with bonded pages or organized binder to keep notes on this research project and log hours.

Pre-Requisite: *Consent of faculty member.*

Grading:

- 20% Midterm progress report
- 40% Research project report and/or oral presentation
- 20% Research Notebook
- 20% Instructor Evaluation

Nominal Grading Scale: 90-100 A  80-89 B  70-79 C  60-69 D  0-59 F

**CATALOG DESCRIPTION**

This is a specialized independent study in research determined by the students’ needs and interests, in consultation with and under the guidance of an ME faculty member. The student is expected to research 3-hours per week per credit hour of research, and document in a professional notebook.

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General LEARNING OUTCOMES

Through Independent Study, students should gain a greater understanding of scientific inquiry and engineering research as well as a greater comprehension of specific scientific and engineering concepts. Students may engage in a variety of activities to meet these intended outcomes, including but not limited to, literature reviews, engineering analysis and design, and laboratory activities and experiments.

Upon the completion of this course, you should be able to:

1. An ability to communicate effectively by documenting research progress, writing and submitting a report.

2. A recognition of the need for, and an ability to engage in life-long learning, by conducting a literature review and learning basic knowledge in their research project (e.g., acoustics, noise control, vibrations, instrumentation).

RESEARCH PROJECT DESCRIPTION

Set up the new vibration and acoustics analyzer (NI) in Q 217. Help to program using LabView the National Instruments (NI) equipment in collecting and analyzing vibration and or acoustics data related to one or more of the three projects below:

1. Noise measurement and analysis of building HVAC fan noise (outdoor unit, Q building, west side). Help set up and use precision microphone with LabView software and NI analyzer to take detailed measurements.

2. Similar to above, but to create vibration measurement with accelerometer and a beam vibration experiment for lab in Q217.

3. Literature search for pavement vibration and tire noise control using different pavement materials. Might work with Georgia Pavement Research Center at SPSU, and attempt some measurements if possible.

4. Perform literature search for musical acoustic instruments related to the vuvuzela. Help with figures and text for journal manuscript in progress.

AMERICANS WITH DISABILITIES ACT COMPLIANCE

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the ATTIC counselor working with disabilities at 678-915-7316, now in the Basement of the Student Center, as soon as possible to better ensure that such accommodations are implemented in a

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timely fashion. Accommodations are best implemented at the beginning of the semester. I will work with you to provide reasonable accommodations to ensure that you have a fair opportunity to perform and participate in class.