Instructors: Dr. Cyders, 228 Stocker, cyderst@ohio.edu
Audra Hilterbran, hilterbr@ohio.edu
John Mullen, jm181214@ohio.edu

Prerequisites: ENG 1510, ME 3122, ME 4701

Meetings: MW 3:05 – 4 PM, Porter 105

Office Hours: TBA

Textbooks (optional): Understanding Design of Experiments by R.J. Del Vecchio
Experimental Methods for Engineers by J.P. Holman
Statistics for Engineers and Scientists by W. Navidi

Course Content: Instrumentation & Data Acquisition
Experimental Design/Hypothesis Testing
Technical Writing (Junior Composition Equivalence)
Error/Precision/Calibration/Uncertainty
Basic Instrumentation Circuitry Analysis
Basic Signal Processing
Simulation/Validation

Grading:

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>93.3-100</td>
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<tr>
<td>A-</td>
<td>90-93.3</td>
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<tr>
<td>B+</td>
<td>86.7-90</td>
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<tr>
<td>B</td>
<td>83.3-86.7</td>
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<tr>
<td>B-</td>
<td>80-83.3</td>
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<tr>
<td>C+</td>
<td>76.7-80</td>
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<td>D-</td>
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<td>F</td>
<td>&lt;60</td>
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Policies: Attendance: Attendance is compulsory. This class involves a lot of in-class individual and team work. I do not take attendance in class. I do, however, expect professional behavior out of all students. If a student is late for class or misses a class unexcused, it is their responsibility to gather material missed from their colleagues. Exams/quizzes may only be made up if an absence is excused beforehand in writing. Acceptable reasons for missing an exam are outlined in the student handbook.

Assignments: All assignments must be turned in at the beginning of the class in hard copy and stapled, unless specified otherwise. Late assignments will not be accepted.

Academic Honesty: Academic misconduct and related sanctions are defined in the Ohio University Code of Conduct. In particular, the first incidence of cheating on an individual homework or plagiarism in a writing assignment will result in a zero for said assignment. Infractions may also be referred to the Director of University Judiciaries.
Repeated instances will result in failure of the course as a whole, and definite referral to Judiciaries. **Copying individual work will not be tolerated.** Please be particularly conservative about avoiding plagiarism and copying others’ work. Cite references and sources in all reports and projects. Sanctions may be appealed through the grade appeal process outlined in the Ohio University Student Handbook.

**Cell Phones:** Please turn cell phones off while in class. Students are reminded that they are expected to behave as professionals in class.

**Disabilities:** Any student who suspects s/he may need an accommodation based on the impact of a disability should contact the class instructor privately to discuss the student’s specific needs and provide written documentation from the Office of Student Accessibility Services. If the student is not yet registered as a student with a disability, s/he should contact the Office of Student Accessibility Services.

**Homework:** Part of the grade on every assignment is the professionalism exhibited in your presentation of results. I may go so far as to reject work that is difficult to decipher for grading. It is often useful to make a separate copy of your assignment after working through it to clearly organize your results. You should be able to hand this to any competent design engineer, and they should be able to quickly determine on their own what the problem was, what assumptions you made, what models you applied, what equations you used, and what your results and recommendations were.

**Writing:** This class serves as one of the Junior Composition course equivalencies for the Mechanical Engineering program. As such, writing quality and style will be heavily graded. All materials to be turned in throughout the course of this class are expected to be of professional quality. **An absence of spelling and major grammatical errors in your work is expected as a minimum.** Again, I may go so far as to reject work that is poor enough that it is difficult to grade. It is very useful to have a third party (i.e.: someone not in the class, preferably from another major) proofread your work after you have done so yourself.

**Course Outcomes:** At the end of this course, ME 4880 students will be able to:

1. Calculate error/uncertainty propagation for systems that include multiple terms with uncertainties

2. Design, plan and execute a real-world experiment, evaluate the experimental results, and use them to inform a decision-making process.

3. Explain the purpose and general methodology of Design of Experiment (DOE) techniques

4. Use fundamental engineering concepts to compare theoretical predictions with real measurement results and explain related sources of error

5. Use DC circuit analysis and basic signal processing techniques to specify
components in a transducer setup

(6) Identify copyright and plagiarism infractions, and describe methods to avoid them in technical writing and presentation

(7) Write and edit clear and effective laboratory reports, including the creation of professional-quality figures, tables and plots

(8) Synthesize a large project report in the form of abstracts, memos and executive summaries

(9) Create a datasheet for an experiment to clearly record and communicate all necessary information for an experimental trial, and properly document an experiment using it.

(10) Identify appropriate regression models, apply regression analysis and discuss the quality and validity of the results

(11) Use performance data from a dynamic test to determine the performance characteristics of an electric motor

(12) Plan an experimental project, including specification of capable instrumentation and hardware and creation of a project budget