**NUCL 325 (NUCL 497M)**

**Nuclear Materials Laboratory**

**5th Edition**

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**Course Overview**

An important aspect of NUCL 325 is learning how to effectively communicate experimental results through writing. All students will have essentially the same data to analyze, thus your grade will depend on your ability to extract relevant data and communicate it using appropriate texts, graphs, and tables. Remember: effective communication and presentation don’t just happen; it is important to think about what the data and analysis mean and how to best communicate that meaning. **It is required to submit all lab reports in order to complete this course**.

All experiments, laboratories, and reports require error analysis. Error Analysis gives bounds and significance to the results generated. For this lab class, and in your careers as engineers, it is *extremely important* to learn to classify the reliability of results from an experiment or measurement through appropriate error analysis. It is important to think about error analysis before beginning an experiment. As such error analysis derivations will be required for not only lab reports but also as a part of the Pre Lab reports.

The first part of the semester will be focused on classical materials laboratories. These labs are designed in accordance with ASTM standards, and represent classical materials laboratories. These labs will cover x-ray diffraction, tensile testing, Rockwell hardness testing, annealing, cold working, three-point-bend testing, microscopy, and sample preparation. During these labs it is important to keep in mind that even the *same* mechanical property, measured with a *different* mechanical test may yield different values. In some cases, this is because the material property in question (such as hardness) is not a fundamental material property, but represents a combination of other properties.

The second part of the semester will cover nuclear materials laboratories. These labs are designed to give an introduction at cutting edge vacuum technology that allows nuclear materials scientists to probe and modify surfaces and interfaces with radiation. The equipment that will be used in the laboratory is extremely delicate and expensive. Therefore, it is important to come well prepared to lecture and lab and to take full advantage of this unique laboratory opportunity for undergraduate students.

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