
MEC 214: Probability and Statistics for Mechanical Engineers

Fall 2018

Prof. Carlos E. Colosqui

155 Light Engineering

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Class Time and Location: TH: 7:00 – 7:50 p.m., ENGINEERING 143

Instructor Office Hours: Mondays & Wednesdays 11 AM– 12:30 PM (Office LE 155)

DESCRIPTION: Foundations of probability and statistics as applied to mechanical measurements and experimentation. Basic statistical analysis of data and assessing likelihood of future events. Concept of random sampling. Uncertainty analysis and error propagation, using both analytical and graphical tools. Assessing dominant sources of error in measurements.

PREREQUISITES: MAT 126 or 131 or 141 or AMS 151; MEC major or permission of instructor

CO-REQUISITES: MAT 127 or 132 or 142 or 171 or AMS 161

CREDIT EARNED: 1 credit

TEACHING ASSISTANT: Aktaruzzaman Al Hossain (aktaruzzaman.alhossain@stonybrook.edu)

TEXT: None, a manual will be provided online during the semester

HOMEWORK: Three sets of homework problems will be assigned
(No late homework will be accepted, except under documented emergency)

EXAMINATION: One final exam (No make-up exam unless arranged prior to the exam)

GRADING: Your semester letter grade will be based upon the following categories:
Homework – 60%, Final Exam – 40%

COURSE Outline (Subject to Change):

- I. Introduction
- II. Statistics (basic definition, central tendency, measure of dispersion)
- III. Probability (definitions and properties)
- IV. Analysis of experimental data (quality of measurement, types of errors, parameter, regression)
- V. Error Propagation (direct and indirect measurements, uncertainty tree)
- VI. Combinatorial methods (counting principles, permutations, combinations)
- VII. Distributions

COURSE LEARNING OBJECTIVES:

- Measure of central tendency and dispersion
- Discrete and continuous probability
- Error analysis and propagation, linear regression
- Combinatorial methods

STONY BROOK UNIVERSITY SYLLABUS STATEMENT:

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or <http://studentaffairs.stonybrook.edu/dss/>. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following web- site: <http://www.sunysb.edu/ehs/fire/disabilities.shtml>

CALCULATOR POLICY

Effective Fall 2008 only the following calculators will be permitted on all midterm and final exams in the Department of Mechanical Engineering. There will be no exceptions! This list of calculators is identical to that allowed for the *National Council for Examiners for Engineering and Surveying* (NCEES) Fundamentals of Engineering (FE) exam that many of you will take in your senior year, as well as the Professional Engineering (PE) exam that you may take several years from now. The sooner you become comfortable on one of these calculators, the better.

NCEES Allowed calculators as of Fall 2009:

- **Casio:** All **fx-115** models. Any Casio calculator must contain **fx-115** in its model name.
- **Hewlett Packard:** The **HP 33s** and **HP 35s** models, but no others.
- **Texas Instruments:** All **TI-30X** and **TI-36X** models. Any Texas Instruments calculator must contain either **TI-30X** or **TI-36X** in its model name.

The NCEES policy on calculator can be found here:

<http://www.ncees.org/exams/calculators/>

Disability Support Services (DSS) Statement:

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities>.

Academic Integrity Statement:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>.

Critical Incident Management:

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.