EXPANDED COURSE DESCRIPTION
MECHANICAL ENGINEERING
Lassonde School of Engineering
Mechanical Engineering
LE / MECH 2502 3.0 SECTION M
INSTRUMENTATION AND MEASUREMENT TECHNIQUES
FALL 2019 / WINTER 2020

Last Modified Date: 08/06/2019

COURSE CALENDAR DESCRIPTION

This course covers underlying physics and design of measurement systems for various phenomena, instrumentation systems and computerized data acquisition, as well as data presentation strategies and related statistics. Prerequisites: SC/MATH 1013 3.00, SC/MATH 1014 3.00, SC/MATH 1025 3.00, LE/EECS 1021 3.00.

INSTRUCTOR(S)

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<tr>
<th>Name</th>
<th>Section / Format / Term</th>
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<tr>
<td>Tabatabaei, Nima</td>
<td>Sec. M / LECT / W</td>
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ADDITIONAL INFORMATION

LECTURE TOPICS

- Introduction to LabView
- Basic Concepts in Measurement and Instrumentation
- Static and Dynamic Signals Characteristics
- Signal Analysis
- Analog Electrical Measurements and Signal Conditioning
- Sampling, Digital Devices and Data Acquisition
- In-Lecture Feedback Session on Final Project Proposals
- Resistive & Voltage Generating Sensors
- Measurement System Behaviour

COURSE LEARNING OUTCOMES

Upon successful completion of this course, the student will have demonstrated the ability to:
1. Identify the fundamental concepts of sensors, signal conditioning, and data acquisition.
2. Investigate the fundamental concepts of instrumentation and measurement systems through hands-on experiments involving measurement of various mechanical parameters (Pressure, deflection, temperature, flow, etc)
3. Identify the problem measurands, unknowns, constrains and the underlying physics; document design requirements, and formulate solution strategy
4. Extend the learned concepts and experiments methods to design and build measurement systems involving sensors, signal conditioning, data acquisition and data analysis through group project.
5. Identify key sources of error and uncertainty in measurements
6. Demonstrate project planning, management, teamwork and communications skills through the completion of a design project and development of concise and coherent reports and design documents that reflect critical analysis

TEXTBOOK

GRADING
Final grades will be determined by the following weighting of assessments:
- Lab Reports (includes pre-lab and post-lab assignments – 50%
- In-Class Pop quizzes – 20%
- Group Project (Includes video pitch, proposal, presentation to the panel, final report, and peer evaluation) – 30%

ACADEMIC INTEGRITY LINKS
- Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
- Academic Integrity - http://lassonde.yorku.ca/academic-integrity

STUDENT LINKS
- Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
- Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
- Student Accessibility Services (SAS) - https://accessibility.students.yorku.ca/
- York University’s Policies on Gender/LGBTQ*/Positive Space - http://rights.info.yorku.ca/lgbtq/

LAND ACKNOWLEDGEMENT
- We acknowledge our presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, the Huron-Wendat, and the Métis. It is now home to many Indigenous Peoples. We acknowledge the current treaty holders, the Mississaugas of the New Credit First Nation. This territory is subject of the Dish With One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.
- The Indigenous Framework for York University: A Guide to Action can be found here: http://indigenous.info.yorku.ca/
- Meaning of a land acknowledgement: http://healthydebate.ca/opinions/indigenous-land-acknowledgements

Many courses utilize Moodle, York University’s course website system. If your course is using Moodle, click here to access it.

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