Instrument systems and procedures for high-precision/accuracy geodetic surveys. ISO Standard 17123. High-precision surveys in engineering physics; geodetic network densification, adjustment and analysis; procedures for deformation surveys and strain analysis. Establishment, observation, adjustment and analysis of control networks for construction and monitoring of large engineering structures. Prerequisites: LE/ESSE 2620 3.00; LE/ESSE 2630 3.00; LE/ESSE 3610 3.00; LE/ESSE 3620 3.00. Note: Recommend students to take LE/ESSE 3630 3.00 together.

INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
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<tbody>
<tr>
<td>Wang, Jianguo</td>
<td>Sec. M / LECT / W</td>
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ADDITIONAL INFORMATION

GRADING
Laboratories: 40%
Mid-term test: 15%
Participation: 5%
Final Exam: 40%

COURSE OBJECTIVES
1) Familiarization with high precision surveying instrument systems.
2) Gain knowledge and skills in testing and calibrating of survey instruments according to standards and specifications.
3) Acquiring knowledge and skills on and become capable of establishing geodetic control for engineering projects of high accuracy/precision.
4) Become capable of applying geodetic theory in high precision monitoring networks.
5) Developing skills in data collection, processing, analysis and interpretation via advanced and complex calculations and computer programming.
6) Acquiring knowledge and skills on integrating modern positioning techniques for engineering applications

COURSE LEARNING OUTCOMES
1) Demonstrate knowledge and understanding of general aspects of control surveying.
2) Explain and apply general aspects of technical specifications and manuals for control surveying
3) Demonstrate knowledge, understanding and skills of horizontal control surveying.
4) Demonstrate knowledge, understanding and skills of vertical control surveying.
5) Demonstrate knowledge, understanding and skills of GNSS in control surveying.
6) Demonstrate knowledge, understanding and skills of geodetic control network establishment.
7) Demonstrate knowledge, understanding and skills of handling various engineering surveying applications.

COURSE OUTLINE
1. Modern survey instruments – Testing, calibration and operation
2. EDM principles and errors
3. Theodolites – principles, methodologies, errors, filed observation procedures.
4. Total station systems.
5. Height systems, high precision levelling – methodologies, errors, filed observation procedures.
6. GPS filed observation and data processing in geodetic control surveying.
8. Engineering surveys.
9. Development of data processing software utility for 3D engineering control survey
10. Optimal control network design.

TEXT BOOKS

SUGGESTED REFERENCES
12. Research papers provided by the instructor.
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.

Moodle @ York University