EXPANDED COURSE DESCRIPTION
EARTH, SPACE SCIENCE AND ENGINEERING
Lassonde School of Engineering
Earth and Space Science and Engineering
LE / ESSE 3620 3.0 SECTION A
ADJUSTMENT CALCULUS
FALL 2017 / WINTER 2018

Last Modified Date: 08/18/2017

COURSE CALENDAR DESCRIPTION
Minima and maxima of functions, Weierstrass theorem, Lagrange multipliers. Quadratic forms. Observables, observations, parameters and mathematical models. The least squares principle; weight matrix and variance factor; parametric, condition and combined adjustments. Three lecture hours and one and a half hours of laboratory exercises per week. One term. Three credits. Prerequisites: SC/MATH 1025 3.00; SC/MATH 2015 3.00; LE/ESSE 2620 3.00. Corequisite: LE/ESSE 3610 3.00. Prior to Fall 2014: Prerequisites: SC/MATH 1025 3.00; SC/MATH 2015 3.00; LE/EATS 2620 4.00 or LE/ENG 2120 4.00; LE/CSE 2501 1.00. Corequisite: LE/EATS 3610 4.00 or LE/ENG 3110 4.00. Prior to Summer 2013: Prerequisites: SC/MATH 1025 3.00; SC/MATH 2015 3.00; SC/EATS 2620 4.00 or SC/ENG 2120 4.00; SC/CSE 2501 1.00. Corequisite: SC/EATS 3610 4.00 or SC/ENG 3110 4.00. Prior to Fall 2009: Prerequisites: AK/AS/SC/MATH 1025 3.00; AK/AS/SC/MATH 2015 3.00; SC/EATS 2620 4.00 or SC/ENG 2120 4.00; AK/AS/SC/CSE 2501 1.00 (formerly COSC). Corequisite: SC/EATS 3610 4.00 or SC/ENG 3110 4.00.

INSTRUCTOR(S)

<table>
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<tr>
<th>Name</th>
<th>Section / Format / Term</th>
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<th>Contact Phone</th>
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<tbody>
<tr>
<td>Jadidi Mardkheh, Amaneh</td>
<td>Sec. A / LECT / F</td>
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TOPICS AND CONCEPTS

Content for this course includes:
- Minima, maxima of functions.
- Quadratic forms.
- Characteristics of random errors.
- Covariance matrices and covariance law.
- The least-squares principle.
- Parametric adjustment.
- Conditional adjustment.
- Combined adjustment.

LIST OF LEARNING OUTCOMES AND EXAMPLES OF

Course Learning Outcomes include:

1. Apply the fundamental concepts to set up the theoretical principles of least-squares adjustment.
2. Demonstrate covariance matrices and covariance law using simple practical examples.
3. Apply the fundamental mathematical concepts and models to set up and perform parametric adjustment.
4. Compute adjustments (e.g. conditional, combined, parametric etc.) through software development, mathematical models and applied on survey projects.
5. Identify and determine the types of measurement errors and the approach to determine degrees of freedom.

GRADED ASSESSMENT

The grading scheme for this course is as follows:

Laboratory assignments, final project and presentation: 37.5%
Class Participation: 7.5%
Midterm examination(s): 15%
Final examination: 40%

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<td>90-100</td>
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<tr>
<td>A</td>
<td>80-89</td>
<td>Excellent / Exemplary</td>
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<tr>
<td>B+</td>
<td>75-79</td>
<td>Very good / Meet expectations</td>
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<tr>
<td>B</td>
<td>70-74</td>
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<tr>
<td>C+</td>
<td>65-69</td>
<td>Competent / Meet expectations</td>
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<td>Fairly Competent / Marginal</td>
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<td>D+</td>
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<td>F</td>
<td>0 - 39</td>
<td>Failing / Below expectations</td>
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ADDITIONAL INFORMATION

Required texts and materials:

Suggested Bibliography:

ACADEMIC INTEGRITY LINKS
• Senate Policy on Academic Honesty
• Academic Integrity
STUDENT LINKS
- Student Rights and Responsibilities
- Religious Observance
- Academic Accommodation for Students with Disabilities
- Counselling and Disability Services

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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