EXPANDED COURSE DESCRIPTION
EARTH, SPACE SCIENCE AND ENGINEERING
Lassonde School of Engineering
Earth and Space Science and Engineering

LE / ESSE 4630 3.0 SECTION A
GEOMATICS IMAGE PROCESSING
FALL 2020 / WINTER 2021

Last Modified Date: 09/04/2020

COURSE CALENDAR DESCRIPTION
Digital imaging from remote platforms. Image processing and analysis, including radiometric and geometric corrections and geometric enhancements, multispectral classification, digital photogrammetry fundamentals, workstations, photogrammetric processing. Prerequisites: LE/ESSE 3650 3.00; LE/ESSE 4220 3.00. PRIOR TO FALL 2014: Prerequisites: LE/EATS 3650 4.00 or LE/ENG 3150 4.00; LE/EATS 4220 3.00. PRIOR TO SUMMER 2013: Prerequisites: SC/EATS 3650 4.00 or SC/ENG 3150 4.00; SC/EATS 4220 3.00.

INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
<th>Contact Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hu, Baoxin</td>
<td>Sec. A / LECT / F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ADDITIONAL INFORMATION

Course Website:
https://moodle.info.yorku.ca/

Required Course Materials

Optional Course Materials

Course Description
Image processing and analysis, including radiometric and geometric corrections, radiometric and geometric enhancements, transformation, multispectral classification, digital photogrammetry fundamentals, data fusion. The aim of this course is to build on the methods and techniques introduced in “Remote Sensing” and “Photogrammetry”; to examine digital data acquisition technologies and sophisticated image processing techniques; and to analyze data for Geomatics Engineering, environmental and geographical applications and research. At the end of the course, students should be capable of advising on the best types of digital data, scales, and analysis procedures for studying specific problems in Geomatics Engineering, environment monitoring and protection, and geography.

Course Learning Outcomes (CLOs)
Upon the completion of this course, students are expected to learn and retain the following concepts and skills:
1. Understand the key concepts in image processing and interpretation in the context of remote sensing and photogrammetry.

2. Describe the characteristics of existing satellite data and their applications.

3. Describe the existing algorithms for remote sensing image processing and interpretation.

4. Apply the existing algorithms to solve Geomatics Engineering/environmental/geographical problems.

5. Advise on the best data to address a certain problem/application.

6. Advise on the analysis procedures to address a certain problem/application.

**Evaluation Scheme**

- Laboratory assignments: 30%
- Mid-term examination: 15%
- Final examination: 40%
- Final project: 15%

**Grading**

The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ = 9, A = 8, B+ = 7, B = 6, etc.).

Assignments and tests will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 90, B+ = 75 to 79, etc.)

(For a full description of York grading system see the York University Undergraduate Calendar - https://calendars.students.yorku.ca/2018-2019/academic-and-financial-information/academic-information/grades-and-grading-schemes)

**Assignment Submission**

Proper academic performance depends on students doing their work not only well, but on time. Accordingly, assignments for this course must be received on the due date specified for the assignment. Assignments are to be handed in during lectures, tutorials, or through the course Moodle site as specified by the respective instructions.

**Lateness Penalty**

Assignments received later than the due date will be penalized (i.e., 20% deduction per day that assignment is late). Exceptions to the lateness penalty for valid reasons such as illness, compassionate grounds, etc., may be entertained by the Course Instructor but will require supporting documentation (e.g., a doctor’s letter).

**Missed Tests**

Students with a documented reason for missing a course test, such as illness, compassionate grounds, etc., which is confirmed by supporting documentation (e.g., doctor’s letter) may request accommodation from the Course Instructor on a case-by-case arrangement. Further extensions or accommodation will require students to submit a formal petition to the Faculty.

For missed exams or final assignments, students are expected to fill out the deferred exam form (https://secure.students.yorku.ca/pdf/final-exam-assignment-deferred-standing-agreement.pdf).

Please note that Senate policy states that “normally, requests for deferred standing must be communicated within one week following a missed examination or the last day to submit course work”. The period during which the University is officially closed for December holidays and statutory holidays is not counted in the determination of deadline days.

**Classroom Etiquette**

The use of electronic devices (smart-phones, tablets, etc.) during lectures and tutorials is only permitted for education purposes.
In all online communications (e.g., email, online discussion, or other forms of online communications), please consider the guidelines from the Core Rules of Netiquette by Virginia Shea (http://www.albion.com/netiquette/corerules.html). Sometimes, online behaviour can appear to be inappropriate or disrespectful that it requires attention and follow up. In this case, please make sure you let your instructor know immediately so that the right resources can be identified to help.

**Reminders**
- If you are using a personal e-mail address, please identify yourself as a student registered in this course by providing your student number in your signature block. You are responsible for ensuring you are receiving official course information in an efficient and timely manner.
- All students are expected to familiarize themselves with the following information:
  - General information (http://calendars.registrar.yorku.ca/2013-2014/policies/index.htm)
  - Senate policy on academic honesty and the academic integrity website (http://www.yorku.ca/secretariat/policies/document.php?document=69) and (http://www.yorku.ca/tutorial/academic_integrity/)
  - Academic Integrity - http://lassonde.yorku.ca/academic-integrity
  - Copyright - Course materials are designed for use only in the course. Copying this material for distribution (e.g. uploading material to a commercial third-party website) may lead to a charge of misconduct under York’s Code of Student Rights and Responsibilities and the Senate Policy on Academic Honesty and/or legal consequences if copyright law has been violated http://www.copyright.info.yorku.ca.
  - Ethics review process for research involving human participants (http://www.yorku.ca/research/support/ethics/)
  - Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities (http://www.yorku.ca/secretariat/policies/document.php?document=68)
  - Additional resources related to add/drop courses, student life, academic resources, campus services, …etc. can be found at this link: http://www.yorku.ca/yorkweb/cs.htm

**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
- Counselling and Disability Services - http://cds.info.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