EXPANDED COURSE DESCRIPTION
ELECTRICAL ENGINEERING AND COMPUTER SCIENCE
Lassonde School of Engineering
Electrical Engineering Computer Science
LE / EECS 4422 3.0 SECTION A
COMPUTER VISION
FALL 2017 / WINTER 2018

Last Modified Date: 08/18/2017

COURSE CALENDAR DESCRIPTION

Fundamental concepts of Computer vision and including aspects of biological vision, image formation process, image processing, feature extraction and matching, 3-D parameter estimation, applications and statistical techniques. Twelve supervised laboratory hours. Prerequisites: General prerequisite; LE/EECS 2030 3.00 or LE/EECS 1030 3.00; SC/MATH 1025 3.00; SC MATH 1310 3.00, LE/EECS 2031 3.00. Course credit exclusions: LE/CSE 4422 3.00, AK/AS/SC/CSE 4422 3.00. (NOTE: The General Prerequisite is a cumulative GPA of 4.50 or better over all major EECS courses. EECS courses with the second digit "5" are not major courses.)

INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
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<tbody>
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TOPICS AND CONCEPTS

This course introduces the fundamental concepts of vision with emphasis on computer science and engineering. In particular, the course covers the image formation process, image representation, feature extraction, stereopsis, motion analysis, 3D parameter estimation and applications. A vision laboratory is available where students can gain practical experience.

Specific topics to be covered in this course include the following:

- Introduction
- Image formation
- Image representation
- Feature detection
- Stereopsis
- Motion analysis
- Example application systems
- Additional topics as time permits

GRADED ASSESSMENT

GRADING

The weight distribution of the course components is as follows:

1. 30% - Assignments: 2 assignments; 15% each.
2. 33% - Tests: 1 mid-term exam
3. 37% - Project: 4 components: 2% - White Paper, 11% - Proposal, 5% - Site Visit, 19% - Final Demo

Each piece of work will be assigned a numeric grade. A final numeric grade will be computed using the weighting given above. The final letter grade will be determined from the numeric score using the standard Computer Science and Engineering mapping.
ADDITIONAL INFORMATION

COURSE TEXTBOOKS
The required textbook for this course is:


Errata for the textbook is available here. This text is available at the York University Bookstore in York Lanes. Also, a copy is on reserve at the Steacie Library on campus.

WEBSITES
A large number of websites contain information of relevance to this course, including the following:

- The Center for Vision Research Homepage provides information about research in computer and biological vision that is done at York University (get involved)!
- The Computer Vision Homepage is a valuable resource for more general information regarding computer vision
- The Vision Science Homepage provides more general information about biological vision

ADDITIONAL BOOKS
Of the many books on computer vision and related topics, the following may be of particular use to students of this course (in addition to the course textbook):


JOURNALS
Journals that regularly contain contributions from computer vision include the following:

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- International Journal of Computer Vision
- Computer Vision and Image Understanding (and previous incarnations, e.g., CVGIP, etc.)
- Image and Vision Computing
- IEEE Transactions on Image Processing

CONFERENCES
Conferences that regularly contain contributions from computer vision include the following (all of these conferences publish proceedings):

- IEEE International Conference on Computer Vision
- European Conference on Computer Vision
- IEEE Conference on Computer Vision and Pattern Recognition
- IAPR International Conference on Pattern Recognition
- IEEE International Conference on Image Processing

WORKLOAD
The workload associated with this course is as follows:

- Lectures: Students will be held responsible for all material covered in lectures. Lecture notes will be posted incrementally on the course website.
- Assigned Readings: Students will be held responsible for all material assigned as reading in the Textbook. Additional reading may be required and copies of relevant material will be made available, as necessary. Reading assignments will be posted incrementally on the course website.
• Labs: Students will be held responsible for all material presented in labs. Labs will provide students with hands-on activities that complement the lecture and reading materials.
• Assignments: Two assignments for the students to complete and hand in will be required; details will be posted incrementally on the course website
• Tests: The only test associated with this course will be a mid-term exam to be given in class, closed book.
• Project: Students will be expected to complete a “hands on” computer vision project.

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
• Academic Accommodation for Students with Disabilities - http://secretariat-policies.info.yorku.ca/policies/academic-accommodation-for-students-with-disabilities-policy/
• Counselling and Disability Services - http://cds.info.yorku.ca/

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