1 INSTRUCTOR

Instructor: Medhat Moussa, Ph.D., P.Eng.
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Email: mmoussa@uoguelph.ca
Office hours: TBA on CourseLink or by appointment

2 LEARNING RESOURCES

2.1 Course Website

Course material, news, announcements, and grades will be regularly posted to the ENGG*6100 CourseLink site. You are responsible for checking the site regularly.

2.2 Required Resources

The course will use multiple resources including different textbooks, articles, and websites. Additional information will be provided by instructor. Most of the following resources are available to students under the Library Scholars Portal Books.

3 ASSESSMENT

3.1 Dates and Distribution

Midterm Exam: 30%

Assignments: 30%
   3 assignments or mini projects

Project: 45%
   Project is focused on the student area of research

3.2 Course Grading Policies

When You Cannot Meet a Course Requirement: When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the graduate calendar for information on regulations and procedures for Academic Consideration:
   http://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e1400.shtml

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations:
   http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

Passing grade: In order to pass the course, students must obtain a grade of 65% or higher on the total mark of all assessments.
4 AIMS & OBJECTIVES

4.1 Calendar Description

Computer vision studies how computers can analyze and perceive the world using input from imaging devices. Topics covered include image pre-processing, segmentation, shape analysis, object recognition, image understanding, 3D vision, motion and stereo analysis, as well as case studies.

4.2 Course Aims

Computer vision is a very diverse interdisciplinary area that has seen significant growth in research and applications in the last decade. The subject is normally an advanced area that requires background in image processing and pattern recognition. However, offering such a traditional course at the School of Engineering is challenging for a number of reasons. Potential students’ background varies significantly ranging from Mechanical/Electrical to Computational/Systems. Some students might have studied image processing in their undergraduate studies while most didn’t and the School doesn’t offer such a course. Finally, graduate students working in industry are mostly interested in applied industrial machine vision while Ph.D. students are interested in developing advanced algorithms and 3D computer vision.

For these reasons, this course will consist of two phases. The first phase is an introduction to machine vision that is suitable for all engineering students. Students will be required to complete several assignments to provide them with a hands-on experience in developing and using machine vision algorithms. The second phase will focus on advance topics related to a problem that the student is interested in. The term project is expected to cover both aspects of research and implementation.

4.3 Learning Objectives

At the successful completion of this course, the student will have demonstrated the ability to:

1. Critically review and articulately communicate the existing state of the art in a sub-area of machine vision research.
2. Apply knowledge of programming languages to understand how to implement a machine vision system.
3. Integrate hands-on experience and review of literature survey to design a novel addition to the state of the art in machine vision. This will be developed using a major project.

4.4 Instructor’s Role and Responsibility to Students

The instructor’s role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected lecture notes will be made available to students on Courselink but these are not intended to be stand-alone course notes. Scheduled classes will be the principal venue to provide information and feedback for assessments and project.

4.5 Students’ Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures and tutorials. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who do (or may) fall behind due to illness, work, or extra-
curricular activities are advised to keep the instructor informed. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

**E-mail Communication:** As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

**Recording of Materials:** Presentations which are made in relation to course work—including lectures—cannot be recorded in any electronic media without the permission of the presenter, whether the instructor, a classmate or guest lecturer.

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5 **TEACHING AND LEARNING ACTIVITIES**

5.1 **Timetable**

Lectures: This will be determined in the first week by email to all students registered in the course.

5.2 **Course Topics and Schedule**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Nominal Weeks (very tentative and subject to change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light, Color, and image formation</td>
<td>Week 1-2</td>
</tr>
<tr>
<td>Image processing</td>
<td>Week 3-4 + Assignment 1</td>
</tr>
<tr>
<td>Image Analysis</td>
<td>Week 5-6 + Assignment 2</td>
</tr>
<tr>
<td>3D shape reconstruction and stereo vision</td>
<td>Week 7-8 + Assignment 3</td>
</tr>
<tr>
<td>Advanced topics/project presentations</td>
<td>Week 9-12 + Midterm exam</td>
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</tbody>
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5.3 **Other Important Dates**

**Drop Date:** The last date to drop one-semester courses, without academic penalty, is November 6, 2015. Two-semester courses must be dropped by the last day of the add period in the second semester. Refer to the Graduate Calendar for the schedule of dates:

[http://www.uoguelph.ca/registrar/calendars/graduate/current/sched/sched-dates-f10.shtml](http://www.uoguelph.ca/registrar/calendars/graduate/current/sched/sched-dates-f10.shtml)

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6 **LAB SAFETY**

Safety is critically important to the School and is the responsibility of all members of the School: faculty, staff and students. As a student in a lab course you are responsible for taking all reasonable safety precautions and following the lab safety rules specific to the lab you are working in. In addition, you are responsible for reporting all safety issues to the laboratory supervisor, GTA or faculty responsible.
7 **ACADEMIC MISCONDUCT**

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. The Academic Misconduct Policy is detailed in the Graduate Calendar:  
[http://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e1687.shtml](http://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e1687.shtml)

7.1 **Resources**

A tutorial on Academic Misconduct produced by the Learning Commons can be found at:  
[http://www.academicintegrity.uoguelph.ca/](http://www.academicintegrity.uoguelph.ca/)

The School of Engineering has adopted a Code of Ethics that can be found at:  
[http://www.uoguelph.ca/engineering/undergrad-counselling-ethics](http://www.uoguelph.ca/engineering/undergrad-counselling-ethics)

The Graduate Calendar is the source of information about the University of Guelph’s procedures, policies and regulations which apply to graduate programs:  
[http://www.uoguelph.ca/registrar/calendars/graduate/current/](http://www.uoguelph.ca/registrar/calendars/graduate/current/)