CS9630 Image Processing and Analysis
Course Description Fall 2018

The University of Western Ontario
Department of Computer Science
London, Ontario, Canada

1. Instructor

  • Name: Prof. John Barron
  • Office Location: Middlesex 379
  • Office Hours: informal (just drop by!) or make a specific appointment
  • Phone: 661-2111 x86896
  • E-Mail: barron@csd.uwo.ca (the preferred means of communication)

2. Description

  • This course will teach the student the basic mathematical and computational concepts of Image Processing.

3. Background

  • Programming Environment – MATLAB only (No Fortran, Python, C, C++, C# or Java). MatLab is available on the csd (via algernon, charlie). The university provides free MatLab licenses for students.
  • Prerequisites – some basic mathematics (calculus and linear algebra) or permission of the instructor.

4. Text

  • Recommended Textbooks (buy or have access to):
    
    (b) Kelmut Kopka and Patrick W. Daly, “Guide to Latex”, 4\textsuperscript{th} edition, Addison-Wesley, 2004 or a similar latex book.
Some Useful Reference Textbooks (not required):


5. Topics (Brief)

- Introduction to Image Processing
- Introduction to MatLab
• The 1D and 2D Fourier Transforms
• Filters (Low-Pass, High-Pass, Bandpass and Bandreject)
• Edge Detection and Region Growing
• Image Enhancement
• Image Noise (Modelling and Processing)
• Image Representation and Manipulation
• Morphological Image Processing

6. **General Course Conduct**

• Classes are held once a week on Tuesdays from 2:30pm-4:30pm in MC320

• Password protected copies of the projected lecture overheads are available on the course webpage, [www.csd.uwo.ca/courses/CS9630a/](http://www.csd.uwo.ca/courses/CS9630a/). The user ID is ”class”. The password for the notes will be supplied in class.

• There will be 2 assignments worth 35% each and a single open-book final exam, to be held in the last class, worth 30%.

• Independent work is required on the assignments and exams. Cheating in any form will not be tolerated.

• MMASc (Master’s in Management of Applied Science) students enrolled in this class may have an alternate grading scheme which will form an addendum to the official course outline. Can such students please identify themselves to the instructor.

• For the assignments, a latex template will be provided (only latex can be used in this course, all graduate students must learn latex!!!). [Latex will be taught in class. Word is completely unacceptable.] The tex file for each assignment will also be available on the course webpage.

• There **will** be a 5% penalty per day for late assignments (the weekend count as 1 day). Assignments will be passed in via Owl and the Owl submission date and time will be used to determine lateness. Assignments are due at 11:55pm so there is no reason to skip class to do your assignment.

• Note that you must also pass in a physical hardcopy of the assignment (your writeup and code). You can pass in the hardcopy during class or slip it under the professor’s door (MC379). The hardcopy and electronic versions of your assignment must be the same.
• Programming must be done using Matlab only. [Note that Fortran, Python, C, C++, C#, Java, etc. are not acceptable]. MatLab will be taught in this course and is used in the course textbook. Any Matlab from R2009 (for sure) and after will be fine. If necessary, a csd network account will be supplied to any students without access to MatLab.

• All marks on assignments are considered to be final 1 week after the graded assignment is handed back in class, even if not picked up. Any grade adjustments must be requested in that 1 week interval.

• Electronic information, including some C/MatLab code, various data and copies of the assignment handouts, are/will be available the course webpage.

7. Important Dates:

• Labour day: September 3rd, 2018

• First Class: Tuesday, September 11th

• Last Class (final exam): Tuesday, December 8th

• The final exam is on the last day of classes (December 11th) or 1 week later (December 18th at class time) [this depends on how much material we have covered].

• Monday, October 8th is a holiday (Thanksgiving Day). This holiday does not affect our class.

• There is a study break (reading week) this semester, Tuesday, October 9th to Friday, October 12th.

• The exam period (undergraduate) is December 10th to 21st.

Scholastic Offenses

• We expect our students to conduct themselves academically in a manner that upholds the integrity and reputation of our academic programs. Cheating on assignments, exams, essays and term papers is considered to be a serious violation of ethical conduct, and will not be tolerated.

• Assignments: Academic dishonesty in assignments includes (but is not limited to):
  
  – Unacceptable collaboration: What is unacceptable? There is a difference between discussing assignments and solutions with fellow students, and working together on
the solutions to the point where the work submitted is clearly not individual work. If in doubt, ask your instructor.

- Copying of another student’s assignment
- Allowing another student to copy
- Using code from an external source (text, instructor, course website) where a student’s own code is expected (if in doubt, ask your instructor) or without citing the source of the code.
- Altering of assignment results.

• Cheating on exams or tests includes (but is not limited to):

  - Using unauthorized aids
  - Communicating in any way with another student during the exam
  - Copying the answers of another student
  - Altering an exam after it is marked.

• Essays and Term Papers: The Department has zero tolerance for plagiarism. The University Senate defines plagiarism as follows: “Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage of text from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citation. Plagiarism is a major academic offense (see Scholastic Offense Policy in the Western Academic Calendar).”

For further clarification of what constitutes plagiarism, refer to the paper titled "Collaboration, Plagiarism and Proper Attribution" by former Professor Jamie Andrews written in 2000 but still relevant today. If in doubt, you should consult with your instructor.

Scholastic offenses will be reported by the instructor to the Graduate Chair. A penalty will be determined. The Graduate Calendar requires that the Dean of Graduate Studies be consulted by the Graduate Chair. Penalties may range from a reprimand to required withdrawal from the university.

Minimum penalties in CS9630a will be minus the total grade for the assignment/exam for which a cheating offense has occurred. It will be effectively impossible to pass this course if you have been caught cheating!!!

\[1\text{https://www.csd.uwo.ca/Courses/CS9630a/jamie_andrews_plagism.pdf}\]
Graduate Student Health and Wellness

As part of a successful graduate student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western’s Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page http://www.music.uwo.ca/ and our own McIntosh Gallery http://www.mcintoshgallery.ca/. Information regarding health and wellness-related services available to students may be found at http://www.health.uwo.ca/.

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at http://www.health.uwo.ca/mental_health/resources.html.

To help you learn more about mental health, Western has developed an interactive mental health learning module, found here: http://www.health.uwo.ca/mental_health/module.html. This module is 30 minutes in length and provides participants with a basic understanding of mental health issues and of available campus and community resources. Topics include stress, anxiety, depression, suicide and eating disorders. After successful completion of the module, participants receive a certificate confirming their participation.