

Syllabus

Course Title: CSCE 590 Introduction to Image Processing

Instructor: Ioannis Rekleitis,
Storey Innovation Center
Computer Science and Engineering
Room 2235
550 Assembly Street, Columbia, SC
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Class meeting:

T Th 10:05 am – 11:20 am
Final Exam standard time.

Course Description: Vision is one of the most powerful senses. Nowadays, every phone, tablet, or laptop has a camera. At the base of every vision system there is the image. In this course we will study the fundamentals of image processing. From image representations to basic operations this course will expand to the principal concepts behind most current image manipulation software.

Course learning outcomes:

- Develop the ability to work with different image formats
- Develop the ability to perform basic image manipulation operations
- Develop the programming skills in large projects involving MATLAB and C++ (MATLAB is available to all students for free).

Prerequisites:

CSCE 240.

Required text(s):

The required textbook is:

- Digital Image Processing, Rafael C. Gonzalez and Richard E. Woods, 3rd Edition, Prentice Hall

Other texts include:

1. Digital Image Processing Using MATLAB, Rafael C. Gonzalez, Richard E. Woods, and Steven L. Eddins, 2nd Edition, Gatesmark Publishing, 2009

Schedule, deliverables, and evaluation:

<u>Component</u>	<u>Undergraduate</u>	<u>Graduate</u>
Assignments (4)	12.5% each	12.5% each
Graduate Assignments (4)	---	2.5% each
Midterm Exam (coding project)	15%	10%
Final Exam (coding project)	30%	25%
<u>Class Participation</u>	<u>5%</u>	<u>5%</u>
Total	100%	100%

Schedule:

- Week 1> Introduction to Images: binary, greyscale, color.
- Week 2> Encodings,
- Week 3> Point Operations,
- Week 4> Histograms
- Week 5> Operating with multiple images (Masks, Addition, Subtraction)
- Week 6> Convolution, Smoothing,
- Week 7> Edge Detection, Enhancing,
- Week 8> Correlation
- Week 9> Deep Learning
- Week 10> Deep Learning
- Week 11> Stereo
- Week 12> Optical Flow, Shape from X
- Week 13> Features (Harris, SIFT, SURF)
- Week 14> Advance topics

Grading Scheme:

- >90% : A
- >87% : B+
- >80% : B
- >77% : C+
- >70% : C
- >60% : D
- <60% : F

Graduate/Honor Grading Policy:

Graduate and Honors student we will have an additional part on each assignment, which will count for ten percent of the marks. Failure to complete these parts will cost one letter grade.

Academic Integrity:

You are expected to practice the highest possible standards of academic integrity. Any deviation from this expectation will result in a minimum academic penalty of your failing the assignment, and will result in additional disciplinary measures. This includes improper citation of sources, using another student's work, and any other form of academic misrepresentation.

University policies and procedures regarding academic integrity are defined in policy STAF 6.25, Academic Responsibility - The Honor Code (see <http://www.sc.edu/policies/ppm/staf625.pdf>). Prohibited behaviors include plagiarism, cheating, falsification, and complicity. All potential Honor Code violations will be reported to the Office of Student Conduct and Academic Integrity, which has the authority to implement non-academic penalties as described in STAF 6.25. Academic penalties for Honor Code violations in this course range from a zero on the assignment to failure of the course.

Use of online resources that contain the solution to a homework/assignment/exam is strictly prohibited and will result to failure of the course.

Attendance Policy:

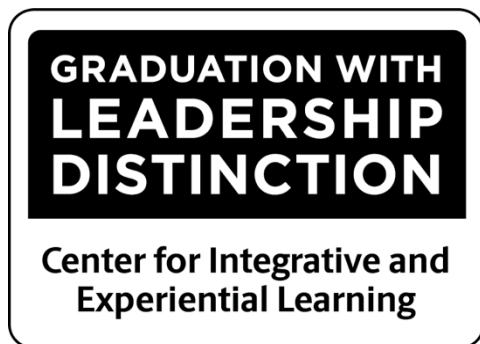
When you miss class, you miss important information. In these days of COVID 19, that means either physical or virtual. If you are absent, you are responsible for learning material covered in class. If you are absent when an assignment is due, you must have submitted the assignment prior to the due date to receive credit. It is your responsibility to follow along.

Accommodating Disability:

Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email sasds@mailbox.sc.edu, or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.

Diversity:

In order to learn, we must be open to the views of people different than ourselves. In this time we share together over the semester, please honor the uniqueness of your fellow classmates and appreciate the opportunity we have to learn from one another. Please respect each others' opinions and refrain from personal attacks or demeaning comments of any kind. Finally, remember to keep confidential all issues of a personal or professional nature that are discussed in class.



Did you know this course is on an approved course list for Graduation with Leadership Distinction? Do you engage in research, study abroad, internships, or community service? If so, you could be eligible to graduate with leadership distinction. Sign up to [meet with a GLD Advisor](#) to learn more and consider ways to get involved throughout your time at UofSC. You'll even have your achievements recognized on your

transcript and diploma. Demonstrate to graduate/professional schools and future employers how you can apply course concepts in real world settings and apply what you learned to make decisions and solve problems! ***Graduation with Leadership Distinction: Your Pathway to Purpose!***