

 <b>FLORIDA ATLANTIC UNIVERSITY</b>	<b>COURSE CHANGE REQUEST</b> <b>Undergraduate Programs</b>		UUPC Approval <u>3-29-21</u> UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	<b>Department</b> Computer & Electrical Eng & Comp Sci <b>College</b> Engineering & Comp Science		
<b>Current Course Prefix and Number</b> CAP 4401		<b>Current Course Title</b> Digital Image Processing	
<i>Syllabus must be attached for ANY changes to current course details. See <a href="#">Checklist</a>. Please consult and list departments that may be affected by the changes; attach documentation.</i>			
<b>Change title to:</b>  <b>Change prefix</b> <b>From:</b> _____ <b>To:</b> _____ <b>Change course number</b> <b>From:</b> _____ <b>To:</b> _____ <b>Change credits*</b> <b>From:</b> _____ <b>To:</b> _____ <b>Change grading</b> <b>From:</b> _____ <b>To:</b> _____ <b>Change WAC/Gordon Rule status**</b> <b>Add</b> <input type="checkbox"/> <b>Remove</b> <input type="checkbox"/> <b>Change General Education Requirements***</b> <b>Add</b> <input type="checkbox"/> <b>Remove</b> <input type="checkbox"/> <small>*Review <a href="#">Provost Memorandum</a></small> <small>**WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to this form. See <a href="#">WAC Guidelines</a>.</small> <small>***General Education criteria must be indicated in syllabus and approval attached to this form. See <a href="#">GE Guidelines</a>.</small>		<b>Change description to:</b>  <b>Change prerequisites/minimum grades to:</b> (EEE 4541 OR STA 4821) AND COP 3530 OR permission of Instructor  <b>Change corequisites to:</b>  <b>Change registration controls to:</b>  Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade (default is D-).	
<b>Effective Term/Year for Changes:</b> Fall 2021		<b>Terminate course? Effective Term/Year for Termination:</b>	
<b>Faculty Contact/Email/Phone</b> Hari Kalva, hkalva@fau.edu, 561-297-0511			
<b>Approved by</b> Hanqi Zhuang Department Chair _____ College Curriculum Chair <u>Dan Meeroff</u> College Dean <u>Frederick Bloetscher</u> UUPC Chair <u>Jerry Haky</u> Undergraduate Studies Dean <u>Edward Pratt</u> UFS President _____ Provost _____		<b>Date</b> _____ <u>3-18-21</u> <u>3-18-21</u> <u>3-29-21</u> <u>3-29-21</u> _____ _____	

Email this form and syllabus to [mjenning@fau.edu](mailto:mjenning@fau.edu) seven business days before the UUPC meeting.

**Department of Computer & Electrical Engineering and Computer Science  
Florida Atlantic University  
Course Syllabus**

<b>1. Course title/number, number of credit hours</b>	
Digital Image Processing – CAP 4401 001 CRN 15390, 002 CRN 16587, 003 CRN 16721	3 credit hours
<b>2. Course prerequisites, corequisites, and where the course fits in the program of study</b>	
(EEE 4541 OR STA 4821) AND COP 3530 OR permission from instructor	
<b>3. Course logistics</b>	
Term: Spring 2021 Class dates and times: TBA Class location: Fully online (zoom)	
<b>4. Instructor contact information</b>	
Instructor's name Office address Office Hours Contact telephone number Email address	Dr. Oge Marques EE 441 (Engineering East (96) building) (Virtual) office hours will be announced via Canvas 561-866-7144 (voice / text / WhatsApp) <a href="mailto:omarques@fau.edu">omarques@fau.edu</a>
<b>5. TA contact information</b>	
TA's name Office address Office Hours Contact telephone number Email address	N/A
<b>6. Course description</b>	
Introduction to image processing principles, tools, techniques, and algorithms. Includes topics in image representation, analysis, filtering, and segmentation, and pattern recognition. Use of image processing software tools for lab assignments and projects.	
<b>7. Course objectives/student learning outcomes/program outcomes</b>	
Course objectives	Upon successful completion of this course, students will be able to: <ol style="list-style-type: none"> <li>1. Explain the main challenges behind the design of image processing and analysis solutions.</li> <li>2. Compare and contrast different approaches for fundamental image processing operations, explaining their strengths and limitations.</li> <li>3. Design and implement algorithms for image processing and analysis using MATLAB.</li> <li>4. Design and implement algorithms for visual pattern recognition and image classification using MATLAB.</li> <li>5. Contextualize the latest advances in deep learning and their impact on the advancement of image processing and computer vision.</li> </ol>

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<b>8. Course evaluation method</b>		
<b>Assessment</b>	<b>Percentage (%)</b>	
Course Orientation <ul style="list-style-type: none"> <li>• Student Introduction – Worth up to 10 points.</li> <li>• Syllabus &amp; Course Agreement Quiz – Worth up to 10 points.</li> </ul>	0%	
3 Discussion Boards <ul style="list-style-type: none"> <li>• Worth up to 100 points each.</li> </ul>	5%	
5 Hands-on Assignments <ul style="list-style-type: none"> <li>• Worth up to 100 points each.</li> </ul>	65%	
Final Project (code) <ul style="list-style-type: none"> <li>• Worth up to 100 points.</li> </ul>	20%	
Final Project (report) <ul style="list-style-type: none"> <li>• Worth up to 100 points.</li> </ul>	10%	
<b>TOTAL:</b>	<b>100%</b>	
<b>9. Course grading scale</b>		
Grading Scale: 93 and above: "A", 90-92: "A-", 87-89: "B+", 83-86: "B", 80-82 : "B-", 77-79: "C+", 73-76: "C", 70-72: "C-", 67-69: "D+", 63-66: "D", 60-62: "D-", 59 and below: "F."		
<b>10. Policy on makeup tests, late work, and incompletes</b>		
<p><i>Makeup tests</i> are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam. Makeup exam should be administered and proctored by department personnel unless there are other pre-approved arrangements.</p> <p><i>Late assignments</i> will be graded with a penalty of 10% of the maximum possible grade for each day after the assignment's due date, up to a maximum of 3 days late (i.e., 30% penalty), beyond which the assignment will receive a grade o (zero).</p> <p><i>Incomplete grades</i> are given only if there is solid evidence of medical or otherwise serious emergency situation <u>and</u> the student is currently passing the class.</p>		
<b>11. Special course requirements</b>		
N/A		
<b>12. Classroom etiquette policy</b>		
Students are required to comply with all requirements specified in the student code of conduct and not in any way disrupt the class or prevent other students from benefiting from the class. Students are to speak and behave respectfully to each other and to all FAU faculty and staff.		
<b>13. Attendance policy statement</b>		
Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance.		

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Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

**14. Disability policy statement**

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at [www.fau.edu/sas/](http://www.fau.edu/sas/).

**15. Counseling and Psychological Services (CAPS) Center**

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

**16. Code of Academic Integrity policy statement**

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#). If your college has particular policies relating to cheating and plagiarism, state so here or provide a link to the full policy—but be sure the college policy does not conflict with the University Regulation.

**17. Required texts/reading**

"Practical Image and Video Processing Using MATLAB"  
by Oge Marques  
Wiley/IEEE Press, 2011  
ISBN-10: 0470048158 | ISBN-13: 978-0470048153

**18. Supplementary/recommended readings**

Additional reading materials will be provided during the semester.

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19. Course topical outline, including dates for exams/quizzes, papers, completion of reading				
Module	DATES	TOPIC	READ/LISTEN/VIEW	TO DO
START HERE	1/9 – 1/17	Introduction to Course	Syllabus Course Schedule Instructor Introduction	
1	1/9 – 1/15	Introduction to image processing and computer vision	Textbook – Chapter 1 Selected readings and websites	
2	1/16 – 1/21	Image processing fundamentals	Textbook – Chapters 2, 5, and 6, and Appendix A Selected readings and websites	
3	1/22 – 1/27	MATLAB and relevant toolboxes	Textbook – Chapters 3 and 4 MathWorks "MATLAB Onramp" Selected readings and websites	Assignment 1 out
4	1/28 – 2/3	Geometric operations	Textbook – Chapter 7 MathWorks "Image Processing Onramp" Selected readings and websites	Assignment 2 out Assignment 1 due (Jan 28)
5	2/4 – 2/12	Intensity transformations	Textbook – Chapter 8 Selected readings and websites	
6	2/13 – 2/18	Summary statistics of images and histogram processing	Textbook – Chapter 9 Selected readings and websites	
7	2/19 – 2/28	Image filtering and enhancement	Textbook – Chapters 10 and 11 Selected readings and websites	Assignment 3 out Assignment 2 due (Feb 28)
8	3/1 – 3/7	Deep Learning basics	MathWorks Deep Learning eBooks MathWorks " Deep Learning Onramp" Selected readings and websites	
9	3/8 – 3/12	Image denoising	Textbook – Chapter 12 Selected readings and websites	Assignment 4 out Assignment 3 due (Mar 12)
10	3/13 – 3/18	Color image processing	Textbook – Chapter 16 Selected readings and websites	
11	3/19 – 3/24	Image segmentation	Textbook – Chapter 15 Selected readings and websites	Assignment 5 out Assignment 4 due (Mar 23)
12	3/25 – 3/29	Global feature detection and extraction	Textbook – Chapter 18 Selected readings and websites	Final Project out
13	3/30 – 4/3	Local feature detection, extraction and matching	Selected readings and websites	
14	4/4 – 4/14	Image classification	Textbook – Chapter 19 Selected readings and websites	Assignment 5 due (Apr 14)
15	4/15 – 4/19	Applications, case studies, and ongoing research topics	Selected readings and websites	Final Project due (Apr 19)