

**UNIVERSITY OF NEW ORLEANS**  
**ENEE 4584/5584**  
**COMPUTER VISION APPS IN DEEP LEARNING**

INSTRUCTOR	Dr. AbdulRahman Alsamman Office: EN 842, Phone: 280-7161 Email: aalsamma@uno.edu
OFFICE HOURS	M/W: 10:40am-3pm; T/Th: 12:15pm-3pm
COURSE INFO	<p><b>ENEE 4584/5584 Computer Vision Apps in Deep Learning, 3 cr. Hr.</b>  Prerequisite: Consent of department.  Focuses on the use of deep learning to solve computer vision design problems. Topics include: basics of computer vision, dense NN, convolutional NN, DL to solve object detection, DL for semantic segmentations, attention and transformers.</p> <p>Time: T/Th 11:00 – 12:15pm. Room EN 320.</p> <p>Zoom: <a href="https://uno.zoom.us/j/6758927200">https://uno.zoom.us/j/6758927200</a>  Video Lecture passcode is q~123456</p> <p>Lectures will only be recorded/broadcast when requested. Old recordings from Fall 2023 are also available and can be requested if you need it to review.</p>
RECOMMENDED TEXTBOOKS	<p><b>Digital Image Processing 3e</b>, by Gonzalez, Woods (ISBN 013168728X)</p> <p><b>Computer Vision: Algorithms and Applications 2e</b>, Richard Szeliski (Springer, ISBN: 9781848829343) <a href="http://szeliski.org/Book/">http://szeliski.org/Book/</a></p> <p><b>Deep Learning</b>, I Goodfellow, Y Bengio, A Courville, (The MIT Press, ISBN: 0262035618 / 978-0262035613.) <a href="http://www.deeplearningbook.org/">http://www.deeplearningbook.org/</a></p> <p><b>Machine Learning with PyTorch and Scikit-Learn</b>, Sebastian Raschka, Yuxi Liu, Vahid Mirjalili, Dmytro Dzhulgakov (O'Reilly, ISBN 9781801819312) <a href="http://www.oreilly.com">http://www.oreilly.com</a></p> <p><b>PyTorch for Deep Learning and Computer Vision</b>, Rayan Slim, Jad Slim, Amer Sharaf, Sarmad Tanveer (O'Reilly, ISBN 9781838822804) <a href="http://www.oreilly.com">http://www.oreilly.com</a></p>

TOPICS	Topic	Week
	Introduction to CV & DL	1
	Python	2
	Low Level CV: Image basics, Color models, Spatial processing	3
	NNet Basics: Backpropagation Regularization and generalization Learning and Optimization	4
	Mid-level CV: Features & keypoints Detection & classification Segmentation	5-7
	Convolutional NNets: Convolutional & pooling layers Skip connections architectures	8
	High-level CV: Single-shot detectors	9
	Regional CNN: R-CNN, Fast R-CNN	10
	Generative Learning: Autoencoder, Variational AE,	11
	Adversarial nets	12
	Transformer: Attention	13
	Vision Transformers	14

**TECHNOLOGY NEEDED** A computer with a webcam is needed for this course.

**QUIZZES** Multiple choice/answer quizzes. These will be open to book&notes and designed to test your understanding of the concepts and theory. No written tests or Final.

**ASSIGNMENTS & PROJECTS** Assignments require students to reproduce some of the results shown in the text. Projects will require more analytical thinking. Unless otherwise stated these will be individual work.

Students are also expected to complete a final project possibly as a group. Students may be required to make a final project presentation.

**GRADUATE CREDIT** Graduate students will be required to cover additional topics, do more quizzes, and additional project assignments.

<b>GRADING POLICY</b>	Quizzes	20%
	Assignments & Projects	60%
	<u>Final Project</u>	<u>20%</u>
	<b>TOTAL</b>	<b>100%</b>

GRADE ASSIGNMENT	Letter grades will be assigned according to the guidelines: A:90-100, B:80-89, C:70-79, D:60-69, F: < 60.
IMPORTANT DATES	<a href="http://registrar.uno.edu/bulletin/importantdates/">http://registrar.uno.edu/bulletin/importantdates/</a>
ATTENDANCE	Class attendance is required and encouraged. Attendance will not be taken in class. Students are responsible for material covered in class as well as assignment due dates and test dates.
MAKEUP POLICY	No makeup will be given for missed quizzes or projects without valid and/or written excuses. The instructor will make decisions regarding the makeup in the case of valid and/or written excuse.  If you have to miss a class let me know so I can record/broadcast the lecture for you.
ACADEMIC DISHONEST	Academic integrity is fundamental to the process of learning and evaluation of academic performance. Academic dishonesty will not be tolerated. Academic dishonesty includes but is not limited to: cheating, plagiarism, tampering with academic records and examinations, falsifying identity, and being accessory to acts of academic dishonesty. Any such behavior will be reported and dealt with in accordance to the UNO Judicial Code see: <a href="http://www.studentaffairs.uno.edu/studentpolicies/policymanual/academic_dishonesty.cfm">www.studentaffairs.uno.edu/studentpolicies/policymanual/academic_dishonesty.cfm</a>
STUDENTS WITH DISABILITIES	If you have a specific disability that qualifies you for academic accommodations, please notify the instructor. Students must register with the Office of Disability Services (UC 260) to qualify for special accommodations.
CHANGES IN COURSE REQUIREMENTS	Since all classes do not progress at the same rate, the instructor may wish to modify the above-mentioned requirements or their timing as circumstances dictate. If such modification is needed, the student will be given adequate notification.