MENG 5308 – Robotic Vision and Control
Course Syllabus

Semester / Year	Spring 2023
Catalog Description	This course focuses on the application of machine vision learning in application to robotics, such as the vision-guided control in arm-type robots. A software package will be selected for use a learning support tool. The course includes a design project and computer programming as a major component.
Prerequisites	Graduate Status.
Section Number	001
Instructor Name	Chung Hyun Goh
Contact Information	Email: cgoh@uttyler.edu Voice: 903-566-6125 Office: RBN 3007
Class Type / Instruction Mode / Location	Face-to-face / RBN 3039
Class Time	M/W: 12:30 PM – 1:55 PM
Office Hours	Tu/W/Th: 11:00 AM – 12:00 PM or by appointment
No. of Credits	3 credits
Required Textbook	Robotics, Vision and Control: Fundamental Algorithm in MATLAB – Peter Corke. 2nd Ed., 2016, Springer
Optional References	Computer & Machine Vision: Theory, Algorithms, and Practicalities – E. R. Davies, 4th Ed., 2012, AP (Academic Press)
Additional Rules and Requirements	Programming skills with MATLAB / Simulink or Python (or other computer languages)
Evaluation Method	Computer Vision Competition: Synthesis AI 10% Final Project Report / Presentations 30% Mid-term Exam 20% Homework 15%, Quizzes 15% Course Participation 10% (In-Class Examples, Assign submissions, etc.)
Grading Policy / Scale	Letter grades / A=>90, B=>80, C=>70, D=>60, F<60
Important Events / Dates	Census date: January 23, 2023 Exam date: TBD Final date: Per published schedule by the registrar – TBD
Attendance / Makeup policy / other rules	Regular attendance is imperative if you want to do well in this course. Therefore, regular attendance is required. In case you have to miss a class, it is your responsibility to keep up with the class work and be informed of all announcements made in the class on homework's, tests etc. No makeup.
Course Learning Objectives / ABET & PEOs Relation	By the end of this course, students will be able to: 1. Demonstrate an understanding of basic knowledge for position and orientation representation and navigation process in robotics. (SO 1)

	2. Apply machine vision and robot learning techniques to analyze forward and inverse kinematics in arm-type robots. (SO 1) 3. Utilize computer programming using MATLAB to perform vision-guided motion control in robotics. (SO 1) 4. Demonstrate the ability to be an effective team member on a group project to apply robot vision concepts for real-world problems. (SO 3) 5. Conduct a major project leading to a draft of a publishable level paper. (SO 3)
Tentative Topics / Course Plans	1. Representation of position and orientation in robotics 2. Navigation and localization in robotics 3. Robot arm kinematics 4. Image formation, processing, and feature extraction in machine vision 5. Vision-guided control in robots 6. Robot learning combined with motion control in robotics
University Policies	https://www.uttyler.edu/academic-affairs/files/syllabus_information_2021.pdf