SPECIAL TOPIC: Mobile Robotics
EE4395-002 – CRN 23042 – Undergraduate Level
EE5390-001 – CRN 21772 – Graduate Level
Spring 2021 Syllabus

Tuesday & Thursday 9-10:20am – Online on Blackboard

Instructor: Dr. Robert C. Roberts
  Engineering A310
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  915-747-6959

Weekly Office Hours:
  W 4:00pm – 5:30pm
  R 10:00pm – 11:00pm
  or by appointment
  http://teamschat.robertcroberts.com

Course Description: Robotics and automation are rapidly growing technologies inside of engineering to increase the efficiency of existing processes, as well as to provide new capabilities to benefit humanity. Mobile robots are one exciting form of these systems that are able to navigate their environment to perform their mission, whether sterilizing a hospital, delivering packages, or hunting for water on the moon. This hands-on class seeks to provide an introduction to mobile robotic fundamentals including embedded programming, control systems, sensors, motor control, navigation, obstacle avoidance, and wireless communication while solving mobile robotics problems. Graduate level students will further explore advanced topics such as machine vision and simultaneous localization and mapping (SLAM).

Pre-requisites for Course: There are no formal pre-requisites for this course, however familiarity with programming (C/C++), and basic electronics will be invaluable. Experience with programming TI's MSP430 or MSP432 microcontrollers will be especially helpful. Please contact the instructor if you have questions.

EE5390 – Graduate Level Students: Students enrolled in the graduate section of the course will be expected to complete additional tasks throughout the semester for the class competitions to show mastery at a higher level.

Course Website: Blackboard will be utilized for presentations and for sharing electronic copies of the presentations and handouts.

Textbook: None. This is a hands-on laboratory course. Handouts and videos will be posted onto the course Blackboard site, as well as supplementary materials to

help guide students through concepts and procedures. The following textbook may serve as useful references for students in addition to the online content:

- Jonathan W. Valvano, "Embedded Systems – Introduction to Robotics," 2020, ISBN:0-8194-5977-1978-1074544300
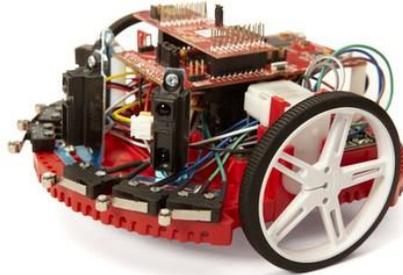
Hardware Kit: The course is built around Texas Instruments' TI-RSLK Max robot platform. This kit is further supplemented with multiple accessory modules and sensors which will be used throughout the semester to learn about important robot sub-systems and be utilized in solving the challenges in the course. In order to minimize student costs, these kits will be loaned to students for the duration of the semester.

Pickup – Students are expected to come to UTEP early in the semester, during times arranged with the instructor to collect their kits, unless other arrangements have been made with the instructor.

Care – It is expected that students will care for the robotics kit throughout the semester and keep all components together and in good working order. It is understood that hardware fails, and these issues should be promptly reported to the instructor via email for recordkeeping and to resolve/repair the issue.

Return – Students are expected to return the complete hardware kit to UTEP to the instructor or Patricia Mendoza, ECE Laboratory Coordinator, at the end of the semester by the end of the final exam period in good working order, unless other arrangements have been made with the instructor in advance. ***Failure to return the kit will result in putting a hold on your UTEP account until the equipment is returned or its replacement cost paid.***

Attendance: In order to be successful in the course, "online" attendance is highly recommended every scheduled day, in order to keep up with the work. This means that the student should watch all videos, and complete all quizzes and lab activities prior to the next class period. Should a situation arise when a student begins to get behind, they should communicate with the instructor promptly to ensure they do not miss any important information and can get back on track.

Course Grading: Students will be evaluated in the following manner:

Online Module Quizzes	20%
Lab Modules:	30%
Midterm Competition	10%
Final Competition	15%
Final Competition Report	10%
Extra Objectives **(EE5390 students only)**	**15%**
TOTAL	100% **(85% for EE4395 students)**

Course Drop Deadline: April 1st

Drop Policy: Students can drop the course before April 1st with a grade of "W". Students who drop the course after April 1st will be assigned the grade earned in the course.

Scholastic Integrity: As an entity of The University of Texas at El Paso, the Department of Electrical and Computer Engineering is committed to the development of its students and to the promotion of personal integrity and self-responsibility. The assumption that a student's work is a fair representation of the student's ability to perform forms the basis for departmental and institutional quality. All students within the Department are expected to observe appropriate standards of conduct. Acts of scholastic dishonesty such as cheating, plagiarism, collusion, the submission for credit of any work or material that are attributable in the whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts will not be tolerated. Any case involving academic dishonesty will be referred to the Engineering Dean's Office and the Office of the Dean of Students. The Dean of Students will assign a Student Judicial Affairs Coordinator who will investigate the charge and alert the student as to its disposition. Consequences of academic dishonesty may be as severe as dismissal from the University. See the Office of the Dean of Students' home page at www.utep.edu/dos/acadintg.htm for more information.

Policy relating to Disability / CASS: In Section 504 of the Vocational Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990, if a student needs an accommodation then the Office of Disabled Student Services located at UTEP need to be contacted. If you have a condition, which may affect your ability to perform successfully in this course, you are encouraged to discuss this in confidence with the instructor and/or the director of the Disabled Student Services. Written guidelines r/t accommodations from CASS must be submitted to the course manager PRIOR to the start of the course. If you have a disability and need classroom accommodations, please contact CASS at 747-5148, or by email

to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass. *CASS' Staff are the only individuals who can validate and if need be, authorize accommodations for students with disabilities.*

UTEP ECE DEPARTMENT
SYLLABUS ADDENDUM

Course models
Most ECE courses will follow either fully-online or hybrid models. Hybrid models will provide a virtual off-campus component and an in-person on-campus component. To follow social distancing guidelines on campus, faculty will arrange staggered attendance schedules. Laboratory classes will be offered online and/or in-person, in small groups and in spaces adequate to health and safety guidelines. For additional details, read the syllabus and consult your professor.

The ECE Department recognizes that students with health conditions or international students facing travel restrictions may encounter difficult situations. Virtual classes may be recorded to offer needed study flexibility and to allow students to review course material if it's helpful.

Required COVID-19 Training
Before the semester starts, the ECE Department requires all its students to complete a training module, which includes a video developed in large part by students and hosted by the President of the Student Government Association. Follow the link to this module:
https://covidfstraining.questionpro.com/

Before you come to campus
Before coming to campus all ECE students should conduct a [daily self-screening](#) to ensure that they are symptom-free before coming to campus. The screening includes taking your temperature and assessing for the following symptoms:
- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat

- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

Source: https://www.cdc.gov/coronavirus/2019-ncov/downloads/COVID19-symptoms-24x36-en.pdf

If you have any of these symptoms, you must stay at home, seek medical attention, and report to your professor. If you show any of the following signs, seek emergency medical care immediately:

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion
- Inability to wake or stay awake
- Bluish lips or face

In addition, everyone MUST complete a COVID-19 screening before coming to campus. The link for reporting is
https://screening.utep.edu
This screening includes three required questions:

- In the last 5 days have you (or someone you live with) experienced any one of the COVID-19 symptoms above?
- If you have been tested for COVID-19 in the past 2 weeks, was the result positive?
- In the last 2 weeks, have you spent 15 minutes or more within 6 feet of anybody that you know has tested positive for COVID-19?

Before coming to campus, wash your hands, and pack a hand sanitizer bottle and a clean face mask.

Source: https://www.cdc.gov/
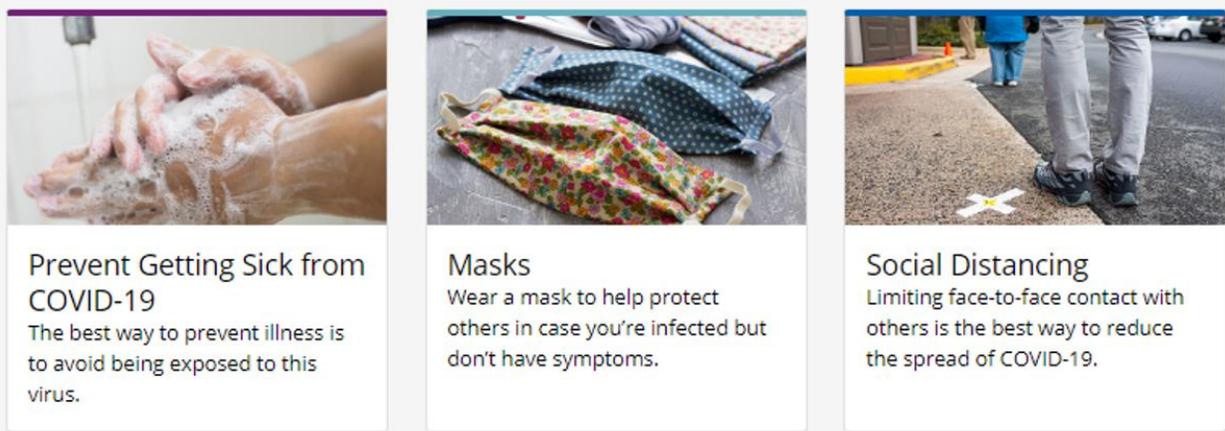
While on campus
UTEP is now requiring that *everyone* on the campus wear a CDC-approved face covering over the mouth and nose in all public spaces. This requirement includes classrooms, building entrances and exits, lobbies and lounges, as well as in hallways, stairwells, restrooms and elevators. UTEP will maintain and adjust its face-covering requirement as the pandemic evolves.

While on campus, ECE faculty will wear a face mask when giving in-person instruction. Likewise, students on campus will wear face masks in classrooms and laboratories and maintain social distancing (6 feet). Anyone refusing to face covering or to social distance themselves will be asked to leave the premises. Any escalation situations will be considered a public disruption and may require actions such as calling the UTEP campus police department and reporting the case to the Chair of the ECE Department and the Office of Student Conduct and Conflict Resolution (OSCCR).

One of the most effective ways of avoiding catching the corona virus, flu, or common cold is to wash your hands thoroughly after touching surfaces in common areas of places with high traffic. If this is not possible, use hand sanitizer as often as needed.

COVID-19 Testing on Campus
UTEP will test for COVID-19 in the fall. This will help us to rapidly identify individuals who have COVID-19 and do not have symptoms so they can isolate and avoid spreading it to others. The testing will focus on faculty, staff, and students who are on campus. Help us stop the spread of the corona virus and agree to participate in this voluntary testing program. Get tested when invited for testing at one of several on-campus locations.

Resources
UTEP Return to Campus Presentation https://www.utep.edu/resuming-campus-operations/_Files/docs/COVID_Return_to_Campus_Safety_Traning_8-7-20.pdf
UTEP Counseling and Psychological Services: 747-5302 or CAPS@utep.edu
UTEP Student Health and Wellness Center: https://www.utep.edu/chs/shc/
UTEP COVID-19 website: https://www.utep.edu/ehs/COVID-19/
El Paso Strong statistics website: http://epstrong.org/
El Paso COVID 19 information website: https://www.epcovid19.org/
Ciudad Juarez COVID-19 resources website: https://www.juarezcovid19.com/
US Centers for Disease Control and Prevention website: https://www.cdc.gov/