

**EE3360 - Introduction to Robotics and Autonomous Systems**  
**Spring 2024 Syllabus**  
CRN 27299

**Tuesday & Thursday 12:00-1:20pm**

**Class Location:**  
**Engineering E338**

**Instructor: Dr. Robert C. Roberts**  
**Engineering A310**  
**rcroberts@utep.edu**  
**915-747-6959**

**Weekly Office Hours:**  
**Th 1:30pm – 3:30pm**  
**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.

**Pre-requisites for Course:** Having passed (with C or better) or being concurrently enrolled EE2369 and EE3353 is required. Familiarity with programming (C/C++), and basic electronics will be invaluable. Experience with programming microcontrollers will be especially helpful. Please contact the instructor if you have questions.

**Course Website:** Blackboard for sharing electronic copies of presentations, course details, and handouts.

**Textbook:** None. This is a hands-on laboratory course. Handouts and tutorials 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:

**Hardware Kit:** The course is built around the Pololu Romi 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.

**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 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, attendance is highly recommended every scheduled day, in order to keep up with the work. This means that the student should attend all lectures, watch all videos, and complete all 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.

**Laboratory Notebook:** Students in the class are required to carefully document their robots design in a laboratory notebook throughout the semester. These notebooks should be treated like a diary, and document all hardware and software in the system, as well as record ideas, thoughts, problems, solutions, etc. Notebooks can be found in the bookstore. Students should take photos and include them in their notebook for documentation. They can also paste in source code as needed to allow for documentation. The purpose of this exercise is to simulate an Inventor's Notebook (<https://www.shaverswanson.com/resources/how-to-keep-an-inventors-notebook>) used by many companies to track ideas for patents. Anyone reading the notebook should be able to understand and reverse engineer your ideas and designs, and be able to replicate your work.



During the first half of the semester, students will turn in their laboratory notebooks for feedback periodically. After the mid-term competition, students should carefully detail the design, fabrication, coding, and testing of their final competition robots. The notebooks will be turned in at the end of the semester for final grading.

In the past, students have asked if they could keep a “digital” notebook. These notebooks are usually far less detailed and are difficult to providing organic feedback. In this way, a paper notebook is required for this course and digital submissions will not be accepted.

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

Bi-Weekly Lab Notebook Checks (1 <sup>st</sup> half)	40%
Midterm Competition	10%
Final Lab Notebook Check	30%
Final Competition	20%
TOTAL	100%

**Course Drop Deadline:** March 28<sup>th</sup>

**Final Exam Period:** The final exam period for this course is Tuesday, May 7<sup>th</sup> from 1-3:45pm. Students should reserve this day and time for the course.

**Drop Policy:** Students can drop the course before March 28<sup>th</sup> with a grade of “W”. Students who drop the course after March 28<sup>th</sup> will be assigned the grade earned in the course.

**Using AI for brainstorming:** Some AI technologies or automated tools, particularly generative AI such as ChatGPT or DALL-E, can be beneficial during the early brainstorming stages of an activity, and you are welcome to explore them for that purpose. However, keep in mind that AI-generated ideas are not your own and may hinder your ability to think critically and creatively about a problem. It is also important to remember that these technologies often “hallucinate” or produce materials and information that are inaccurate or incomplete—even providing false citations for use. That said, you are not allowed to submit any AI-generated work in this course as your own. If you use any information or materials created by AI technology, you are required to cite it like you would any other source. You must also provide (1) which tool you used. (2) what input(s) you provided the tool, and (3) what the raw output(s) of the tool provided. Consider how this will affect your credibility as a writer and scholar before doing so. Any direct use of AI generated materials submitted as your own work will be treated as plagiarism and reported to the Office of Student Conduct and Conflict Resolution (OSCCR).

**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](http://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](mailto: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](http://www.sa.utep.edu/cass). *CASS' Staff are the only individuals who can validate and if need be, authorize accommodations for students with disabilities.*