

Kennesaw State University
MTRE 4400 – Directed Research – Mechatronics
Course Syllabus – Fall 2019

I. Identifying information

Student(s): xxxxxxxx

Course: MTRE 4400 VR Remote Controlled Robot, 1 credit

Instructor: Kevin McFall, PhD.

II. Course Description

This course aims to create a VR-remote-controlled robot working in real time. The user will have live video displayed to them through a VR headset, and be given access to a control panel that operates a physical robot in the real world.

III. Objective of the Course

Goals: (1) Add more physical objects to the VR car like a horn, controllable lights, and some sort of HUD, (2) Create a PID controller for velocity (think cruise control), and (3) Add object tracking to the display by pointing and clicking on the screen in VR..

IV. Detailed Schedule

Week 1: Physical capabilities of car in circuitry (horn/lights)

Week 2: Physical capabilities of car in circuitry (horn/lights)

Week 3: VR controls for physical components

Week 4: Accelerator for velocity estimation

Week 5: Accelerator for velocity estimation

Week 6: HUD integration

Week 7: HUD integration

Week 8: PID Loop testing

Week 9: PID implementation

Week 10: VR Controls for PID

Week 11: VR Pointer to select screen

Week 12: VR Pointer to select screen

Week 13: Draw Box on screen based on pointer

Week 14: Object tracking implementation

Week 15: Object tracking implementation

The student is expected to work independently on this project, of course under direction of the instructor. Meeting with the instructor is expected at least once weekly, demonstrating completion of the week's task. A minimum total of 50 hours of time is required on this project. The student is expected to follow all safety guidelines when interacting with equipment as directed by instructors and laboratory technicians.

V. Basis for Evaluation

The primary deliverable for this course is the working VR robot. The student will be evaluated on satisfactory operation the robot (40%), compilation of a logbook documenting the progress made and time spent (20%), and preparation of a promotional video demonstrating the technology for the Department's YouTube channel (40%). Grades will be assigned for each component according to the following rubric:

- A (90-100): Exceptional deliverable quality and/or completion of extended topics
- B (80-89): Satisfactory completion of deliverables
- C (70-79): Incomplete completion of deliverables
- D (60-69): Partial completion of deliverables
- F (0-59): Little or no completion of deliverables

Federal, BOR, & KSU Course Syllabus Policies

Information contained in the links below constitutes the Federal, BOR, and KSU course syllabus policies and procedures and may be referenced by faculty members in their course syllabi. These policies are updated on the Academic Affairs Website annually.

[Academic Affairs - Federal, BOR, & KSU Policies](#)

[Academic Affairs - KSU Student Resources for Syllabus](#)

Note to Faculty: The KSU faculty handbook requires the Academic Integrity Policy in the course syllabus.

Note to Faculty and Students: The Office of the Provost will work to keep the policies and links in this document as accurate as possible.

Academic Integrity Statement

Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section 5c of the Student Code of Conduct addresses the university's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to university materials, misrepresentation/falsification of university records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the Department of Student Conduct and Academic Integrity (SCAI), which includes either an "informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement. See also [KSU Student Code of Conduct](#).

Electronic Communication

The University provides all KSU students with an "official" email account with the address "students.kennesaw.edu" or "kennesaw.view.usg.edu" (in D2L). As a result of federal laws protecting educational information and other data, this is the sole email account you should use to communicate with your instructor or other University officials.