

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

I. Identifying information

Student(s): xxxxxx

Course: MTRE 4400 Install and Operation of Robotic Arm, 2 credits

Instructor: Kevin McFall, PhD.

II. Course Description

The Department has purchased equipment to install a Kawasaki robotic arm in Q 121, including securing it to the floor and the control box. This course intends for the student to assist with the installation and prepare the robot for use in future projects.

III. Objective of the Course

This directed research will result in a fully functioning robotic platform. Additionally, a user manual and software library will be produced to assist participants in future projects using the arm.

IV. Detailed Schedule

Week 1: Familiarize with Kawasaki robot arm and prepare for install

Week 2: Physically install the robot arm on the floor

Week 3: Connect necessary electrical and pneumatic systems

Week 4: Develop code for moving robotic arm between given positions

Week 5: Determine appropriate end effector to allow arm to grab a given object

Week 6: Prepare and install end effector

Week 7: Troubleshoot using end effect for pick and place functionality

Week 8: Test pick and place operation of robot arm

Week 9: Organize existing code into software library and add new functionality as needed

Week 10: Write user manual for robotic arm operation

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 100 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 a robotic arm. The student will be evaluated on satisfactory operation of the arm (40%), compilation of a logbook documenting the progress made and time spent (20%), and preparation of a user manual and software library (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.