

Kennesaw State University

Syllabus

Southern Polytechnic College of Engineering and Engineering
Technology

Department of Robotics and Mechatronics Engineering
MTRE 1000: Introduction to Mechatronics Engineering
2021 Fall

Course Information

Class meeting time:

Lecture — T 14:00–14:50

Lab — M 15:30–18:15

Lab — M 18:30–21:15

Lab — T 11:00–1:45

Lab — F 09:30–12:15

Modality and location:

Face-to-face — KSU may shift the method of course delivery at any time during the semester in compliance with University System of Georgia health and safety guidelines. In this case, alternate teaching modalities that may be adopted include hyflex, hybrid, synchronous online, or asynchronous online instruction.

Engineering Technology Center room Q 202 (lecture) and Q 118 (lab)

This syllabus is posted in D2L.

Instructor Information

Matt Marshall (lecture)

Email: mqm@kennesaw.edu

Office location: Q 317

Office phone: (470) 578-5135

Office hours:

M 15:30–17:00

T 09:30–13:00

Preferred method of communication: email

(Be sure to use mqm@kennesaw.edu and not the @kennesaw.view.usg.edu account. That is, do not use D2L to send emails to the instructor.)

(Chris) Razvan Voicu (lab, Monday)

Email: rvoicu@kennesaw.edu

Office location: TBD

Office phone: (470) 333-2212 (text)

Office hours:

T 16:00–18:05
or by appointment

Preferred method of communication: email

Waqas Majeed (lab, Tuesday)

Email: wmajeed@kennesaw.edu

Office location: TBD

Office phone: TBD

Office hours:

T 09:00–11:00
R 09:00–11:00

Preferred method of communication: email

Meiling Sha (lab, Friday)

Email: rsha@kennesaw.edu

Office location: N.A.

Office phone: (678) 200-5951

Office hours:

N.A.

Preferred method of communication: email

Course Description

Prerequisites: *none*

Credit hours: 1 class hour + 3 laboratory hours = 2 credit hours

An introduction to career opportunities in Mechatronics Engineering; familiarization with college and departmental policies, curriculum, and facilities.

Course Materials

Required texts: *none*

Recommended texts: *none*

Technology requirements:

- Each team will need access to a personal computer capable of running RobotC for VEX Robotics. Ideally, every student will have a copy on their own computers, but each team must have at least one. Inform the instructor if this is a problem in order to make alternate arrangements.
- Students will use SolidWorks CAD software for at least one assignment. Lab computers in the Engineering Technology Center, including those in the Peer Mentoring Center (room Q 306) have this software installed. All students in the college can download and install SolidWorks on their personal computers by following the instructions posted in the “Reference Material” module.

Learning Outcomes

By the end of this course, students will:

- appreciate the fundamental components that make up mechatronics engineering systems and
- undertake independent research, analysis, and design to creatively solve engineering problems.

Course Requirements and Assignments

Lecture assignments: All graded assignments are weighted equally. Due dates for the following topics are marked in the course schedule and are due at the beginning of lecture. See the D2L learning modules and assignments for more detailed descriptions.

- Pre-test (D2L quiz)
- Personalized curriculum flowchart
- Computer programming with Ruby
- CAD model
- Literature review
- Units exercises
- Units example for CO₂ emissions
- Interview with an engineer
- Vectors exercises
- Statics exercises
- Dynamics exercises
- Controls exercises
- Circuits exercises

Lab attendance: Participation in the face-to-face (F2F) labs is essential and required. Late arrival (after your name has been called) results in a 75% attendance grade for the day.

Lab cleanliness: Each team is allocated a dedicated workspace in the lab, which is expected to remain tidy. When leaving lab, no stray items are allowed left on the workspace. A partially, or completely, built robot may be placed neatly on the counter along the windows. Any trash or spare parts left will result in a 10% point deduction from the lab cleanliness grade. A similar deduction results may result from negligently lost or damaged important robotic parts such as motor leads breaking, lost sensors, etc.

Lab assignments: The term project is a mechatronics design competition using VEX robotic systems. The following items will count equally towards the project grade. Generally, the same grade will be shared by all team members although those found not contributing to the effort may receive reduced scores. The following assignments are due at the beginning of the lab meeting for your section. See D2L for more detailed descriptions of these assignments.

1. Build of the Clawbot
2. Program the Clawbot
3. Concept sketches and decision table
4. Final robot competition

Evaluation and Grading Policies

Grades are converted as: A 90–100, B 80–89, C 70–79, D 60–69, F 0–59. Grade items and their respective weights are given in the table below.

Assignment	Weight
Lecture assignments	50%
Lab attendance	5%
Lab cleanliness	5%
Lab assignments	40%

Items will be graded within one week of submission. Grades will be rounded up if they are at 0.5 or above. For example, an 89.6 is an A, but 79.2 is a C.

All assignments other than the final robot challenge will be graded on the following scale.

- 10 points: all or nearly all requirements met
- 8 points: many/most requirements met with an obviously serious attempt made
- 3 point: minimal effort is evident
- 0 points: little or no effort made

Course Policies

Teams: Lab assignments in this course will be completed in teams that will be created in the second week of classes. All team members are expected to contribute equally to the teams. Students not pulling their weight will be given a warning once and thereafter will be assigned zero grades for subsequent assignments unless their activity level increases to an acceptable level.

Robotics kits will be checked out to each team. No student is permitted to access any kit other than the one assigned to their team.

Course Communication: Course material will be disseminated in D2L including lecture notes, homework assignments, etc. All official course announcements, including instructions when class may be cancelled, will be posted in the D2L course news. Be sure to check D2L regularly. 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. (As stated in Instructor Information above, for this course you should use only the `students.kennesaw.edu` address.)

Late/Missed Assignments: In general, late and improperly submitted assignments are not accepted. Extenuating circumstances can result in exceptions to this rule, but agreement must be reached with the instructor in advance of the assignment or class to be missed. Late and/or improperly submitted work in D2L drop boxes will be assigned a zero grade.

COVID-19 illness: If you are feeling ill, please stay home and contact your health professional. In addition, please email your instructor to say you are missing class due to illness. Signs of COVID-19 illness include, but are not limited to, the following:

- Cough
- Fever of 100.4 or higher
- Runny nose or new sinus congestion
- Shortness of breath or difficulty breathing
- Chills
- Sore Throat
- New loss of taste and/or smell

COVID-19 vaccines are a critical tool in “Protecting the Nest.” If you have not already, you are strongly encouraged to get vaccinated immediately to advance the health and safety of our campus community. As an enrolled KSU student, you are eligible to receive the vaccine on campus. Please call (470) 578-6644 to schedule your vaccination appointment or you may walk into one of our student health clinics.

For more information regarding COVID-19 (including testing, vaccines, extended illness procedures and accommodations), see KSU’s official Covid-19 website.

Face coverings: Based on guidance from the University System of Georgia (USG), all vaccinated and unvaccinated individuals are encouraged to wear a face covering while inside campus facilities. Unvaccinated individuals are also strongly encouraged to continue to socially distance while inside campus facilities, when possible

Institutional Policies

Federal, BOR, & KSU Course Syllabus Policies

KSU Student Resources

This link contains information on help and resources available to students: [KSU Student Syllabus Resources](#).

Course Schedule

LECTURE	LAB
Aug 17th Introduction	20th <i>No lab</i>
24th Programming	27th Introduction to VEX robot kit
31st Computer-Aided Design (CAD)	Sep 3rd Introduction to VEX programming
7th University resources	10th <i>No lab</i>
14th Units	17th Clawbot build

LECTURE	LAB
21st Units Example for Energy	24th Clawbot build <i>Build of Clawbot due</i>
28th Mechatronics careers	Oct 1st Clawbot program
5th Vector math	8th Clawbot program <i>Program for the Clawbot due</i> Competition discussion and engineering design <i>Concept sketches and decision table due</i>
12th Statics	15th Build
19th Newton's second law and equations of motion	22nd Program
26th Controls	29th Build
Nov 2nd Circuits	5th Program
9th Sensors	12th Test
16th Computers	19th Competition
23rd Fall Break	26th Fall Break
30th Actuators	Dec 3rd <i>No lab</i>
7th Final Exam 13:00–15:00	10th <i>No lab</i>