SYLLABUS SPRING 2015
CSCI 497.01E – Introduction to Robotics

Day and Time:  M 9:00am-11:40am, Location: EDS127
Meets 1/20/2015 through 5/15/2015

Instructor:  Dr. Abdullah N. Arslan
Office:  JOUR206
Office Hours:  M: 4pm-7pm,  T: 4:30pm-6:30pm,
R 1:30pm-4:30pm
Additional by appointment
Office Phone:  903 468 3097
E-mail: Abdnslan@tamuc.edu

Pre-requisite:  None. However, a foundation in Linear Algebra and Calculus, and the ability to program, preferably in C/C++ will be helpful.

Content:  This course is intended for undergraduate students with interests in robotics. The objective of this course is to introduce the fundamental concepts in robotics. The topics include coordinate transformations, sensors, path planning, kinematics, feedback and feedforward control, stressing the importance of integrating sensors, effectors and control. Course topics will be tied to lab experiments; students will work in teams to build, program, and test increasingly more complex robots. Robot kits from robotis.com will be used in weekly team assignments illustrating lecture material. Student-teams will also develop a new robotics-based project and present their work at the end of the semester.

Main Objective:  To teach students basic robot building and programming.

STUDENT LEARNING OUTCOMES (SLO)
• To learn how to collaborate in teams
• To understand importance of gears, pulleys, torque, friction, timing, sensors in building robots
• To learn how to design robots for specific activities and scenarios

TOPICS BY WEEKS

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to robotics, brief history</td>
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<tr>
<td>2</td>
<td>Sensing, sensors, path planning, inertial navigation, manipulators</td>
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<td>3</td>
<td>Direct kinematics, effectors and actuators, dynamics, inverse kinematics</td>
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<td>4</td>
<td>Motion sequence programming, robotics programming environments, programming languages, robot building kits</td>
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<td>5</td>
<td>Discussion of Assignment #1: Robot following orders in sequence.</td>
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<td>6</td>
<td>Presentations of Assignment #1 and discussion of Assignment #2: Tumbler robot maneuvering rough terrain.</td>
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<td>7</td>
<td>Presentations of Assignment #2 and discussions of Assignment #3: Motorcycle steering for balance.</td>
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<td>8</td>
<td>Presentations of Assignment #3 and discussions of Assignment #4: Smart car avoiding obstacles and cliffs.</td>
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<td>9</td>
<td>Presentations of Assignment #4 and discussions of</td>
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Assignment #5: Detect a cup with the IR sensors and move it to a specified location.

10 Presentations of Assignment #5 and discussions of Assignment #6: Walking Droid

11 Presentations of Assignment #6 and Final Exam

12 Team Project Presentations

13 Team Project Presentations

14 Team Project Presentations

COURSE EVALUATION
Basis for Evaluation:

| Assignments | 60% |
| Final Exam  | 20% |
| Team Project| 20% |

Grading Policy:

- **A:** 100%- 90%
- **B:** 89% - 80%
- **C:** 79% - 70%
- **D:** 69% - 60%
- **F:** Less than 59%

CHEATING WILL NOT BE TOLERATED

| Final Test | Section: TBA | Date: TBA | Time: TBA |

COURSE POLICIES

**Assignments:** Assignments are group work. The instructor will ask questions to assess the contribution of each student. For each assignment a score will be assigned to each student based on team’s success and student’s contribution.

**Final Exam:** There will be one final exam measuring students’ understanding of general robotics concepts and the level of practical knowledge acquired. No opportunity will be given to take the test at earlier or later times except in extreme cases as judged by the instructor.

**Team Projects:** Teams are expected to come up with new creative project ideas, and have them approved by the professor. They will complete and present their work in the last three weeks of the semester. Each student will receive a score based on team-project’s success and his/her contribution.

During the lectures and exams laptops and phones must be switched off all the time except when allowed by the instructor.

**Attendance:**
From the Students’ Handbook: “Students are expected to be present for all class meetings of any course for which they are enrolled. Per University Procedure A13.02, effective September 1, 1996, students are responsible for learning about and complying with the attendance policy stated in the catalog, Student’s Guidebook, and/or faculty syllabus. It is the prerogative of the faculty to drop students from courses in which they have accrued excessive absences as defined in the course syllabus.”

The instructor will take the attendance at the beginning of each lecture and only once. AFTER THAT THE INSTRUCTOR WILL CLOSE THE CLASSROOM DOOR AND/OR PUT A NOTE AT THE DOOR INDICATING LECTURE IS ON. NO STUDENT WILL BE ALLOWED TO THE LECTURE AFTER THIS.
If a student misses 3 or more lectures without legitimate reasons, the instructor will make the student drop the course. If this is not possible, the letter grade of ‘F’ will be assigned to the student.

Lateness and leaving class early may count as an absence and are not acceptable unless you are ill or a family emergency exists. If you miss a lecture, it is your responsibility to obtain notes from a fellow student. Office hours are not meant for individual lectures. Any class material missed by the student is the student’s responsibility to acquire.

**Academic Dishonesty:**
Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. If you are caught in an academic dishonesty situation on any course work, you will be given a grade of F for the course and referred to the Dean of Students for further disciplinary action.

“All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment.” (See Student’s Guide Handbook, Policies and Procedures, Conduct).

**Withdrawal Policy:**
There are deadlines for withdrawing from this course. It is the student’s responsibility to follow these deadlines.

**Students with Disabilities:**
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

**Office of Student Disability Resources and Services**
Texas A&M University-Commerce
Gee Library
Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamuc.edu

**Smoke, Vapor & Tobacco Free Environment:** Procedure 34.05.99.R1 now prohibits the use of vapor/electronic cigarettes, smokeless tobacco, snuff and chewing tobacco inside and adjacent to any building owned, leased, or operated by A&M – Commerce.

The professor will make supplementary information for the course available in eCollege. These include class notes, assignments, PowerPoint slides, class announcements, the course syllabus, test dates, etc. The professor will announce in class when such information becomes available electronically. It is the student’s responsibility to follow these announcements.

**We will finalize this course syllabus in the first few lectures. There may be some changes.**