

Department of Mechanical and Aerospace Engineering
The University Of Texas at Arlington
Computer Aided and Applied Robotics (CAAR) – UG/GR – Summer 2014

Instructor: Dr. P. S. Shiakolas

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Course Web Page: TBA

Office Hours: By appointment

GTA: TBA **Office:** **Office Hours:**

Prerequisites: MAE 4345 and/or ME 5337 or equivalent or consent of instructor

Text: No official text but information and/or links to the Web and other resources will be provided

Description of Course Content: Review of Robotics theory, Use of Computer tools to simulate the performance of robotic devices and/or manufacturing lines, Design and fabrication of specialized grippers and Interface with industrial robots, Extensive programming of industrial robotic cells in the laboratory. Note that this is a project intensive class.

Grading Policy – Expectations – Course Logistics

Assume no collaboration is allowed unless expressed permission is obtained from the instructor.

Anyone collaborating on an exam will be given a failing grade in the course.

Anyone intentionally damaging equipment will be given a failing grade in the course.

Anyone not following the safety rules will be given a failing grade in the course.

Homework (2.0 pts each): The purpose of the homework is to provide practice exercises that apply the theory and concepts presented in class in order to identify and improve on any deficiencies that might exist. It could be either analytical and/or computational.

Projects (10 pts each – anticipate 4 to 6 projects): There will be two types of projects in this class; projects for which you will be required to apply computational techniques using CAD and/or numerical analysis software tools and projects for which you will have to learn and program the robotic manufacturing cells in the laboratory. A final presentation on the projects by each student will take place the last week of the semester. Note that a passing grade in the class cannot be obtained unless all projects are completed with a grade of B or better.

Semester Exam (15 pts): The semester exam will be comprehensive and **may** consist of two parts (an analytical and a computational). Note that part of or the whole exam may be take-home. The time of the exam will be announced later and will not necessarily last the whole class time.

Final Exam (25 pts): The final exam will be comprehensive and may consist of two parts; an analytical and a computational. The exam might take place the last week of the semester (you will have at least one week notice); if it does not take place during the last week, it will be given at the university scheduled time. It is your responsibility to find and know this information. If there will be a computational part, it could be given the last week of classes.

Makeup Exam: No makeup exams will be given unless I am notified in advance and approve of it. If you miss a semester exam due to approved reason, there will be only one comprehensive (all material covered) makeup exam the last week of the semester. There will be no makeup for the final exam except in extreme circumstances.

Attendance Policy: It is your responsibility to attend the lectures, participate in class discussion and keep up-to-date with the course material. I do not re-teach missed lecture material during office hours. If you are habitually late, you will not be allowed in the classroom as this is disruptive to the other students.

Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 10 – 12 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, completing the projects, etc.

Laboratory Access: This is a class where you will have to learn how to program the industrial robotic devices in the laboratory in order to apply this knowledge in completing project work. The robots in the lab are industrial strength and extra care must be taken when you are working with them to avoid injuring you or anyone else and to avoid damaging the robots. If anyone damages any hardware intentionally, then that person will be given a failing grade in the class (will not be allowed to drop the class for any reason to avoid a failing grade). While in the lab, you must have your lab partner with you at all times. We will have a safety lesson in the lab. Access to the lab is privilege you have as students in this course and if you abuse this privilege your access will be revoked and essentially you will fail the class.

Software: You may use any computer software that you like. In this class several software packages could be used depending on the project topic. Numerical analysis software tools include MATLAB <http://www.mathworks.com>, Mathematica <http://wolfram.com>, and LabVIEW-MathScript <http://www.ni.com>; CAD tools include DELMIA, SolidWorks Motion, and CATIA. The robot programming language, Adept ACE, is provided by the robot manufacturer. Introduction to some of these software tools will be provided but you will have to spend time learning/applying some of them for the projects.

Remember that computer tools are encouraged but are used to help better understand certain concepts – **DO NOT** just learn how to exercise the software tools but make sure you understand the underlying theory and concepts employed.

Additional Reference Material: There are plenty of resources on resources on the web for robotics. Videos of robotic concepts will be played and discussed in class/ Guest lectures from practicing integrators and other faculty will take place. Visit(s) to robotic integrators and/or factories with robotic devices will be planned.

Drop Policy: According to university regulations and schedule. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. Students will not be automatically dropped for non-attendance. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information see <http://wweb.uta.edu/ses/fao>.

Guaranteed Grading Scale: The guaranteed grading scale based upon the minimum percentage number of points earned is **A >= 90%, 90% > B >= 80%, 80% > C >= 70%, 70% > D >= 60%, 60% > F**

Note that no incomplete grade will be given unless prior arrangements are made and only in extreme circumstances.

Grade Grievances: Any appeal of a grade must follow the procedures and deadlines for grade-related grievances as published in the current undergraduate catalog.

http://wweb.uta.edu/catalog/content/general/academic_regulations.aspx#10

Communication: Email communication will be through the MyMav system to your official UTA issued email account and/or through Blackboard and/or the class web page. It is your responsibility to check your email and web page often.

Miscellaneous: If you have a disability, any religious holidays that you need to observe or anything else that might interfere with this class and you would like for me to know about it, you must inform me in writing no later than the third class meeting.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, email to resources@uta.edu, or view the information at www.uta.edu/resources.

GTA Duties: The GTA will be available to assist with your homework/projects and lab access.

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KEEP FOR YOUR RECORDS

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

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Academic Dishonesty

It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspensions or expulsion from the University. "Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in 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." (Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22)

Instructors may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

University of Texas at Arlington Honor Code

The University of Texas at Arlington Honor Code can be found at <http://www.uta.edu/conduct/>.

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or that I contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

College of Engineering Ethics

The college of engineering ethics tutorial is at <https://www.uta.edu/engineering/academics/ethicstutorial.php>. You are required to go through the tutorial and sign and return the attached sheet indicating you carefully went over the material, you understand the implications of the presented material and that you will abide and follow the instructions. You must return this at the second class meeting. You will not be allowed in the class if you do not return this form.

By signing below, I affirmed that I have gone through the college of engineering ethics tutorial and that I will follow the instructions, guidance and rules given in the tutorial.

Name (Block letters)

Student ID

Date

Signature

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SIGN AND RETURN TO INSTRUCTOR BY SECOND CLASS MEETING

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