CISC 3415: Principles of Robotics, Fall 2023 (MW3)

Instructor:
Prof Y. Xiang (email: cisprofx2@gmail.com)
Office hours: Tue/Thu 3:40 – 4:40 pm (2156a-IH, Tel: x1517)

Course website:
http://www.sci.brooklyn.cuny.edu/~xiang/cisc3415/
(For lecture notes, readings, homework assignments and project descriptions, and a detailed schedule)

Class meeting time and room:
Mon, Wed: 3:40 – 4:55pm, Room 525-IA
Dates the college has no classes: 9/4, 9/25, 10/9, 11/22.
Conversion day: 10/10 (Monday schedule)

Prerequisites:
CISC 3130 and CISC 2210

Course description:
Basic principles of mobile robotics: architectures, mathematical foundations, control algorithms, human robot interaction, and practical applications.

The course consists of generally alternate lectures and labs. Lecture topics include an introduction to robotics, legged vs wheeled robots in locomotion and their characteristics of kinematics, sensors and perception, feature extraction and basics of computer vision, localization and mapping based on probabilistic filtering, robot path planning and navigation. Labs involve C/C++ programming projects on a simulated hobby/education robot kit, iRobot Create, using the open-source player/stage suite.

By the end of the course, students should develop a firm understanding of the topics covered and be able to write programs that implement needed control algorithms.

Textbook:

Homework assignments:
There are 5 homework assignments which will be assigned roughly every 2-3 weeks online with their specific due dates posted in red. They are due at the class time on the due date. Please submit your work via email. Late submissions will not be accepted!

Homework assignments are generally checked for completion only but some may be randomly picked to undergo more careful evaluation. Please clearly label your answers for proper crediting. Grades for homework are final, and standard answers to assignments will either be posted on the class website or discussed/reviewed in class (for open-ended questions). Your submitted work should demonstrate that you have put in an independent and genuine effort in your attempt to complete them. Please be advised that sharing/copying homework will earn zero points for all parties involved.

Lab/Projects:
There will be 6 Projects that progressively explore the control of a robot in locomotion, perception, localization and navigation, all developed in a simulation environment. You will be working in groups of up to 3 members. The lab sheets (instructions) and project-related files for each project have been posted on the class website. Please have the lab sheets ready, together with the project files, for each lab session. Programs of your finished projects should be submitted via email.

[Important!] Please be advised that, your submitted projects should always reflect your group’s independent work. Sharing your group’s work with other groups will earn zero points for all parties involved.

It is understood that all group members should work together closely, and ideally every member contributes to the final submitted work, so you should at least obtain your lab partners’ contact information to facilitate collaboration. But please submit only ONE single copy for the entire group when you are done to ensure proper crediting. To this end it is highly recommended that all members of the group get a cc-copy of the submission, so everyone can keep track of where you stand with all projects, and more importantly all members bear responsibility for the work submitted. In other word, if you object to the quality of your group ’s work, try to resolve it within your group before submitting it.
Projects are due on the day when the next project is started/assigned. The grade for a project will be given to you in private during the labs, possibly with a discussion on how improvements could be made, if warranted. However, grades for projects are final and revision is only granted in case of evident misunderstanding.

Grading:
Term grade is based on component grades of your homework assignments, projects and the final exam. The percentile score will be eventually converted to a letter grade with curving.

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<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Homework assignments:</td>
<td>15</td>
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<td>Projects:</td>
<td>45</td>
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<tr>
<td>Final exam (Wed 12/20, 1-3pm):</td>
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University’s policy on Academic Integrity:
The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for policy implementation can be found at http://www.brooklyn.edu/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation. Students should be aware that faculty may use plagiarism detection software.

Center for Student Disability Services:
The Center for Student Disability Services (CSDS) is committed to ensuring students with disabilities enjoy an equal opportunity to participate at Brooklyn College. In order to receive disability-related academic accommodations, students must first be registered with CSDS. Students who have a documented disability or suspect they may have a disability are invited to schedule an interview by calling (718) 951-5538 or emailing Josephine.Patterson@brooklyn.cuny.edu. If you have already registered with CSDS, email Josephine.Patterson@brooklyn.cuny.edu or testingclds@brooklyn.cuny.edu to ensure the accommodation emails are sent to your professor.

Additional Information:
- The Student Bereavement Policy
- Policy regarding non-attendance due to religious beliefs can be found in the front matter of the Undergraduate Bulletin and Graduate Bulletin, as well as on the Bulletins page of the Registrar’s website.
- Brooklyn College library’s services: https://library.brooklyn.cuny.edu/resources/

Important Dates:
- Friday, August 25 – First day of Fall 2023 classes
- Thursday, August 31 – Last day to add a course
- Monday, September 4 – College Closed – No classes scheduled
- Friday, September 15 through Sunday, September 17 – No classes scheduled
- Monday, September 25 – No classes scheduled
- Monday, October 9 – College Closed – No classes scheduled
- Tuesday, October 10 – Conversion Day – Classes follow a Monday schedule
- Wednesday, November 22 – No classes scheduled
- Thursday, November 23 and Friday, November 24 – College Closed – No classes scheduled
- Saturday, November 25 and Sunday, November 26 – College OPEN – No classes scheduled
- Monday, December 11 – Last day to withdraw from a course with a “W” grade
- Tuesday, December 12 and Wednesday, December 13 – Reading Days
- Thursday, December 14 – Final Exams Begin
- Tuesday, December 26 – Grade Submission Deadline