# CSC 126 Introduction to Robotics
# Spring 2018 Syllabus

## Instructor Information:

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Office Hours: MWF 11:50 am - 1:00 pm

Please feel free to email me if you have questions or would like to schedule a time to meet outside of office hours. Please also feel welcome to drop by in case I happen to be in my office.  I always enjoy meeting with students!

## Course Description:

Robots often perform tasks that are too dull, too dirty, or too dangerous for humans. Robots entertain us, clean our houses, mow our lawns, build our cars, fight our wars, perform surgery on our bodies, dive to the bottoms of the deepest oceans on our planet, and visit distant planets in our galaxy. This course introduces the fundamental concepts of robotics. Topics include how robots move, sense, and perceive the world around them. Students will construct and program robots in laboratory sessions. No previous computer programming or electronics experience is necessary. *This course is designed to meet the Practical Reasoning (PR) General Education Requirement.*

**Prerequisite:** Completion or waiver of developmental mathematics or the consent of the instructor is required.

**Learning Goals:** Students who successfully complete this course will have:

- Gained familiarity with the interdisciplinary field of robotics and its growing impact on society.
- Developed the ability to direct robots using computer languages for communication.
- Become familiar with widely used computer programming constructs including variables, assignment, looping, and conditional statements.
- Gained aptitude in understanding, designing, and evaluating patterns of logic and reasoning expressed as algorithms.
- Learned to practice reflection on topics related to disciplinary content, including ethics.
- Have become more comfortable and effective working in a team setting, particularly in analyzing and communicating logical and computational ideas with others.

## Resources:

- *Our course website:*  Linked from http://cs.berea.edu/courses/csc126 as well as from our Moodle site: http://moodle.berea.edu/course/view.php?id=9971. We will use our course web site as a resource to find this syllabus, course readings, homework, labs, and other course-related information, and our Moodle site for submissions and additional resources.
- *Required text: The Robotics Primer* by Maja J. Mataric, MIT Press, September 2007, ISBN-10: 0-262-63354-X & ISBN-13: 978-0-262-63354-3
- *Other Readings:* will be drawn from: *The Case of the Killer Robot: Stories about the Professional, Ethical, and Societal Dimensions of* Computing by RG Epstein

## Technology Policies:

Much of the work in this course will require use of the computer, so these policies are designed to help students better understand how to be effective in a technology-rich environment.

- *Laptop and Software:* Each student is required to bring their appropriately equipped laptop to class every day except when otherwise announced.
- *Unapproved Technology:* The in-class use of unapproved technology will not be tolerated and in certain cases will constitute a violation of academic honesty. For example, no games are ever acceptable and communication programs, such as e-mail or instant messaging programs, are only acceptable for class work during class, so must otherwise be disabled before class. Likewise, cellular devices must be disabled before class. To help students to appreciate the gravity of this policy, each and every in-class use of unapproved technology will result in a 1% reduction of the student's homework assignment grade.
- *Appropriate Collaboration:* Team participation is a proven and useful means by which students can learn material. Much information is easily accessible by searching the web. Students are encouraged to appropriately use information from other students, the web, and other resources. However, any information used from other students or any other resource MUST BE CITED. (See below for more information on this serious topic.)
- *Communication:* On the other hand, electronic communication programs are useful when used appropriately, so each student is required to use the course web page and Moodle course management system to access assignments and to use a Berea College e-mail account to facilitate electronic communication outside of class.
- *Backups:* All students are expected to back-up their work, which includes assignments, quizzes, and exams daily. The best way to do this is to store a copy of all work in a cloud service such as Dropbox, SkyDrive, or Google Drive, or on a DVD, flash drive, or some other media, and not in another location on their laptop. The normally understanding instructor will not be at all sympathetic to loss of electronic work, so it is the student's responsibility to protect their work from such heartbreaking loss.
- *Exceptions:* Exceptions to any of these technology policies will be considered on an individual case-by-case basis but will only be granted under extremely unusual circumstances.

## The Attendance Policy:

Class mini-lectures, discussions, and hands-on laboratory work are considered to be a vital key to success in this course. It is the hope of the instructor that class sessions are both informative and useful, therefore attendance is expected at each class session unless a specific exception is made. If you are sick with flu-like symptoms, the Center for Disease Control (CDC) recommends that you stay home for at least 24 hours after your fever is gone except to get medical care or for other necessities. Therefore, please do not come to class if you show flu-like symptoms. Instead, e-mail the instructor from your room and go to health services immediately. When you return to class, bring paperwork showing that you sought medical attention that day and your absence will be excused. Students who come late, leave early, or fail to fully participate during the class will be considered absent for that portion of the period, and such partial absences will accumulate. The final grade may be lowered by one third of a letter grade for each unexcused absence beyond the third. Thus, it is the responsibility of the student to contact the instructor about each absence from class. This should be done via email, as soon as possible, and if at all possible before the absence occurs. Students who miss class are held responsible for all of the material covered, assigned, and collected during their absence. Quizzes will be announced and/or occasionally "popped," and because I will drop the lowest quiz grades before computing your overall quiz score, so under nearly all circumstances, make-up quizzes will not be given.

## Grading Policies:

For the benefit of the students in the class, all course grade computations are continually updated in Moodle by the instructor and teaching assistants, so students may check frequently on their in-progress course grade during the term. Any questions/concerns regarding grading of any component of the course are to be addressed to the instructor only, never to a teaching assistant.

### Scale:

### System of Evaluation: *

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|---|---|
| Exam 1: | 20% |
| Exam 2: | 20% |
| Quiz total: | 20% |
| Assignments: | 20% |
| Labs and Outreach: | 20% |

A's:   90% ≤ A- < 93 ≤ A ≤ 100%

B's:   80% ≤ B- < 83 ≤ B < 87 ≤ B+ < 90%

C's:   70% ≤ C- < 73 ≤ C < 77 ≤ C+ < 80%

D's:   60% ≤ D- < 63% ≤ D < 77 ≤ D+ < 70%

F:       0% ≤ F  < 60%

Note that the of the exam and quiz grade items may be dropped as explained below.

Please refer to the Grading Scale http://www.berea.edu/cataloghandbook/academics/aps/grades/gradingscale.asp as described in the current Berea College Catalog for the College-wide interpretations of these letter grades.

## * "Good Student" Drop Bonus:

After having completed all work in the course, students who satisfy all of the following conditions will have their lowest exam score or quiz total dropped before their final grade is computed:

   a.      They have completed all coursework assignments, labs, outreach, quizzes and exams.
   b.      They have not been excessively tardy to or absent from class.
   c.      They have not had any noted incidents of disruptive behavior.

The instructor reserves the right to raise the grade of students who have demonstrated significant improvement in their performance. This is at the discretion of the instructor, but a student is welcome to bring this possibility to her attention.

## Final Exam and Final Reflection:

There will not be a final examination in this course. Instead, a final reflection will be due on Wednesday, May 2, 2018 by 1 pm, which is the assigned final exam time. We will meet during that time to debrief on the last outreach event, eat cookies, and restore order to our robotic equipment.

## Exams and Quizzes:

Two exams and frequent short reading quizzes will be given in this course. Reading quizzes will be given on many class days. Quiz questions will include questions relating to the reading assignment for that lesson. Students will take these quizzes individually at the start of the class period. After everyone has completed taking the quiz individually, students will take the quiz again in groups, coming to consensus on the answers to each of the questions. Thus, evidence that you have engaged and retained the information you have read will be reflected in your quiz scores. By keeping track of group and individual scores separately, you will have measures of your ability to listen and to learn from others as well.

The most likely time of the two exams will be:

•       Exam 1: Thursday, February 15, 2018
•       Exam 2: Tuesday, April 17, 2018

Problems that appear on the tests will be more varied in nature, ranging from homework or lab-like problems to problems that require a deeper synthesis of ideas and from true or false questions to short-answer questions.

## Outreach:

One really exciting and rewarding part of this course is the outreach we will do to children. Some of this outreach will be at the Berea branch of the Madison County Public Library, which is located at 319 Chestnut St., just a short walk from campus. Our two outreach events will take place on Saturday, April 21, 2018 and Sunday, April 29, 2018 in the afternoons. You will be expected to arrive at the library by 2:30 pm. You will only need to attend one of these two events, but you may attend both to earn extra credit. All other outreach in the planning stages will take place during the designated class time.

## Plagiarism and Academic Honesty:

Plagiarism is the use of anyone else's work or ideas without adequate citation. It is a crime which is both easy to commit and easy to avoid. Ideas taken from other people include those from published or unpublished books, articles, websites, TA's, or friends' homework. The best way to avoid plagiarism is to cite ALL your sources, including those from which you paraphrase or borrow ideas, and to be sure use quotation marks when quoting verbatim. If you are not sure whether or not to cite a source, you should cite it! Simply put, plagiarism is stealing because it constitutes theft of someone else's ideas. It is a serious offense, and Berea College takes it very seriously. Plagiarism will not be tolerated! At the first offense, the student will receive an F for that assignment. At the second offense, the student will fail the course. In addition, ALL offenses of plagiarism will be reported to the Associate Provost for Academic Services as detailed in the Berea College Student Handbook.

## The Class Atmosphere:

The members of this class constitute a learning community. Learning in such a community best takes place in an atmosphere in which instructor and students treat everyone with mutual respect. Students need not always raise their hands in order to ask questions or to make comments, but they should not interrupt the instructor or fellow students in doing so. Students typically find the atmosphere set by the instructor to be a sometimes playful and nearly always relaxed one, but students will still need to work hard and consistently both in and out of class in order to do well. If at any time you have thoughts or suggestions about how the class atmosphere could be improved or made into one which is more supportive of your learning, please come by or drop me a note about it. I welcome such suggestions.

## Additional Support and Disability Accommodation:

The Computing and Digital Crafts Lab is open Sunday through Thursday from 7:00 to 9:00 pm (except on evenings of convocations). Our primary teaching assistants, Rusty Dotson and Bianca Marrero, as well as several other CS TA's who have taken this class will be able to answer questions about the computational content in the course during consultations in their Computing and Digital Crafts Lab hours. Students are strongly encouraged to make use of the help available in the Computing and Digital Crafts Lab, as well as in the instructor's office hours. Missed labs may be made up in office hours or in the hours of the Computing and Digital Crafts Lab. Remember that best results are obtained trying to solve problems before asking for help, so students should be prepared to show what they have already tried. Topics in this course build throughout the course, so students should be sure to do their best to keep up with the class so as to not get behind and forever lost. No question to which you do not know the answer is "dumb" unless it goes unanswered because it remained unasked.

Berea College values diversity and inclusion and seeks to create a climate of mutual respect and full participation. My goal is to create learning environments that are accessible, equitable, and inclusive. If you encounter barriers based on the impact of a disability or health condition, please let me and Disability & Accessibility Services (DAS, 111 Lincoln Hall, 859-985-3237, lisa.ladanyi@berea.edu) know immediately so that we can determine if there is a design adjustment that can be made to the course or if accommodations might be needed to overcome the barriers. Together we can explore all of your options and establish how to best coordinate accommodations for this course.