Course Title:
Introduction to Intelligent Robotics

Instructor:
Dean Hougen, Devon Energy Hall 242, 405-325-3150, hougen@ou.edu

Teaching Assistant:
None!

Class Hours:
Tuesday, Thursday, 5:00-6:20, Devon Energy Hall 130

Office Hours:
Dean Hougen:
Tuesday 8:30-10:00 and Thursday 3:00-4:00, Devon Energy Hall 242

TA:
None!

Required Text Books:
Each student is required to have his or her own copy of the following textbooks.

Required for both 4023 and 5023:

Required for 5023:

Students should read ahead the chapters and other materials that are expected to be covered in the class period (see the class schedule). Students should always bring their textbooks with them to class, including lectures/discussions, group work days, and exams.

Communication:
The primary means of transmitting class information to the students will be through announcements and discussions during class time and web pages. You are responsible for announcements made through either or both of these means.

Occasionally, urgent information may be sent via email. You must ensure that the email address the University has on file for you is valid and is monitored by you. A test of the email addresses provided by the University will be made during the second week of class. You are responsible for notifying the instructor if you do not receive this test email.

The best way for students to communicate with the teaching staff is to come to scheduled office hours. If you cannot attend office hours in person, phone calls can be accepted during office hours but students present in the office will get priority. Email can also be used but a quick or detailed personal response is unlikely as we get a lot of email and responding to email can be very time consuming. Students present in the office or on the phone will get priority over emailed questions.

Students may communicate with one another using the discussion forums in Desire2Learn (note the combined course for 4023/5023 in D2L) or by other means outside of class as mutually agreed to by the students involved.

Details of all of the communication methods follow:
WWW:
Information about this class will be found on the class website. The URL is 
http://www.cs.ou.edu/~hougen/classes/Fall-2012/Robotics/
This page will contain links to the directory of class materials and other important information.

Email:
Students should use the email addresses listed above. Note that we get a lot of email. Do not expect a reply in minutes; one or two days is more likely in most cases. If you have not heard back within five days, please resend your message, if it is still relevant.

Expectations and Goals:
The prerequisite for this course is CS 2413 (Data Structures) or instructor permission. You are expected to have a sufficient background in Computer Science to be able to support team projects involving robots. You are expected to have a working knowledge of a high-level object-oriented or imperative language, including a familiarity with its basic data types and control structures. A background in AI such as that provided by CS 4013 (Artificial Intelligence) may be useful but is not a requirement.

This course will introduce students to the state of the art in Intelligent Robotics and cover the principles involved.

Topics:
- History of Intelligent Robotics
- The Functional Modules Approach
- Reactive Robots
  - Ethology for Roboticists
  - Architectures and Methodologies
  - Implementation
  - Sensing
- Hybrid Deliberative/Reactive Robots
- Multiple Robots
- Navigation
  - Topological Path Planning
  - Metric Path Planning
  - Localization and Mapping

ABET Student Outcomes to be addressed:
A: An ability to apply knowledge of computing and mathematics appropriate to the discipline.
B: An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
C: An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
D: An ability to function effectively on teams to accomplish a common goal.
F: An ability to communicate effectively with a range of audiences.
H: Recognition of the need for and an ability to engage in continuing professional development.
I: An ability to use current techniques, skills, and tools necessary for computing practice.
K: An ability to apply design and development principles in the construction of software systems of varying complexity.

Computer Accounts and Software:
All students in this class should have an account on the Computer Science Network (CSN). This will be used for writing and testing programs and sending and receiving materials electronically. Source code written for the projects MUST run on these machines. You may do your development work on whatever system you choose but it is your responsibility to ensure that your code runs on the CSN machines.
Requirements:

The graded assignments and their contribution to a student's grade are given in the table below. (Subject to change.)

<table>
<thead>
<tr>
<th>Item</th>
<th>4023</th>
<th>5023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam (1)</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>Homework</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Group Project 1 (Simulation)</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Group Project 2 (Real Robots)</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Major Group Project</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Technical Paper Review &amp; Presentation</td>
<td>—</td>
<td>5%</td>
</tr>
<tr>
<td>Technical Paper Comparison</td>
<td>—</td>
<td>15%</td>
</tr>
</tbody>
</table>

All homework, exams, and technical paper projects in this course are to be done ALONE; the work submitted by a student MUST be the student's own.

Group work is REQUIRED for the projects; students will select their own groups and each group will give specific roles and tasks to its group members.

You are responsible for the material covered during the lecture sessions, whether or not it is also found in your textbooks or other assigned reading materials. Similarly, you are responsible for the material found in your textbooks and other assigned reading materials, whether or not it is also covered during the lecture sessions. In other words, you are responsible for the UNION of these sources of knowledge, as depicted by the shaded region of the Venn diagram below, not merely their intersection.

You may write your programs from scratch or may start from programs for which the source code is freely available on the web or through other sources (such as friends or student organizations). If you do not start from scratch, you must give a complete and accurate accounting of where all of your code came from and indicate which parts are original, which are changed, and which you got from which other source. Failure to give credit where credit is due is academic fraud and will be dealt with accordingly.

All work must properly cite sources. For example, if you quote a source in one of your technical paper reviews, you must include the quotation in quotation marks and clearly indicate the source of the quotation.

Late assignments will be penalized 20% per day late. (All parts of days will be rounded up.) After five days, you will not be able to turn in that assignment for credit. If you are worried about turning in the assignment late and losing points, turn in the assignment ahead of time. You will be turning in electronic and paper copies of all projects and homeworks. (For projects, because they are to be done in groups, only one electronic copy and one paper copy need be submitted per group regardless of the group size.) The paper copy may be submitted in class or turned in during office hours or by slipping it under my office door.
All exams will be open book/open notes. **NO** electronic devices will be permitted in the testing area.

Copying another's work, or possession of electronic computing or communication devices in the testing area, is cheating and grounds for penalties in accordance with school policies.

Please see [OU’s academic integrity website](http://www.cs.ou.edu/~hougen/classes/Fall-2012/Robotics/materials/Syllabus.htm).

**Accommodations:**
Any student with a disability should contact the instructor so that reasonable accommodations may be made for that student.

**Drop Policy:**
Any student who fails to attend the first week of class may be dropped from the class.

**Related Documents:**
Students should also read the related documents on [Replacement Assignments or Extensions](http://www.cs.ou.edu/~hougen/classes/Fall-2012/Robotics/materials/Syllabus.htm) and [Discussions of Scores and Grades](http://www.cs.ou.edu/~hougen/classes/Fall-2012/Robotics/materials/Syllabus.htm).