C105 Brains & Minds, Robots & Computers
Fall 2014 Syllabus

CLASS TIME AND PLACE

Lecture:

Section 16358: Monday & Wednesday, 9:05 – 9:55 PM in room BH 006

Lab Sections:

Section 16359: Friday 9:05A – 9:55A
Section 16359: Friday 10:10A – 11:00A in room PH155
Section 16365: Friday 11:15A – 12:05P

INSTRUCTOR INFORMATION

Instructor: Rick Hullinger
Office: PY A300B
Office Hours:
Tuesday, 2:30 – 4:00 PM in PY A300B
Wednesday, 10:30 AM – 12:00 PM in PYA300B
Or by appointment
Office Telephone: 856-6854
Email Address: rahullin@indiana.edu

LAB INSTRUCTOR INFORMATION

Lab Instructor: Zach Tosi
Office: Swain West 064
Office Hours:
Monday: 1:00 – 3:00 PM
Or by appointment
Email Address: ztosi@indiana.edu

COURSE OVERVIEW

This course will explore the main thrusts in cognitive science and robotics. The topics will include general questions about intelligence and artificial intelligence, as well as the mechanistic view of cognition. The second half of the semester will be spent comparing and contrasting the abilities of the human mind with the current capabilities of machines and robots. These comparisons should yield insights into the incredible abilities of the human mind as well as raise questions about what constitutes true intelligence. Hands-on experience in the laboratory section will allow students to get acquainted with both computer simulations of artificial agents and actual robots.

READINGS

Weekly readings will be assigned on Oncourse. It is important that you complete all of these readings before class so that you can understand the lecture and participate in our discussions. I will ask questions about these readings, and your reactions to them, using the online forums on Oncourse and in class. Your answers to these questions (your participation in the forums, in-class discussions, and clicker responses) will determine your "class participation" grade.

LABS

Lab projects will be posted on Oncourse each week. The labs are designed to be completed during your lab section, but you may start work on them early and continue to work on them after your lab section if needed. Lab assignments will be submitted via Oncourse and must be turned in no later than 5 PM on the Monday following the lab section. Many lab assignments will have additional tasks that can be completed for extra credit.

Because there is limited seating and resources in the lab, it is critical that you attend the lab section to which you have been assigned.

EXAMS

There will be a mid-term exam on Wednesday, Oct. 8th, and a cumulative final exam during finals week. With the exception of the final exam, the course schedule is *tentative* and subject to change. However, I will do my best to make sure that the mid-term exam is on the date listed. Both exams will be closed book and closed note.

According to the Final Exam Schedule from the Office of the Registrar, the final exam for this course will be given on Monday, December 15th from 8:00 – 10:00 AM. The final exam will be a cumulative exam covering the full semester of material.

It is your responsibility to double-check your lab and exam grades – both that the assignments themselves were correctly graded and that the scores posted on Oncourse match your actual grades. You have two weeks from the time a lab or exam score is posted to address any grading issues with me. After that, the grades posted on Oncourse will be considered final.

If you have a scheduling conflict or cannot take an exam at its appointed date and time, you must let me know as soon as possible. With the exception of extreme and unforeseen circumstances, contacting me the day of (or even worse, after) the exam will be considered an unexcused absence and will result in a 0 on the exam.

Grading

Your final grade is computed using the following formulas:

Participation (in-class clicker responses):	20%
Lab assignments & projects:	40%
Mid-term exam:	20%
Final exam:	20%
	100%

Grading Scale

A+: 97.0%-100%;	A: 93.0%-96.99%;	A-: 90.0%-92.99%
B+: 87.0%-89.99%;	B: 83.0%-86.99%;	B-: 80.0%-82.99%
C+: 77.0%-79.99%;	C: 73.0%-76.99%;	C-: 70.0%-72.99%
D+: 67.0%-69.99%;	D: 63.0%-66.99%;	D-: 60.0%-62.99%

F: Below 60%

CLICKERS

Clickers (Turning Technologies Response Card keypads) will be used in this class, and I require that you have one. You are welcome to use either the RF or the NXT ResponseCard from Turning Technologies. The clickers will be used to answer questions about the course readings and to gather other feedback. The clicker responses determine your class participation grade, so you must register your clicker on Oncourse and always bring your clicker to class to class with you.

EMAIL

I expect you to be checking your IU e-mail account no less than once a day. I will send frequent messages to the class with announcements, clarifications, instructions, and/or updates. You are responsible for the content of these messages exactly as if the material had been presented in class. Saying "I didn't read that e-mail" or "I haven't checked my e-mail for a few days" will not be considered a valid excuse for missing information. All class-wide e-mail messages are archived by the Oncourse Email Archive tool and will be available for reference throughout the course.

RESPECT

In order for this class to work well, there must be a certain level of respect between you and me and between you and your fellow classmates. Please be smart with your in-class behavior. If you have to arrive late, enter quietly and sit in the back. If you believe that you may leave early, please sit in the back and slip out quietly. Please turn off your cell phones and do not text-message your friends while I'm teaching – your friends will all still be sleeping anyway. If you are being disruptive to me or to the class, I will ask you to leave.

FEEDBACK

Do not wait until the end of the semester course evaluations to let me know that I could be doing something better. Tell me as soon as possible so that I can make the class valuable and relevant as we go along.

If you have any feedback, good or bad, about the course or how it's being taught, please feel free to send it to me *anonymously* using this link: http://www.indiana.edu/~rahteach/feedback.html

ACADEMIC HONESTY

This course is conducted under the University's Ethics Code. Specifically, it is considered cheating if you obtain any kind of information about answers and solutions to the assignments in this course – exams and homework – from any non-intended source or conversely transfer such information to others. It is also considered cheating if you lie to me about an absence relating to a lab assignment or an exam. The punishment for academic dishonesty is **failure of the course**.

STATEMENT FOR 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 believe you have a disability requiring an accommodation, please contact IU Disability Services for Students.

COPYRIGHT

DISCLAIMER

This syllabus is an outline of the course and its policies, which may be changed for reasonable purposes during the semester at the instructor's discretion. You will be notified in class and / or via email if any changes are made to this syllabus, and an updated syllabus will be provided on Oncourse.

C105, Fall 2014
Minds & Machines – Schedule

DOW	Date	Description	Assignment
M	Aug 25	Intro	
W	Aug 27	Lab Prep & Demos	
F	**Aug 29**	**Lab 1 – Kinesis**	
M	Sep 01	No Class – Labor Day	
W	Sep 03	Cognitive Science – Early History	R1
F	**Sep 05**	**Lab 2 – Braitenburg: Drive**	
M	Sep 08	Cognitive Science – Early History	Lab 2 Due
W	Sep 10	The Rise of the Machines	R2
F	**Sep 12**	**Lab 3 – Braitenburg: Fear and Love**	
M	Sep 15	Computation as Cognition / Formal Logic	R3 / Lab 3 Due
W	Sep 17	Computation as Cognition – Problems	R4
F	**Sep 19**	**Lab 4 – Turing Machines**	
M	Sep 22	Neuroanatomy	Lab 4 Due
W	Sep 24	Neuroanatomy	
F	**Sep 26**	**Lab 5 – SimBrain**	
M	Sep 29	Animal Intelligence	R5 / Lab 5 Due
W	Oct 01	Stigmergy	R6
F	**Oct 03**	**Lab 6 – Group Behavior**	
M	Oct 06	Mid-Term Review	Lab 6 Due
W	**Oct 08**	**Mid-Term Exam**	
F	Oct 10	No Lab – Fall Break	
M	Oct 13	Language and Understanding	
W	Oct 15	Language and Understanding	
F	**Oct 17**	**Lab 7 – Braitenburg: Balancing Multiple Needs**	
M	Oct 20	Pleo Lab Prep	Lab 7 Due
W	Oct 22	Pleo Lab Prep	R7
F	**Oct 24**	**Pleo Intro, Part I**	
M	Oct 27	Language and Understanding	
W	Oct 29	Logic and Reasoning	R8
F	**Oct 31**	**Pleo Intro, Part II**	
M	Nov 03	Logic and Reasoning	
W	Nov 05	Logic and Reasoning	
F	**Nov 07**	**Pleo Intro, Part III**	
M	Nov 10	Creativity	
W	Nov 12	Creativity	R9
F	**Nov 14**	**Final Project Work Day**	Project Plan Due
M	Nov 17	Emotions	R10
W	Nov 19	Emotions	
F	**Nov 21**	**Final Project Work Day**	
M	Nov 25	No Class – Thanksgiving	
W	Nov 27	No Class – Thanksgiving	
F	Nov 29	No Class – Thanksgiving	
M	Dec 01	Social Robotics	
W	Dec 03	Robo-Ethics	R11
F	**Dec 05**	**Final Project Work Day**	
M	Dec 08	The Singularity	R12
W	Dec 10	Final Exam Review	
F	**Dec 12**	**Final Lab Project Demonstrations**	Final Project Due
M	**Dec 15**	**Final Exam, 8:00 – 10:00 AM**	