

CSE 505 – Computing with Logic

Course Information

Fall 2019

Stony Brook University

Instructor: Dr. Paul Fodor

<http://www.cs.stonybrook.edu/~cse505>

Course Description

- “The course explores *logic-based computing* and *logic programming*. It includes an introduction to programming in logic, covering basic *techniques for solving problems in a logic programming system*. Particular attention will be paid to user interface issues and how a logic system can provide a useful computing environment. The course covers implementation issues, emphasizing how a logic programming system generalizes both traditional programming language systems and traditional database systems.”

(<https://www.cs.stonybrook.edu/students/Graduate-Studies/courses/CSE505>)

General Information

- Meeting Information:
 - Lectures: MoWe 5:30PM - 6:50PM, Computer Science 2120.
 - Course Web page:
<http://www.cs.stonybrook.edu/~cse505>
- Blackboard will be used for assignments, grades and course material

Instructor Information

- Dr. Paul Fodor
214 New Computer Science Building
- Office hours: Mondays and Wednesdays
4-5:30pm.
- I am also available by appointment
- Email: paul(dot)fodor(at)stonybrook (dot) edu
 - Please include “CSE 505” in the email subject and your name in your email correspondence

Course Outcomes

- Develop a fundamental understanding of logic as a programming language
- Explore the **computable fragments of first-order logic**
- Study the **use of logic for specifying and programming complex systems**

What will you learn in CSE505?

- Logic Programming:
 - Programming in Prolog
 - Computational Basis
 - Resolution, Unification, Memoization
- Extensions and Applications:
 - Non-monotonic reasoning
 - Knowledge Representation
 - Probabilistic Logic Programming
 - Satisfiability (SAT) and descendants
 - Constraint Programming
 - Abduction and Inductive Logic Programming
 - Frames, defeasible aspects, dynamic aspects, and more

What is Logic Programming?

- A framework for unambiguously specifying knowledge and computation

Textbooks (optional)

- Programming in Prolog: Ivan Bratko, Prolog Programming for Artificial Intelligence, 3rd edition, Addison-Wesley; ISBN: 0201403757.
- Foundations: Ulf Nilsson, Jan Maluszynski, Logic, Programming and Prolog, Wiley. Online (PDF); linked from Blackboard.
- Stable Models and Answer Set Programming textbook: Michael Gelfond, Yulia Kahl, Knowledge Representation, Reasoning, and the Design of Intelligent Agents: The Answer-Set Programming Approach, Cambridge University Press. ISBN-13: 978-1107029569.
- Additional References:
 - Michael Spivey, An introduction to logic programming through Prolog, Prentice Hall, ISBN: 0135360471.
 - Edmund Burke, Eric Foxley, Logic and its Applications, Prentice Hall, ISBN: 0130302635.

Grading Schema

- Grades will be based on homework and exams according to the following formula:
 - Homework assignments = 15%
 - Project phase 1 = 2.5%
 - Project phase 2 = 2.5%
 - Project phase 3 (final) = 10%
 - Quizzes = 10%
 - Midterm exam 1 = 20%
 - Midterm exam 2 = 20%
 - Final exam = 20%

Examinations

- Midterm exam 1: We. 10/9, during class time, in classroom.
- Midterm exam 2: Mo. 11/11, during class time, in classroom.
- Final exam: Monday December 16, 2019, 5:30-7:30pm , in classroom. See Final Exams University Schedule

here: <https://www.stonybrook.edu/commcms/registrar/registration/exams.php>

Grading Schema

- **Grade Cutoffs**

- A [95-100], A- [90-95), B+ [87-90), B [83-87), B- [80-83), C+ [77-80), C [73-77), C- [70-73), D+ [65-70), D [60-65), F [0-60)
- **SPECIAL RULE:** If all your grades, including homework assignments, quizzes, recitation and your three exam grades are above the respective class averages, you're guaranteed to receive a grade of C or higher for this class.
- There will be extra credit problems as a part of quizzes and homework assignments which values to an increase of less than 4% in the final grade.
- There will be in-class quizzes / brief assessments used to practice the class material and measure growth in knowledge, abilities, and skills. They will be solved in class and they are valued 2 points each.

Grading

- The final grade you receive in this class will **reflect, as far as possible, the extent to which you have mastered the concepts and their applications**
- How much someone needs a grade, or how close they are to the next higher grade, will have no effect on grade
- As the instructor, I want everyone to do well in this course, and will make every reasonable effort to help you understand the material taught
- However, the grades provided at the end of the semester are final, except for rare situations involving grading errors
- They will not be altered for any reason, so please do not ask me to do so

Assignments

- Homework assignments due on fixed dates and times.
 - **no late submission is permitted**
- All assignments should be submitted electronically
 - Blackboard

Regrading of Homework/Exams

- Please meet with a TA or the instructor and arrange for regrading.
- **You have one week from the day grades are posted or mailed or announced**
- Late requests will not be entertained

Academic Integrity

- The following rules are posted in every course syllabus:
"Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/"

Academic Integrity

- You can discuss general assignment concepts with other students: explaining how to use systems or tools and helping others with high-level design issues
- You **MAY NOT share** assignments, source code or other answers by copying, retyping, looking at, or supplying a file
 - Assignments are subject to manual and automated similarity checking (We do check! and our tools for doing this are much better than cheaters think)
- If you cheat, you will be brought up on academic dishonesty charges - we follow the university policy:
 - <http://www.stonybrook.edu/uaa/academicjudiciary>

Examples of Academic Dishonesty

- Unpermitted collaboration (on a paper, homework, lab reports, etc.). Unless an instructor has explicitly approved working together, students should assume, for their own protection, that it is not permitted.
- Helping someone else to plagiarize from one's own homework (for example, by giving them a copy of yours, or doing it for them).
 - This includes having a public repository on Github that other students can copy from.
- Representing someone else's source code as one's own. If another person's code is being used, it must be properly cited.
- Buying or selling source code.
- Using source code or pieces of a paper from the internet without properly citing the source.

Academic Integrity

- The instructor makes a recommendation at the Academic Judiciary office
 - Cheating is cheating! No matter the amount of cheating or if one is the source or destination of cheating.
 - Do not cheat! You are cheating yourself.
 - Our job is to teach you the material and make sure that you learn it.
 - Our recommendation is always F for the cheaters!

Disability

- If you have a physical, psychological, medical or learning disability, contact the DSS office at Room 128 ECC. Phone 632-6748/TDD
- If you are planning to take an exam at DSS office, you need to tell me ahead of time for every exam.
- **All documentation of disability is confidential.**

Course Software and Facilities

- SWI-Prolog, XSB Prolog, Flora-2, clingo: freely available for Unix-based systems (Linux, Solaris, BSD, ...) and Windows.
- Work from home or use CS Graduate Lab.
 - **You can also use the SINC sites, but you have to download a binary version of the software**

Course Support

- Course web pages are partly hosted by the Blackboard system.
- Course Material: handouts, homeworks, notes, etc will be available directly from the course web site.
- Course Announcements: available from the blackboard system.
 - Check these regularly!
- **Piazza:**
 - Use this to discuss any course-related material: lectures, homework problems, exams, etc.
- All homework assignments will be submitted via the Blackboard system.

Questions

- How to contact course staff:
 - Post your question on Piazza
 - Come to my office during my office hours
 - Send me email (Post on discussion board unless the question is personal).

Catastrophic events

- Major illness, death in family, ...
- Formulate a plan (with your CEAS academic advisor) to get back on track
- Advice
 - Once you start running late, it's really hard to catch up

Please

- Please be on time
 - Please show respect for your classmates
 - Please turn off (or use vibrate for) your cellphones
- ...
- On-topic questions are welcome

Welcome
and Enjoy!