

CSE371, MAT371
LOGIC
Professor Anita Wasilewska
Web page: www.cs.sunysb.edu/~cse371

Lecture TUESDAY, THURSDAY 6:50 - 8:10 pm pm

Location PHYSICS P117

Professor Anita Wasilewska, e-mail: anita@cs.sunysb.edu
Please e-mail the professor with serious concerns only.

Phone number 632 8458

Office hours will be held in Computer Science Department building, office 1428
Tuesday, Thursday at 2:30 - 3:30 pm, and by appointments.

TA There is no TA.

Important There is no recitations, but I will cover solutions to homework assignments and held questions/answers sessions each week in class.

BOOKS

Main text: Anita Wasilewska, *An Introduction to Classical and Non-Classical Logics*, 2007, SUNY, Stony Brook, NY. I will post all chapters on the course webpage; please print them and bring to class.

You also can purchase the book (\$20) from our Undergraduate Secretary. Her office is located in the Computer Science Building (entrance is in front of the Javits Center) on the first floor, just in front of the entrance to the Department.

Additional texts: (1). C.C. Leary, *A Friendly Introduction to Mathematical Logic*, Printice Hall, 2000.
(2) Any Logic Textbook you find in the Library.

Course Goal The goal of the course is to make student understand the need of, and to learn the formality of logic. I will progress relatively slowly, making sure that the pace is appropriate for the undergraduate class. But it doesn't mean that you can just come to class and listen without doing work at home!! You have to go over the text in proper chapters; in fact to go over and over again! The book is written with students on my mind so that they can read and learn by themselves, even before coming to class. For sure, it is essential to study after the class.

The book, and the course is developed to teach not only intuitive understanding of different logics, but (and mainly) to teach formal logic as scientific subject, with its language, definitions and problems.

Workload There will be 4 quizzes, one midterm and a final examination.

The consistency of your efforts and work is the most important for this course.

None of the grades will be curved.

Quizzes: total 100pts There will be 4 quizzes (25 minutes), 25 points each. The problems will be taken from Problems Solved or listed in the book and Homework Assignments located at the end of the chapters of the main text. Quizzes are **closed book** examinations.

Mid-term: 100pts Midterm will cover material from Q1 and Q2.

Final: 100pts Final test will cover some material from the midterm, but mainly (70%) the material covered after the midterm, i.e. material covered by Q3 and Q4. It is a take home test due on the scheduled day for the final.

Practice quizzes There will be 4 Practice Quizzes. I will put them on the WEB on Tuesdays a week before the Quiz on Tuesday. I want you to solve them, and if you don't know how, ask questions in the class. I will also put (on Thursdays) detailed solutions so you can test yourself before each of the quizzes. Some of Practice quizzes problems may appear on real quizzes as extra credit problems.

Practice Midterm: total 10 extra points It is an open book test given in class.

Practice Final: total 10 extra points It is a practice take home test.

Practice tests policy Practice tests (quizzes and tests) are designed to help you to learn what and how much you have learned and what you still don't understand from the material covered by the test. You can take them for your own practice (don't need to submit it), or for extra points (need to submit it). Sometimes (Practice Final) they will be given as a take home assignments.

Final grade computation You can earn up to 300 points + 20 extra points = 320 points during the semester.

None of the grades will be curved The grade will be determined in the following way:

of earned points divided by 3 = % grade.

The % grade is translated into a letter grade in a standard way i.e.

100 – 94 % is *A*, 93 – 90 is *A–*,
89 – 86% is *B+*, 85 – 83 % is *B*, 82 – 80 % is *B–*,
79 – 76 % is *C+*, 75 – 73 % is *C*, 72 – 70 % is *C–*,
69 – 60 % is D range and F is below 60%.

ACADEMIC INTEGRITY STATEMENT (Adopted by the Undergraduate Council September 12, 2006)

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/uaa/academicjudiciary/>

Stony Brook University Syllabus Statement If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or <http://studentaffairs.stonybrook.edu/dss/>. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: <http://www.sunysb.edu/ehs/fire/disabilities.shtml>

Quizzes and Tests schedule

Rosh Hashanah break September 18 (after 5pm) - September 20

Q1 Tuesday, September 22

Yom Kippur break September 29, Tuesday - no class

Q2 Tuesday, October 12

PRACTICE MIDTERM THURSDAY, October 14, in class. Solutions will be put on Web the same day. It is an OPEN book test.

Midterm Review Tuesday October 20

MIDTERM THURSDAY, October 22 It is a closed book test.

Q3 Tuesday, November 10.

Thanksgiving Break November 25 -29. No class on Thursday, November 26

Q4 Tuesday, December 8.

11. PRACTICE FINAL Due Thursday, December 10 (last class). It is a take home test. Will be put on the Web on Thursday, December 3. Solutions will be put on the Web after class December 10

12. FINAL is a take home test and will be put on the WEB on December 15. It is due on the day of official final date during the Finals week, or ANY DAY BEFORE.

COURSE CONTENT The course will to cover in depth the following subjects.

Part one Motivation, history, syntax and semantics for classical propositional calculus. Formal languages, formal definitions of model, counter model, tautology.

Part two Semantics for some three valued logics.

Part three Formal deductive systems, called also *proof systems*. General definition and examples. Definition of a formal proof. Relationship between proof systems and their semantics, i.e general definition of notions of **soundness and completeness** of a given proof systems relatively to given semantics. Definition of a logic as a complete proof system.

Part four : Hilbert style proof systems for classical propositional logic. Proofs of DEDUCTION theorem, and two different proofs of the COMPLETENESS theorem.

Part five Automated Gentzen type proof systems 1: RS proof system for classical propositional logic. Examples of the automatic proof-search. Constructive proof of COMPLETENESS theorem. Original Gentzen proof system.

Part six A Hilbert style proof system for Intuitionistic Logic. Relationship between Intuitionistic and Classical logics.

Part seven Automated proof systems 2: Gentzen proof system for Intuitionistic Logic. Heuristic decision procedures.

Part eight A Hilbert style proof systems for Modal Logics S4 and S5. Relationships with Intuitionistic Logic.

Part nine Introduction (intuitive and formal) to First Order Logic.