

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

Lecture TUESDAY, THURSDAY 5:20 - 6:40 pm

Location SBUNION 236

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 1:00 - 2:00 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.

All book chapters, and lecture slides on are posted on the course webpage; please print them and bring to class.

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 REGULAR TEST scheduled at the regular UNIVERSITY TIME for finals.

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 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.

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%.

Quizzes and Tests schedule

Q1 Tuesday, September 13

Rosh Hashanah break: September 29 -30

Q2 Tuesday, October 11

PRACTICE MIDTERM Tuesday, October 18 Solutions will be put on Web the same day. This is an CLOSED BOOK test.

MIDTERM THURSDAY, October 20 It is a closed book test.

Q3 Tuesday, November 15.

Thanksgiving Break: November 23 -27.

Q4 Tuesday, December 6.

PRACTICE FINAL Due Thursday, December 8 (last class). It is a take home test. Will be put on the Web on Thursday, December 1. Solutions will be put on the Web after class December 8.

FINAL is a take home test and will be put on the WEB on December 1. It is due on the day of official final date during the Finals week, or ANY DAY BEFORE.

COURSE CONTENT The course will 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. Semantics for some three valued logics.

Part two Intuitive Introduction to First Order Logic: first Order languages and basic tautologies.

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 Formal Introduction to First Order Logic.

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

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>