CSE541  
LOGIC for COMPUTER SCIENCE  
Spring 2020  
Professor Anita Wasilewska  

web page: http://www3.cs.stonybrook.edu/~cse541

Lecture   TUESDAY, THURSDAY  4:00pm - 5:20 pm  
Location  JAVITS 110  
Professor  Anita Wasilewska, e-mail: anita@cs.stonybrook.edu  
    Please e-mail the professor with serious concerns only  
Phone number  632 8458  
Office Hours  Tuesday, Thursday  5:45 pm - 8:30 pm and by appointment.  
Place  New Computer Science Building, Room 208, telephone: 2-8458  
TA  TBA  
TA Office Hours  TBA  
Textbook  
    Anita Wasilewska  
    LOGICS FOR COMPUTER SCIENCE: Classical and Non - Classical  
    Springer 2018  
    You can get the book in Hard cover, or in Electronic form.  
    Springer also has an option of providing you with chapters of your choice.  

BOOK Chapters Slides  
    Lectures Slides covering all book chapters are posted on the course webpage.  

COURSE Lectures Slides  The course webpage also contains current LECTURES Slides with material we cover during the semester.  

Course Goal  
    The goal of the course is to make student understand the need of, and to learn the formality of logic. 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.  

    I will progress relatively slowly, making sure that the pace is appropriate for the students in class. 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 also essential to study after the class.
Important
Students are responsible to study chapters examples and problems solutions that are not included in the Lectures Slides and do the Homework Assignments located at the end of the chapters. They may be included in Quizes and Tests.

Workload
There will be 2 quizzes, Midterm, and Final examinations
The consistency of your efforts and work is the most important for this course.

None of the grades will be curved.

Quizzes: total 50 pts
There will be 2 quizzes (35 minutes), 25 points each.

No make-up for quizzes except of important, well proven reasons
I might give some additional quizzes for extra credit
Quizzes will be given on Thursdays at the end of the class.
Each quiz will consist of 2 -4 questions
Quizzes and Tests problems will be taken mainly from examples, exercises and problems solved in the Textbook and from Homework Assignments located at the end of the chapters of the book, or will be similar to problems from previous Quizzes and Tests as published on the course Webpage.
Quizzes and Tests are closed book (and cell phones) examinations.

Midterm (75pts)
Midterm will covers material from Q1 and material covered after Q1 in class before Midterm.

Final (75pts)
Final will cover mainly material covered after Midterm including material from Q2 and covered after Q2.

Extra Credit
I will give some extra credit problems on Tests and Quizzes.

Previous TESTS and Quizzes
I posted a collection of past Quizzes and Tests on the course Webpage. They are designed to help you to learn what you have learned and what you still may not understand.

Final grade computation
You can earn up to 200 points + x extra credit points = (200 + x ) points during the semester.
Extra points are BENEFICIAL for students as they add to the TOTAL number of points!!

None of the grades will be curved
The grade will be determined in the following way:
# of earned points divided by 2 = % grade.
The % grade is translated into a letter grade in a standard way i.e.
100 – 95 % is A, 94 – 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%.
Tentative Quizzes and Tests schedule
Changes (if any) will be advertised on the course webpage

Q1    Thursday, February 20

MIDTERM Thursday, March 12 in class

Spring Break March 15 - 22

Q2    Thursday, April 16

Last Class (Review for Final) Thursday, May 7

FINAL  time and place as scheduled by University during the FINALS TIME: May 12 - 20

Course Content

The course will cover a selection of the following subjects.

1. Paradoxes and Puzzles (Chapter 1)
2. Introduction to classical Logic (Chapter 2).
   Propositional and predicate languages. AI languages. Basic propositional and predicate tautologies.
   Equational Laws for quantifiers.
3. Propositional Semantics: Classical and Many Valued (Chapter 3).
   Formal propositional languages. Classical semantic: formal definitions of model, counter model,
   tautology. Equivalence of propositional languages, Some many valued semantics.
   General definition and examples. Definition of a formal proof. Relationship between proof systems
   and their semantics. 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.
   Hilbert style proof systems for classical propositional logic. Proofs of the Deduction theorem, and
   two different proofs of the Completeness theorem.
   Automated Gentzen type proof systems: RS, RS1, RS2 for Classical logic. Examples of the auto-
   matic proof-search. Constructive proof of the Completeness Theorem. Original Sequent Gentzen
   proof systems GL, G, LK or Classical logic.. Completeness and Hauptxatz Theorems.
7. Introduction to Intuitionistic and Modal logic (Chapter 7).
   Hilbert and Gentzen style proof systems for Intuitionistic logic. Heuristic decision procedures.
   Relationship between Intuitionistic and Classical logics. Hilbert style proof systems for Modal
   logics S4 and S5. Relationships with Intuitionistic logic.
   Completeness theorem.
   Reduction of Predicate logic to Propositional logic. Proof of the Completeness Theorem.

11. Formal Theories and G"{o}del Theorems (Chapter 11).

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