CSE541
LOGIC for COMPUTER SCIENCE
Fall 2020
Professor Anita Wasilewska

Course Webpage:
http://www3.cs.stonybrook.edu/~cse541

Time: Official University time is Tuesday, Thursday 6:30 pm - 7:50pm
Place: YOUTUBE CHANNEL:
LOGIC, Theory of Computation
https://www.youtube.com/channel/UCLZp06JC9yit6M_YW3XuvIw
The first 4 Lectures are the Theory of Computation. the LOGIC Lectures follow:
Chapter 1 to Chapter 11 of the BOOK

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Office location: New Computer Science Department, office 208
NO IN PERSON CONTACT

Office Hours: e-mail only
I read emails DAILY and respond within a day- two to students e-mails
Teaching Assistants tba on course webpage
TAs office hours: e-mail and/or zoom to be announced
TA Office Location NO IN PERSON CONTACT

Course TEXTBOOK
Anita Wasilewska
LOGICS FOR COMPUTER SCIENCE: Classical and Non - Classical
Springer Nature Switzerland AG 2018
SBN 978-3-319-92590-5 ISBN 978-3-319-92591-2 (e-book)

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Course webpage contains Three SETS of Lecture Notes

L1. VIDEO Lecture Notes that are created especially for the Book Chapters VIDEOS so students can follow the Video Lectures, chapter by chapter, with exactly the same slides in hand that were used in the videos.

L2. A set of very detailed CLASS Lecture Notes complementing the Videos Lectures. These lectures are much shorter and contain many more examples and problems; usually there are 3-5 of them for one Chapter of the book. i.e. for one VIDEO Lecture.

Class Lecture Notes also contain many extra examples and carefully written detailed solutions to many of the homework problems.

L3. BOOK Chapters Slides created to facilitate reading of the BOOK

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.

TESTING

ALL QUIZZES and TESTS, including the FINAL Examination will be given as a TAKE HOME test.

I will design them in a way the most profitable for your new way of learning.

TAKE HOME TESTS POLICY

Sometimes you will be able to find answers to some tests questions in the materials you have access to.

I decided to include such questions in your tests as an encouragement and help for you to study from the book, Course and Videos Lectures with help of the Videos and other posted materials.

But you always have to write your solutions in your own words and to do it in such way as to make it visible to US (and yourself) that you really worked and you understood the material you supposed to study.

Straightforward copy of what was published and you have found in the the materials you have access to will result in 0pts for the Question - as in any case of cheating.
GRADING PRINCIPLES and WORKLOAD

Workload  There will be 2 Quizzes, Midterm, a Practice Final (for extra credit), and Final examinations.

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

None of the grades will be curved.

Records  of students points are kept on BLACKBOARD.

Contact the TA for information about grading, grades changes, etc....

Tests and Quizzes  cover Lectures and Book Chapters only for the portion of material that was covered (see Weekly STUDY PLAN!) before the dates of tests.

Quizzes: total 50 pts  There will be 2 quizzes, 25 points each.

No make-up  for quizzes except of important, well proven reasons.

I might give some additional quizzes for extra credit.

Each quiz will consist of 4 - 6 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.

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

Practice Final  (15 extra pts)

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

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

Test and Quizzes Policy

We do not give makeup tests or quizzes except of documented cases of Illness or other emergencies.

Quizzes and Tests  are TAKE HOME examinations. They will be posted on the Blackboard and you submit them there.

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:

\[ \frac{\text{# of earned points}}{2} = \% \text{ grade.} \]

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%.

**QUIZZES and TESTS PRELIMINARY SCHEDULE**

Changes, if any, will be posted on Blackboard and the course Webpage.

**Q1** - posted **September 22**, Tuesday - due Thursday **September 24**

**MIDTERM** - posted **October 20**, Tuesday - due Friday **October 23**

**Q2** - posted **November 10**, Tuesday - due Thursday **November 12**

**Thanksgiving Break** - **November 23** - **29**

**Practice Final** - posted **December 3**, Tuesday - due Friday, **December 4**

**FINAL** - given during the **FINALS period December 9** - **17**

**COURSE CONTENT**

The course will follow the book very closely and in particular we will cover some or all material from the following chapters and 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).

4. **General Proof Systems: Syntax and Semantics** (Chapter 4).
   - 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.

5. **Hilbert Proof Systems: Completeness of Classical Propositional Logic** (Chapter 5).

7. Introduction to Intuitionistic and Modal logic (Chapter 7).


   Reduction of Predicate logic to Propositional logic. Proof of the Completeness Theorem.

    Automated Gentzen type proof system QRS. Constructive proof of the Completeness Theorem.

11. Formal Theories and Gödel Theorems (Chapter 11).

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**Student Accessibility Support Center Statement**

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, 128 ECC Building, (631) 632-6748, or via e-mail at: sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

**Academic Integrity Statement**

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://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

**Critical Incident Management**
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students’ ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.