Time:  Tuesday, Thursday  5:00pm - 6:20 pm
Place:  JAVITS 110
Professor:  Anita Wasilewska
e-mail:  anita@cs.stonybrook.edu
Office phone:  (631) 632 8458
Office location:  New Computer Science Department, office 208
Office Hours:  Tuesday, Thursday  6:30 pm - 7:30 pm and by Appointment
  I also read emails DAILY and respond within a day to students e-mails
Teaching Assistants tba on Brightspace
TA Office Location  2126 Old CS Building

COURSE TEXTBOOKS

B1  LOGICS FOR COMPUTER SCIENCE: Classical and Non - Classical
Anita Wasilewska
We will cover Chapter 2 (Introduction to Classical Propositional and Predicate Logic) and an OVERVIEW of parts of Chapters 3, 4, 5. In particular we define extensional semantics for classical and many valued Logics, followed by definitions General and Hilbert Proof Systems, and prove Completeness Theorem for the Classical Propositional Logic (Chapters 4, 5)

B2  ELEMENTS OF THE THEORY OF COMPUTATION
Harry R. Lewis and Christos H. Papadimitriou
We cover Chapter 1. This is Discrete Mathematics Basics segment of the course. We supplement it by Special Discrete Mathematics Lectures. We also present an OVERVIEW of Chapters 2, 3, 4 - in particular of Regular and Context Free Languages, Finite Automata, and Turing Machines.

B3  CONCRETE MATHEMATICS: A Foundations for Computer Science
R. Graham, D. Knuth, O. Patachini
We cover content of Chapter 1 (Recurrent and Closed Form Formulas, Repertoire Method), some of Chapter 2 (Sums and Recurrences, Finite and Infinite Calculus, Infinite Sums), and some of Chapter 4 (Number Theory).

VIDEO LECTURES

We have a YOUTUBE CHANNEL: LOGIC, THEORY OF COMPUTATION
https://www.youtube.com/channel/UCLZp06dC9yi6M_YW3XuVIw
The first 4 Video Lectures are for the Theory of Computation and cover Chapter 1 to Chapter 5 of the book B2. The Logic Lectures follow and cover all 11 Chapters of the book B1.
The YOUTUBE CHANNEL contains a set of professional VIDEOS filmed in Stony Brook TV Studio.
Please use them as a supplement to class Lectures when you study at home.

Course Graduate Bulletin Description:
The SBU Graduate Program in Data Science (DAS) features both MS and PhD degree programs in Data Science. It is jointly offered by the Department of Applied Mathematics and Statistics (AMS), and the Department of Computer Science (CS), both part of the College of Engineering and Applied Sciences (CEAS). Students will receive vigorous training in Data Science encompassing topics such as statistical analysis, big data analysis/management and fundamentals of computing.

Prerequisite: no prerequisites

Credits: 3 credits

COURSE STRUCTURE
The course presents Fundamentals of Computer Science Theoretical Foundations divided into THREE PARTS:
- P1 Logic,
- P2 Discrete Mathematics, Theory of Computation,
- P3 Concrete Mathematics.

TESTING
All tests are given in CLASS. The PRELIMINARY schedule is posted below and on the course webpage. Changes will be posted on the course webpage and on Brightspace.

Make-up Exams
The Course Policy on make-up exams, is consistent with university policy on Student Participation in University Sponsored Events, the policy on Final Exams and the New York State Education Law regarding Equivalent Opportunity and Religious Absences as defined in the UNDERGRADUATE BULLETIN https://www.stonybrook.edu/sb/bulletin/current/

Additionally, we would provide make-up tests in a case of legally documented health problems.

WORKLOAD and GRADING PRINCIPLES

WORKLOAD
There will be 4 Quizzes, a Midterm, and a Final examination.

Quizzes (80pts) There will be 4 half an hours Quizzes, 20pts each.

Midterm (100pts) Midterm covers material from all Lectures given in class before Midterm.

Final (120pts) Final covers mainly material Lectured after Midterm but there will be 3 - 4 questions from Midterm material.

Records of students points are kept on Brightspace. Contact TAs for information about grading, grades changes, etc....

Make-up TESTS POLICY
We give makeup tests only in documented cases of Illness or other documented emergencies.
We follow the policy on make-up exams, which is consistent with university policy on Student Participation in University Sponsored Events, the policy on Final Exams and the New York State Education Law regarding Equivalent Opportunity and Religious Absences as stated in the Undergraduate Bulletin https://www.stonybrook.edu/sb/bulletin/current/

GRADING PRINCIPLES
HONESTY of students is the most important part of the class work.

All Quizzes and tests are "closed book" - no cell phones, no computers, clean desks, no extra papers, no communication with other students.

I will supervise all quizzes and tests together with TAs. Anybody violating these rules will have to immediately submit the test to the Professor and leave the class. We will correct only the portion of the test accomplished till that moment.

FINAL GRADE COMPUTATION
Extra Credit You can earn up to 30 extra credits points for the course. Each Test will include an extra credit points Problem.
You can earn up to 300 points + x extra credit points = (300 + x ) 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 – 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%.

TESTS PRELIMINARY SCHEDULE

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

We will have each 2-3 weeks short 30 minutes One Problem Quizzes for 20pts given in class. The first one will be on Thursday, September 12 changes if any will be advertised in class

Quiz 1 Thursday, September 12
Quiz 2 Thursday, October 10
Fall Break October 14 -15

MIDTERM TUESDAY, October 22

Quiz 3 Thursday, November 3
Quiz 4 Thursday, November 21

Last Day of classes December 6

FINAL - during the Finals Period December 11 -19

Course Schedule and Content

PART P1: LOGIC - from the book B1

Approximately 4 weeks of classes

We cover Chapter 2, relevant parts of Chapters 3, 4, 5.

In particular we will cover some material from the following chapters and subjects.

1. Paradoxes and Puzzles - Chapter 1 - READING and a full Lectures VIDEO

2. Introduction to classical Logic - Chapter 2
   OVERVIEW Lectures in class and a full Lectures on VIDEO

3. - Chapter 3
   Formal definitions of model, counter model, tautology. Some many valued semantics.
   OVERVIEW Lectures in class and a full Lectures VIDEO
   Relationship between proof systems and their semantics. Definition of notions of soundness and completeness of a given
   proof systems relatively to given semantics.
   OVERVIEW Lecture in class and a full Lectures VIDEO

   OVERVIEW Lecture in class and a full Lecture VIDEO

PART P2: DISCRETE MATHEMATICS and THEORY OF COMPUTATION - from the book B2 and Lecture Notes
Approximately 8 weeks of classes.
The Midterm is scheduled after the Fall Break for October 22 and will cover material from PARTS P1 and P2 covered
in class before the Fall Break

I will have a comprehensive REVIEW for MIDTERM Lecture on Thursday, October 17 to prepare students for the Midterm

We will cover in detail Chapter 1 of B2. This is Discrete Mathematics Basics segment of the course. We supplement it by
Special Discrete Mathematics Lectures and present OVERVIEW Lectures of Chapters 2, 3, 4 - in particular we cover
classes of Regular
and Context Free Languages, and heir relationships with Finite Automata, and and Push-down Automata. We will also
present additional, more advanced topic of the Discrete Mathematics in a series of Special Lectures created for this course.

PART P3: CONCRETE MATHEMATICS - from the book B3 and special Lecture Notes
Approximately 2 weeks of classes.

We will cover content of Chapter 1 (Recurrent and Closed Form Formulas, Repertoire Method), some of Chapter 2 (Sums and
Recurrences, Finite and Infinite Calculus, Infinite Sums), and some of Chapter 4 (Number Theory).

The book B3 Concrete Mathematics: A Foundations for Computer Science introduces the mathematics that supports advanced
computer programming and the analysis of algorithms. It is both a partner to abstract mathematics and a blending of CON-
TINUOUS and DISCRETE mathematics. It is defined in the book as “a controlled manipulation of (some) mathematical
formulas using a collection of techniques for solving problems”. Original textbook was an extension of “Mathematical
Preliminaries” part of Knuth book ART OF COMPUTER PROGRAMMING. Concrete Mathematics is supposed to help
reader (and hopefully will) in the art of writing programs, or thinking about them.

Academic Dishonesty

The following statement about academic dishonesty, is required to be included in syllabi for all undergraduate courses:

"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. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at the academic judiciary website."

Be advised that any evidence of academic dishonesty will be treated with utmost seriousness. Those involved will be prosecuted to the fullest extent permitted by the University and College policies.

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.