



**Stony Brook
University**

MAT 200

Logic, Language and Proof

Tu-Th, 1:30pm - 4:55pm, Harriman Hall 111

***Important:** This syllabus contains the policies and expectations that the instructor has established for this course. Please read the entire syllabus carefully before continuing in this course. These policies and expectations are intended to create a productive learning atmosphere for all students. Unless you are prepared to abide by these policies and expectations, you risk losing the opportunity to participate further in the course.*

Instructor: El Mehdi Ainasse (elmehdi.ainasse@stonybrook.edu)

Office: Physics Tower, D-107 (Floor D, Office 107)

Hours:

- MLC Hours: Monday, 4:00pm - 6:00pm
- Office Hours: Wednesday, 10:30am - 11:30am

Course Description: A basic course in the logic of mathematics, the construction of proofs and the writing of proofs. The mathematical content is primarily set theory, combinatorics and Euclidean geometry. There is considerable focus on writing. The major topics covered are propositional logic, logic connectives and truth tables proofs, proofs by contradiction, mathematical induction, set theory and operations with sets, quantifiers, proofs involving quantifiers, functions, injections, surjections, and bijections, the pigeonhole principle, counting finite sets and basic combinatorics, infinite sets, countable and uncountable sets, equivalence relations.

Prerequisite(s): Level 4 on the mathematics placement examination or equivalent course or permission of the instructor.

Credit Hours: 3

SBC: STEM+

Text:

An Introduction to Mathematical Reasoning by Peter J. Eccles (Cambridge University Press 2007), 16th printing 2013, ISBN 978-0-521-59269-7 (hardback), ISBN 978-0-521-59718-0 (paperback)

Grade Distribution:

Assignments	30%
Midterm Exam I	20%
Midterm Exam II	20%
Final Exam	30%

Course Policies:

- **General:**

- Computers are not to be used by students unless they are allowed to do so.
- Every student is expected to arrive to lecture on time and remain until the lecture is concluded. (Leaving early creates distraction and is disrespectful to the instructor and your fellow students.) Cell phones should be silenced for the duration of the lecture.
- Quizzes and exams are closed book, closed notes. No aids of any kind.
- **No makeup quizzes or exams will be given. The only exceptions will be due to medical conditions.**
- If you do not sit in the Final Exam, you will fail the course.
- You may however take exams early if need be.

- **Grades:**

- Your *course average* will be determined by a weighted average of the graded components above. (This is a purely quantitative grade.)
- Your *final grade* for the class will be based on your course average above and on your participation. (This is a partially qualitative grade.)

- **Homework:**

- Homework will be subdivided into **Assignments** and **Practice Problems**. The graded component will be the **Assignments** component.
- Students are expected to work independently. **Offering** and **accepting** solutions from others is an act of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the Academic Integrity Policy**. Discussion amongst students is encouraged, but when in doubt, direct your questions to the professor (that is me), or a tutor – at the MLC (which also includes me), for instance.
- **No late assignments will be accepted under any circumstances, except truly reasonable ones; e.g., health issues** (be it physical, mental, whatsoever).
- You may turn in homeworks in advance if you wish. However, that may be to your disadvantage. You will not be allowed to resubmit your answers.
- Note that the **Practice Problems** may be used for **extra credit** in special circumstances (such as a significantly low exam grade or in case you miss an exam). You should personally consult me about that.

- **Attendance and Absences:**

- Attendance is expected and encouraged. It will be to your benefit since some material presented in class may differ from what is offered in the textbook (say, more detailed, for instance), and also because participation will factor in your final grade.
- Students are responsible for all missed work, regardless of the reason for absence (except reasonable cases such as health issues, as mentioned above). It is also the absentee's responsibility to get all missing notes or materials.

University Policies:

- **Academic Integrity:**

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 are required to report any suspected instance of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at the following link:

www.stonybrook.edu/uaa/academicjudiciary/

- **Disability Support Services:**

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services (631) 632-6748 or

studentaffairs.stonybrook.edu/dss/

They will determine with you which 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:

www.sunysb.edu/facilities/ehs/fire/disabilities

- **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 Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, and/or inhibits students' ability to learn.

- **Syllabus Revision:**

The standards and requirements set forth in this syllabus may be modified at any time by the course instructor. Notice of such changes will be by announcement in class and changes to this syllabus will be posted on the Blackboard.

Tentative Schedule:

Lecture	Content (from the Textbook)
Lecture 1 (May 30th)	<ul style="list-style-type: none">• 1. The language of mathematics• 2. Implications• 3. Proof
Lecture 2 (June 1st)	<ul style="list-style-type: none">• 4. Proof by contradiction• 5. The induction principle
Lecture 3 (June 6th)	<ul style="list-style-type: none">• 6. The language of set theory• 7. Quantifiers
Lecture 4 (June 8th)	<ul style="list-style-type: none">• 8. Functions• 9. Injections, surjections and bijections
Lecture 5 (June 13th)	<ul style="list-style-type: none">• Midterm Exam I – Read Review Sheet for Midterm I
Lecture 6 (June 15th)	<ul style="list-style-type: none">• 10. Counting• 11. Properties of finite sets• 12. Counting functions and subsets
Lecture 7 (June 20th)	<ul style="list-style-type: none">• 13. Number systems• 14. Counting infinite sets
Lecture 8 (June 22nd)	<ul style="list-style-type: none">• 15. The division theorem• 16. The Euclidean algorithm• 17. Consequences of the Euclidean algorithm
Lecture 9 (June 27th)	<ul style="list-style-type: none">• Midterm Exam II – Read Review Sheet for Midterm II
Lecture 10 (June 29th)	<ul style="list-style-type: none">• 18. Linear diophantine equations• 19. Congruence of integers• 20. Linear congruences
Lecture 11 (July 4th)	<ul style="list-style-type: none">• 21. Congruence classes and the arithmetic of remainders• 22. Partitions and equivalence relations
Lecture 12 (July 6th)	<ul style="list-style-type: none">• Final Exam (Cumulative)