**Syllabus**

1. **Course Name Course Number Credit Hours**

Introduction to Advanced Mathematics MAA 3204 3

1. **Course prerequisites**

MAC 2312 with minimum grade C

1. **Course logistics**
   1. Term – Fall 2018
   2. Class location and time: TBA
2. **Instructor**

Name: Xiao-Dong Zhang, Office SE 274

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1. **Course description**

This course serves as a transition into advanced mathematics courses. Students will learn the

formalism for correctly doing and writing proofs in mathematics. Topics include logic and

language of proofs, set theory, mathematical induction, relations and orders, functions, and

foundations of advanced calculus.

1. **Course objectives**

Students who successfully complete this course will be able to:

* Understand definitions of some fundamental terms such as countable and uncountable sets, indexed families, functions, equivalence relations, partitions, sequences and convergence, and function limits.
* Understand some of the fundamental theorems in mathematics,
  + Master some of the basic techniques commonly used in writing mathematical proofs such as the Principle of Mathematical Induction, the Pigeonhole Principle, and the Contradiction Method of Proof.
  + Read, write, and understand proofs.

1. **Course evaluation method**

The course grade will be based on the following weights:

10% Class participation, 20% Homework, 20% Midterm 1, 20% Midterm 2, and 30%

Final exam

1. **Course grading scale**

Cumulative Performance Grade

90%-100% A

88% - 89% A-

85% - 87% B+

80% - 84% B

78% - 79% B-

75% - 77% C+

70% - 74% C

65% - 69% C-

60% - 64% D

0% - 59% F

1. **Policy on makeup tests, late work, and incompletes**

Make-up exams will be given only under exceptional circumstance, and

written, verifiable excuses must be provided in advance of the scheduled exams. No late

work will be accepted. Grades of Incomplete (“I”) are reserved for students who are

passing a course but have not completed all the required work because of exceptional

circumstances. A grade of “I” will only be given under certain conditions and in

accordance with the academic policies and regulations put forward in FAU’s University

Catalog. The student must show exceptional circumstances why requirements cannot be

met. A request for an incomplete grade has to be made in writing withsupporting

documentation, where appropriate.

1. **Classroom etiquette policy**

University policy on the use of electronic devices states: “In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions.”

1. **Disability policy statement**

In compliance with the Americans with Disabilities Act (ADA), students who require

reasonable accommodations due to a disability to properly execute coursework must

register with Student Accessibility Service (SAS) ---in Boca Raton, SU 133 (561-297-

3880); in Davie, LA 131 (954-236-1222); or in Jupiter, SR 110 (561-799-8585)---and

follow all SAS procedures.

1. **Honor Code policy statement**

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 at <http://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf>

1. **Required texts/readings**

***Foundations of Higher Mathematics***, 3rd Edition, by Peter Fletcher and C. Wayne

Patty, ISBN: 978-0-534-95166-5, Brooks/Cole, 1995.

1. **Exams and assignments**

There will be two midterm exams and one comprehensive final exam on the scheduled

dates. All exams are closed books and notes. Homework will be assigned frequently and

should be handed in on the due dates. Late assignments will not be accepted.

1. **Course topical outline**

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| Week | Topics |
| 1 | Propositions and quantifiers |
| 2 | Methods of proof and the contradiction methods of proof |
| 3 | Introductions to sets, operations on sets |
| 4 | Indexed families |
| 5 | Proofs of induction and other principles of induction |
| 6 | Induction and recursion |
| 7 | Relations and equivalent relations |
| 8 | Partitions, identifications, and congruence |
| 9 | Functions as relations, functions viewed globally |
| 10 | Functions and partitions, real-valued functions |
| 11 | Images and inverse images of sets |
| 12 | Functions and indexed families |
| 13 | Sequences |
| 14 | Convergence |
| 15 | Limits of functions |