Math 341 Syllabus Fall 2017

Professor David Catlin
Email: catlind@purdue.edu
Office: MATH 744

MA341 is an introductory course in rigorous analysis. It covers real numbers, sequences, series, continuous functions, differentiation, and integration.

Text: An Introduction to Real Analysis (4th Edition) by Bartle and Sherbert
Class schedule: MWF 12:30-1:20 in REC 122
Office hours: Mon, Wed 1:30-2:30, Thurs 11:30-12:30, or by appointment.
Course website: https://math.purdue.edu/~catlin/MA341-fall2107
All homework assignments and exam information will be available online. Lectures will be available online on the day of the lecture.

Exams: There will be 2 midterm exams and a comprehensive final. Study guides, review problems, and tests from previous semesters will be available at the course website. The grading scale for each exam will be given on the day the exam is returned. If you have any questions about the grading of exam problems, you can make an appointment to discuss.

Homework: Homework problems and due dates will be posted at the course website. Homework will generally be collected on Fridays and returned on the following Wednesday. Late homework will have **30%** of the score deducted. Homework that is not handed in by the next class will not not be accepted. If you are not in class on Wednesday to pick up the graded homework, you will need to come to MATH 744 during office hours to pick it up. Your total homework score will be **12%** of your final grade. If you have any questions about the grading of your homework, you can make an appointment to discuss.

Quizzes: A quiz will be given each Monday except for the first class and during exam weeks. Quizzes cannot be made up. Your total quiz score will be **8%** of your final grade.

Class policies: You should attend every class. Make an appointment to discuss any special requests such as: you cannot take an exam on the scheduled day, you need special accomodations to take exams, there are special circumstances for late homework or a missed quiz, etc. The grading policy is as follows:

. Homeworks 12%
. Quizzes 8%
. Midterm Exam I and II 25% for each
. Final Exam 30%

You are expected to observe academic honesty to the highest standard. Any form of

cheating automatically leads to an F grade, plus other disciplinary action deemed appropriate.

Accomodations for Students with Disabilities: In this mathematics course, accommodations are managed between the instructor, student, and DRC Testing Center. Students should see this instructor outside class hours as soon as possible – before or after class or during office hours – to discuss necessary accommodations.

The topic for each lecture is listed below and includes the section where the material is covered in the textbook. Sections refer to the course textbook unless otherwise noted. Some lectures will cover material from other textbooks.

Lecture 1 : **Sets and Functions** Section 1.1
Lecture 2 : **Mathematical Induction** Section 1.2
Lecture 3 : **Finite and Infinte Sets** Section 1.3
Lecture 4 : **Properties of the Real Numbers** Section 2.1
Lecture 5 : **Absolute Value** Section 2.2
Lecture 6 : **Completeness Property** Section 2.3
Lecture 7 : **Applications of the Supremum Property** Section 2.4
Lecture 8 : **Intervals** Section 2.5
Lecture 9 : **Sequences** Section 3.1
Lecture 10 : **Limit Theorems** Section 3.2
Lecture 11: **Monotome Sequences** Section 3.3
Lecture 12: **Bolzano-Weierstrass Theorem** Section 3.4
Lecture 13: **Cauchy Criterion** Section 3.5
Lecture 14: **Properly Divergent Sequences** Section 3.6
Exam 1: Covers Lecture 1 through Lecture 13
Lecture 15: **Infinite Series** Section 3.7
Lecture 16: **Limits of Functions** Section 4.1
Lecture 17: **Limit Theorems** Section 4.2
Lecture 18: **Extensions of Limits** Section 4.3
Lecture 19: **Continuous Functions** Section 5.1
Lecture 20: **Combinations of Continuous Functions** Section 5.2
Lecture 21: **Combinations of Continuous Functions Part II**
Continuous Functions on Intervals Sections 5.2 and 5.3
Lecture 22: **Continuous Functions on Intervals Part II** Section 5.3
Lecture 23: **Uniform Continuity** Section 5.4
Lecture 24: **Monotone and Inverse Functions** Section 5.6
Lecture 25: **The Derivative** Section 6.1
Lecture 26: **Mean Value Theorem** Section 6.2
Exam 2: Covers Lecture 14 through Lecture 25

Lecture 27: **Mean Value Theorem Part II**
L'Hospital's Rule Sections 6.2 and 6.3
Lecture 28: **L'Hospital's Rule Part II** Section 6.3
Lecture 29: **Taylor's Theorem** Section 6.4
Lecture 30: **Taylor's Theorem Part II** Section 6.4
Lecture 31: **The Darboux Integral** Section 7.4
Lecture 32: **Darboux Integrable Functions** Section 7.2 adapted
Lecture 33: **The Fundamental Theorem** Section 7.3
Lecture 34: **Pointwise and Uniform Convergence** Section 8.1
Lecture 35: **Interchange of Limits** Section 8.2
Lecture 36: **Exponential and Logarithmic Functions** Section 8.3
Lecture 37: **The Trigonometric Functions** Section 8.4
Lecture 38: **The Trigonometric Functions Part II** Section 8.4
Lecture 39: **Limits in Two Variables** (adapted from external sources)
Lecture 40: **Fundamental Theorem of Algebra** (adapted from external sources)
Final Exam: Comprehensive