



Department of Mathematics

Summer 2015

GRADUATE COURSE SUMMER 2015

SENIOR UNDERGRADUATE COURSES

Course	Section	Course Title & Session	Course Day & Time	Rm #	Instructor
Math 4377	11967	Advanced Linear Algebra I (06/01/2015 - 07/07/2015)	MoTuWeThFr 10:00AM - 12:00PM	SEC 202	K. Kaiser
Math 4378	13482	Advanced Linear Algebra II (07/08/2015 - 08/13/2015)	MoTuWeThFr 10:00AM - 12:00PM	SEC 202	A. Torok
Math 4389	18715	Survey of Undergraduate Mathematics (06/01/2015 - 07/22/2015)	Arrange (online course)	Online	C. Peters

GRADUATE ONLINE COURSES

Course	Section	Course Title	Course Day & Time	Instructor
Math 5310	16157	History of Mathematics (07/08/2015 - 08/13/2015)	Arrange (online course)	S. Ji
Math 5336	12537	Discrete Mathematics (06/01/2015 - 07/07/2015)	Arrange (online course)	K. Kaiser
Math 5378	19416	Axiomatic Geometry (06/01/2015 - 08/14/2015)	Arrange (online course)	L. Hollyer
Math 5382	15806	Probability (06/01/2015 - 07/22/2015)	Arrange (online course)	C. Peters
Math 5383	17302	Number Theory (06/01/2015 - 07/07/2015)	Arrange (online course)	M. Ru
Math 5389	16451	Survey of Mathematics (06/01/2015 - 07/07/2015)	Arrange (online course)	G. Etgen

GRADUATE COURSES

Course	Section	Course Title	Course Day & Time	Rm #	Instructor
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Math 6397	18373	Scientific Code Development (07/08/2015 - 08/13/2015)	MoTuWeThFr 12:00PM - 2:00PM	AH 304A. Torok
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-----**Course Details**-----

SENIOR UNDERGRADUATE COURSES

Math 4377 - Advanced Linear Algebra I

Prerequisites:

Text(s):

Linear Algebra, Fourth Edition by Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence
Syllabus: Chapter 1, Chapter 2, Chapter 3, Chapter 4 (4.1-4.4), Chapter 5 (5.1-5.2) (probably not covered)

Description:

Course Description: The general theory of Vector Spaces and Linear Transformations will be developed in an axiomatic fashion. Determinants will be covered to study eigenvalues, eigenvectors and diagonalization.
Grading: There will be three Tests and the Final. I will take the two highest test scores (60%) and the mandatory final (40%). Tests and the Final are based on homework problems and material covered in class.

<< back to top >>

Math 4378 - Advanced Linear Algebra II

Prerequisites:

Text(s):

Math 4377 or Math 6308
Linear Algebra, 4th edition, by Friedberg, Insel, and Spence, ISBN 0-13-008451-4

Description:

The instructor will cover Sections 5-7 of the textbook. Topics include: Eigenvalues/Eigenvectors, Cayley-Hamilton Theorem, Inner Products and Norms, Adjoints of Linear Operators, Normal and Self-Adjoint Operators, Orthogonal and Unitary Operators, Jordan Canonical Form, Minimal Polynomials.

ONLINE GRADUATE COURSES

MATH 5310 - History of Mathematics

Prerequisites:

Graduate standing

Text(s):

No textbook is required.

This course is designed to provide a college-level experience in history of mathematics. Students will understand some critical historical mathematics events, such as creation of classical Greek mathematics, and development of calculus; recognize notable mathematicians and the impact of their discoveries, such as Fermat, Descartes, Newton and Leibniz, Euler and Gauss; understand the development of certain mathematical topics, such as Pythagoras theorem, the real number theory and calculus.

Aims of the course: To help students
to understand the history of mathematics;
to attain an orientation in the history and philosophy of mathematics;
to gain an appreciation for our ancestor's effort and great contribution;
to gain an appreciation for the current state of mathematics;
to obtain inspiration for mathematical education,
and to obtain inspiration for further development of mathematics.

Description:

On-line course is taught through Blackboard Learn, visit <http://www.uh.edu/webct/> for information on obtaining ID and password.

The course will be based on my notes.

Homework and Essays assignment are posted in Blackboard Learn. There are four submissions for homework and essays and each of them covers 10 lecture notes. The dates of submission will be announced.

All homework and essays, handwriting or typed, should be turned into PDF files and be submitted through Blackboard Learn. Late homework is not acceptable.

There is one final exam in multiple choice.

Grading: 40% homework, 45% projects, 15 % Final exam

MATH 5336 - Discrete Mathematics

Prerequisites: Graduate standing
Discrete Mathematics and Its Applications, Kenneth H. Rosen, seventh edition, McGraw Hill,
Text(s): ISBN-13 978-0-07-288008-3, ISBN-10 0-07-288008-2.
Instructor lecture note: Plus: on the Zermelo-Fraenkel Axioms and Equivalence of Sets.

Syllabus: Chapter 1 (Logic and Proofs): 1.1, 1.3, 1.4 -1.6 , Chapter 2 (Sets and Functions), Chapter 5 (Induction): 5.1-5.3, Chapter 9 (Relations)

Description: The Zermelo Fraenkel Axioms; Equivalence of Sets in form of my notes.

Grading: Midterm is worth 40%, the final is worth 40% and Homework is worth 20%.

For turning in Homework, students need to get the software program Scientific Notebook.

<< back to top >>

MATH 5378 - Selected Topics in Mathematics : Axiomatic Geometry

Prerequisites: Three semesters of calculus, or consent of instructor
Text(s): "College Geometry: a Discovery Approach" by David C Kay
ISBN0-321-04624-2
Description: A review of the axiomatic approach to Euclidean Geometry and an introduction to non-Euclidean Geometries. Some finite geometries, Hyperbolic Geometry and Spherical Geometry are introduced. A student version of The Geometer's Sketchpad is required for the homework assignments.

<< back to top >>

MATH 5382 - Probability

Prerequisites:
Text(s): Probability: With Applications and R | Edition: 1 by Robert P. Dobrow,
ISBN: 9781118241257
Description:

<< back to top >>

MATH 5383 - Number Theory

Prerequisites: None

Text(s): Instructor's lecture notes. The reference book will be "Beginning Number Theory" by Neville Robbins, second Edition.

Description: Number theory is a subject that has interested people for thousand of years. This course is a one-semester long graduate course on number theory. Topics to be covered include divisibility and factorization, linear Diophantine equations, congruences, applications of congruences, solving linear congruences, primes of special forms, the Chinese Remainder Theorem, multiplicative orders, the Euler function, primitive roots, quadratic congruences, representation problems and continued fractions. There'll be no specific prerequisites beyond basic algebra and some ability in reading and writing mathematical proofs.

<< back to top >>

MATH 5389 - Survey of Mathematics

Prerequisites:

Text(s):

Description:

GRADUATE COURSES

<< back to top >>

MATH 6397 - Selected Topics in Mathematics: Scientific Code Development

Prerequisites: familiarity with computers

Text(s): material will be posted on-line

Description: The purpose of this course is to improve programming skills in order to tackle mathematical problems that require computations (e.g., numerically solving ODE's, PDE's, SDE's). The emphasis is on converting an algorithm or theoretical result into a good code, and presenting the results in a convenient format.

Students can use a language they are familiar with or, if needed, learn a new one. Some material will be posted on-line. After presenting the basic principles, students will work on projects. During the face-to-face meetings we will discuss and debug code.

<< back to top >>