



Department of Mathematics

Summer 2016

GRADUATE COURSE SUMMER 2016 - (05/16/16–08/14/16)

SENIOR UNDERGRADUATE COURSES

Course	Section	Course Title & Session	Course Day & Time	Rm #	Instructor
Math 4377	12173	Advanced Linear Algebra I (Session #2: 06/06-07/09)	MTWThF, 10am-Noon	SEC 203	K. Kaiser
Math 4378	13667	Advanced Linear Algebra II (Session #4:07/11-08/13)	MTWThF, 10am-Noon	SEC 203	A. Török
Math 4389	18101	Survey of Undergraduate Math	(online)	(online)	C. Peters

GRADUATE ONLINE COURSES

Course	Section	Course Title	Course Day & Time	Instructor
Math 5310	20278	History of Mathematics (Session #2: 06/06 - 07/09)	(online)	S. Ji
Math 5336	12739	Discrete Mathematics (Session #2: 06/06 - 07/09)	(online)	K. Kaiser
Math 5378	20283	Axiomatic Geometry (Session #4: 07/11-08/13)	(online)	L. Hollyer
Math 5382	15933	Probability (Session #3: 06/06 - 07/21)	(online)	C. Peters
Math 5383	20279	Number Theory (Session #4: 07/11 - 08/13)	(online)	M. Ru
Math 5389	16534	Survey of Mathematics (Session #2: 06/06 - 07/09)	(online)	G. Etgen

GRADUATE COURSES

Course	Section	Course Title	Course Day & Time	Rm #	Instructor
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Math 6397	19996	Scientific Code Development (Session #4: 07/11 - 08/13)	MTWThF, Noon-2pm	SEC 202	A. Török
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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.

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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.

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Math 4389 - Survey of Undergraduate Math

Prerequisites:

MATH 3330, MATH 3331, MATH 3333, and three hours of 4000-level Mathematics.

Text(s):

Instructors notes

Description:

A review of some of the most important topics in the undergraduate mathematics curriculum.

ONLINE GRADUATE COURSES

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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

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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.

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MATH 5378- Axiomatic Geometry

Prerequisites: Graduate standing

Text(s): College Geometry: A Discovery Approach, David Kay, 2nd. Ed.
ISBN:9780321046246

Description: An axiomatic approach to Finite Geometries, Taxicab Geometry, Spherical Geometry, Hyperbolic Geometry and a review of Euclidean Geometry. Does not apply toward the Master of Science in Mathematics of Applied Mathematics.

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MATH 5382 - Probability

Prerequisites: Graduate standing and Two semesters of calculus and one semester of linear algebra

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

Description: Sample spaces, events and axioms of probability; basic discrete and continuous distributions and their relationships; Markov chains, Poisson processes and renewal processes; applications. Applies toward the Master of Arts in Mathematics degree; does not apply toward Master of Science in Mathematics or the Master of Science in Applied Mathematics degrees.

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MATH 5383 - Number Theory
Prerequisites: Graduate standing.

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, and introduction to cryptography . There'll be no specific prerequisites beyond basic algebra and some ability in reading and writing mathematical proofs.

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MATH 5389 - Survey of Mathematics
Prerequisites: Graduate standing

Text(s): Instructor's notes

Description:

GRADUATE COURSES

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Math 6397 (19996) -Scientific Code Development

Prerequisites: Graduate standing.

Text(s): Instructor's notes, will be posted online

The purpose of this course is to acquire/improve programming skills in order to tackle mathematical problems that require computations (e.g. numerically solving ODEs, PDEs, SDEs). The emphasis is on converting an algorithm or theoretical result into a good code, and presenting the results in a convenient format.

Description:

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.

The course is suitable both for students who have very little/no programming experience and more advanced students. The individual projects will be tailored to each student's level. Alternatively, students can work on projects that are relevant to their own research.

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