Department of Mathematics

Summer 2020

*(**Disclaimer**: Be advised that some information on this page may not be current due to course scheduling changes. Please view either the **UH Class Schedule page** or your Class schedule in **myUH** for the **most current/updated information**.)*

GRADUATE COURSES - SUMMER 2020

SENIOR UNDERGRADUATE COURSES

This schedule is subject to changes. Please contact the Course Instructor for confirmation

Course	Section	Course Title & Session	Course Day & Time	Rm #	Instructor
Math 4364 - 01/ Math 5344 - 01	19327/19591	Intro. to Scientific Computing (Session #3: 06/01—07/25)	TWTh, 2—4PM	Online	A. Török
Math 4377 - 01/ Math 6308 - 01	11070/19601	Advanced Linear Algebra I (Session #2: 06/01—07/01)	MTWThF, 10AM—Noon	(online)	A. Török
Math 4378 - 01 / Math 6309 - 01	12135/19602	Advanced Linear Algebra II (Session #4: 07/06—08/05)	MTWThF, Noon—2PM	(online)	A. Haynes
Math 4389 - 03	15825	Survey of Undergraduate Math (Session #4: 07/06—08/05)	MTWThF, 10AM—Noon	(online)	D. Blecher

GRADUATE ONLINE COURSES

Course	Section	Course Title	Course Day & Time	Instructor
Math 5310	15815	History of Mathematics (Session #4: 07/06—08/05)	(online)	S. Ji
Math 5336	11577	Discrete Mathematics (Session #2: 06/01—07/01)	(online)	K. Kaiser
Math 5341	16335	Mathematical Modeling (Session 1: 06/01—08/07)	(online)	J. Morgan

Math 5344	19591	Intro. to Scientific Computing (Session #3: 06/01—07/25)	(online)	T.W. Pan
Math 5389	14076	Survey of Mathematics (Session #2: 06/01—07/01)	(online)	G. Etgen

GRADUATE COURSES *(under construction)*

Course	Section	Course Title	Course Day & Time	Rm #	Instructor
Math 6308	19601	Advanced Linear Algebra I (Session #2: 06/01—07/01)	MTWThF, 10AM—Noon	(online)	A. Török
Math 6309	19602	Advanced Linear Algebra II (Session #4: 07/06—08/05)	MTWThF, Noon—2PM	(online)	A. Haynes
Math 6386	18607	Big Data Analytics (Session #3: 06/01—07/21)	Fr., 3—5PM	(online)	D. Shastri

----------Course Details----------

SENIOR UNDERGRADUATE COURSES

Math 4364 - Intro. to Scientific Computing

Prerequisites: MATH 3331 or MATH 3321

Text(s): Numerical Analysis (9th edition), by R.L. Burden and J.D. Faires, Brooks-Cole Publishers. ISBN: 978-0538733519

Description: Root finding, interpolation and approximation, numerical differentiation and integration, numerical linear algebra, numerical methods for differential equations

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Math 4377 - Advanced Linear Algebra I

Prerequisites: MATH 2331 and MATH 3325, and three additional hours of 3000-4000 level Mathematics.

Text(s): Linear Algebra, 5th Edition by Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence. ISBN: 9780134860244

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: Math 4377 or Math 6308

Text(s): Linear Algebra, 5th edition, by Friedberg, Insel, and Spence,
ISBN: 9780134860244

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 assignement 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

Text(s): Discrete Mathematics and Its Applications, Kenneth H. Rosen, seventh edition, McGraw Hill,
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.

Description:

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)

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 5341 - Mathematical Modeling

Prerequisites: Graduate standing. Calculus III and Linear Algebra

Text(s): **Notes** will be provided.

Description:

Course Overview: Basics of random sampling and an introduction to Monte Carlo methods, a review of multivariable calculus and linear algebra, orthogonality, projection and visualization in higher dimensions, least squares approximation and multiple linear regression, discrete and continuous dynamical systems, stability theory associated with steady states and periodic solutions for continuous and discrete dynamical systems, periodic solutions for discrete dynamical systems, and multiple applications. Computations will be part of regular assignments, and I'll provide guidance and sample code using Excel, Matlab and Python. Students who decide to use Excel are expected to have access and basic familiarity with Excel, but they are not expected to know advanced spreadsheet functionality or have programming experience with VBA. Students will not be tested over Excel/VBA, Matlab, Python, etc. but it will be necessary to use these types of tools to complete many of the computations in the assignments.

Course Homepage: This course will use the Space LMS. After 5/25/2020, go to https://www.space.uh.edu, create an account, and access the course.

Live Online Meetings: The class will have optional live online meetings on Thursday evenings from 8-10:00pm, starting week 2. Students are strongly encouraged to attend the live online sessions. Notes and a video of the session will be posted for students who cannot attend.

Discussion Board Activity: All students are expected to discuss the course material via the discussion board.

To view the full course syllabus, click this **PDF link.**

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MATH 5344 - Intro. to Scientific Computing

Prerequisites: Graduate standing and MATH 3331 or MATH 3321

Text(s): Numerical Analysis (9th edition), by R.L. Burden and J.D. Faires, Brooks-Cole Publishers. ISBN: 978-0538733519

Description: Root finding, interpolation and approximation, numerical differentiation and integration, numerical linear algebra, numerical methods for differential equations

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MATH 5389 - Survey of Mathematics

Prerequisites: Graduate standing

Text(s): Instructor's notes

Description: A review and consolidation of undergraduate courses in linear algebra, differential equations, analysis, probability, and astract algebra. Students may not receive credit for both MATH 4389 and MATH 5389.

GRADUATE COURSES

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MATH 6308 (19601) - Advanced Linear Algebra I

Prerequisites: **Graduate standing**. MATH 2331 and MATH 3325, and three additional hours of 3000-4000 level Mathematics.

Text(s): Linear Algebra, 5th Edition by Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence. ISBN: 9780134860244

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 6309 (19602) - Advanced Linear Algebra II

Prerequisites: **Graduate standing**. Math 4377 or Math 6308

Text(s): Linear Algebra, 5th edition, by Friedberg, Insel, and Spence,
ISBN: 9780134860244

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 6386 (18607) - Big Data Analytics

Prerequisites:	Graduate standing. **Students must be in the Statistics and Data Science, MS program**
Text(s):	TBA
Description:	TBA

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