



Department of Mathematics

Summer 2021

(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.**)*

Mini Session: (5/17—6/05) , **Session #1:** (6/07—8/13) , **Session #2:** (6/07—7/08) , **Session #3:** (6/07—7/27) , **Session #4:** (7/12—8/11)

GRADUATE COURSES - SUMMER 2021

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	16025	Intro. to Scientific Computing (Session #3)	Online	Online	T. Pan
Math 4377 / Math 6308	10482	Advanced Linear Algebra I (Session #2)	MTWThF, 2—4PM	Online	M. Kalantar
Math 4378 / Math 6309	11498	Advanced Linear Algebra II (Session #4)	MTWThF, 10AM—Noon	Online	A. Haynes
Math 4389	14828	Survey of Undergraduate Math (Session #2)	MTWThF, 10AM—Noon	Online	D. Blecher

GRADUATE ONLINE COURSES

Course	Section	Course Title	Course Day & Time	Instructor
Math 5310	14822	History of Mathematics (Session #1)	(online)	S. Ji
Math 5341	15228	Mathematical Modeling (Session #2)	(online)	J. He
Math 5383	18222	Number Theory (Session #2)	(online)	M. Ru
Math 5389	13307	Survey of Mathematics (Session #2)	(online)	G. Etgen

GRADUATE COURSES

Course	Section	Course Title	Course Day & Time	Rm #	Instructor
Math 6308	16183	Advanced Linear Algebra I (Session #2)	MTWThF, 2—4PM	(online)	M. Kalantar
Math 6309	16184	Advanced Linear Algebra II (Session #4)	MTWThF, 10AM—Noon	(online)	A. Haynes
Math 6386	15688	Big Data Analytics (Session #3)	Fr, 3—5PM	(online)	D. Shastri

-----**Course Details**-----

SENIOR UNDERGRADUATE COURSES

Math 4364 (16025) - 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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Prerequisites: Math 4377 (10482)- Advanced Linear Algebra I
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.

<< back to top >>

Prerequisites: Math 4378 (11498) - Advanced Linear Algebra II
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.

<< back to top >>

Math 4389 (14828) - Survey of Undergraduate Math
MATH 3330, MATH 3331, MATH 3333, and three hours of 4000-level
Mathematics.

Prerequisites:

Text(s): Instructors notes

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

ONLINE GRADUATE COURSES

<< back to top >>

MATH 5310 (14822) - 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

Prerequisites: **Graduate standing.** Calculus III and Linear Algebra

Textbooks: (free download)

Text(s):

- **Introduction to Applied Linear Algebra**, Boyd and Vandenberghe, Cambridge University Press, 2018
- **Exploring ODEs, Trefethen, Birkisson, and Driscoll**, SIAM Publishing, 2018

Course Platforms: MS Teams and Blackboard.

Course Technology Requirements: Computer, internet, microphone and webcam.

Description:

Course Overview: The course is divided into two parts. Part I introduces vectors, matrices, and least squares methods, related topics on applied linear algebra that are behind modern data science and other applications, including document classification, prediction model from data, enhanced images, control, state estimation, and portfolio optimization. We will quickly review Part I.1 Vectors and I.2 Matrices in the first two weeks, and then focus on Part I.3 Least Squares and more advanced examples and applications in the following two and half weeks. Part II aims to use Chebfun, an open-source MATLAB package, to explore ODEs and bring new perspectives and insights on topics that are ubiquitous in advanced applications, including heat conduction, chemical reactions, chaos, population dynamics, deformations of a beam, radioactivity, bifurcation theory, stability theory, infectious diseases, nerve signals, vibrations, dynamics of networks, ballistics, planetary dynamics.

Detailed Syllabus (PDF)

<< back to top >>

Prerequisites:

MATH 5383 (18222) - Number Theory
Graduate standing.

Text(s): TBA
Description: TBA

<< back to top >>

MATH 5389 (13307) - 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 abstract algebra. Students may not receive credit for both MATH 4389 and MATH 5389.

GRADUATE COURSES

<< back to top >>

MATH 6308 (16183) - 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.

[<< back to top >>](#)

MATH 6309 (16184) - 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.

[<< back to top >>](#)

MATH 6386 (15688) - Big Data Analytics

Prerequisites:

Graduate standing. **Students must be in the Statistics and Data Science, MS program**

Text(s):

TBA

Description:

TBA

[<< back to top >>](#)