Department of Mathematics

Summer 2022

(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: (05/16—06/04), Session #1: (06/06—08/12), Session #2: (06/06—07/07), Session #3: (06/06—07/26), Session #4: (07/11—08/10)

GRADUATE COURSES - SUMMER 2022

SENIOR UNDERGRADUATE COURSES

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Section</th>
<th>Course Title &amp; Session</th>
<th>Course Day &amp; Time</th>
<th>Rm #</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>Math 4377 / Math 6308</td>
<td>10125</td>
<td>Advanced Linear Algebra I (Session #2)</td>
<td>MTWThF, Noon—2PM</td>
<td>CBB 104</td>
<td>A. Haynes</td>
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<tr>
<td>Math 4378 / Math 6309</td>
<td>10744</td>
<td>Advanced Linear Algebra II (Session #4)</td>
<td>MTWThF, 10AM—Noon</td>
<td>CBB 104</td>
<td>M. Kalantar</td>
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<tr>
<td>Math 4389</td>
<td>12373</td>
<td>Survey of Undergraduate Math (Session #2)</td>
<td>MTWThF, 10AM—Noon</td>
<td>SEC 203</td>
<td>D. Blecher</td>
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GRADUATE ONLINE COURSES
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<th>Course Day &amp; Time</th>
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<tr>
<td>Math 5341</td>
<td>12620</td>
<td>Mathematical Modeling</td>
<td>(online)</td>
<td>J. He</td>
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<td>(Session #4)</td>
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<tr>
<td>Math 5383</td>
<td>13408</td>
<td>Number Theory</td>
<td>(online)</td>
<td>M. Ru</td>
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<tr>
<td>Math 5389</td>
<td>11333</td>
<td>Survey of Mathematics</td>
<td>(online)</td>
<td>G. Etgen</td>
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<tr>
<td>Math 5397</td>
<td>16145</td>
<td>Survey of Mathematics</td>
<td>(online)</td>
<td>A. Török</td>
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**GRADUATE COURSES**

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<tr>
<td>Math 6308</td>
<td>13221</td>
<td>Advanced Linear Algebra I</td>
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<td>CBB 104</td>
<td>M. Kalantar</td>
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<tr>
<td>Math 6309</td>
<td>13222</td>
<td>Advanced Linear Algebra II</td>
<td>MTWThF, 10AM—Noon</td>
<td>CBB 104</td>
<td>A. Haynes</td>
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<td>(Session #4)</td>
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<tr>
<td>Math 6386</td>
<td>12913</td>
<td>Big Data Analytics</td>
<td>Fr, 3—5PM</td>
<td>SEC 201</td>
<td>D. Shastri</td>
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<td>(Session #3)</td>
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-------------------------------------------Course Details------------------------------------------

**SENIOR UNDERGRADUATE COURSES**

Math 4377 - Advanced Linear Algebra I
Prerequisites: MATH 2331 and MATH 3325, and three additional hours of 3000-4000 level Mathematics.


Syllabus: Chapter 1, Chapter 2, Chapter 3, Chapter 4 (4.1-4.4), Chapter 5 (5.1-5.2) (probably not covered)

Course Description: The general theory of Vector Spaces and Linear Transformations will be developed in an axiomatic fashion.

Description: 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


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.

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ONLINE GRADUATE COURSES
Prerequisites: Graduate standing. Calculus III and Linear Algebra

Textbook (free download): Introduction to Applied Linear Algebra, Boyd and Vandenberghe, Cambridge University Press, 2018

Course Platforms: MS Teams and Blackboard.

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

Course Overview: The course 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 review vectors and matrices in the first two weeks, and then focus on least squares and more advanced examples and applications in the following two and half weeks.

Detailed Syllabus (PDF)

MATH 5383 - Number Theory
Prerequisites: Graduate standing.
Text(s): TBA
Description: TBA

MATH 5389 - Survey of Mathematics

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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.

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MATH 5397 - Selected Topics in Mathematics

PREREQUISITES: Graduate standing

TEXT(S): Instructor's notes

DESCRIPTION: TBD

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GRADUATE COURSES

MATH 6308 - Advanced Linear Algebra I

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


DESCRIPTION: Syllabus: Chapter 1, Chapter 2, Chapter 3, Chapter 4 (4.1-4.4), Chapter 5 (5.1-5.2) (probably not covered)

Course Description: The general theory of Vector Spaces and Linear Transformations will be developed in an axiomatic fashion.

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.
MATH 6309 - Advanced Linear Algebra II
Prerequisites: Graduate standing. Math 4377 or Math 6308
Linear Algebra, 5th edition, by Friedberg, Insel, and Spence,
ISBN: 9780134860244

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

MATH 6386 - Big Data Analytics
Prerequisites: Graduate standing. Students must be in the Statistics and Data
Science, MS program. Linear algebra, probability, statistics, or
consent of instructor.

Text(s): TBA

Description: Concepts and techniques in managing and analyzing
large data sets for data discovery and modeling: big data storage
systems, parallel processing platforms, and scalable machine learning
algorithms.

Class notes: Computer and internet access required for course. For the
current list of minimum technology requirements and resources,
copy/paste/navigate to the URL
http://www.uh.edu/online/tech/requirements. For additional
information, contact the office of Online & Special Programs at
UHOnline@uh.edu or 713-743-3327. Course instruction for this section
takes place both in a classroom face-to-face environment during the
scheduled time and additionally by electronic means.