

Advice on FALL 2014 MATH CLASSES FOR PROSPECTIVE MATH MAJORS WHO HAVE TAKEN MATH 212 or Math 222 (not including most 400-level classes)
A separate mailing will offer advice for MATH minors.

PLEASE BE AWARE THAT AS OF FALL 2014 there will be a new option of a BS with major in MATH. The official requirements will appear in the next General Announcements. I will send you the (unofficial) list of requirements in a separate email.

These are the opinions of Professor Cochran, not official opinions of the Math Dept..

CORE MATH CLASSES: These are upper-division classes that, in my opinion, should be taken by all MATH majors: 354 Honors Linear Algebra or 355 Linear Algebra, 321 Introduction to Analysis I, 382 or 427 Complex Analysis, 356 Abstract Algebra. For those going to graduate school, 443 General Topology, 322, and 463 are also advised. Just for some perspective, these classes constitute the minimum preparation to enter the Rice Ph.D. program. Other Ph.D. programs might have lesser or greater guidelines. Individuals with a more science leaning who have taken Math 321 should consider Math 423 Partial Differential Equations (which I especially recommend for this fall).

Note: Math Minors should consider taking Combinatorics or Number theory this fall to satisfy their algebra/discrete math breadth requirement; The abstract algebra classes in the spring are more abstract and more difficult and perhaps less relevant to your major.

Since Math 321 is a difficult class that is typically taught at a very high level, I advise students to take either Honors Calculus 221-222 OR Math 302 before taking 321.

Honors Calculus 221 MWF 11; Prof. Jones

Covers the differential calculus of functions of more than one variable and much more from a theoretical viewpoint. For people who have completed MATH 101-102, but not MATH 212 and really love math. See a math advisor.

321 Intro to Modern Analysis I: MWF3 Prof. Semmes

Metric spaces, open, closed sets, continuity, compactness, connectedness, sequences and series of functions. This is a gateway class for all the more advanced classes in real analysis and topology. Requires 221-222 or Math 302 or permission of Instructor.

354 Honors Linear Algebra MWF2; Dr. Calabrese

Theoretical treatment of matrices, vector spaces, linear transformations etc. Some instruction in mathematical proof. For people who like math, and abstraction, and might want to be a math (or double) major, or mathematically able students in economics, physics, electrical engineering, computer science. Recommend: completion/concurrent enrollment in a 200-level math course. This is the preferred option for all MATH majors.

355 LINEAR ALGEBRA MWF 2; Dr. Kinneberg

Less theoretical than 354, more matrices, fewer proofs. Linear algebra is a required class for many majors. If you might be going to graduate school then take 354.

365 Number Theory MWF1 Dr. Shadrach

Basic theory of integers, prime numbers, factorization, Diophantine equations, applications in cryptography. This can be a first or second "proofs" class. Taught in alternate years. Good motivation for Math 356 (Spring).

368 Combinatorics TTh 1; Dr. Allison Moore

No pre reqs. Graph theory, enumerative combinatorics, combinatorial games. Fun topics, though not necessarily easy.

Math 371 Lie Theory: TR 10:50 Dr. Tanimoto

Study of classical groups as symmetries of Euclidean spaces. Geometry of complex numbers and quaternions, rotations and reflections of \mathbb{R}^n , the orthogonal, unitary and symplectic groups. Tangent spaces to matrix groups, Lie algebras and the exponential map. If time permits: the structure of Lie algebras and the matrix logarithm. (MATH 211 AND MATH 212) OR MATH 221; Recommended Corequisite(s): MATH 354 or MATH 355.

374 Intro to Representation theory MWF 3 Cancelled

381 Intro to Partial Diff. Equations MWF 1; Dr. Wu

Laplace transform: inverse transform, applications to constant coefficient differential equations. Boundary value problems: Fourier series, Bessel functions, Legendre polynomials. Especially good if you are a double major in certain science and engineering. Suggested prerequisite Math 211 or permission of instructor.

401 Differential Geometry MWF3; Dr. Wu

Geometry of curves and surfaces in the plane and 3-space; curvature. This class is significantly less difficult than some other 400-level classes. It requires only Math 212 or 221-222.

423 Partial Diff Equations I TTh 9:25 Dr. Ariturk

First order of partial differential equations. The method of characteristics. Analysis of the solutions of the wave equation, heat equation and Laplace's equation. Integral relations and Green's functions. Potential theory, Dirichlet and Neumann problems. Asymptotic methods: the method of stationary phase, geometrical optics, regular and singular perturbation methods. I suggest taking Math 321 before this class.

499 VIGRE in Math Sections 1 and 3 (maybe others in CAAM and STAT)

Tired of being lectured to? Opportunities for undergrad research in team format. Variable credit (normally 1 credit hour). Should try to do some research sometime at Rice if you are not already doing some in another department. MORE info later in summer or early fall or email Dr. Moore or Dr. Ariturk ; "http://math.rice.edu/VIGRE/" <http://math.rice.edu/VIGRE/>.

Note: if you plan to go to Math grad school, you should aspire to take one or more of 423, 425, 444, 463 in your senior (or in exceptional cases junior) year. These are not required for entrance to math grad school (in fact 425, 444, 464 are considered graduate level courses) but many matriculants at the top 10 grad schools will have taken several of these.