Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. This request is submitted by the Department of
Mathematics

2. Course prefix, number and complete title of course:
Math 626 Analytic Number Theory

3. Catalog Course description (not to exceed 50 words):
Analytic properties of the Riemann zeta function and Dirichlet L-functions; Dirichlet characters; prime number theorem; distribution of primes in arithmetic progressions; Siegel's theorem; the large sieve inequalities; Bombieri-Vinogradov theorem.

4. Prerequisite(s):

Cross-listed with:

Cross-listed courses require the signature of both department heads.

5. Is this a variable credit course? □ Yes □ No If yes, from _______ to _______
6. Is this a repeatable course? □ Yes □ No If yes, this course may be taken _______ times.
Will this course be repeated within the same semester? □ Yes □ No
7. Has this course been taught as a 489/689? □ Yes □ No If yes, how many times? ______ As Math 662, Spring 08-5 students

8. This course will be:

a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

PhD in Mathematics

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (excluding punctuation)

| MATH | 626 | ANALYTIC NUMBER THEORY |

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>GP and Fund Code</th>
<th>Admin. Unit</th>
<th>Acad. Year</th>
<th>FICE Code</th>
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Approval recommended by:
Albert Bogess 2/1/09

Department Head - Type Name & Sign:

Chair, Coordinating Committee:

Dean of College:

Submitted to Coordinating Board by:

Date

Effective Date

Associate Director, Curricular Services

Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu
Curricular Services - 12/08
Course title and number  MATH 626 Analytic Number Theory
Term (e.g., Fall 200X)  TBA
Meeting times and location  TBA

Course Description and Prerequisites
This course is an introduction to analytic number theory. A driving question in this subject is, "How many primes numbers are there up too a given large quantity?" The most successful method for studying this problem (and related problems and generalizations) is the use of the Riemann zeta function (and its many generalizations, including Dirichlet's L-functions). Basic arithmetical properties then become translated into analytic properties of the zeta function (e.g. its rate of growth, location of zeros, etc.).

Topics we will cover this semester include
Analytic properties of Dirichlet's L-functions
Prime number theorem for arithmetic progressions
The large sieve inequalities
The Bombieri-Vinogradov theorem
Further topics as time permits
Prerequisite: Basic complex analysis, e.g. in the form of Math 617

Learning Outcomes or Course Objectives
The basic goal is for students to understand analytic properties of Dirichlet L-functions and how they apply to specific problems in number theory, in particular to the distribution of the prime numbers.

Instructor Information
Name  Matthew Young
Telephone number  845-7862
Email address  myoung@math.tamu.edu
Office hours  TBA
Office location  Milner 225

Textbook and/or Resource Material
The required textbook is Multiplicative Number Theory, 3rd Ed., by Harold Davenport and revised by Hugh Montgomery, Springer GTM.

Grading Policies
Your final grade will be determined by the total number of points obtained on exams and homework. Out of 450 total points, each component contributes to your grade as follows: Homework, 200 points; Midterm, 100 points; Final exam, 150 points.
The following grade distribution will be used in determining final course grades:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage of Total Points</th>
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<tbody>
<tr>
<td>A</td>
<td>85.0%-100.0%</td>
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<tr>
<td>B</td>
<td>70.0%-84.9%</td>
</tr>
<tr>
<td>C</td>
<td>55.0%-70.0%</td>
</tr>
<tr>
<td>D</td>
<td>40.0%-54.9%</td>
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<tr>
<td>F</td>
<td>0.0%-39.9%</td>
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</table>
Course Topics, Calendar of Activities, Major Assignment Dates

Topics we will cover this semester include
- Analytic properties of Dirichlet's L-functions
- Prime number theorem for arithmetic progressions
- The large sieve inequalities
- The Bombieri-Vinogradov theorem
- Further topics as time permits

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
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Other Pertinent Course Information

Americans with Disabilities Act (ADA)
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit [http://disability.tamu.edu](http://disability.tamu.edu)

Academic Integrity
For additional information please visit: [http://www.tamu.edu/aggiehonor](http://www.tamu.edu/aggiehonor)

"An Aggie does not lie, cheat, or steal, or tolerate those who do."

It is not permissible to hand in the work of others for a grade, including work on exams, quizzes, and homework. You are allowed to discuss homework with others, but your write-ups are expected to be done on your own and in your own words. Copying the work of others will be prosecuted to the full extent possible under University policies.

Cheating during an exam will be sanctioned by assigning 0 points on the exam. Further action will be taken in agreement with Texas A&M University Student Rules on Academic Honesty and the Aggie Honor System Code.