MATH 116 (4 units)

THEORY OF NUMBERS

Mo We 8 am - 9:50 am in S139
California State University, Fresno
Spring 2013

Instructor : Dr. Stefaan Delcroix
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Phone : (559) 278-2555
E-mail : sdelcroix@csufresno.edu
Web Page : http://zimmer.csufresno.edu/~sdelcroix
Office Hours : M 10am-11am; W 10:30am-1:30pm

Prerequisites : MATH 111


Course Description : Divisibility theory in the integers, primes and their distribution, congruence theory, Diophantine equations, number theoretic functions, primitive roots, indices and the quadratic reciprocity law. If time permits, other topics like continued fractions may be considered.

Course Goals : This course will give the students a thorough understanding of algebraic number theory. The following concepts will be covered:

- the Division Algorithm and its applications
- the Prime Factorization Theorem and its applications
- modular arithmetic and its applications
- arithmetic functions and Möbius Inversion
- primitive roots and index arithmetic
- quadratic residues and the Law of Quadratic Reciprocity

Primary Learning Outcomes : In addition to the obvious goal of mastering the concepts listed in the course description and the course goals, it is also intended that each student will:
• write rigid formal mathematical proofs
• understand deep number theoretic results from a practical point of view
• perform calculations related to congruence theory
• appreciate the beauty of some rather theoretical results

Grading Policy: I will use the following grading scheme:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Exam I and II</td>
<td>25% each</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
</tbody>
</table>

A : 85% - 100%
B : 70% - 84%
C : 60% - 69%
D : 50%-59%
F : 0% - 49%

Web Page: My web page is

http://zimmer.csufresno.edu/~sdelcroix

It will contain important information about this course: homework assignments, solutions to homeworks and exams, etc.

Homework: I will assign homework almost every Wednesday. You will have one week to hand in the homework in class. No late homework will be accepted.

Exams and Final: There will be two in-class exams and one final. Each exam will cover a specific unit of material covered in class while the final is comprehensive. No notes or textbooks are allowed on these exams. See the schedule for the tentative dates. No make-up exams are given unless you have an extremely good reason for not taking the exam at the scheduled time. If possible, notify me ahead of time if you will not be able to take the exam at the scheduled time.

Attendance: Attendance is not required but very strongly recommended! If you are absent from class, it is your responsibility to check on announcements made while you were absent.

Students with Disabilities: Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Service to Students with Disabilities in the Henry Madden Library Suite 1202 (278-2811). For required syllabus statements about Students with Disabilities, the Honor Code, Cheating and Plagiarism, Computers, Disruptive Classroom Behavior, and Copyright Policy: see

http://www.fresnostate.edu/academics/policies-forms/instruction/syllabus.html
**Classroom Behavior**: Please turn off cell phones and pagers before entering the classroom. No talking, texting or reading newspapers while in class.

**SUBJECT TO CHANGE**

This syllabus and schedule are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent.

**IMPORTANT DATES**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Monday 1/21</td>
<td>Martin Luther King holiday - no classes</td>
</tr>
<tr>
<td>Thursday 2/14</td>
<td>Last day to add classes with permission/</td>
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<tr>
<td></td>
<td>Last day to drop classes without a serious and compelling reason</td>
</tr>
<tr>
<td>Monday 2/18</td>
<td>Presidents’ Day - no classes</td>
</tr>
<tr>
<td>Wednesday 2/27</td>
<td>Exam I</td>
</tr>
<tr>
<td>Monday 3/25 till Friday 3/29</td>
<td>Spring Recess - no classes</td>
</tr>
<tr>
<td>Monday 4/1</td>
<td>Cesar Chavez holiday-no classes</td>
</tr>
<tr>
<td>Monday 4/15</td>
<td>Exam II</td>
</tr>
<tr>
<td>Tuesday 4/16</td>
<td>Last day to withdraw from class for serious and compelling reasons</td>
</tr>
<tr>
<td>Wednesday 5/8</td>
<td>Last day of instruction</td>
</tr>
<tr>
<td>Monday 5/13 till Thursday 5/16</td>
<td>Final semester examinations</td>
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</tbody>
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**FINAL EXAM FOR THIS CLASS**

**WEDNESDAY MAY 15 FROM 8:45AM TILL 10:45AM**