

# MATH 6043: Topics in Number Theory

## Summer Semester, 2018

**Instructor:** Dr. Abdollah Khodkar  
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**Online Office Hours:** Tuesday 10am-11am and Thursday 2pm-3pm.  
If you would like to talk to me but cannot make it during one of these times, please make an appointment.

**Prerequisites:** Math 2853, Elementary Linear Algebra and Math 3003, Transition to Advanced Mathematics

**Hours Credit:** 3 hours

**Textbook:** Elementary Number Theory by James K. Strayer, Lock Haven University

**Courses Description:** An in-depth study of selected topics in number theory

### Topics include:

<u>Sections</u>	<u>Title</u>
1.1	Divisibility
1.2	Prime Numbers
1.3	Greatest Common Divisor
1.4	The Euclidean Algorithm
1.5	The Fundamental Theorem of Arithmetic
2.1	Congruences
2.2	Linear Congruences in One Variable
2.3	The Chinese Remainder Theorem
2.4	Wilson's Theorem
2.5	Fermat's Little Theorem; Pseudoprime Numbers
2.6	Euler's Theorem
3.1	Arithmetic Functions; Multiplicativity
3.2	The Euler Phi-Function
3.3	The Number of Positive Divisors Function
3.4	The Sum of Positive Divisors Function
3.5	Perfect Numbers
3.6	The Möbius Inversion Function
4.1	Quadratic Residues

4.2	The Legendre Symbol
4.3	The Law of Quadratic Reciprocity
5.1	The Order of an Integer; Primitive Roots
5.2	Primitive Roots for Prime Numbers
5.3	Index Arithmetic; $n$ th Power Residues
5.4	Index Arithmetic; $n^{\text{th}}$ power Residues
6.1	Linear Diophantine Equations
6.2	Nonlinear Diophantine Equations; Congruence Method
6.3	Pythagorean Triples
6.4	Fermat's Last Theorem
6.5	Representation of an Integer as a Sum of Squares

**Calculators:** You are not allowed to use “**advanced**” calculators such as TI-84 or better in your tests or final exam.

**Rescheduling tests/Final:** If you have a *university-approved excuse* for missing a homework or the final exam, you may be allowed to reschedule, but you must make arrangements with me in advance.

**Homework Problems:** There will be six homework problems. Each will be worth 10%. Students should email me their solutions to the weekly homework problems. Students should make a .pdf of their solutions and send it to me as an attachment to an email. Please use the email server embedded in CourseDen.

**Final exam:** The final exam is a proctored exam and will be on Thursday July 19, 2018 at 3pm-4:30pm in Boyd 301. The final exam will be worth 40%.

### **Grading Scale:**

- A= 90-100%
- B= 80-89%
- C= 70-79%
- D= 60-69%
- F= 0-59%

**Grading:** Your final grade will be determined as follows:  
Homework problems 60%, final exam 40%.

Students, please carefully review the following information at this link

<https://www.westga.edu/administration/vpaa/common-language-course-syllabi.php>

It contains important material pertaining to your rights and responsibilities in this class. Because these statements are updated as federal, state, university, and accreditation standards change, you should review the information each semester.