Syllabus for Math 335, Number Theory, Sec. 01, Fall 2018

Teacher: Dr. Robert Kreczner

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Office Location: D 351, Science Building

Office Hours: 11:00 a.m. –11:50 a.m., Monday to Friday, or by appointment if this time is not convenient.

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Classroom: A207, Science Building

Meeting Time 4:00 PM to 4:50 PM, Monday, Tuesday, and Thursday

Textbook: *Elementary Number Theory, 7th Edition*, by David M. Burton

You must read the textbook, paying extra attention to definitions, theorems, and proofs. While reading, your goal should be to gain a deep understanding of studied topics. As a result, you should be able to recall definitions, theorem, and certain proofs.

Prerequisites: 300 or instructor's consent.

Course Overview:

Mostly we will work with integer numbers, with primary focus given to prime numbers. The goal is to learn the main properties of the prime numbers, study their some fascinating old and new problems, and above all appreciate the ingenuity, creativity, mystery, and beauty involved in solving these problems. These solutions are one of the best masterpieces in mathematics. In more detail, we will study the topics such as greatest common divisors, congruences and its applications, multiplicative functions, primitive Roots, quadratic residues, linear and nonlinear diophantine equations, continued fractions; Mersenne, Fermmat, Perfect, and Fibonacci numbers, plus some additional topics if time permits.

TOPICS:

Chapter 1: Some Preliminary Considerations

Chapter 2: Divisibility Theory in the Integers

Chapter 3: Primes and Their Distributions

Chapter 4: The Theory of Congruences

Chapter 5: Fermat's Theorem

Chapter 6: Number-Theoretic Functions

Chapter 7: Euler's Generalization of Fermat's Theorem

Chapter 9: The Quadratic Reciprocity Law

Chapter 11: Numbers of Special Form

Chapter 12: Certain Nonlinear Diophantine Equations

Chapter 13: Representation of Integers as Sums of Squares (if time permits)

Chapter 14: Fibonacci Sequence Squares (if time permits)

Chapter 15: Continued Fractions Squares (if time permits)

Chapter 16: Some Modern Developments (if time permits)

Calculators, Computers, IPhones, Smartphones: For most of the course, if not tor the whole, you may not need any calculator or computer. For some computations, however, a calculator might be very helpful. It is solely up to you to decide whether or not to purchase one. You are responsible by yourself for learning how to use your calculator. You may use any graphic calculator during the exams; **however, laptops, computers, iPhones, smartphones, or any computing devices with wireless connection capability are not allowed during the tests.**

Homework: About every week, with some exceptions, there will be given a homework assignment. The purpose of homework is to keep pace with the progress in class and provide an opportunity for practicing skills and techniques that are presented in class. Even though you do not have to turn in the homework assignments, you should treat them with at most responsibility, it should be your number one priority, and without doing homework it is very unlikely to pass the course successfully, or more importantly, to learn the covered material at satisfactory level. In principle, you are strongly urged to work out solutions on your own, but in case of difficulty you may work together; however, you should write down solutions by yourself. A solution should usually contain some reasonable amount of explanation; an answer alone is usually not enough. In addition, solutions should be written down clearly, with legible handwriting, and easy to follow for me.

Attendance: You ought to attend every class. There is no makeup for missing classes or exams, except university's schedule conflicts, or extreme personal emergencies. You should get my approval beforehand in case you plan to miss a class or test, and it is your responsibility to make prompt arrangements with me for finding out what you have missed and for making up any assigned work. I will check attendance every class. For each missing class you will have deducted one percentage point, but not more than 5 per cent. In addition, you may miss two classes for personal emergencies without incurring any penalties. Regarding the university's attendance policy, you should also check the portion of the UWSP catalog at http://www.uwsp.edu/news/uwspcatalog/academic.htm . In case of extreme personal emergencies, you should contact me immediately, and if possible, I will try to find a positive way to handle your absence. Examples of extreme emergencies: being sick or hospitalized, death in immediate family, court or military duties, etc.; some documentation will be required. Examples of not extreme emergencies: oversleeping, broken car, going on vacations, having scheduled a flight, etc.

Exams: There will be three one- class-period midterm exams during the semester, plus a final exam.

- Midterm I, after Chapter 2
- Midterm II, after Chapter 4
- Midterm III, after Chapter 6
- Final Exam, Tuesday, December 18, 5:00 PM - 7:00 PM

The exams will include problems, definitions, theorems, and proofs.

The final exam is **comprehensive**, that is, it will include the whole material covered in the course. The final exam may be in the form of a short presentation.

Grading:

A	93-100%	C	73-76%
A-	90-92%	C-	70-72%
B+	87-89%	D+	71-65%
B	83-86%	D	64-60%
B-	80-82%	F	< 60%
C+	77-79%		

Description	Points
Midterms	3 X 23% = 69%
Final Exam	26%
Attendance	5%
Total	100%
Description	**Points**

An Example how your Final grade will be Determined:

Let's assume that your grades are as follows: the first midterm 80%, second 70%, third 85%, the final exam 80%, and you missed 3 classes, which is 1 above the allowance, so your number of percentage points for the attendance is 5 – 1 = 4.

Then, your final cumulative percentage will be computed as follows: 80 x 0.23+ 70 x 0.23 + 85 x 0.23 + 80 x 0.26 + 4 = 78.85 %, and this corresponds to letter grade C+.

I also reserve the rights to exercise discretion in raising student's final grade in some special circumstances. Examples for raising the grade, student was very active during whole semester by asking and answering questions, got very high score on the final test, made some interesting discovery that pertained to the course, read mathematical books or articles.

Add/Drop

The dates for add/drop deadlines can be found at
http://www.uwsp.edu/regrec/Pages/calendars.aspx

The last day to drop a 16-week class with a "W" grade is Friday, Apr. 08.

Rights and Responsibilities: You should be fully aware of your rights and responsibilities as a UWSP student, and the pertaining information you can access at

https://www.uwsp.edu/dos/Documents/CommunityRights.pdf

Disabilities: Information regarding Section 504 of the Rehabilitation Act or the Americans with Disabilities Act can be found at the UWSP Disability and Assistive Technology Center site
http://www4.uwsp.edu/special/disability/

HAVE A GREAT SEMESTER AND ABOVE ALL ENJOY LEARNING THE NEW MATERIAL IN THIS COURSE!