

Math 444 (Number theory)

| Math 444 | Number theory | | Credits | Lec | Tut |
|----------------|--|--|-----------------------------------|------|-----|
| | | | 3 | 3 | 1 |
| Course Summary | Divisibility theorem in the integers - primes and their distribution - The theory of congruencies - Fermat's theorem, Wilson's theorem and their Applications - Primitive roots. Applications of congruencies - The quadratic reciprocity law. | | | | |
| Prerequisites | Math 342 | Abstract Algebra I | | | |
| Textbook | Kenneth H. Rosen | Elementary Number Theory and its Applications, Fifth Edition | Addison Wesley (Boston, New York) | 2005 | |

Objectives:

- 1- The student will improve his logical thinking and learn the techniques of the proofs of the theorems.
- 2- The student will be equipped with the methods of solved exercises.
- 3- It is expected that the students may apply the techniques learn in this course to apply of the theorems of number theory.

Course description:

- 1- Divisibility theorem in the integers, primes and their distribution
- 2- The theory of congruencies

- 3- Fermat's theorem, Wilson's theorem and their Applications
- 4- Primitive roots
- 5- Applications of congruencies
- 6- The quadratic reciprocity law

Teaching Schedule:

| Delivery Type | Number | Lecture Length (hours) | Student Hours |
|---------------------|--------|------------------------|---------------|
| Lecture | 39 | 1 | 39 |
| Tutorial | 13 | 1 | 13 |
| Private Study Hours | | | 117 |
| Total Contact Hours | | | 52 |
| Total Hours | | | 169 |

Methods of Assessment:

1- Coursework

| Assessment Type | Notes (paper HW/Online) | % of Formal Assessment |
|----------------------|-------------------------|------------------------|
| In-course Assessment | Weekly Paper HW | 10 |
| Total Percentage | | 10 |

2- Exams

| Assessment Type | Notes (MCQ, etc ...) | % of Formal Assessment |
|------------------|----------------------|------------------------|
| First Exam | MCQ & Written | 25 |
| Second Exam | MCQ & Written | 25 |
| Final Exam | MCQ & Written | 40 |
| Total Percentage | | 90 |