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|  | Course name: MATH 318 Introduction to Number Theory | | Department: Mathematics | | | | Semester 7 | | |
| | Methods of Education | | | | | | | Credit (ECTS) | |
| | Lecture 42 | Recitation/ (Etud) 0 | Lab 0 | Exams 38 | Homework/ Quiz 0 | Other 70 | Total 150 | 5 | |
| Language | English | | | | | | | | |
| Compulsory/Elective | Compulsory | | | | | | | | |
| Prerequisites | No | | | | | | | | |
| Course Contents | Weeks | Subjects | | | | | | | |
| | 1 | <ul style="list-style-type: none"> Preliminaries Divisibility Theory in the Integers | | | | | | | |
| | 2 | <ul style="list-style-type: none"> Divisibility Theory in the Integers | | | | | | | |
| | 3 | <ul style="list-style-type: none"> Divisibility Theory in the Integers | | | | | | | |
| | 4 | <ul style="list-style-type: none"> The Theory of Congruences | | | | | | | |
| | 5 | <ul style="list-style-type: none"> The Theory of Congruences | | | | | | | |
| | 6 | <ul style="list-style-type: none"> Fermat's Theorem, Wilson's Theorem | | | | | | | |
| | 7 | <ul style="list-style-type: none"> Euler's Generalization of Fermat's Theorem | | | | | | | |
| | 8 | <ul style="list-style-type: none"> Euler's Generalization of Fermat's Theorem | | | | | | | |
| | 9 | <ul style="list-style-type: none"> Primitive Roots and Indices | | | | | | | |
| | 10 | <ul style="list-style-type: none"> The Quadratic Reciprocity Law | | | | | | | |
| | 11 | <ul style="list-style-type: none"> The Quadratic Reciprocity Law | | | | | | | |
| | 12 | <ul style="list-style-type: none"> Introduction to Cryptography From Caesar Cipher to Public Key Cryptography | | | | | | | |
| | 13 | <ul style="list-style-type: none"> The Knapsack Cryptosystem | | | | | | | |
| | 14 | <ul style="list-style-type: none"> An Application of Primitive Roots to Cryptography | | | | | | | |
| Course Objectives | <p>The purpose of this course is to</p> <ul style="list-style-type: none"> give the standard knowledge of number theory. apply the technical tools to solve the problems related to number theory. | | | | | | | | |
| Learning Outcomes and Competences | <p>Upon completion of this course students will be able to</p> <ul style="list-style-type: none"> Acquires mathematical thinking skills (problem solving, generating ways of thinking, forming correspondence, generalizing etc.) and can use them in related fields. Can design mathematics related problems, devise solution methods and apply them when appropriate. | | | | | | | | |
| Textbook and /or References | Textbook: Elementary Number Theory, David M. Burton, McGraw-Hill, Sixth Edition, 2007. | | | | | | | | |

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|---------------------|---|---------------------|----------------|
| | References: <ol style="list-style-type: none"> 1. Niven, Ivan, Herbert S. Zuckerman, and Hugh L. Montgomery. <i>An Introduction to the Theory of Numbers</i>. Wiley, 1991. ISBN: 9780471625469. 2. Hardy, G.H., and Edward M. Wright. <i>An Introduction to the Theory of Numbers</i>. Oxford University Press, 1960. ISBN: 9780198533108. 3. Davenport, Harold, and James H. Davenport. <i>The Higher Arithmetic: An Introduction to the Theory of Numbers</i>. Cambridge University Press, 2008. ISBN: 9780521722360. | | |
| Assessment Criteria | | If any, mark as (X) | Percentage (%) |
| | Midterm Exams | X | 40 |
| | Quizzes | | |
| | Homeworks | | |
| | Projects | | |
| | Laboratory work | | |
| | Other | | |
| | Final Exam | X | 60 |