King Fahd University of Petroleum & Minerals

Department of Mathematics and Statistics

Linear & Abstract Algebra and Number Theory

Math 570; Semester 201

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Textbook: Alexey L. Gorodentsev, Algebra I, Springer (2016).

MATH 570 Linear & Abstract Algebra and Number Theory (3-0-3)
Description: Basis and Linear Independence, Linear Operators and Matrices, Eigenvectors and Eigenvalues, Inner Products, Divisibility, Euclidean Algorithm, Congruence, Definition of Groups, Subgroups, Lagrange Theorem, Euler Phi Function, Euler's Theorem, Cyclic Groups, Groups Isomorphism, Group Homomorphism, Permutation Groups, Finite fields, Quadratic Residues, Reciprocity, Discrete Probability Theory.

Syllabus

Topic(s)	Material	Week
Vector Spaces, Linear Operators	6.1 & 6.3	1
Basis and Linear Independence	6.2	2
Matrices	8.2	3
Eigenvectors and Eigenvalues	15.2.4	
Inner Products	10.1	4
September 23rd, 2020: National Day Holiday		
First Major Exam: 30.9.2020		
Divisibility	2.2.1 & 2.2.2	5
Euclidean Algorithm	2.2.3	
Congruence	2.4.1	6
Groups and Subgroups	12.1	7
Lagrange Theorem	12.6	
Euler Phi Function	2.3	8
Euler's Theorem		
Second Major Exam: 26.10.2020		
Cyclic Groups	12.2.1 & 12.2.2	9
Groups Isomorphism	12.4	10
Group Homomorphism	2.6.1 – 2.6.3	
Permutation Groups	1.3.4 & 12.2.3	11
Midterm Exam: **25.11.2020**		
Finite fields	3.6.1 & 3.6.2	12
Quadratic Residues	3.6.3	13
Reciprocity		
Discrete Probability Theory	**Handout**	14
Revision and Catch Up		15
Sunday 13.12.2020: Normal Wednesday Classes		
Final Exam: TBA		

Grading Policy:

Homework	Projects	1st Major Exam	Midterm Exam	2nd Major Exam	Final Exam
15%	15%	15%	15%	15%	25%