

Department of Mathematics

Faculty of Science

MATH 328 (206328) THEORY OF EQUATIONS

3(3/3-0/0)

Prerequisite MATH 112 (206112) or MATH 203 (206203) or MATH 261 (206261)

Course Description

Continuity and evaluation of polynomials. Properties of the coefficients of an algebraic equation. Numerical solution of the algebraic equation. The location of the roots of an equation. The cubic equation. The quartic equation. Canonical forms of cubic and quartic equations. Gregory's method of solution. Further limiting and approximation processes.

Course Contents

No. of Lecture Hours

1. Replay	2
Properties of complex numbers. Properties of polynomial under detaching coefficients.	
2. Continuity and evaluation of polynomials	10
Algebraic equation. Remainder theorem. Synthetic division. Depressed equations. Factor form of polynomial root of multiplicity m. Relation between roots and degree of polynomial (algebraic).	
3. Properties of the coefficients of an algebraic equation	5
Fundamental theorem of algebra. Relation between roots and coefficients. Conjugate roots and coefficients. Sums and products of coefficients and roots.	
4. Location of roots	10
Integral and rational roots. Limits of roots. Upper limit to real roots. Newton's method to give upper limit to positive real roots. Sturm's process and Sturm's theorem.	
5. Numerical solution of algebraic equations	12
Horner's method. Iteration method. Newton's method. Gregory's method.	
6. The cubic equation, canonical form, roots	6
The biquadratic equation. Canonical form. Roots.	
Total	<u>45</u>