DEPARTMENT OF MATHEMATICS,

UNIVERSITY OF KARACHI,

Course Outline

MATH 602: GALOIS THEORY AND ITS APPLICATIONS.

Course contents:

The theory of fields, field extension, algebraic extensions, monomorphism of algebraic extension. Test for irreducibility, Einstein's criterion. Other methods for establishing irreducibility. Rules and compass construction. Splitting fields, the extension of monomorphism with examples. The algebraic closure of a field. Normal extensions, separability. Galois extensions, differentiation, the Frobenius monomorphism. Inseparable polynomials, automorphisms and fixed fields. The Galois theory, the theorem on natural irrationalities.

Books Recommended:

1. Fraleigh, J. B., A First Course in Abstract Algebra, Third Edition, Addison Wesley Publishing Co., 1982.
2. Allenby, R. B. J. T., Rings, Fields and Groups: An Introduction to abstract Algebra, Edward Arnold Ltd., 1983.
3. Burnisde, W., Theory of Groups of Finite Order, Second Edition, Dover, N.Y., 1955.
4. Hall, M., Nesbitt, C. J. and Thrall, R.H., Rings with Minimum Conditions, Ann Arbor, Univ. of Michigan Press, 1944.
5. Artin, E., Nesbitt, C. J. and Thrall R.H., Rings with Minimum Conditions, Ann Arbor, Univ. of Michigan Press, 1944.
6. Mecoy, N. H., Rings and Ideals, Cerus Monograph No.81 Buffalu, The Mathematical Association of America.
7. Stewart, J. N., Galois Theory, Chapman and Hall, London, 1973.
8. Artin, E., Galois Theory, University of Notre Dam Press, Indiana, 1964
9. Garling, D. J. H., A Course in Galois Theory, C.U.P., 1986.
10. Adamson, I. T., Introduction to Field Theory, Oliver and Boyd, 1964,
11. Albert, A. A., Studies in Modern Algebra, Mathematical Association of America, 1963.
12. Gaal, L., Classical Galois Theory with Examples, Markham, Chicago, 1971.
13. Hadlock, C. R., Field Theory and its Classical Problems, Carus Monograph, Mathematical Association of America, 1978.