Math 2004	APPLIED MATHEMATICS	(CR3)
Preq.	Math 1001, 1002	

Objectives
The main objectives of this course is to introduce students with some applied mathematical methods.

Syllabus
Vector Analysis, Vectors in 2-space and 3-space, lines and planes in 3-space, vector spaces, Gram-Schmidt orthogonalization process, vector functions, motion on a curve, curvature and components of acceleration, partial derivatives, directional derivatives, tangent planes and normal lines, curl and divergence, line integrals, independence of the path, double integrals, double integrals in polar coordinates, Green's theorem, surface integrals, Stokes' theorem, triple integrals, divergence theorem, change of variables in multiple integrals, vector operators acting on sums and products, combinations of grad, div and Curl, general curvilinear coordinates. Group Theory, Symmetry of a square, the dihedral group, definition and examples of groups, elementry properties of groups, finite groups, subgroups, tests of subgroups, examples of subgroups, cyclic groups, properties of cyclic groups, classifications of subgroups of cyclic groups, permutation groups, properties of permutations, a check-digital scheme based on D_5.

Recommended Books
1. *Contemporary Abstract Algebra by J. A. Gallian (8th Edition), Cengage Learning (2013)*
2. *Mathematical Methods for Physicists by G.B. Arfken, , H. J. Weber and F. E. Harris (7thEdition), Academic Press (2012)*
3. *Advanced Engineering Mathematics by D. G. Zill and W. S. Wright (6th Edition), Jones and Bartlett (2018)*
4. *Mathematical methods for physics and engineering by K. F. Riley, M. P. Hobson, and S. J. Bence (3rd Edition), Cambrige (1999)*
5. *Advanced Engineering Mathematics by E. Kreyszig (9th Edition), John Wiley & Sons (2006)*
6. *Mathematical Methods for Physicists: A Concise Introduction by T. L. Chow, Cambridge (2000)*