DEPARTMENT OF MATHEMATICS,

UNIVERSITY OF KARACHI,

Course Outline

MATH 504: COMPUTER ALGEBRA

Course contents:

Computer codes and Number system : Number systems, binary, octal and hexadecimal system. 4 bit, 6 bit and 8 bit BCD codes. Zone decimal and packed decimal formats. Computer arithmetic, errors. Logic, Truth tables: Conjunction, disjunction, negation, propositions and truth tables, tautologies and contradictions, logical equivalence, algebra and propositions, conditional and biconditional statements, logical implication. Algorithms, flowcharts, pseudocode, and programs: Computer programs variables, constants, flowcharts and their language. Loops, initialization counters, accumulators, DO loops pseudocode programs. Boolean algebra, Logic gates: Boolean algebra, duality, basic theorems. Order and Boolean algebra. Boolean expressions, sum of product form. Logic gates, logic circuits, Minimal Boolean expressions. Combinatorial analysis. Graph Theory: Graphs and multi graphs, Degree of a vertex, deterministic and non-deterministic automata.

Books Recommended:

1. Stanley, I., Grossman, Applied Linear Algebra, Second Edition, Wadsworth Publishing Co., California, 1984.
2. Stroud, K. A., Linear Algebra: Theory and Application, Stanley Thornes Publishers Ltd., 1978.
3. Graham, A., Matrix Theory and Applications for Engineers and Mathematicians.
4. Graham, A., Nonnegative Matrices and Applications for Engineers and Mathematicians.
5. Lipschutz, S., Essential Computer Mathematics, Mc Graw Hill Inc., 1982.
6. Lennox, S. C., Chadwick, M., Computer Mathematics for Applied Scientists, Second Edition, Heinemann Educational Books Ltd., London, 1985.
7. Garding and Tambour, Algebra and Switching Circuits, Mc Graw Hill 1988.
8. Mendelson, E., Boolean Algebra and Switching Circuits, Mc Graw Hill 1978.
9. Halmon, P. R., Lectures on Boolean Algebra, Van Nostrand, 1963.
10. Rosen, K. H., Discrete Mathematics and its Applications, Fifth Edition, AT and T Laboratories, New Jersey, Mc Graw Hill, 2001.