DEPARTMENT OF MATHEMATICS,

UNIVERSITY OF KARACHI,

Course Outline

MATH 404: DATA PROCESSING & PROGRAMMING - II (2 + 1)

Course contents:

Design technique, algorithm analysis, complexity of algorithm, randomized algorithm and simulation concept. General features of Fortran/ C/ Turbo C; operators, statements, loops, functions, pointers, arrays, structures and files. Data manipulation in lists, linked lists, searching, sorting, and duplicating; tree algorithms. File concept, different access modes, print control, standard functions, user defined functions and subroutines. Numerical computing using Mathematica/ Matlab/ Maple.

PRARICALS:

1. Programming in Fortran/ C/ Turbo C.
2. Use of Mathematica/ Matlab/ Maple.

Books Recommended:

1. Aho, A., The Design and Analysis of Computer Algorithms, Addison Wesley, Reading Mass, 1974.
2. Burgard, M. J., Dos Unix Networking and Internetworking, J. Wiley, New York, 1994.
3. Date, C. J., An Introduction to Database Systems, Fourth edition, Addison Wesley, Reading Mass, 1986.
4. Horowitz, E. and Sahni, S., Fundamentals of Computer Algorithms, Computer Science Press, Potomac, Maryland, 1978.
5. Ullman, J. D., Principles of Database Systems, Computer Science Press, Potomac, Maryland, 1980.
6. Weiss, M. A., Data Structures and Algorithm Analysis, Benjamin Cummings, New York, 1992.
7. Mashaw, B., Programming Byte by Byte Structures Fortran 77, Little / Brown, Boston, 1983.
8. Rudd, A., Mastering C, John Wiley, New York, 1994.
9. Crandall, R. E., Mathematica for the Sciences, Addison Wesley, Redwood City, California, 1991.

10. Gray, T., and Glynn, J., Exploring Mathematics with Mathematica, Addison Wesley, Redwood City, California, 1991.
11. Maeder, R., Programming in Mathematica, Addison Wesley, Redwood City, California, 1991.
12. Skiena, S., Implementing Discrete Mathematics: Combinatories and Graph Theory with Mathematica, Addison Wesley, Redwood City, California 1990.
13. Wolfram, S., Mathematica: A System for Doing Mathematics by Computer, second edition, Addison Wesley, Redwood City, California, 1991.
14. Artwick, B. A., Applied Concepts in Microcomputer Graphics, Prentice Hall, Englewood Cliffs, New Jersey, 1984.
15. Demel, J. T., and Miller, M. J., Introduction to Computer Graphics, Brookes / Cole Engineering Division, Monterey1984.
16. Escher, M. C., The Graphic Work of M.C. Esher, Ballantine, New York, 1971.
17. Foley, J. D., and Van D., A., Fundamentals of Interactive Computer Graphics, Addison Wesley, Redwood City, California, 19.