# DEPARTMENT OF MATHEMATICS,

# UNIVERSITY OF KARACHI,

## Course Outline

**MATH 646: OPERATIONS RESEARCH – II**

Course contents:

Stochastic process, Markov Chains, Chapman- Kolmogrov Equation, Classification of Markov Chains, long-run Properties, first Passage time, Absorbing states, Continuous time Markov chain.

Inventory models, machine interference problem forecasting techniques. Markovian process. Decision analysis, reliability theory. Renewal process. Queuing theory, ams and graph theory. CPM and PERT theories. Inventory models. Related software application models. Simulations, generation of random numbers. Models for bond analysis yield the maturity, duration immunization and convexity.

**Labs / Drills:**

Network Optimization (Three Cases), Decision Analysis (Two Cases), Queuing Theory (Two Cases),

Inventory Theory (Four Cases).

**Books Recommended:**

1. Saaty, L. S., Mathematical Methods of Operations Research, John Wiley, 1986.
2. Rao, S. S., Optimization Problem, Willey Eastern, New Delhi, 1987.
3. Killier, F. S. and Lieberman, G. J., Operations Research, Holden Day, San Fransisco, Calif,. 1988.
4. Mustafi, C. K., Operations Research, Willey Eastern, New Delhi, 1982.
5. Gupta, P. K. and Hira, D. S., Operations Research S. Chand, New Delhi, 1994.
6. Moder and Elmaghrby, Hand Book of Operation Research Models and Application, Vols 1 and 2, Van Nostrand Renhold, 1982.
7. Taha, S. A., Operation Research, Willey Eastern, New Delhi, 1996.
8. Minkash, T. A., the Optimization Problem, Eastern Publishers, 1992.

9. Loomba, N. P., Management – A quantitative Perspective, Barnch College, City University of New York, 1978.
10. Hiller, F., Introduction to Operational Research, Stanford University, Eighth Edition, 2005