

Department of Mathematics

Faculty of Science

MATH 784 (206784) OPERATIONAL RESEARCH TECHNIQUES II

3(3-0-6)

Prerequisite MATH 783

Course Descriptions :

Inventory control including deterministic and stochastic inventory models. Introduction to dynamic programming. Network analysis, PERT and CPM. Review of stochastic processes, queueing problems and storage systems.

Course Contents

No. of Lecture Hours

1. Review of stochastic process	6
- Introduction	
- Laws of probability	
- Random variables and probability distributions	
- Central limit theorem	
- Stochastic process	
- The Z-transform	
2. Inventory control including deterministic and stochastic model	15
- Definition of the inventory problem	
- Deterministic static model	
- Deterministic dynamic model	
- Production scheduling model	
- Continuous review stochastic model	
- Single and multiple periods stochastic model	
3. Dynamic programming	8
- Dynamic programming model	
- Recursive equation	
- Forward and backward computation	
- Selected dynamic programming application	
- Dimensionality in dynamic programming	
- Solution of linear programming problems by dynamic programming	

4. Network analysis PERT and CPM	8
- Introduction	
- Project management and control	
- Network (arrow) diagram	
- Critical path calculation	
- Total, free and independent floats	
- Time chart and resource levelling	
- Probability consideration	
5. Queueing problem	8
- Basic definition and notations	
- Axiomatic derivation of the arrival and departure distributions for Poisson queues	
- Poisson queueing models	
- Non-Poisson queueing models, queueing decision models	
Total	45