# 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 scheduring model

- Continuous review stochastic model

- Single and multiple periods stochastic model

3. Dynamic programing 8

- Dynamic programing 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