# 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