# Department of Mathematics Faculty of Science

**MATH 773 (206773) STOCHASTIC PROCESSES AND APPLICATIONS 3(3-0-6)  
Prerequisite** MATH 771

**Course Descriptions :**

Discrete and continuous stochastic processes. Markov chains, birth and death processes, branching processes. Applications.

**Course Contents** **No. of Lecture Hours**

1. Basic principles 6

- Introduction and philosophy

- A classic example

- Axiom system and models

- A growth example

2. Deterministic and stochastic process 12

- A discrete model

- Stochastic birth processes

- The logistic equation

- Phase plane of linear systems

3. Predator - prey models 15

- Predator - prey

- The Lotka - Volterra

- Qualitative solution of the Lotka - Volterra equations

- Average populations of predators and preys

- Two competing species

4. Markov chain models 12

- Small group decision making

- Basic properties

- Regular and Ergodic Markov chains

- Absorbing Markov chains

Total 45