# 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