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