**King Saud University**

**College of Science**

**Mathematics Department**

## Syllabus of Math 380: Stochastic Processes (1)

Instructor: Dr Abdulkarem Berkaoui

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Textbook: **Introduction to Probability models. 10th editon by Sheldon Ross.**

Pre-requisites for this course (if any): **Math 280, Stat 215**

**Course Description**

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| 1 Topics to be Covered | | | | | |
| List of Topics | | | No of  Weeks | | Contacthours |
| **Chapter 1: Probability:( Space; random Variable; distributions; Expectation; Conditional Expectations; Independence; Characteristic Function).** | | | **5** | | **15** |
| Chapter 2: Stochastic Process:( Equivalence; Isonomy; examples). | | | **1** | | **3** |
| **Discrete Markov Chains: (Transition Probabilities, Recurrence, Long-term behaviour, examples).** | | | **6** | | **18** |
| **Chapter 3: Continuous time processes: (Poisson Process, Birth-death process; Wiener Process; examples).** | | | **3** | | **9** |
|  | | |  | |  |
| Schedule of Assessment Tasks for Students During the Semester | | | | | |
| Assessment | Assessment task (eg. essay, test, group project, examination etc.) | Week due | | Proportion of Final Assessment | |
| 1 | **First midterm exam.** | 22-02-2016From 10am to 12am | | **25%** | |
| 2 | **Second mid term exam.** | **28-03-2016**  **From 10am to 12am** | | **25%** | |
| 3 | **Homework and tutorial activities** | Over all weeks | | **10%** | |
| 4 | **Final exam** | **By the end** | | **40%** | |

**Exercises**

|  |  |
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| 1 Topics to be Covered | |
| List of Topics | Pages/Numbers |
| **Probability:( Space; random Variable; distributions; Expectation; Conditional Expectations; Independence; Characteristic Function).** | **Pages 15,16,:**  **1,3,4,18,19,21,29,31,33,36,42.**  **Pages 86,87..: 7,8,12,14,20,22,34,35,53,54,59,60,61,62,63.**  **Pages 173,174..:**  **3,11,14,15,17,19.** |
| Stochastic Process:( Equivalence; Isonomy; examples). |  |
| **Discrete Markov Chains: (Transition Probabilities, Recurrence, Long-term behaviour, examples).** |  |
| **Continuous time processes: (Poisson Process, Birth-death process; Wiener Process; examples).** |  |