IAM 530
ELEMENTS OF PROBABILITY ANS STATISTICS

INTRODUCTION

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TOPICS:

1. Introduction to Probability
2. Conditional Probability and Bayes Theorem
3. Random Variable, Probability Mass Function, Probability Density Function, Cumulative Distribution Function.
4. Marginal Distribution Function, Conditional Distribution Function, Joint Distribution Function

5. Expectation of Random Variables, Transformation of Random Variables, Parameter, Statistics.
6. Moment Generating Function, Characteristic Function.
7. Statistical Distributions: Discerete and Continuous Distributions
8. Limiting Distributions and Sampling Distributions
9. Point Estimation Methods (Method of Moments and Maximum Likelihood Estimation Method)

10. Unbiasedness, Consistency, Efficiency and Sufficiency of an estimator

11. Hypothes Testing, Neyman Peaorson Lemma

12. Confidence Intervals

13. Simple Linear Regression Analysis.

14. Multiple Linear Regression Analysis and Assumptions

REFERENCES:

- Introduction to Probability and Mathematical Statistics, 2nd edition, Bain and Engelhardt, 1992.
- Statistical Inference. Second Edition. Casella, G. and Berger, R.L., Thomson Learning, 2002.
- Introduction to Mathematical Statistics, 6th edition, Hogg, McKean and Craig, Prentice Hall, 2005.
- A First Course in Probability, 8th edition, Ross, Sheldon Pearson, 2014.
- John E. Freund's Mathematical Statistics with Applications, 7th edition, Miller, I. and Miller, M., Prentice Hall, 2004.

GRADING:

- Midterm exam (30%)
- Homework (30%)
- Final (40%)