1. **Basic Information**

**Course Title**: Statistics and Random Processes **Code**: ENG 506

**Lecture**: 3 **Tutorial**: 3 **Practical**: - **Total:** 3

**Program on which the course is given:** Master of Science in Engineering Mathematics

**Major or minor element of program:** Major

**Department offering the program:** Department of Engineering Mathematics and Physics

**Department offering the course:** Department of Engineering Mathematics and Physics

**Academic year / level:** Academic year 2014/2015 First semester

**Date of specifications approval:** December 2015

1. **Professional Information**
2. **Overall aims of course**

By the end of the course the students will be able to:

* Use statistical methodology and tools in the engineering problem-solving process.
* Compute and interpret descriptive statistics using numerical and graphical techniques.
* Understand the basic concepts of probability, random variables, probability distribution, and joint probability distribution.
* Compute point estimation of parameters, explain sampling distributions, and understand the central limit theorem.
* Construct confidence intervals on parameters.

1. **Intended Learning outcomes of Course (ILOs)**
2. **Knowledge and Understanding:**

2.1.5 List the principles and fundamentals of probability and statistics

2.1.6 Define the basics and the ethics of random variables and probability distributions.

1. **Intellectual Skills**

2.2.1 Analyze and assess information of random variables

2.2.2 Solve problems of probability distributions.

1. **Professional and Practical Skills**

2.3.2 Write and evaluate professional reports in probability and statistics and its applications

2.3.3 Assess methods and current tools for treating, solving and analyzing practical problems.

1. **General and Transferable Skills**

2.4.2 Use information technology to develop modeling, and analyzing real problems

2.4.8 Conduct self learning and continuous research for recent topics related to this subject

1. **Contents**

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| --- | --- | --- | --- | --- |
| **No** | **Topic** | **No. of hours** | **Teaching / learning methods and strategies** | **Assessment method** |
| 1 | Statistical data and notations | 3 | Lectures Research Assignments | Homework Assignments  Using mathematical programming |
| 2 | Measures of central tendency and dispersion | 3 |
| 3 | Regression analysis | 3 |
| 4 | Probability theory | 3 |
| 5 | Discrete and continuous random variable | 3 |
| 6 | Distributions : Bernoulli ,Binomial ,Normal ,Gamma ,Possion | 3 |
| 7 | T distribution , F distribution and χ2 distribution | 3 |  |  |
| 8 | Mid term exam | 3 |
| 9 | Confidence intervals | 6 |
| 10 | Test of hypothesis | 9 |
| 11 | Correlation coefficients of two random variables | 3 |

1. **Teaching and Learning Methods**
   1. Lectures
   2. Class activity
   3. Case study
   4. Assignments / homework √
2. **Student Assessment Methods**
   1. Homework assignments and others
   2. Quiz to assess student’s creativity and problem assessments.
   3. Final exam to assess understanding and scientific knowledge. 

Assignments to assess 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.3.2, 2.4.2, 2.4.8

Quiz to assess 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.3.3

Mid-term exam to assess 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.3.3

Final exam to assess 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.3.2,

1. **Assessment schedule**

Assessment 1

Assessment 2 Quizzes

Assessment 3 Mid-term exam on week 8

Assessment 4 Final exam on week 15

1. **Weighting of Assessments**

Mid- Term Examination 13%

Final- Term Examination 67%

Oral Examination 00%

Practical Examination 00%

Semester Work 20%

Other 00%

Total 100%

1. **List of References**
   1. Course Notes

* Lecture material and training sheets
  1. Essential Books (Text Books)
* Probability and Statistics Engineering and Management science
* Probability and statistics with reliability
* Queuing and computer science application-KISHORS TRIVEDI
* Miller & Freund’s Probability and Statistics for Engineering seventh edition Richard A.Johnson
  1. Recommended Books
* Modern elementary statistics, Johan. Freund
* Elementary Statistics A step by step Approach, Bluman Fifth Edition, Mc GRAW – Hill International Edition
* Probability and Statistics for Engineers & Scientists, Walpole , Myers ,Ye, Pearson International Edition, Eighth Edition
  1. Periodicals Web sites, etc
* [www.MathematicsResearch.com](http://www.MathematicsResearch.com)
* [www.Google.com](http://www.Google.com)
* [www.probabilityResearch.com](http://www.probabilityResearch.com)

1. **Facilities Required for Teaching and learning**

Data show, Overhead Projector, White board, Prepared notes, Sheets and solving problems.

**Course coordinator:** Ass.Prof. Dr. Saddika A. Abdalla

**Course instructor:** Ass.Prof. Dr. Saddika A. Abdalla

**Head of department:**  **Prof. Dr.** Said Abdallah **Date: 28 / 7 / 2015**