

1. Course name: - Probability & statistics Course
2. Course Description:-

About this course we can understand easily we live in an uncertain and complex world, yet we continually have to make decisions in the present with uncertain future outcomes. Indeed, we should be on the look-out for "black swans" - low-probability high-impact events.

To study, or not to study? To invest, or not to invest? To marry, or not to marry? While uncertainty makes decision-making difficult, it does at least make life exciting! If the entire future was known in advance, there would never be an element of surprise. Whether a good future or a bad future, it would be a known future. In this course we consider many useful tools to deal with uncertainty and help us to make informed (and hence better) decisions - essential skills for a lifetime of good decision-making. Key topics include quantifying uncertainty with probability, descriptive statistics, point and interval estimation of means and proportions, the basics of hypothesis testing, and a selection of multivariate applications of key terms and concepts seen throughout the course.

1. Objectives of the Course:-

Main objective for taking this course is to learn about statistics. To explore my knowledge. To know basics of statistics, with easy to follow and clear examples. This course is for beginners so it was not too much difficult to understand.

2. Course Contents

First week

Dealing with Uncertainty and Complexity in Chaotic World:-

- 1.1 The Monty Hall Problem (9m)
- 1.2 Decision Making Under Uncertainty (10m)
- 1.3 Uncertainty in the News (9m)
- 1.4 Simplicity vs. Complexity - The Need for Models (10m)
- 1.5 Safe to Assume? Beware, When Model Assumptions Go Wrong! (9m)
- 1.6 Roadmap of the Course (9m)
- Week One Summary and Key Takeaways (4m)

6 readings

- 1.1 The Monty Hall Problem (10m)
- 1.2 Decision Making Under Uncertainty (10m)
- 1.3 Uncertainty in the News (10m)
- 1.4 Simplicity vs. Complexity - The Need for Models (10m)
- 1.5 Safe to Assume? Beware, When Model Assumptions Go Wrong! (10m)
- 1.6 Roadmap of the Course (10m)

1 practice exercise

Week One Quiz (20m)

Second week

7 videos (Total 74 min), 6 readings, 1 quiz

7 videos

- 2.1 Probability Principles (13m)
- 2.2 Simple Probability Distributions (11m)
- 2.3 Expectation of Random Variables (13m)
- 2.4 Bayesian Updating (11m)
- 2.5 Parameters (9m)
- 2.6 The Distribution Zoo (11m)
- Week Two Summary and Key Takeaways (4m)

6 readings

- 2.1 Probability Principles (10m)
- 2.2 Simple Probability Distributions (10m)
- 2.3 Expectation of Random Variables (10m)
- 2.4 Bayesian Updating (10m)
- 2.5 Parameters (10m)
- 2.6 The Distribution Zoo (10m)

1 practice exercise

Week Two Quiz (20m)

Week Third

7 videos (Total 78 min), 6 readings, 2 quizzes

7 videos

- 3.1 Classify Your Variables! 11m
- 3.2 Data Visualisation 11m
- 3.3 Descriptive Statistics - Measures of Central Tendency 13m
- 3.4 Descriptive Statistics - Measures of Spread 10m
- 3.5 The Normal Distribution 11m
- 3.6 Variance of Random Variables 13m

Week Three Summary and Key Takeaways 5m

6 readings

- 3.1 Classify Your Variables! (10m)
- 3.2 Data Visualisation 10m
- 3.3 Descriptive Statistics - Measures of Central Tendency 10m
- 3.4 Descriptive Statistics - Measures of Spread 10m
- 3.5 The Normal Distribution 10m
- 3.6 Variance of Random Variables 10m

1 practice exercise

Week Three Quiz

Week four

7 videos (Total 78 min), 6 readings, 1 quiz

7 videos

- 4.1 Introduction to Sampling (12m)
- 4.2 Random Sampling (11m)
- 4.3 Further Random Sampling (12m)

- 4.4 Sampling Distributions (11m)
- 4.5 Sampling Distribution of the Sample Mean (11m)
- 4.6 Confidence Intervals (13m)
- Week Four Summary and Key Takeaways5m

6 readings

- 4.1 Introduction to Sampling (10m)
- 4.2 Random Sampling (10m)
- 4.3 Further Random Sampling10m
- 4.4 Sampling Distributions10m
- 4.5 Sampling Distribution of the Sample Mean10m
- 4.6 Confidence Intervals10m

1 practice exercise

Week Four Quiz

Week five

7 videos (Total 77 min), 6 readings, 2 quizzes

7 videos

- 5.1 Statistical Juries12m
- 5.2 Type I and Type II errors11m
- 5.3 P-values, Effect Size and Sample Size Influences13m
- 5.4 Testing a Population Mean Claim11m
- 5.5 The Central Limit Theorem11m
- 5.6 Proportions: Confidence Intervals and Hypothesis Testing12m
- Week Five Summary and Key Takeaways5m

6 readings

- 5.1Statistical Juries10m
- 5.2 Type I and Type II errors10m
- 5.3 P-values, Effect Size and Sample Size Influences10m
- 5.4 Testing a Population Mean Claim10m
- 5.5 The Central Limit Theorem10m
- 5.6 Proportions: Confidence Intervals and Hypothesis Testing10m

1 practice exercise

Week Five Quiz

Week six

6 videos (Total 71 min), 5 readings, 1 quiz

6 videos

- 6.1 Decision Tree Analysis13m
- 6.2 Risk9m
- 6.3 Linear Regression12m
- 6.4 Linear Programming11m
- 6.5 Monte Carlo Simulation14m
- 6.6 Overview of the Course and Next Steps8m

5 readings

- 6.1 Decision Tree Analysis10m

6.2 Risk10m
6.3 Linear regression10m
6.4 Linear Programming10m
6.5 Monte Carlo Simulation10m

1 practice exercise

Week Six Quiz

3. Learning Methodology used in the course

Lectures: - there was online videos and we have to watch these video. Each video was in 10 to 20 min. time period.

Reading material: - they were providing each topic material.

Quiz: - After classes and reading materials we have to give exam, if we will get 80% or more than 80% then we passed exam, otherwise we have to read again, then give exam again.

4. Key Learnings from the course

I learned many things that is new for me for example Monty hall problem, it is very useful in our life normally we are facing Monty hall problem. From this course I understand how I can increase my win chances. I studied sampling , sample standard deviation, sample median, binomial coefficient, probability function, binomial distribution, poisson distribution, systematic random sampling, cluster sampling etc . The course taught about the basics and that's exactly what I was looking for. I learnt a lot, and so many things which I hear and read, became clearer and more meaningful.