

-STSE111C - Basic Spreadsheettools

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course (Total - 02 Credit)			Prerequisite(s) of the Course (if any)
	Lecture	Practical	Experiential lab	
Basic Spreadsheet tools & STSE111C	0	4	0	Basic Mathematics, Observation & Analytical Skills

Course Outcomes:

- CO-1 Compute the skill of making charts and Pivot tables.
- CO-2 Compute the skill working with different functions.
- CO-3 By studying this course, students will be able to make reports and formatting using spreadsheets and use interpretation to make decisions.

Learning Outcomes: After completion of this course, the students will be able to

- (1) To apply function in Excel tables, formation of Pivot tables and Pivot chart
- (2) By filtering, reordering, summarizing data to generate reports

Unit-1 Basic Excel and functions

(30Hrs)

- Overview of Excel
- Shortcut keys for various functions in Excel
- Working with data and Excel tables
- Basic function, logical functions, and power functions
- Conditional expressions
- Performing calculations on data

Unit: 2 Reports, Formatting, and Basic Data Analysis

(30Hrs)

- Changing workbook appearance
- Focusing on specific data by using filters
- Reordering and summarizing data
- Combining data from multiple sources
- Using PivotTables and Pivot Charts
- Printing worksheets and Charts

References:

1. Graduate Statistics in Excel by Mark Harmon (2011).
2. Statistical Analysis with Excel by Excel for professionals (2002).
3. Step by step Microsoft Excel 2013 by Curtis D. Frye.

Pedagogy:

1. The course is taught using computer to solving problem through examples and exercises.
2. Students are encouraged to use resources available on open sources.

STSE221C Advance Spreadsheet tools

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course (Total - 02 Credit)			Prerequisite(s) of the Course (if any)
	Lecture	Practical	Experiential Lab	
Advance Spreadsheet tools & STSE221C	0	4	0	Basic Mathematics, Observation & Analytical Skills

Learning Objectives:

- CO-1 Compute the skill of formation of Pivot tables, Pivot chart.
- CO-2 Compute data analysis by doing data analysis tools and use interpretation to make decisions.
- CO-3 By studying this course, students will be able to make macros, data analysis and visual basic tasks using spreadsheets

Learning Outcomes: After completion of this course, the students will be able to

- (1) To use macros, pivot table and visual basic task.
- (2) To interpret results using data analysis tool.

Unit-1 Getting the Most from Your Data

(30Hrs)

- Outlining and Grouping Data
- Exploring Scenarios
- Using Data Analysis Tools
- Formatting PivotChart
- Advanced PivotChart Tasks

Unit: 2 Macros, Visual Basic and Excel Programming

(30Hrs)

- Creating a Basic Macro
- Relative Reference Macros
- Visual Basic and Macros
- Advanced Visual Basic Tasks

References:

4. Graduate Statistics in Excel by Mark Harmon (2011).
5. Statistical Analysis with Excel by Excel for professionals (2002).
6. Step by step Microsoft Excel 2013 by Curtis D. Frye.

SKILL ENHANCEMENT COURSE

STSE331C Statistical analysis using JAMOVI software

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course (Total - 02 Credit)			Prerequisite(s) of the Course (if any)
	Lecture	Practical	Experiential lab	
Statistical analysis using JAMOVI software &STSE331C	0	4	0	Basic Mathematics, Observation & Analytical Skills

Course Outcomes:

- CO-1 Gain familiarity with statistical concepts and techniques commonly used in data analysis.
- CO-2 Learn how to import data from various sources into Jamovi, such as spreadsheets or statistical software formats.
- CO-3 Understand how to manipulate data within Jamovi, including sorting, filtering, and recoding variables.
- CO-4 Learn to calculate and interpret descriptive statistics, such as mean, median, standard deviation, and frequencies.
- CO-5 Gain proficiency in creating visualizations, including histograms, scatter plots, bar charts, and box plots, to explore and present data effectively.

Learning Outcomes: After completion of this course, the students will be able to

- (1) Efficiently navigate the Jamovi user interface, accessing various tools and features for data analysis.
- (2) Calculate and interpret descriptive statistics to summarize and understand the characteristics of datasets.
- (3) Generate a variety of visualizations, including histograms, scatter plots, bar charts, and box plots, to explore data and communicate findings effectively.

Unit-I: Introduction to Jamovi

(12Hrs)

- Introduction and Features of Jamovi
- Navigating and Understanding User interface (UI)
- Types of Data, Measurements of Scale
- Entering data, Importing data, Wrangling data
- Computing means, Computing z-scores
- Transforming variables
- Computing variables
- Filtering cases

Unit-II: Descriptive data analysis**(18Hrs)**

- Measures of central tendency
- Measures of Dispersion
- Exporting tables and plots
- Frequency distribution
- Normality test
- Categorical data analysis
- Tabulation, Frequency tables, Contingency tables
- Descriptive summary

Unit-III: Presentation of Data**(10Hrs)**

- Simple Bar diagram
- Multiple bar diagram
- Sub-divided Bar diagram
- Line chart
- Pie Diagram
- Histogram
- Scatter diagram
- Box plot
- Violin chart

References:

1. "Discovering Statistics Using Jamovi" by Andy Field, Jeremy Miles, and Zoë Field.
2. "Statistics with Jamovi for Dummies" by Greg Fox and Michael Mitchell.
3. "Introduction to Statistics: A Hands-on Approach with Jamovi" by Robert V. Hogg, Elliot A. Tanis, and Dale Zimmerman.

Pedagogy:

1. The course is taught using computer to solving problem through examples and exercises.
2. Students are encouraged to use resources available on open sources.

SKILL ENHANCEMENT COURSE

STSE441O - Statistical data analysis using R

SWAYAM PORTAL –

https://onlinecourses.swayam2.ac.in/e-learning/course/ini26_ma05

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course (Total - 02 Credit)			Prerequisite(s) of the Course (if any)
	Lecture	Practical	Experiential lab	
Statistical data analysis using R & STSE441O	0	4	0	Basic Mathematics, Observation & Analytical Skills

Course Outcomes:

- CO-1 Understand the basics of inferential statistics, including hypothesis testing, confidence intervals, and p-value.
- CO-2 Learn to perform common statistical tests, such as t-tests, correlation, regression, chi-square tests, and non-parametric tests.
- CO-3 Develop skills in interpreting statistical results and making informed conclusions based on analysis outcomes.
- CO-4 Learn how to generate reports and export results, tables, and charts for presentations or publications.

Learning Outcomes: At the end of this course students are expected to be able-

1. Understand and apply basic inferential statistics techniques such as hypothesis testing, confidence intervals, and p-value.
2. Conduct common statistical tests such as t-tests, correlation, regression, chi-square tests, and non-parametric tests to analyze relationships and differences within data.
3. Interpret the results of statistical analyses accurately, drawing meaningful insights and conclusions based on the findings.
4. Generate comprehensive reports summarizing analysis procedures and results, and export tables, charts, and data for further analysis or presentation purposes.
5. Apply learned skills in statistical analysis to various domains, including academic research, business analytics, healthcare, and social sciences.

Unit 1: Introduction to R

(04Hrs)

- Installation and Introduction to R-studio and R-markdown
- Concept of vector, matrices and arrays in R
- Import and export of data

Unit 2: Descriptive Statistics (12Hrs)

- High level graphic functions
- Low level graphic functions
- Measures of central tendency
- Measure of dispersion

Unit 3: Probability and Probability distributions (18Hrs)

- Introduction to probability models in R
- Discrete probability distribution
- Continuous probability distribution

Unit 4: Correlation and Regression (06Hrs)

- Linear regression model
- Logistic regression model
- Multiple regression model

References:

1. Dalgaard, P. (2008). Introductory Statistics with R. New York: Springer. ISBN: 978-0-387-79053- 4
2. Braun, W.J. and Murdoch, D.J. (2021) A First Course in Statistical Programming with R. Cambridge University Press, Cambridge.
3. Ismay, C., & Kim, A. Y. (2019). Statistical inference via data science: a Modern Dive into R and the tidyverse. Chapman and Hall/CRC
4. Wickham, H., Çetinkaya-Rundel, M., & Grolemund, G. (2023). R for data science: import, tidy, transform, visualize, and model data. " O'Reilly Media, Inc."

Pedagogy:

1. The course is taught using computer to solving problem through examples and exercises.
2. Students are encouraged to use resources available on open sources.

STSE551O Foundations of R software

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course (Total - 04 Credit)			Eligibility Criteria	Prerequisite(s) of the Course (if any)
	Lecture	Practical	Experiential Lab		
Foundations of R software & STSE551O	0	4	0	10 + 2 from a recognized board in any stream	Basic Mathematics, Observation & Analytical Skills

Course Outcomes:

CO-1 Demonstrate the skills to use data type and different function using R.

CO-2 Demonstrate the skills of diagrams using R-programming.

CO-3 Identify the need and application of measures of central tendency, dispersion, skewness and kurtosis using R-programming.

CO-4 Apply the skill of drawing various graphs using R- programming

Co-5 Apply the skill of draw and fit a probability distribution and test a hypothesis.

I. Course Content:

https://onlinecourses.nptel.ac.in/noc24_ma95/preview