

Office: 0480 2825258

Email: office@christcollegeijk.edu.in

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CRITERION	II	Teaching-Learning and Evaluation
KEY INDICATOR	2.3	Teaching - Learning Process
METRIC	2.3.1	Student-centric methods such as experiential learning, participative learning and
		problem-solving methodologies are used for enhancing learning experiences:

DEPARTMENT OF STATISTICS(ACADEMIC YEAR 2022-2023)

Introduction

In the dynamic landscape of higher education, the adoption of student-centric methods has become imperative for institutions committed to providing a holistic and enriching learning experience. Student-centric approaches plays a very significant role in shaping a learning environment that caters to the diverse needs and aspirations of students. Three key student-centric methodologies are—Experiential Learning, Participative Learning, and Problem-Solving Methodologies—and their transformative impact on education.

Experiential learning is an educational approach that engages students in direct experiences, encouraging reflection and the application of knowledge to real-world situations. It includes different methods like internships, field trips, making of products, fests, simulation etc. Participative learning involves active involvement and engagement of students in the learning process, fostering collaboration, discussion, and shared exploration. It includes activities like debates, seminars, group discussions, interactive workshops and so on. Problem-solving methodologies involve teaching students' systematic approaches to address complex issues, emphasizing critical thinking and analytical skills.

Department of Statistics conduct innovative programs which stimulate the creative ability of students and provide them a platform to nurture their problem-solving skills and ensure participative learning.



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SI No 2.3.1	Participative Learning 2.3.1(A)	Experiential Learning 2.3.1 (B)	Problem-Solving Method 2.3.1 (C)
1.	Quiz Competition	Workshop on "R- Programming for data analysis"	Projects
2.	Seminar presentation		

Experiential Learning - Hands on Workshop on "R-Programming for data analysis"

Programme Objectives:

- To develop programming skills
- Enables to analyses statistical data

Programme Report:

The Department of statistics jointly with IQAC organized a three day workshop on R-programming for data analytics. The workshop took place on 27-29 Feb and 1st Mar 20, 2023at Fr. DISMAS LAB with the objective to introduce R programming to PG students and research scholars. 18 PG students and 3 research scholars attended the workshop.



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Programme attained Outcome:

- 1. Students got a picture about how to do analysis using by R programming
- 2. Students got a picture about how to do statistical analysis.

Brochure



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List of Participants







			Hands on Workshop C		
		R PROGRAMMI	NG FOR DATA AN	ALYSIS	
te:	28-02-	2023 (Afternoon)			
SI.	CI.			Year of	
No.	No	Name	Department	Study	Signature
1	-	Amrutha Suresh	Environmental Science	2021-23	Andri
2	-	Archana M	Environmental Science	Res. Scholar	Balance
3		Ashin Saji	Environmental science	2021-23	Ash -
4		Aswathy K V	Environmental Science	2021-23	Quelip-
5		Augnes Jose	Zoology	2021-23	adagran
6		Chandni Shashi Menon	Environmental science	2021-23	thandent
7		Christy M B	Environmental science	2021-23	Thinks
8		Deneetta Francis	Environmental science	2021-23	D. Th
9		Devika Surendran T	Zoology	2021-23	Day.
10		Devika.K	Environmental science	2021-23	There
11		Emil Sabu	Environmental Science	2021-23	
12		Ganashyam.T.S	Environmental science	2021-23	Lyles
13		Greeshma C B	Environmental Science	2021-23	Shar a
14		Haritha D S	Environmental Science	Res. Scholar	lake
15		Indra Sasikumar	Environmental Science	2021-23	Charge firence
16		Krishnapriya P G	Environmental science	2021-23	Kerebook
17		Manu Simon	Environmental Science	2021-23	Maria
18		Muhammad Suhail V. A.	Environmental Science	2021-23	Julan -
19		Shehanaz U	Environmental Science	Res. Scholar	25
20		Vivek Chandran A	Environmental Science	Res. Scholar	John -
21		Williams Raphael	Environmental science	2021-23	Millian



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		Christ Co Irinjal Three Day	ENT OF STATISTI bllege (Autonomous akuda, Kerala 680125 Hands on Workshop C) On	
		R PROGRAMMI	NG FOR DATA AN	ALYSIS	
ate:	01-03-	2023 (Forenoon)			
SI.	Cl.			Year of	1
No.	No.	Name	Department	Study	Signatur
1	4	Amrutha Suresh	Environmental Science	2021-23	A sules
2		Archana M	Environmental Science	Res. Scholar	OBC TOTAL
3		Ashin Saji	Environmental science	2021-23	Ach: -
4		Aswathy K V	Environmental Science	2021-23	Quility.
5		Augnes Jose	Zoology	2021-23	a kapul
6		Chandni Shashi Menon	Environmental science	2021-23	Cl makes
7		Christy M B	Environmental science	2021-23	THAT
8		Deneetta Francis	Environmental science	2021-23	D. H
9		Devika Surendran T	Zoology	2021-23	Deul.
10		Devika.K	Environmental science	2021-23	Bent
11		Emil Sabu	Environmental Science	2021-23	-
12		Ganashyam.T.S	Environmental science	2021-23	- Just
13		Greeshma C B	Environmental Science	2021-23	Quest
14		Haritha D S	Environmental Science	Res. Scholar	Cui
15		Indra Sasikumar	Environmental Science	2021-23	Girdon
16		Krishnapriya P G	Environmental science	2021-23	Vistor
17		Manu Simon	Environmental Science	2021-23	Mastrus
18		Muhammad Suhail V. A	Environmental Science	2021-23	Sulviv
19		Shehanaz U	Environmental Science	Res. Scholar	Ship
20		Vivek Chandran A	Environmental Science	Res. Scholar	Villed
21		Williams Raphael	Environmental science	2021-23	William



Participative Learning1 - Quiz Competition

Programme Objectives:

- To improve statistical literacy
- To encourage critical thinking and problem-solving skills in analyzing data

Programme Report

An inter collegiate Quiz competition was organized by the department in connection with the Moments: The Fest of Stat.The Quiz competition was led by Dr.Davis Antony Mundassery. Coordinator of the department. There was a total of 24 teams participating in the competition.

The competition started with a preliminary round. After elimination 7 teams entered into the final round. In final round there were 7 rounds; The winners were John Tony and Johny Thomson, 2nd year statistics students from St. Thomas College(Autonomous)Thrissur. The Second prize goes to Mervin Dennis and Viswanad A.S. 2nd year Mathematics students from Christ College(Autonomous)Irinjalakuda. The First prize is Rs.2500 and the second prize Rs. 2000



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Programme attained Outcome:

- 1. Students got a picture about the questions appearing in a competitive exam of statistics
- 2. Students' leaders got an idea about the mode of competitive exams

Brochure







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https://drive.google.com/file/d/1rUx WCNr39krIhIzJHTzWH9WdG3tLxxT/view?usp=share link

Participative Learning 2 - Seminar presentation

Program Objectives

- 1. Discuss Properties and Characteristic various distributions
- 2. Examine Non-parametric Distribution

Programme Report:

Introduction: The seminar on distribution theory in statistics aimed to provide participants with a comprehensive understanding of probability distributions, their properties, and their applications in various fields. The session covered fundamental concepts, explored different types of



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distributions, discussed advanced topics, and engaged participants in discussions and activities to enhance learning.

Presentation Content:

- 1. **Introduction to Distribution Theory:** The seminar began with an overview of distribution theory, emphasizing the importance of probability distributions in statistical analysis. Basic concepts such as random variables, probability density functions, and cumulative distribution functions were introduced to lay the foundation for further exploration.
- 2. **Types of Probability Distributions:** The presentation covered a range of probability distributions, including:
 - Normal Distribution
 - Binomial Distribution
 - Poisson Distribution
 - Exponential Distribution
 - Gamma Distribution
 - Weibull Distribution
 - Beta Distribution
 - Lognormal Distribution

Each distribution was discussed in terms of its characteristics, properties, and real-world applications. Examples and visualizations were used to illustrate the shapes and behaviors of different distributions.

- 3. **Properties and Applications:** The seminar delved into the properties of probability distributions, such as mean, variance, skewness, and kurtosis, and their implications for statistical analysis. Participants learned how to interpret these properties and apply them in various contexts, including hypothesis testing, estimation, and modeling.
- 4. **Advanced Topics:** Advanced topics in distribution theory were also addressed, including:
 - Multivariate Distributions
 - Copulas
 - Mixture Distributions
 - Extreme Value Theory



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These topics provided participants with insights into complex distributions and their applications in areas such as finance, engineering, and environmental science.

5. **Interactive Sessions:** Throughout the seminar, interactive sessions were conducted to engage participants actively. Group discussions, case studies, and hands-on activities allowed participants to apply their knowledge and collaborate with peers.

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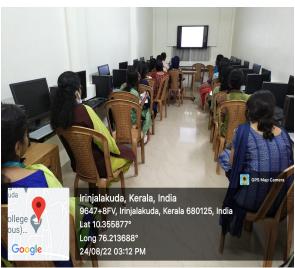
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Problem solving Learning - Project

Program Objectives

- Application of Statistical Techniques
- Problem-Solving Skills
- Data Analysis Proficiency
- Interdisciplinary Learning
- Research Skills Development

Report

In M.Sc. Statistics programs, projects serve as the cornerstone of experiential learning, offering students a dynamic platform to apply theoretical concepts in practical settings. These projects provide a hands-on approach to exploring the intricate world of statistics, empowering students to delve into real-world data, analyze complex problems, and derive meaningful insights. By immersing themselves in projects, M.Sc. Statistics students embark on a journey of discovery, innovation, and professional growth, honing their analytical skills, fostering critical thinking, and preparing them for successful careers in academia, industry, or research. In this introduction, we



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delve into the significance of projects in M.Sc. Statistics programs, highlighting their role in enhancing learning outcomes, promoting interdisciplinary collaboration, and contributing to the advancement of statistical knowledge. Through projects, students not only gain practical experience but also develop a deeper appreciation for the relevance and impact of statistics in addressing contemporary challenges across various domains.

List of Students

Sl.No	Name	Project Topics
1	Anitta Baby	Statistical analysis using multinomial logistic regression
2	Meenu C S	Statistical analysis on global carbon dioxide emission
3	Helda Edison	Artificial neural network in machine learning
4	Aswathy Jayaraj	Forecasting of rainfall in Kerala and outbreak of dengue incidence
5	Kavya R Nair	Comparison of logistic regression and random forest models for prediction of heart attack
6	Anila Benny	A study on stock market value of TCS group
7	Shahana V M	Effect of Covid-19 on Indian auto sales using time series analysis
8	Sheethal Anna Sabu	Study on mental health of businessmen or entrepreneurs during Covid-19 pandemic in Kerala

Programme Outcomes

1. Model Development and Estimation:

• Time Series Analysis: Develop and estimate a suitable time series model (e.g., ARIMA, SARIMA) to capture the underlying patterns and dynamics in the data, such as trends, seasonality, and autocorrelation.



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• Regression Analysis: Develop and estimate a regression model to explore the relationships between the dependent variable and one or more independent variables, estimating the coefficients of the model.

2. Prediction and Forecasting:

- Time Series Analysis: Use the fitted time series model to generate forecasts of future values, providing insights into future trends, seasonal patterns, and potential fluctuations.
- Regression Analysis: Utilize the regression model to make predictions or forecasts of the dependent variable's values based on the values of the independent variables, enabling informed decision-making and planning.

3. Model Evaluation and Validation:

- Time Series Analysis: Evaluate the forecasting accuracy of the time series model using metrics such as mean absolute error (MAE), root mean squared error (RMSE), or forecast accuracy measures.
- Regression Analysis: Assess the goodness of fit of the regression model by evaluating metrics such as R-squared, adjusted R-squared, or other model fit statistics, ensuring the model adequately captures the variability in the data.

4. Interpretation and Communication of Results:

- Time Series Analysis: Interpret the forecasted values and patterns identified by the time series model, communicating insights and implications to stakeholders effectively.
- Regression Analysis: Interpret the estimated coefficients and relationships between variables in the regression model, explaining how changes in the independent variables impact the dependent variable and providing actionable insights.



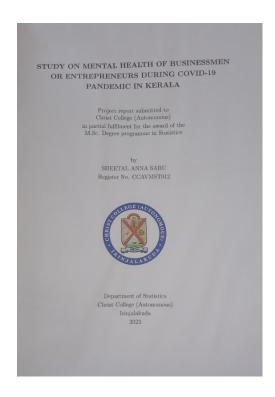
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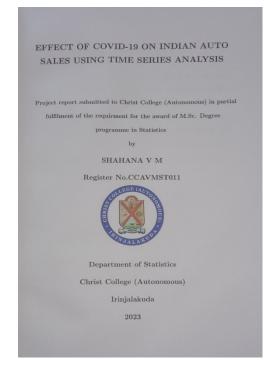
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Supporting Documents





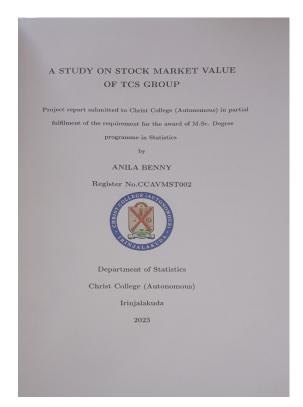


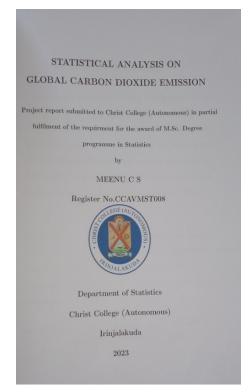
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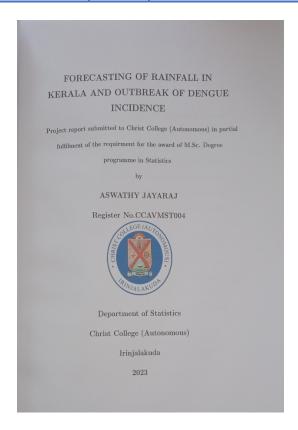


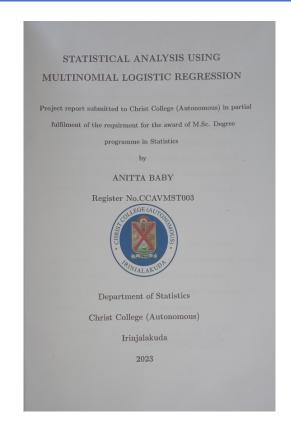
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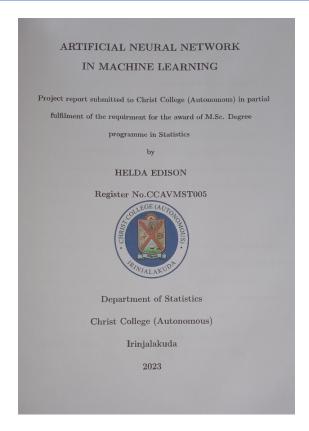


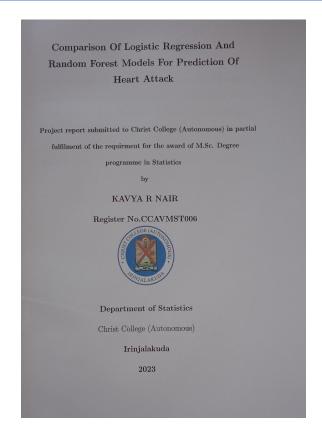
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PRINCIPAL

Fr. Dr. Jolly Andrews
Associate Professor In-Charge of Principal
Christ College (Autonomous)
Irinjalakuda