

Programme Matrix: Bachelor of Science – Statistics, Mathematics [2023 Batch]



Kristu Jayanti College

AUTONOMOUS Bengaluru

Reaccredited 'A++' Grade by NAAC | Affiliated to Bengaluru North University

FACULTY OF SCIENCES

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Programme Outcomes

After successful completion of B.Sc. honours in Statistics and Mathematics, a student will be able to:

PO1: integrate scientific temper; spirit of enquiry, humanism and reform

PO2: apply scientific knowledge and skills ethically for societal development and entrepreneurship

PO3: design, execute and interpret the results of experiments in Statistics and Mathematics involving programming concepts, mathematical foundation and visualisations techniques

PO4: develop critical thinking, mathematical modelling and logical reasoning skills to solve real-life problems.

PO5: acquire coherent understanding of the academic field of Statistics and its different learning areas and applications.

PO6: analyse research projects by using research skills- preparation of questionnaire, conducting national sample survey, research projects using sample survey, sampling techniques.

PO7: Plan and execute Statistical experiments or investigations, analyse and interpret data/information collected using appropriate methods, including the use of appropriate statistical software including programming languages, and report accurately the findings of the experiment/investigations.

Date of Approval: 10/2/2023

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FACULTY OF SCIENCE
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K. Narayanapura, Kothanur PO
Bengaluru - 560077



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I Semester			
Course Type	Course Code	Course Title	Course Outcomes
DSC	21STS2T411	Descriptive Statistics	<ol style="list-style-type: none"> 1. Acquire knowledge of introductory statistics, its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc 2. Categorize various types of data and their organization, formulate evaluation of summary measures such as measures of central tendency and dispersion etc 3. Perceive the knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations 4. Identify different types of data reflecting independence and association between two or more attributes.
DSC	21STS2L211	Descriptive Statistics Practical	<ol style="list-style-type: none"> 5. Acquire knowledge of introductory statistics, its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc 6. Categorize various types of data and their organization, formulate evaluation of summary measures such as measures of central tendency and dispersion etc 7. Perceive the knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations 8. Identify different types of data reflecting independence and association between two or more attributes.
DSC	21UMT2T411	Algebra I and Calculus I	<ol style="list-style-type: none"> 1. Evaluate rank and inverse of a matrix using elementary transformations 2. Solve the system of homogeneous and non-homogeneous linear m equations in variables by using concept of rank of matrix, finding eigen values and eigen vectors 3. Formulate pedal equation, derivatives of arc, curvature, asymptote, evolute, envelope of curves in Cartesian, polar and pedal forms 4. Apply the concepts of limits, continuity, differentiability and intermediate value theorems, Taylor's, Maclaurin's series and L'Hospital rule 5. Construct nth derivative of $(z)=uv$ using Leibnitz's Theorem and of standard functions.
DSC	21UMT2L211	Algebra I and Calculus I Practical	<ol style="list-style-type: none"> 1. Execute problems on algebra theory using FOSS software 2. Execute problems on calculus theory using FOSS software 3. Compare and relate the programs and solutions obtained through direct method of problems on algebra through FOSS 4. Compare and relate the programs and solutions obtained through direct method of problems on calculus through FOSS.
AECC	22ENG1T312	Musings in English Literature	<ol style="list-style-type: none"> 1. Articulate the relevant issues of society through the imbibed knowledge of prose 2. Identify and appreciate nuances of poetry 3. Implement the basic concepts of grammar and its usage.

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AECC	21KANIT312	Saahithya Sangama I	<p>1: ಸಾಹಿತ್ಯದಲ್ಲಿ ಅಡಗಿರುವ ವಿವಿಧ ನಾಪಾಜಿಕ ಮೌಲ್ಯ ಮತ್ತು ಜವಾಬ್ದಾರಿಗಳನ್ನು ಅರಿಯುವರು.</p> <p>2: ಭಾಷಾ ಕೌಶಲವನ್ನು ಅಭಿವೃದ್ಧಿ ಪಡಿಸಿಕೊಳ್ಳುವರು.</p> <p>3: ವಿದ್ಯಾರ್ಥಿಗಳು ತಮ್ಮ ಜೀವನದ ಸೃಜನಶೀಲತೆಯ ಮಹತ್ವವನ್ನು ಚರ್ಚಿಸುವರು.</p> <p>4: ಹದಿಹರೆಯ ವಯಸ್ಸಿನ ಸಮಸ್ಯೆಗಳು ಹಾಗೂ ಪರಿಹಾರಗಳನ್ನು ವಿಶ್ಲೇಷಿಸುವರು.</p>
AECC	21HINIT312	Hindi Kahani aur Prayajanmulak Hindi	<p>1: हिन्दी कहानी विधा का ज्ञान ग्रहण करने की क्षमता का विकास।</p> <p>2: विद्यार्थियों में सामाजिक यथार्थ और मुल्यांकन करने का विकास।</p> <p>3: विद्यार्थियों में कहानी विधा का वर्णन करने की क्षमता का विकास।</p> <p>4: विद्यार्थियों में कहानी का विश्लेषण और भाषा कौशल में प्रवीणता।</p>
AECC	22AENIT311	Listening and Comprehension in English	<p>1. identify the barriers to listening and describe the key components that contribute to effective listening</p> <p>2. use their grammatical knowledge to refine their speech and writing</p> <p>3. analyse complex human situations and challenges that emerge from the prescribed texts.</p>

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II Semester			
Course Type	Course Code	Course Title	Course Outcomes
DSC	21STS2T421	Probability and Distributions	<ol style="list-style-type: none"> 1. Perceive the concept of basic probability and its terminologies. Simultaneously, learn the concept of conditional probability including the concept of Bayes' Theorem 2. Understand the calculation concept of univariate and bivariate random variables 3. Identify the characteristics of discrete distributions- binomial, Poisson, negative binomial, geometric, hyper geometric and continuous distribution- normal 4. Apply simulation techniques to generate random samples for uniform, Poisson. Binomial and normal distributions and descriptive statistics problems are solved using R programming.
DSC	21STS2L221	Probability and Distributions Practical	<ol style="list-style-type: none"> 1. Perceive the concept of basic probability and its terminologies 2. Understand the calculation concept of univariate and bivariate random variables 3. Identify the characteristics of discrete distributions- binomial, Poisson, negative binomial, geometric, hyper geometric and continuous distribution- normal 4. Apply simulation techniques to generate random samples for uniform, Poisson, binomial and normal distributions and descriptive statistics problems are solved using R.
DSC	21UMT2T421	Algebra II and Calculus II	<ol style="list-style-type: none"> 1. Recognize the basic theorems and techniques of real analysis 2. Explain the significance of groups, subgroup, cosets, factor groups and related theorems 3. Evaluate partial derivatives of algebraic and transcendental functions 4. Determine the Taylor's and Maclaurin's series and extreme values of functions of two variables 5. Solve problems on line, double and triple integral.
DSC	21UMT2L221	Algebra II and Calculus II Practical	<ol style="list-style-type: none"> 1. Execute problems on algebra theory using FOSS software 2. Execute problems on calculus theory using FOSS software 3. Compare and relate the programs and solutions obtained through direct method of problems on algebra through FOSS 4. Compare and relate the programs and solutions obtained through direct method of problems on calculus through FOSS.
AECC	22ENG1T322	Glimpses: Readings from English Literature	<ol style="list-style-type: none"> 1. Identify the themes and relevant issues through the study of prose and poetry 2. Develop the skill to identify the pertinent themes and characters in the novel 3. Implement new approaches in speaking and writing skills.

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AECC	21KANIT322	Saahithya Sangama II	<p>1: ಸಾಹಿತ್ಯದಲ್ಲಿ ವ್ಯಕ್ತವಾಗಿರುವ ಮಾನವೀಯ ಮೌಲ್ಯಗಳನ್ನು ಅರಿಯುವರು.</p> <p>2: ಸಾಹಿತ್ಯದಲ್ಲಿ ಅಡಗಿರುವ ಸಾಮಾಜಿಕ ಮೌಲ್ಯಗಳನ್ನು ಅರಿಯುವರು.</p> <p>3: ಯುದ್ಧದಿಂದಾಗುವ ಅನಾಹುತಗಳನ್ನು ಅರಿಯುವರು.</p> <p>4: ಮಾನ್ಯವಿಲ್ಲದ ಜಾತಿ ಬೇಧಭಾವಗಳ ಬಗ್ಗೆ ಅರಿಯುವರು.</p> <p>5: ಜೀವನ ಕೌಶಲವನ್ನು ಅಭಿವೃದ್ಧಿ ಪಡಿಸಿಕೊಳ್ಳುವರು.</p>
AECC	21HINIT322	Hindi Kavitha aur Anuvaad Koushal	<p>1: हिन्दी कविता का विश्लेषण एवं समझने की योग्यता का विकास।</p> <p>2: विद्यार्थियों में सामाजिक यथार्थ और मूल्यांकन करने का विकास।</p> <p>3: कविता में वर्णित कथा का वर्णन एवं काव्य सृजन करने का विकास।</p> <p>4: अनुवाद एवं भाषा कौशल में प्राविण्यता।</p>
AECC	22AENIT321	Conversation Practice in English	<p>4. Identify the barriers to listening and describe the key components that contribute to effective listening</p> <p>5. Use their grammatical knowledge to refine their speech and writing</p> <p>6. Analyse complex human situations and challenges that emerge from the prescribed texts.</p>
AECC	21EVSIT321	Environmental Studies	<p>4. Understand the concept of Environment and ecosystems</p> <p>5. Gain knowledge on various components controlling the stability of ecosystem</p> <p>6. Understand the Policies and laws pertaining to the welfare of life forms.</p>

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III Semester			
Course Type	Course Code	Course Title	Course Outcomes
DSC	21STS2T431	Calculus and Probability Distributions	<ol style="list-style-type: none"> 1. Understand how the Central Limit Theorem describes the shape, center, and spread of sampling distributions of sample statistics; and the statement of law of large numbers 2. Identify the characteristics of different continuous distributions and apply selected probability distributions to solve problems in real world events 3. Perceive the concept of random samples, parameter, and statistics; obtain the sampling distribution of mean and variance and understand the details of important sampling distributions, namely chi-square, Student -t, and Snedecor's F-distributions 4. Apply simulation technique to generate random samples from Uniform, Poisson, Binomial and Normal and Cauchy distributions.
DSC	21STS2L231	Calculus and Probability Distributions Practicals	<ol style="list-style-type: none"> 1. Understand how the Central Limit Theorem describes the shape, center, and spread of sampling distributions of sample statistics; and the statement of law of large numbers 2. Identify the characteristics of different continuous distributions and apply selected probability distributions to solve problems in real world events 3. Perceive the concept of random samples, parameter, and statistics and obtain the sampling distribution of mean and variance 4. Apply simulation technique to generate random samples from Uniform, Poisson, Binomial and Normal and Cauchy distributions.
DSC	21UMT2T431	Ordinary Differential Equations and Real Analysis I	<ol style="list-style-type: none"> 1. Apply the concept of differential equation and solve first order linear and homogeneous differential equations 2. Evaluate and apply second and higher order differential equations 3. Define sequence, examine the boundedness and apply the properties to test convergence of a sequence 4. Define series and implement different test to examine convergence of series.
DSC	21UMT2L231	Ordinary Differential Equations and Real Analysis I Practical	<ol style="list-style-type: none"> 1. Execute ODE problems using FOSS software 2. Execute a program to find the complementary function for the ordinary linear differential Equation 3. Execute a program to find the solution of ordinary linear differential equation using FOSS software 4. Verify for convergence and divergence of a sequence using FOSS software 5. Verify for convergence and divergence of a series using FOSS software.
AECC	21ENG1T332	Symphony of English Literature	<ol style="list-style-type: none"> 1. Identify the themes and relevant issues through the study of prose and poetry 2. Develop the skill to identify the pertinent themes and characters in the novel 3. Implement new approaches in speaking and writing skills.

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AECC	21KANIT332	Saahithya Sangama III	<p>1: ಸಾಹಿತ್ಯದಲ್ಲಿ ಅಡಗಿರುವ ವಿವಿಧ ಸಾಮಾಜಿಕ ಮೌಲ್ಯ ಮತ್ತು ಜವಾಬ್ದಾರಿಗಳನ್ನು ಅರಿಯುವರು.</p> <p>2: ಭಾಷಾ ಕೌಶಲವನ್ನು ಅಭಿವೃದ್ಧಿ ಪಡಿಸಿಕೊಳ್ಳುವರು.</p> <p>3: ವಿದ್ಯಾರ್ಥಿಗಳು ತಮ್ಮ ಜೀವನದ ವರ್ತಮಾನದ ಘಟನೆಗಳ ಕುರಿತು ಚರ್ಚಿಸುವರು.</p> <p>4: ಹದಿಕರೆಯ ವಯಸ್ಸಿನಲ್ಲಿ ಅರಿಯಬೇಕಾಗಿರುವ ಶಾಂತಿ-ಸೌಹಾರ್ದತೆಯ ಕುರಿತು ವಿಶ್ಲೇಷಿಸುವರು.</p> <p>5: ಜೀವನದಲ್ಲಿ ಮಾನವನು ಬೆಳೆಸಿಕೊಳ್ಳಬೇಕಾದ ಬಹುಮುಖ್ಯ ಆದರ್ಶ, ತತ್ವಗಳ ಕುರಿತು ಚರ್ಚಿಸುವರು.</p>
AECC	21HINIT332	Hindi Natak Sahitya aur Sanchar Maadhyam evam Hindi	<p>1: हिन्दी नाटक विधा को समझना और अभिनय करने की योग्यता का विकास।</p> <p>2: विद्यार्थियों में सामाजिक यथार्थ और मुल्यांकन करने का विकास।</p> <p>3: नाटक लेखन और पठन में रुचि एवं सृजनात्मक कौशल्य का विकास।</p> <p>4: संचार माध्यम कला में प्राविण्यता।</p>
AECC	21AENIT331	Essential English Reading	<p>1. Recognize the techniques of effective reading and demonstrate their competence in comprehension.</p> <p>2. Articulate their thoughts and structure written compositions as needed in official contexts</p> <p>3. Formulate their responses to contemporary challenges that emerge from the prescribed texts.</p>

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IV Semester			
Course Type	Course Code	Course Title	Course Outcomes
DSC	21STS2T441	Statistical Inference I	<ol style="list-style-type: none"> 1. Understand the properties of unbiasedness, consistency, efficiency and sufficiency of estimators and obtain the estimators for unknown parameters 2. Construct confidence intervals for means, difference of mean, proportions, difference of proportions, variance, and ratio of variances 3. Perceive the concepts of statistical hypothesis and analyze type I error, type II error and power of test 4. Relate to test of significance for means, difference of mean, proportions, difference of proportions.
DSC	21STS2L241	Statistical Inference I Practical	<ol style="list-style-type: none"> 1. Formulate point estimators using maximum likelihood method and method of moments. 2. Construct confidence intervals for means, difference of mean, proportions, difference of proportions, variance, and ratio of variances. 3. Calibrate type I error, type II error and power of test and Design MP test for mean of normal distribution, parameters of binomial and Poisson distributions. 4. Develop test of significance for means, difference of mean, proportions, difference of proportions, variance, ratio of variances, correlation coefficients
DSC	21UMT2T441	Partial Differential Equations and Integral Transforms	<ol style="list-style-type: none"> 1. Solve partial differential equation of first order using charpit's method and second order using complementary function and particular integral 2. Evaluate Fourier series 3. Apply properties of Fourier transforms 4. Evaluate Laplace transforms and inverse Laplace transforms.
DSC	21UMT2L241	Partial Differential Equations and Integral Transforms Practical	<ol style="list-style-type: none"> 1. Execute problems on PDE using FOSS software. 2. Execute problems on Laplace Transforms using FOSS software. 3. Acquire knowledge of applications of algebra and calculus through FOSS
AECC	21ENGIT342	Ruminations of English Literature	<ol style="list-style-type: none"> 1. Articulate the relevant social issues and thematic representation in prose and poetry 2. Analyse the characters, plot, setting and themes of novel 3. Acquire vital employability skills and employment opportunities with in-depth knowledge of writing skills.
AECC	21KANIT342	Saahithya Sangama IV	<ol style="list-style-type: none"> 1: ಸಾಹಿತ್ಯದಲ್ಲಿ ಅಡಗಿರುವ ವಿವಿಧ ಸಾಮಾಜಿಕ ಮೌಲ್ಯ ಮತ್ತು ಜವಾಬ್ದಾರಿಗಳನ್ನು ಅರಿಯುವರು. 2: ಭಾಷಾ ಕೌಶಲವನ್ನು ಅಭಿವೃದ್ಧಿ ಪಡಿಸಿಕೊಳ್ಳುವರು. 3: ವಿದ್ಯಾರ್ಥಿಗಳು ತಮ್ಮ ಜೀವನದಲ್ಲಿ ಧಾರ್ಮಿಕ ಸಹಿಷ್ಣುತೆಯ ಮಹತ್ವವನ್ನು ಚರ್ಚಿಸುವರು. 4: ಶ್ರೀಸಾಮಾನ್ಯನ ಬದುಕಿನ ನಮಸ್ಕಗಳು, ಬವಣೆಗಳು ಹಾಗೂ ಪರಿಹಾರಗಳನ್ನು ವಿಶ್ಲೇಷಿಸುವರು. 5: ದಮನಿತ ಲೋಕದ ಶೋಷಣೆಯ ಭಿನ್ನ ರೂಪಗಳ ಕುರಿತು ಚರ್ಚಿಸುವರು.

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AECC	21HIN1T342	Hindi Laghu Upanyas aur Bhasha Ke Vividh Roop	1: हिंदी उपन्यासों का ज्ञान ग्रहण और समझने की योग्यता का विकास। 2: विद्यार्थियों में सामाजिक यथार्थ और मुल्यांकन करने का विकास। 3: लघु उपन्यास की कथा का वर्णन और विश्लेषण करने की क्षमता का विकास। 4: भाषा के विविध रूपों एवं भाषा कौशल में प्राविण्यता।
AECC	21AEN1T341	Fundamentals of English Written Communication	1. Examine the features of effective writing and demonstrate their skills in complex, non-formulaic writing 2. Identify and fix common stylistic errors in written English 3. Analyze the representation of cross-cutting issues in literary works.
AECC	21INC1T341	India and Indian Constitution	1. Evaluate the philosophy of the Constitution and its structure 2. Appraise the powers and functions of various offices under the Constitution 3. Analyze the Indian values, Ideals and the role of Constitution in a Democracy.

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