



**Kristu Jayanti College**

**AUTONOMOUS** Bengaluru

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

## **FACULTY OF SCIENCE**

### **B.Sc. Mathematics, Statistics, Economics**

#### **Programme Educational Objectives**

PEO1: To empower the students with mathematical concepts and tools.

PEO2: To equip the students with knowledge and skills in statistical analysis and inferences.

PEO3: To provide the theoretical and practical propositions in micro and macro-economics

PEO4: To nurture the students with employability skills and professional ethics.

#### **Programme Outcome**

After successful completion of three year B.Sc. MSE Programme, the graduate will be able to:

PO1: Apply professional and social skills to cater to the needs of the industry, society and global scientific community.

#### **Programme Specific Outcomes**

After successful completion of three year B.Sc. MSE Programme, the graduate will be able to:

PSO1: Appraise mathematical concepts and reasoning.

PSO2: Examine statistical data and draw logical inferences.

PSO3: Analyze national and global economic issues.

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

### I Semester

Course Type	Course Code	Course Title	Course Outcome
AECC	AEN103A11	Additional English I	<ol style="list-style-type: none"> <li>1. Describe and differentiate between ballads and sonnets</li> <li>2. Analyze critically the writing style of prose writers</li> <li>3. Develop interest to appreciate one act plays</li> <li>4. Apply the rules of punctuation to write concisely</li> <li>5. Demonstrate proficiency in creating leaflets and brochures</li> </ol>
AECC	HIN103B11	Hindi I	<ul style="list-style-type: none"> <li>● हिन्दी साहित्य के गद्य विधाओं का विश्लेषण करने की क्षमता का विकास</li> <li>● विद्यार्थियों में सामाजिक यथार्थ का मूल्यांकन करने का ज्ञान</li> <li>● सृजनात्मक कौशल्य में परिपूर्णता</li> <li>● गद्य विधाओं के अध्ययन करने के बाद सामाजिक मूल्यों का ज्ञान प्राप्त</li> <li>● अनुवाद कला और भाषा में परिशुद्धता</li> </ul>
AECC	KAN103B11	Kannada I	<ul style="list-style-type: none"> <li>● ಜಾನಪದ &amp; ಶಿಷ್ಟ ಸಾಹಿತ್ಯದ ವ್ಯತ್ಯಾಸಗಳೇ ಮಾಡುವರು</li> <li>● ಸಾಮಾಜಿಕ ಸಮಾನತೆ ಮತ್ತು ಜೀವನಮೌಲ್ಯಗಳ ಪುನರಾವಲೋಕನ ಮಾಡುವರು</li> <li>● ಗ್ರಾಮೀಣ ಸಂಸ್ಕೃತಿಯನ್ನು ವಿವರಿಸುವರು</li> <li>● ಕನ್ನಡ ಭಾಷಾಪ್ರೇಮವನ್ನು ಇತರೆ ಭಾಷೆಗಳೊಂದಿಗೆ ಹೋಲಿಕೆ ಮಾಡುವರು</li> </ul>
AECC	ENG103A11	English I	<ol style="list-style-type: none"> <li>1. To attune young minds to concerns and issues which have a broad and wide scope of use and application to life.</li> <li>2. To cut across the history of creative expression in focusing primarily on the core values that governs human lives.</li> </ol>
DSCC	UMT204B11	Mathematics I [Calculus and Analytical Geometry]	<ol style="list-style-type: none"> <li>1. Construct nth derivative of <math>f(z)=uv</math> using Leibnitz's Theorem.</li> <li>2. Evaluate partial derivatives of algebraic and transcendental functions.</li> <li>3. Evaluate integral using a reduction formula.</li> <li>4. Use the equations of line, plane, sphere, cone and cylinder.</li> </ol>
DSCC	STS203B11	Statistics I [Basic Statistics I]	<ol style="list-style-type: none"> <li>1. Distinguish nominal, ordinal, ratio and interval data types</li> <li>2. Analyze univariate data using measures of central tendency, measures of dispersion, skewness and kurtosis</li> <li>3. Analyze bivariate and trivariate data sets using correlation and regression</li> <li>4. Apply addition, multiplication and conditional probability law</li> </ol>
DSCL	STS2L1B11	Statistics Practical I	<ol style="list-style-type: none"> <li>1. Explain data structures, dynamic memory management and usage of pointer variables</li> <li>2. Differentiate operations associated with arrays, linked lists, stacks, queues and trees</li> <li>3. Design recursive procedures, sorting and searching algorithms for data structure applications</li> </ol>
DSCC	ECO204A11	Economics I [Microeconomics]	<ol style="list-style-type: none"> <li>1. Apply the principles of utility theories in real life situations.</li> <li>2. Examine the elasticities of demand and supply to make appropriate price decisions.</li> <li>3. Analyze production theories to lead the firm in the optimum expansion path.</li> <li>4. Interpret the price-output decisions of producers under different market situations.</li> <li>5. Compare the scope of the factor market with the product market to determine the prices.</li> </ol>

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

### II Semester

Course Type	Course Code	Course Title	Course Outcome
AECC	AEN103A21	<b>Additional English II</b>	<ol style="list-style-type: none"> <li>To provide the young learners an introduction to new ideas and issues that bear relevance to our life today.</li> <li>To give the students an opportunity to develop values that will help them adapt to the changing world.</li> </ol>
AECC	HIN103B21	<b>Hindi II</b>	<ul style="list-style-type: none"> <li>काव्य अध्ययन में संगीतात्मक शैली को समझ लेता है</li> <li>काव्य विश्लेषण करने की क्षमता</li> <li>काव्य में निहित विचारों का मूल्यांकन</li> <li>काव्य सृजन करने का कौशल्य</li> <li>व्याकरणिक भाषा का ज्ञान एवं स्पष्टता</li> </ul>
AECC	KAN103B21	<b>Kannada II</b>	<ul style="list-style-type: none"> <li>ಕನ್ನಡ ಸಾಹಿತ್ಯದಲ್ಲಿನ ಭಾಷಾ ಮಡಿವಂತಿಕೆಯ ವಿವರಣೆ ತಿಳಿಯುವರು</li> <li>ಪುರಾಣ ಕಾವ್ಯಗಳಲ್ಲಿನ ಸಾಂಸ್ಕೃತಿಕ ಮುಖಾಮುಖಿಯ ವಿಶ್ಲೇಷಣೆ ಮಾಡುವರು</li> <li>ನಾಟಕಗಳಲ್ಲಿನ ಪರಿಸರ ವರ್ಣನೆಯ ಪುನರಾವಲೋಕನ ಕೈಗೊಳ್ಳುವರು</li> <li>ವೃತ್ತಿಧಾರಿತ ವ್ಯವಸ್ಥೆ ಬಗ್ಗೆ ಚರ್ಚಿಸುವರು</li> </ul>
AECC	ENG103A21	<b>English II</b>	<ol style="list-style-type: none"> <li>Discuss the use of animal imagery and hypersensitive characters in the twentieth century writings</li> <li>Describe poetic style and its devices in the English verses of the Victorian age</li> <li>Analyze poems and sonnets regarding existentialist and metaphysical themes</li> <li>Discover and implement new strategies of grammar in speaking English language</li> <li>Integrate the prominence of media and the elements of advertising by creating media awareness</li> </ol>
AECC	NES102A01	<b>Environmental Science</b>	<ol style="list-style-type: none"> <li>Discuss the overexploitation of natural resources.</li> <li>Appraise the components of the ecosystem.</li> <li>Assess the conservation of biodiversity.</li> <li>Criticize the mitigation process of natural disasters</li> <li>Survey the effects of pollution in the environment.</li> <li>Recommend the various policies for the betterment of the environment.</li> </ol>
DSCC	UMT204B21	<b>Mathematics II [Algebra and Differential Calculus]</b>	<ol style="list-style-type: none"> <li>Identify algebraic structures as groups</li> <li>Construct pedal equation, radius of curvature and evolute</li> <li>Explain singular point, asymptote and envelope</li> <li>Solve first order linear and homogeneous differential equations</li> </ol>
DSCC	STS203B21	<b>Statistics II [Basic Statistics II]</b>	<ol style="list-style-type: none"> <li>Relate to univariate and bivariate random variables in terms of p.m.f/ p.d.f , c.d.f and their properties</li> <li>Discriminate probability distributions as discrete -binomial, poisson, negative binomial, geometric, hyper geometric; and continuous- uniform, exponential, normal gamma, beta</li> <li>Apply the properties of expectation and variance of random variables</li> </ol>

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

			4. Interpret wlln and chebychev's inequality
<b>DSCL</b>	<b>STS2L1B21</b>	<b>Statistics Practical II</b>	<ol style="list-style-type: none"> <li>1. Calibrate univariate and bivariate random variables</li> <li>2. Formulate discrete distributions- binomial, poisson, negative binomial, geometric, hyper geometric; and continuous distributions- uniform, exponential, normal</li> <li>3. Demonstrate wlln and chebychev's inequality</li> </ol>
<b>DSCC</b>	<b>ECO204A21</b>	<b>Economics II[Macro Economics]</b>	<ol style="list-style-type: none"> <li>1. Analyze the components of national income and circular flow of income model to understand the basic elements of Macro Economics.</li> <li>2. Interpret the differences between Classical approach and Keynes approach.</li> <li>3. Examine the Monetary theories and working pattern of banking institutions in the present scenario.</li> <li>4. Estimate the effects of inflation and relate the phases of the business cycle with inflation.</li> <li>5. Categorize the reasons of disequilibrium in the Balance of Payment and prioritize the measures to correct it.</li> </ol>

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

### III Semester

Course Type	Course Code	Course Title	Course Outcome
AECC	AEN103A31	<b>Additional English III</b>	<ol style="list-style-type: none"> <li>1. Appreciate the theme of love and suspense in the works of Alfred Noyes, Robert Southey, Sir Arthur Conan Doyle and Shakespeare</li> <li>2. Discover the sufferings of human being in the works of Tagore, Mary Fisher, Charley Chaplin, John Stainbeck and Philip Larkin</li> <li>3. Analyses the dramatic techniques in the prescribed one act play</li> <li>4. Outline the difference between essay writings and precis writing</li> <li>5. Develop the interest on poem and prose</li> </ol>
AECC	HIN103B31	<b>Hindi III</b>	<ul style="list-style-type: none"> <li>• हिन्दी कविता और खण्डकाव्य के भेद को समझलेता है</li> <li>• पौराणिक कथा का विश्लेषण</li> <li>• पौराणिक आदर्श विचारों का अनुकरण करता है</li> <li>• आधुनिक और पौराणिक विचारों का मूल्यांकन</li> <li>• काव्य सृजन शैली का विकास</li> </ul>
AECC	KAN103B31	<b>Kannada III</b>	<ul style="list-style-type: none"> <li>• ಕನ್ನಡ ಸಾಹಿತ್ಯದ ವಿವಿಧ ಪ್ರಕಾರಗಳನ್ನು ಪರಿಚಯಿಸುತ್ತದೆ</li> <li>• ಮಧ್ಯಕಾಲೀನಯುಗದ ಭಕ್ತಿ ಪರಂಪರೆಯೊಂದಿಗೆ ಬದುಕಿನ ವಾಸ್ತವತೆಯನ್ನು ಹೋಲಿಸಿ ಚರ್ಚಿಸುವರು</li> <li>• ಭಾಷೆಯ ಕೌಶಲ್ಯಗಳೊಂದಿಗೆ ವಿಜ್ಞಾನ ಹಾಗೂ ತಾಂತ್ರಿಕ ಚಿಂತನೆಗಳನ್ನು ಗ್ರಹಿಸಲು ಅಗತ್ಯ ಕ್ರಮಗಳನ್ನು ಅರಿಯುವರು</li> <li>• ಯುವಜನಾಂಗವು ಅಭಿವೃದ್ಧಿಯ ಜಗತ್ತಿನಲ್ಲಿ ಹೊಂದಾಣಿಕೆಯಾಗಲು ಸಂವಹನ ಕೌಶಲ್ಯಗಳ ಅಗತ್ಯತೆಯನ್ನು ಚರ್ಚಿಸುವರು</li> <li>• ಧರ್ಮ ಮತ್ತು ಪರಂಪರೆಗಳ ಕುರಿತು ಪುನರಾವಲೋಕನ ಮಾಡುವರು</li> </ul>
<b>Compulsory Courses</b>			
AECC	ENG103A31	<b>English III</b>	<ol style="list-style-type: none"> <li>1. State the problems of a man and the significance of parental affection in real life</li> <li>2. Review the historical background of true events in roman history</li> <li>3. Extrapolate the reflections on the lives of writers in literary genres</li> <li>4. Interpret the significance of English literature in the forms of movies and serials in media</li> <li>5. Formulate the structure of oral and written presentations and develop speaking skills</li> </ol>

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

<b>DSCC</b>	<b>UMT204B31</b>	<b>Mathematics III [Algebra, Differential Calculus, Improper Integrals and Linear Programming]</b>	<ol style="list-style-type: none"> <li>1. Explain cyclic group and Lagrange's theorem.</li> <li>2. Evaluate limit of algebraic and transcendental function using L' Hospital's Rule.</li> <li>3. Evaluate integral using beta and gamma functions.</li> <li>4. Formulate a given simplified definition as a linear programming problem and solve using graphical or simplex methods.</li> </ol>
<b>DSCC</b>	<b>STS203A31</b>	<b>Statistics III [Statistical Inference I]</b>	<ol style="list-style-type: none"> <li>1. Compare point estimators based on the properties of unbiasedness, consistency, efficiency and sufficiency</li> <li>2. Construct confidence intervals for means, difference of mean, proportions, difference of proportions, variance, ratio of variances</li> <li>3. Create random samples for uniform, Poisson, binomial and normal distributions</li> </ol>
<b>DSCL</b>	<b>STS2L1A31</b>	<b>Statistics Practical III</b>	<ol style="list-style-type: none"> <li>1. Develop confidence intervals for means, difference of mean, proportions, difference of proportions, variance, ratio of variances</li> <li>2. Construct random samples for uniform, Poisson, binomial and normal distributions</li> </ol>
<b>DSCC</b>	<b>ECO204A31</b>	<b>Economics III [Development Economics]</b>	<ol style="list-style-type: none"> <li>1. Analyze the indicators of Economic development and examine the socio economic factors leading towards Economic development.</li> <li>2. Compare the development theories with different economic systems.</li> <li>3. Examine the significance of natural and human resources for the Economic development.</li> <li>4. Interpret the connecting process of capital formation and Economic development.</li> <li>5. Analyze the role of monetary and fiscal policies towards economic development.</li> </ol>
<b>SEC</b>	<b>SSP4L2A01</b>	<b>Soft Skills Practices</b>	<ol style="list-style-type: none"> <li>1. Build verbal/oral communication, leadership and listening skills</li> <li>2. Perform group discussion, presentations and personal interview</li> </ol>

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

### IV Semester

Course Type	Course Code	Course Title	Course Outcome
AECC	AEN103A41	Additional English IV	<ol style="list-style-type: none"> <li>1. Interpret select poems of Robert Frost, Sarojini Naidu and William Blake</li> <li>2. Explain the style and significant features of prose writings of R. K Narayan, Willa Cather, Doris Lessing, O. Henry, and Booker. T. Washington</li> <li>3. Compare the ethical and cultural differences in Wole Soyinka's play 'The Lion and the Jewel' and learn the unique native culture of Nigeria</li> <li>4. Assess the issues related to marriage, education, moral code of conduct, the concept of sublime, modernity, tradition, and the mindsets of human beings in life</li> <li>5. Appraise the literary devices and techniques used in poetry and prose</li> <li>6. Formulate grammatically correct sentences using proper punctuations</li> <li>7. Create citations of books, articles and journals using MLA format 8th edition</li> </ol>
AECC	HIN103B41	Hindi IV	<ul style="list-style-type: none"> <li>● हिन्दी व्यंग्य अध्ययन करने की शैली को समझलेता है</li> <li>● व्यंग्य में निहित विचारों का विश्लेषण</li> <li>● व्यंग्य कथाओं में अभिव्यक्त विचारों का मूल्यांकन</li> <li>● निबंधों में निहित आदर्श विचारों का अनुकरण करता है</li> <li>● व्यंग्य सृजन कौशल्य का विकास</li> </ul>
AECC	KAN103B41	Kannada IV	<ul style="list-style-type: none"> <li>● ನಮ್ಮ ನಾಡು-ಸಮಾಜ-ಕುಟುಂಬ ಪರಂಪರೆಯಕುರಿತುಅರಿವು ಹಾಗೂ ಕಾಳಜಿಯನ್ನು ಅಧ್ಯಯನಮಾಡುವರು</li> <li>● ಮಹಿಳಾ ಹಕ್ಕುಗಳು ಹಾಗೂ ರಕ್ಷಣೆಯಜವಾಬ್ದಾರಿಯನ್ನು ಸ್ಪಷ್ಟವಾಗಿ ತಿಳಿಯುವರು</li> <li>● ಅರಣ್ಯ ಹಾಗೂ ನೈಸರ್ಗಿಕ ಸಂಪನ್ಮೂಲಗಳನ್ನು ವಿವಿಧ ವಿಷಯಗಳ ಅಧ್ಯಯನದೊಂದಿಗೆಚರ್ಚಿಸುವರು</li> <li>● ಭಕ್ತಿಯಅರ್ಥ, ಗ್ರಹಿಕೆಗಳು, ವಿವಿಧ ನೆಲೆಗಳು ಕುರಿತುಕಾಲಘಟ್ಟದ ಹಿನ್ನೆಲೆಯಲ್ಲಿ ಹೋಲಿಸುವರು</li> <li>● ಆದರ್ಶಗಳು, ಸಮಾಜಿಕ ಸೇವೆ ಈ ಕುರಿತು ಮೌಲ್ಯಧಾರಿತ ಬದುಕನ್ನುಕುರಿತು ಪುನರಾವಲೋಕನ ಮಾಡುವರು</li> </ul>
<b>Compulsory Courses</b>			
AECC	ENG103A41	English IV	<ol style="list-style-type: none"> <li>1. Recognize, define, and identify poetic terms and genres</li> <li>2. Examine novels analytically and interpretively, to identify literary, elements of plot, character, setting, tone, point of view, theme, style, symbol, metaphor, and image</li> <li>3. Analyze the characters and themes of one act plays</li> <li>4. Acquire vital employability skills and employment opportunities with in-depth knowledge of cv, cover letter, report writing and paragraph writing</li> </ol>
DSCC	UMT204B41	Mathematics IV [Algebra, Differential Equations, Laplace Transforms and	<ol style="list-style-type: none"> <li>1. Analyze homomorphism and isomorphism of a group</li> <li>2. Solve second and higher order differential equations</li> </ol>

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

		<b>Fourier Series]</b>	<ol style="list-style-type: none"> <li>3. Evaluate Laplace transforms and inverse Laplace transforms</li> <li>4. Estimate Fourier series for even and odd functions</li> </ol>
<b>DSCC</b>	<b>STS203A41</b>	<b>Statistics IV [Statistical Inference II]</b>	<ol style="list-style-type: none"> <li>1. Analyze type I error, type II error and power of test</li> <li>2. Relate to test of significance for means, difference of mean, proportions, difference of proportions, variance, ratio of variances, correlation coefficients</li> <li>3. Discriminate chi-square test for goodness of fit and independence of attributes</li> <li>4. Apply non-parametric tests and Wald's sequential tests</li> </ol>
<b>DSCL</b>	<b>STS2L1A41</b>	<b>Statistics Practical IV</b>	<ol style="list-style-type: none"> <li>1. Calibrate type I error, type II error and power of test</li> <li>2. Design MP test for mean of normal distribution, parameters of binomial and Poisson distributions</li> <li>3. Develop test of significance for means, difference of mean, proportions, difference of proportions, variance, ratio of variances, correlation coefficients</li> <li>4. Formulate chi square test for goodness of fit and independence of attributes</li> </ol>
<b>DSCC</b>	<b>ECO204A42</b>	<b>Economics IV [Monetary Economics]</b>	<ol style="list-style-type: none"> <li>1. Analyze the history of money and estimate its importance in maintaining economic stability.</li> <li>2. Identifies the major determinants of demand &amp; supply of money and measures its impact to decide the value of money.</li> <li>3. Compare the monetary theories schools of economics to make effective monetary policy.</li> <li>4. Evaluate the money market and capital market instruments and relate its impacts on the economy.</li> <li>5. Evaluate India's monetary system and monetary policy and its effectiveness on economy.</li> </ol>
<b>NCCC</b>	<b>LSE5A2A41</b>	<b>Life Skills Education</b>	<ol style="list-style-type: none"> <li>1. Develop self-competency and confidence in their day to day life</li> <li>2. Evaluate the problems and find the sustainable solutions in their daily life</li> <li>3. Enhance interpersonal relationship effectively in the community</li> <li>4. Develop coping mechanisms to manage their stress effectively in their environment</li> </ol>

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

### V Semester

Course Type	Course Code	Course Title	Course Outcome
DSCC	UMT204A51	Mathematics V [Real and Complex Analysis]	<ol style="list-style-type: none"> <li>1. Categorize sequences and series to convergent, divergent or oscillatory.</li> <li>2. Construct analytic functions from complex functions.</li> <li>3. Evaluate integrals using Cauchy's integral theorem and formula.</li> <li>4. Compare circles and lines in z-plane and w-plane.</li> </ol>
DSCC	UMT204A52	Mathematics VI [Total and Partial Differential Equations, Algebra and Numerical Analysis]	<ol style="list-style-type: none"> <li>1. Solve the partial differential equation of first order using Charpit's method and second order using complementary function and particular integral.</li> <li>2. Identify rings, integral domain and field.</li> <li>3. Apply numerical methods to perform interpolation and integration.</li> <li>4. Solve algebraic and transcendental equations using bisection method, newton's method and secant method.</li> </ol>
DSCL	UMT2L2B51	Mathematics Practical I	<ol style="list-style-type: none"> <li>1. Create programs for sequences and series using the Maxima tool.</li> <li>2. Develop solutions for algebraic, transcendental and partial differential equations using the Maxima tool.</li> </ol>
DSCC	STS203A51	Statistics V [Sampling theory and statistical quality control]	<ol style="list-style-type: none"> <li>1. Distinguish between probability and non-probability sampling techniques</li> <li>2. Demonstrate the estimation of population mean for simple random, stratified and systematic samplings</li> <li>3. Construct the confidence intervals for population mean and population proportion in simple random samplings</li> <li>4. Differentiate the theoretical basis, background and utility of <math>\bar{x}</math>, <math>r</math>, <math>s</math>, <math>\sigma</math>, <math>p</math>, <math>d</math>, <math>u</math> and <math>c</math> control charts</li> <li>5. Relate to single and double sampling plans by attribute</li> </ol>
DSCL	STS2L2A51	Statistics Practical V	<ol style="list-style-type: none"> <li>1. Develop the confidence intervals for population mean and population proportion in simple random samplings</li> <li>2. Manage stratified random sampling and systematic sampling</li> <li>3. Design <math>\bar{X}</math>, <math>r</math>, <math>s</math>, <math>\sigma</math>, <math>p</math>, <math>d</math>, <math>u</math> and <math>c</math> control charts</li> <li>4. Create single and double sampling plans by attribute</li> </ol>
DSCC	STS203A52	Statistics VI [Design and analysis of experiments]	<ol style="list-style-type: none"> <li>1. Classify one-way and two-way ANOVA</li> <li>2. Construct CRD, RBD and LSD</li> <li>3. Relate to <math>2^2</math> and <math>2^3</math> factorial experiments</li> <li>4. Analyze complete and partial confounding in a <math>2^3</math> factorial experiment with RBD layout</li> </ol>
DSCL	STS2L2A52	Statistics Practical VI	<ol style="list-style-type: none"> <li>1. Calibrate one-way and two-way ANOVA</li> <li>2. Formulate CRD, RBD and LSD</li> <li>3. Develop <math>2^2</math> and <math>2^3</math> factorial experiments</li> </ol>
DSCC	ECO204A51	Economics V [Indian Economy I]	<ol style="list-style-type: none"> <li>1. Evaluate the planning methods of Indian economy and examine its impacts on Economic growth.</li> <li>2. Analyze the major challenges of Indian Economy and examine the causes and recommend relative solution.</li> <li>3. Interpret the reason for low productivity in Indian agriculture sector and analyze the functions of</li> </ol>

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

			<p>agricultural financed institution in India.</p> <p>4. Examine the role of industries in Indian economic development and list out the features of different industrial policies of India.</p> <p>5. Recommend the significance of Infrastructure for Economic Development.</p>
<b>DSCC</b>	<b>ECO204A52</b>	<b>Economics VI [International Economics]</b>	<p>1. Interpret the theories of International trade and examine its application in real world.</p> <p>2. Analyze the Trade practices and understand the components of Terms of Trade.</p> <p>3. Interpret the determination of foreign exchange and find out the causes of disequilibrium in balance of payment and examine its Measures.</p> <p>4. Examine the working of economic integration and trade organization.</p> <p>5. Appraise the role of international economic institutions on economic development.</p>

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

### VI Semester

Course Type	Course Code	Course Title	Course Outcome
DSCC	UMT204A61	Mathematics VII[Vector Calculus and Integral Calculus]	<ol style="list-style-type: none"> <li>1. Use curl, divergence and gradient. Solve problems on line and multiple integrals.</li> <li>2. Evaluate length, area and volume of curves using multiple integrals.</li> </ol>
DSCC	UMT204A62	Mathematics VIII [Matrices, Linear Algebra and Calculus of Variations]	<ol style="list-style-type: none"> <li>1. Evaluate rank, inverse, Eigen values and Eigen vectors of a matrix and solve a system of linear equations.</li> <li>2. Explain vector space, subspace, linear span, basis and dimension.</li> <li>3. Interpret linear transformation and fundamental concepts of rank nullity theorem.</li> <li>4. Evaluate the extreme value of a functional.</li> </ol>
DSCL	UMT2L2B61	Mathematics Practical II	<ol style="list-style-type: none"> <li>1. Create programs for matrices and linear transformations using the Maxima tool.</li> <li>2. Design Maxima programs to evaluate line and multiple integral.</li> </ol>
DSCC	STS203A61	Statistics VII [Applied Statistics]	<ol style="list-style-type: none"> <li>1. Construct time series by method of moving averages, least square technique</li> <li>2. Design seasonal indices by simple averages and ratio to moving averages</li> <li>3. Develop price and quantitative index numbers, consumer price index number</li> <li>4. Measure demography in terms of mortality rates, fertility rates, reproduction rates, life table</li> <li>5. Categorize clinical trials in terms of observational, cross-sectional, prospective, retrospective and randomized control studies</li> <li>6. Explain official statistics in terms of gnp, gdp, nnp, ndp, per capita income, real national income</li> </ol>
DSCL	STS2L2A61	Statistics Practical I	<ol style="list-style-type: none"> <li>1. Calibrate linear and nonlinear trends; seasonal variation using simple averages and ratio to moving averages method</li> <li>2. Create price and quantity index numbers, consumer price index number</li> <li>3. Formulate mortality rates, fertility rates, reproduction rates, life table</li> <li>4. Demonstrate odds ratio, relative risk, sensitivity, specificity, roc curve</li> </ol>
DSCC	STS203A62	Statistics VIII[Operations research]	<ol style="list-style-type: none"> <li>1. Evaluate LPP using graphical, simplex and big M method</li> <li>2. Illustrate TP using NWCR, MMM, VAM, MODI and AP using Hungarian method</li> <li>3. Explain M/M/1 queuing theory in terms of arrival pattern, customer behaviour, queue discipline, service pattern</li> <li>4. Interpret decision making under uncertainty and risk</li> <li>5. Evaluate game theory using maximin-minimax principle, dominance rule, graphical method</li> <li>6. Prepare project network using CPM and PERT</li> </ol>
DSCL	STS2L2A62	Statistics Practical VIII	<ol style="list-style-type: none"> <li>1. Formulate LPP using graphical, simplex and big M method</li> <li>2. Calibrate TP using NWCR, MMM, VAM, MODI and AP using Hungarian method</li> <li>3. Design decision problem using EMV and EOL</li> <li>4. Formulate game theory using maximin-minimax principle, dominance rule, graphical method</li> <li>5. Create project network using CPM and PERT</li> </ol>
DSCC	ECO204A61	Economics VII [Indian Economy II]	<ol style="list-style-type: none"> <li>1. Measure the performance of banking institutions in India.</li> </ol>

## Programme Matrix: Bachelor of Science- Mathematics, Statistics, Economics [2019 Batch]

			<ol style="list-style-type: none"> <li>2. Evaluate the Indian financial system and relate the performance of its instruments towards economic growth.</li> <li>3. Examine the present currency system of India and explain the importance of Indian Monetary system.</li> <li>4. Explain the structure of Indian Trade system and examine the features of Trade policy.</li> <li>5. Measure the contribution of Karnataka Economy towards Indian economy growth.</li> </ol>
<b>DSCC</b>	<b>ECO204A62</b>	<b>Economics VIII [Public Economics]</b>	<ol style="list-style-type: none"> <li>1. Compare the features of public and private finance of an economy.</li> <li>2. Categorize the sources of public revenue and effects of taxation.</li> <li>3. Identify the various reasons for growth of public expenditure and its effect and role in a developing economy.</li> <li>4. Assess the burden and effect of public debt on economic growth.</li> <li>5. Evaluate the nature of center-state financial relationship and recommendations of finance commission.</li> </ol>