BAGALKOT UNIVERSITY, JAMKHANDI

B.A. Statistics

THE COURSE STRUCTURE & SYLLABUS

FOR

B. Ed

III and IV Semester

w.e.f.

Academic Year 2024-25 and Onwards

Under

STATE EDUCATION POLICY (SEP)

Syllabus & Regulations Governing the Choice-Based Credit System (CBCS) for the Three-Years (Six Semesters) Bachelor of Arts (B.A

With Applied Statistics as Minor without practicals& other course as Major without practicalsProgram Structure

MODEL CURRICULUM

Degree Program: B.A. Degree

DisciplineCore: Statistics **Total Credits for the Program:**146 (till 6th Semester)

ProgramOutcomes

Bythe endofthe programthestudents willbeable to:

1. Acquirefundamental/systematicorcoherentunderstandingoftheacademicfieldofStatisticsand its different learningareas andapplications.
2. Develop and demonstrate an ability to understand major concepts in variousdisciplines ofStatistics.
3. Demonstrate the ability to use skills in Statistics and different practicing areas forformulatingandtacklingStatisticsrelatedproblemsandidentifyingandapplyingappropriate principles and methodologies to solve a wide range of problems associatedwith Statistics.
4. Understandproceduralknowledgethatcreatesdifferenttypesofprofessionalsrelatedtosubjecta reaofStatistics,includingprofessionalsengagedingovernment/publicserviceandprivatesectors.
5. PlanandexecuteStatisticalexperimentsorinvestigations,analyzeandinterpretdata/informatio n collected using appropriate methods, including the use of appropriatestatisticalsoftwareincludingprogramminglanguages,andreportaccuratelythefindi ngsoftheexperiment/investigations.
6. HaveaknowledgeregardinguseofdataanalyticstoolslikeExcelandR-programming.
7. Developed ability to critically assess a standard report having graphics, probabilitystatements.
8. Analyze,interpretthedataand hencehelp policymakersto takeaproperdecision.
9. Recognize the importance of statistical modelling andcomputing,andthe role ofapproximationandmathematicalapproachestoanalyzetherealproblemsusingvariousstatistic altools.
10. Demonstraterelevant genericskillsandglobalcompetenciessuchas
    (i) Problem-solving skills that are required to solve different types of Statistics relatedproblemswithwell-definedsolutions,andtackleopen-endedproblems,that belong to the disciplinary area boundaries

(ii) Investigative skills, including skills of independent thinking of Statistics-related issues andproblems;

(iii) Communicationskillsinvolvingtheabilitytolistencarefully,toreadtextsandreferencematerialanalyticallyandtopresentinformationinaconcisemannertodifferentgroups/audiences of technical or popular nature;

(iv) Analytical skills involving paying attention to details and ability to construct logical Arguments using correct technical language related to Statistics and ability to translate them with popular language when needed; ICT skills;

(v) Personals kills such as the ability to work both independently and in a group.

11. Undertakeresearchprojectsbyusingresearchskills-preparationofquestionnaire,conductingnationalsamplesurvey,researchprojectsusingsamplesurvey,samplingtechniques.
12. Understand and apply principles of least squares to fit a model to the given data, study theassociationbetweenthevariables,applicationsofProbabilityTheoryandProbabilityDistributions.

B.A. SEMESTER-III

Category	Course code	Title of the Paper	Marks			Teaching hours/week			Credit	Duration of exams (Hrs)
			IA	SEE	Total	L	T	P		
L5	21BA3L5LK3	Kannada	40	60	100	4	-	-	3	2
	21BA3L5LFK3	Functional Kannada								
L6	21BA3L6EN3	English	40	60	100	4	-	-	3	2
	21BA3L6HI3	Hindi								
	21BA3L6SN3	Sanskrit								
	21BA3L6TE3	Telugu								
	21BA3L6UR3	Urdu								
DSC3	21BA3STSDSCT1	Exact Sampling Distributions and Statistical Inference	**40**	**60**	**100**	**3**	**-**	**-**	**3**	**2**
	21BA3STSDSCT2	Sampling Techniques	**40**	**60**	**100**	**3**	**-**	**-**	**3**	**2**
DSC3	Another Department Code	Another Department Course Title	40	60	100	3	-	-	4	2
			40	60	100	3	-	4	2	2
SEC2	21BA3SE2ES2	Artificial Intelligence	25	25	50	1	-	2	2	2
VBC5	21BA3V5PE3	Physical Education- Sports	25	-	25	-	-	2	1	-
VBC6	21BA3V6NC2	NCC/NSS/R&R(S&G) / Cultural	25	-	25	-	-	2	1	-
OEC3	21BA3STSOECT1	Data Analysis With SPSS	**40**	**60**	**100**	**3**	**-**	**-**	**3**	**2**
			Total Marks		**800**	**Semester Credits**			**25**	

B.A. SEMESTER-IV

Category	Course code	Title of the Paper	Marks			Teaching hours/week			Credit	Duration of exams (Hrs)
			IA	SEE	Total	L	T	P		
L7	21BA4L7LK4	Kannada	40	60	100	4	-	-	3	2
	21BA4L7LFK4	Functional Kannada								
L8	21BA4L8EN4	English	40	60	100	4	-	-	3	2
	21BA4L8HI4	Hindi								
	21BA4L8SN4	Sanskrit								
	21BA4L8TE4	Telugu								
	21BA4L8UR4	Urdu								
DSC4	21BA4STSDSCT1	ANOVA and Design of Experiments	40	60	100	3	-	-	3	2
	21BA4STSDSCT2	Regression Analysis and Econometrics	40	60	100	3	-	-	3	2
DSC4	Another Department Code	Another Department Course Title	40	60	100	4	-	-	4	2
			40	60	100	-	-	4	2	2
AECC2	21BA4AE1ES2	Constitution of India	25	25	50	1	-	2	2	2
VBC7	21BA4V5PE4	Physical Education- Sports	25	-	25	-	-	2	1	-
VBC8	21BA4V6NC3	NCC/NSS/R&R(S&G) / Cultural	25	-	25	-	-	2	1	-
OEC4	21BA4STSOECT1	Quantitative Analysis Technique	40	60	100	3	-	-	3	2
		Total Marks			**800**	**Semester Credits**			**25**	

B.A. SEMESTER-V

Category	Course code	Title of the Paper	Marks			Teaching hours/week			Credit	Duration of exams (Hrs)
			IA	SEE	Total	L	T	P		
STATISTICS AS A MINOR										
DSC5	21BA1STSDSCP5	Statistical Quality Control	40	60	100	4	-	-	3	2
DSC5	Another Department CodeasaMajorSubject	Another Department Course Title	40	60	100	4	-	-	3	2
			40	60	100	4	-	4	2	2
DSE1	Another Department	Another Department Course Title	40	60	100	3	-	4	2	2
VC1 (Any one)	21BA5VCGEG5.1A	Basics of Map Making	40	60	100	3	-	-	3	2
	21BA5VCGEG5.1B	Mobile AssetMapping								
VBC9	21BA5V5PE5	Physical Education-Sports	25	-	25	-	-	2	1	-
VBC10	21BA5V6NC4	NCC/NSS/R&R(S&G) / Cultural	25	-	25	-	-	2	1	-
SEC3	21BA5SE3CS3	Cyber Security	25	25	50	1	-	2	2	2
		Total Marks			**600**	**Semester Credits**			**22**	

B.A. SEMESTER-VI

Category	Course code	Title of the Paper	Marks			Teaching hours/week			Credit	Duration of exams (Hrs)
			IA	SEE	Total	L	T	P		
STATISTICS AS MINOR										
DSC6	21BA1STSDSCP6	Operations Research	40	60	100	4	-	-	3	2
DSC6	AnotherDepartmentCode asaMajorSubject	Another Department Course Title	40	60	100	4	-	-	3	2
			40	60	100	4	-	4	2	2
DSE2	AnotherDepartmentCode	Another Department Course Title	40	60	100	3	-	4	2	2
VC2 (Any one)	21BA6VCGEG6.1A	Open Source GIS	40	60	100	3	-	-	3	2
	21BA6VCGEG6.1B	Landscape and Layout Mapping								
INT1	21BA6 INT1L	Internship	25	50	75	-	-	2	2	2
VBC1	21BA6V5PE5	Physical Education- Sports	25	-	25	-	-	2	1	-
VBC2	21BA6V6NC4	NCC/NSS/R&R(S&G) / Cultural	25	-	25	-	-	2	1	-
SEC4	21BA6SE4CS4	Professional Communication	25	25	50	1	-	2	2	2
		Total Marks			**675**	**Semester Credits**			**24**	
		Total Marks for BA Program			**4475**	**Total Credits for BA Program**			**146**	

COURSE-WISE SYLLABUS

Semester – III

BA Statistics

The course STATISTICS in III semester has two papers (Paper V & VI) for 06 credits: Each paper has 03 credits. Both the papers are compulsory. Details of the courses are as under.

Course No.5 (Paper-I): Title of the Course (Paper-I): **21BA3STSDSCT1**
: Title of Paper: EXACT SAMPLING DISTRIBUTIONS AND STATISTICAL INFERENCE

Year	II	**Course Code: 21BA3STSDSCT1**	**Credits**	03
Sem.	III	**Course Title: Title of Paper: EXACT SAMPLING DISTRIBUTIONS AND STATISTICAL INFERENCE**	**Hours**	42
Course Pre-requisites, if any		NA		
Formative Assessment Marks: 40		Summative Assessment Marks: 60		Duration of ESA:.03 hrs.

Number of TheoryCredits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours/semester
3	**42**	**0**	**0**

Syllabus- Course 5: 21BA3STSDSCT1 : Title- EXACT SAMPLING DISTRIBUTIONS AND STATISTICAL INFERENCE	**Total Hrs: 42**
UNIT-I Sampling distribution and Estimation	**20 hrs**
Definition of basic concepts: population, sample, parameter and statistic. Definition of a Random Sample, Sampling distribution of a Statistic along with examples, Definition of standard error, Standard error of mean, standard deviation, proportion, difference of means and difference of proportions. Uses of standard error and simple problems. Definition of the terms – Estimate, Estimation, Point estimation and interval estimation. Meaning of confidence interval, confidence limits and confidence co-efficient with examples. Construction of 95% and 99% confidence intervals - mean, difference of means, proportion and difference of proportions for large samples only and their numerical problems on the construction of 95% and 99% confidence limits.	
UNIT-II Testing of Hypothesis	**10 hrs**
Explanation of terms – Statistical hypothesis, Null hypothesis, Alternative hypothesis, Level of significance, critical region, size of the test, power of the test with examples. Definition of type–I and type–II errors. Large sample tests- Test of significance of population mean, test of significance of equality of means of two populations, test of significance of population proportion and test of significance of equality proportion of two populations.	

Unit-III Chi-Square, *t* - test and F-test Distributions	12 hrs
Introduction to Chi-square distribution, definition of Chi-square variate. Properties of Chi-square distribution. Applications of Chi-square distribution. Chi-square test of goodness of fit. Problems on Chi-square test of Goodness of fit and independence of attributes. Definition, assumption and properties of t-test. t-test for testing population mean, equality of sample means and paired t-test. Applications of t-test. Simple problems. Definition, assumption and properties of F-statistic. F-test for equality of variances and its applications. Numerical problems.	

Books recommended.

1. Ramchandran, K.M. and Tsokos C. P. (2009). Mathematical Statistics with Applications, Academic Press.

2. Gupta S. P. (2021). Statistical Methods, Sultan Chand and Sons, New Delhi, 46th edition.

3. Mukhopadhyaya, P. (2011). Applied Statistics, Books and Allied Ltd.

4. Gupta, S C. and V. K. Kapoor. (2018). Fundamentals of Mathematical Statistics, Sultan Chand, New Delhi, 11th Edition.

5. Gani S. G.(2003). Sankhyshastra and Ganakayantra, Udaya Ravi Publications, Bijapur.

Semester – III

Subject: BA STATISTICS
Discipline Specific Course (DSC)

Course No.-6 (Paper No. II): Title of the Course : 21BA3STSDSCT2: SAMPLING TECHNIQUES

Year	II	**Course Code: 21BA3STSDSCT2**	**Credits**	03
Sem.	III	**Course Title: SAMPLING TECHNIQUES**	**Hours**	42
Course Pre-requisites, if any		NA		
Formative Assessment Marks: 40		Summative Assessment Marks: 60	Duration of ESA:.02 hrs.	

Course Outcome (CO):

After successful completion of this course, students will be able to:

CO 1 : Know the concept of Population, Sample, Sampling unit, sampling design, sampling frame, sampling scheme, need for samping.

CO 2 : Apply different sampling methods for designing and selecting a sample from a population.

CO 3 : Design good questionnaire relevant to a survey for a specific investigation.

CO 4 : Explain sampling and non-sampling errors.

Syllabus-Course 6: 21BA3STSDSCT2 : Title- SAMPLING TECHNIQUES	Total Hrs: 42
Unit-I Basic Concepts of Sampling	**08 hrs**
Meaning of population, population size, finite population, infinite population, sample, sample size, sampling, sampling technique, sampling unit, sampling frame, census and sample survey, advantages of sampling. Examples of sampling. Types of errors in sample survey-Sampling errors and non-sampling errors, non response errors, response errors and tabulation errors. Advantages of sampling over complete census. Limitation of sampling. Planning of sample survey and its execution.	
Unit-II Simple Random Sampling	**14 hrs**
Introduction and definition of Simple Random Sampling (SRS), Notations and formulae for estimating population mean, total and variance. Methods of obtaining simple random sample-Lottery method and Random numbers table method. Merits and demerits of Simple Random Sampling. Simple problems on simple random sampling method.	
Unit-III Stratified Random and Systematic Random Sampling Techniques	**20 hrs**
Need for stratification, stratifying factors, improvement of method over SRS, Definition of strata, stratification, and stratified random sampling. Notations and formulae for estimating population mean, total and variance. Methods of allocation and sample size in different strata-Equal allocation, Proportional allocation and Optimal allocation. Determination of Bowley's formulae for proportional allocation and Neyman's formula for optimal allocation. Advantages and disadvantages of stratified random sampling method. Simple problems on stratified random sampling method, Proportional and Optimal allocation. Definition of systematic random sampling. Explanation of methods of obtaining systematic random samples. Examples of systematic random sample. Formulae for estimating population mean, total and variance. Applications of systematic random sampling method. Merits and demerits of systematic random sampling method. Simple problems on systematic random sampling method.	

Books recommended.

1. Parimal Mukhopadhyay (2008). Theory and methods of Survey Sampling, PHI publications.
2. Gupta S. P. (2021). Statistical Methods, Sultan Chand and Sons, New Delhi, 46th edition.
3. Gupta S. C. and V. K. Kapoor (2018). Fundamentals of Applied Statistics, Sultan Chand, New Delhi
4. Gani S. G.(2003). Sankhyshastra and Ganakayantra. Udaya Ravi Publications, Bijapur.

Title of the Course: OEC-3: DATA ANALYSIS WITH SPSS

(Open Elective)

OEC-3 : Title of the Course : 21BA3STSOECT1: Data Analysis With SPSS

Year	II	**Course Code: 21BA3STSOECT1**	**Credits**	03
Sem.	III	**Course Title: Data Analysis With SPSS**	**Hours**	42
Course Pre-requisites, if any		NA		
Formative Assessment Marks: 40		Summative Assessment Marks: 60	Duration of ESA:.02 hrs.	

Course Outcome (CO):

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

CO 1 : Use SPSS software for cleaning and presentation of data.

CO 2 : Present the data in the form of diagrams and graphs.

CO 3 : Analyze univariate, bivariate and multivariate data.

Syllabus-Course OEC-3 : 21BA3STSOECT1 : Title- DATA ANALYSIS WITH SPSS	**Total Hrs: 42**
Unit-I Introduction	**18 hrs**
Need of SPSS, preparation of coding sheet of the questionnaire, defining the type of variable and data, constructing the database – defining variable name, type of variable, width of variable name, labeling, assigning the numeric value to the characteristic, declare measurement of scale of data. **Data Editing in SPSS**: Enter the data based on type of data case wise for different variables, defining the grouping of variable for repeated measures. transforming the data into same variable and different variable,	
Unit-II Tabulation and Graphical representation	**12 hrs**
Formation of frequency distribution, representation of frequency distribution by graphs, construction cross table, P-P plots and Q-Q Plots.	
Unit-III Univariate, Bivariate and multivariate Data analysis	**12 hrs**
Calculation of Measures of central tendency, Dispersion, Karl-Pearson's correlation, Regression, fitting different curves, testing of hypothesis- t-test for single mean, difference of means for independent samples, one-way ANOVA.	

Note: Various techniques studied in the paper has to be demonstrated using SPSS software.

Books recommended.

1. Robert V. Hogg, Joseph W. McKean and Allen T. Craig (2007). Introduction to Mathematical Statistics, Pearson Education, Asia.
2. Irwin Miller and Marylees Miller, John E. Freunds (2006). Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia.
3. Sheldon Ross (2007). Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint.
4. Gardener, M (2012). Beginning R: The Statistical Programming Language, Wiley Publications.
5. Cunningham, B.J (2012). Using SPSS: An Interactive Hands-on approach.

Details of Formative assessment (IA) for DSCC/OEC/SEC: 40% weightage for total marks

Type of Assessment	Weightage	Duration	Commencement
Written test-1	10%	1 hr	8th Week
Written test-2	10%	1 hr	12th Week
Seminar	10%	10 minutes	--
Case study / Assignment / Field work / Project work/ Activity	10%	------	--
Total	40% of the maximum marks allotted for the paper		

Faculty of Social Science
04 - Year UG Honors programme:2021-22

GENERAL PATTERN OF THEORY QUESTION PAPER FOR DSCC/ OEC
(60 marks for semester end Examination with 2 hrs duration)

Part-A

1. Question number 1-06 carries 2 marks each. Answer any 05 questions : 10marks

Part-B

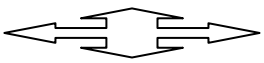
2. Question number 07- 11 carries 05Marks each. Answer any 04 questions : 20 marks

Part-C

3. Question number 12-15 carries 10 Marks each. Answer any 03 questions : 30 marks
   (Minimum 1 question from each unit and 10 marks question may have sub questions for 7+3 or 6+4 or 5+5 if necessary)

Total: 60 Marks

Note: Proportionate weightage shall be given to each unit based on number of hours prescribed.



Semester-IV

Course : BA STATISTICS
Discipline Specific Course (DSC)

The course STATISTICS in IV semester has two papers (Paper VII & VIII) for 06 credits: Each paper has 03 credits. Both the papers are compulsory. Details of the courses are as under.

Course No.7 (Paper-I): Title of the Course (Paper-I): **21BA4STSDSCT1: Title of Paper: ANALYSIS OF VARIANCE AND DESIGN OF EXPERIMENTS**

Year	II	**Course Code: 21BA4STSDSCT1**	**Credits**	03
Sem.	IV	**Course Title: Title of Paper: ANALYSIS OF VARIANCE AND DESIGN OF EXPERIMENTS**	**Hours**	42
Course Pre-requisites, if any		NA		
Formative Assessment Marks: 40		Summative Assessment Marks: 60	Duration of ESA:.03 hrs.	

Course Outcome (CO):

After the successful completion of the course, the students will be able to:

CO 1 : Develop strategic plans for experimentation in scientific research projects.

CO 2 : Apply the principles of Design of Experiment to generate experimental designs.

CO 3 : Develop problem solving skills for the application of Design of experiments to Agriculture and controlled laboratory experiments.

Syllabus-Course 7: 21BA4STSDSCT1: Title of Paper: ANALYSIS OF VARIANCE AND DESIGN OF EXPERIMENTS	**Total Hrs: 42**
Unit-I Analysis of Variance: One-Way and Two-way Classification	**18 hrs**
Definition of analysis of variance and its basic assumptions. Meaning of assignable and chance variations. ANOVA for one-way classified data-definition, linear mathematical model, assumptions, statement of hypothesis, splitting up of total sum of squares into various component sum of squares, degrees of freedom and ANOVA table. Simple numerical problems one-way classified data. Analysis of variance for two-way classification – definition, linear mathematical model, assumptions, statement of hypothesis, splitting up of total sum of squares into various component sum of squares. Degrees of freedom and ANOVA table. Simple numerical problems on two way classified data.	
Unit-II Design of Experiments: Completely Randomized Design	**12 hrs**
Definition of terms - Experiment, treatment, experimental unit, experimental	

material, yield, block, precision, experimental error, uniformity trials, and efficiency. Basic principles of design of experiments – Replication, Randomization and Local control. Completely Randomized Design (CRD) -definition, layout, linear mathematical model, assumptions, hypothesis, splitting up of sum of squares into various component sum of squares, degrees of freedom and ANOVA table. Merits, demerits and applications of CRD. Simple numerical problems.	
Unit-III Randomized Block Design	**12 hrs**
Introduction and definition of Randomized Block Design (RBD), layout, linear mathematical model, assumptions, statistical hypothesis, splitting up of total sum of squares into various component sum of squares, degree of freedom, and ANOVA table. Merits and demerits of RBD. Applications of RBD. Comparison between CRD and RBD. Simple problems.	

Books recommended.

1. Das, M.N. and Giri, N.C. (1986). Design and Analysis of Experiments, II Edition Wiley Eastern Ltd., New Delhi

2. Goon, A.M., Gupta, M.K. and Dasgupta, B. (1998). Fundamentals of Statistics, Vol. II, The world Press Pvt. Ltd. Kolkatta.

3. Gupta S. P. (2021). Statistical Methods, Sultan Chand and Sons, New Delhi, 46th edition.

4. Gupta S. C. and V. K. Kapoor (2018). Fundamentals of Applied Statistics, Sultan Chand, New Delhi.

5. Mukhopadhaya, P. (2011). Applied Statistics, Books and Allied Ltd.

6. Gani S. G.(2003). Sankhyshastra and Ganakayantra. Udaya Ravi Publications, Bijapur.

Semester – IV

Course : BA STATISTICS
Discipline Specific Course (DSC)

Course No.-8 (Paper No. II): Title of the Course: 21BA4STSDSCT2 : REGRESSION ANALYSIS AND ECONOMETRICS

Year	II	**Course Code: 21BA4STSDSCT2**	**Credits**	03
Sem.	IV	**Course Title: Title of Paper: REGRESSION ANALYSIS AND ECONOMETRICS**	**Hours**	42

Course Pre-requisites, if any	NA	
Formative Assessment Marks: 40	Summative Assessment Marks: 60	Duration of ESA:.03 hrs.

Course Outcome (CO):

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

CO 1 : Provide a wider and deeper exposure to the econometric techniques and their application to the discipline of Economics.

CO 2 : Gain an understanding of how to solve problems using econometrics that are common to economic modeling.

CO 3 : Develop ability to accurately translate complex economic problems into models and so as to solve them by applying econometric techniques.

Syllabus-Course 8: 21BA4STSDSCT2: Title- REGRESSION ANALYSIS AND ECONOMETRICS	**Total Hrs: 42**
Unit-I: Introduction to Econometrics and Simple Regression Analysis	**18 hrs**
Econometrics – definitions – scope – methodology – types. Quantification of hypothetical linear relationship using appropriate data. Two variable regression model, assumptions, method of least squares properties. maximum likelihood method, testing of hypotheses using point and interval estimates, forecasting solving problems using SPSS.	
Unit-II : Multiple Regression Analysis	**12 hrs**
Nonlinear relationships – transformation of variables – functional forms – three variable regression model – applications using SPSS. General linear model (matrix approach) – specification – OLS estimators –The properties of the estimated regression coefficients, hypothesis testing and the construction of confidence intervals of the regression model, problems.	

Unit-III: Problems in regression analysis	12 hrs
Violation of classical assumptions – multicollinearity – autocorrelation — problems – causes – consequences – remedial measures – model specification and diagnostic testing.	

Books recommended.

1. Damodar N. Gujarathi (2009). Basic Econometrics, New Delhi: Tata McGraw Hill

2. Companies Johnston, J. (1972). Econometric Methods, 2nd Edition, McGraw Hill International.

3. Koutsoyiannis, A. (2004). Theory of Econometrics, 2nd Edition, , Palgrave Macmillan Limited

4. Maddala, G.S. and Lahiri, K. (2009). Introduction to Econometrics, 4th Edition, John Wiley & Sons

5. G.M.K. Madanani (1980). Introduction to Econometrics, second edition, Oxford & IBH Publishing company, New Delhi.

6. Gupta, S.C. and Kapoor, V. K. (2020). Fundamentals of Applied Statistics, Sultan Chand & Sons, New Delhi.

Semester – IV

Course : BA STATISTICS

OEC-4: Title of the Course: 21BA4STSOECT1: Quantitative Analysis Techniques

Year	II	Course Code: 21BA4STSOECT1	Credits	03
Sem.	IV	Course Title: Title of Paper: Quantitative Analysis Techniques	Hours	42

Course Pre-requisites, if any	NA	
Formative Assessment Marks: 40	Summative Assessment Marks: 60	Duration of ESA:.03 hrs.

Course Outcome (CO):

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

CO 1 : Carryout correlation and regression analysis

CO 2 : Formulate and solve linear programming problems

CO 3 : Formulate and solve transportation and assignment problems

Syllabus-Course OEC-4 : 21BA4STSOECT1: Title- Quantitative Analysis Techniques	Total Hrs: 42
Unit-I Correlation and regression analysis	**18 hrs**
Correlation- Definition, Types - Simple, multiple, partial. Causation - Spurious, positive, negative, perfect and no correlation, explanation with examples. Importance of	

correlation analysis. Measurement of correlation- scatter diagram, Karl Pearson's coefficient of correlation, Properties of coefficient of correlation, interpretation. Spearman's coefficient of rank correlation – with and without ties, interpretation. Coefficient of determination and its interpretation. **Regression**-Definition, regression lines/equations of X on Y and Y on X. Properties of regression coefficients and regression lines/equations. Principle of least squares and fitting of linear, quadratic and exponential curves. Uses of regression analysis. Comparison between correlation and regression.	
Unit-II Linear programming problem (LPP)	**12 hrs**
Definition and scope of Operations Research (OR). Modeling and solution. Linear Programming Problem (L.P.P): Definition, Standard forms. Formulation of LPP. Basic Solutions, degenerate and non-degenerate solutions. Graphical method of solving LPP. Criteria for unbounded, Multiple and infeasible solutions.	
Unit-III Transportation problem and Assignment Problem	**12 hrs**
Transportation problem: Mathematical formulation. Existence of feasible solution. Finding initial basic feasible solution: North West Corner Rule, matrix minima method and Vogel's method. Unbalanced transportation problem. **Assignment Problem:** Mathematical Formulation and Hungarian algorithm. Unbalanced assignment problem.	

Books recommended.

References

1. Goon, A.M., Gupta, M.K. and Dasgupta, B. (2002). Fundamentals of Statistics, Vol. I, 8th Ed., The World Press, Kolkata.
2. Ross, S.M. (2014). Introduction to Probability and Statistics for Engineers and Scientists, 5th Edition, AcademicPress.
3. KanthiSwaroop, Manmohan and P. K. Gupta (2013). Operation Research, Sultan Chand New Delhi.
4. Mustafi, C.K.(2006). Operations Research Methods and Practice, 3/e.NewAge Publication.
5. Narag. A.S.(1970). Linear Programming and Decision Making. Sultan Chand and Co.
6. Sharma, J K.(2013). Operations Research: Theory and Applications (5/e). New Delhi: Laxmi Publications.

Details of Formative assessment (IA) for DSCC/OEC/SEC: 40% weight age for total marks

Type of Assessment	Weight age	Duration	Commencement
Written test-1	10%	1 hr	8th Week
Written test-2	10%	1 hr	12th Week
Seminar	10%	10 minutes	--
Case study / Assignment / Field work / Project work/ Activity	10%	------	--
Total	40% of the maximum marks allotted for the paper		

Faculty of Social Science
04 - Year UG Honors programme: 2022-24

GENERAL PATTERN OF THEORY QUESTION PAPER FOR DSCC/ OEC
(60 marks for semester end Examination with 2 hrs duration)

Part-A

7. Question number 1-06 carries 2 marks each. Answer any 05 questions : 10marks

Part-B

8. Question number 07- 11 carries 05Marks each. Answer any 04 questions : 20 marks

Part-C

9. Question number 12-15 carries 10 Marks each. Answer any 03 questions : 30 marks

(Minimum 1 question from each unit and 10 marks question may have sub questions for 7+3 or 6+4 or 5+5 if necessary)

Total: 60 Marks

Note: Proportionate weightage shall be given to each unit based on number of hours prescribed.