BAGALKOT UNIVERSITY

Mudhol Road, Jamkhandi – 587301 Dist. Bagalkote
The Draft
REGULATIONS AND COURSE STRUCTURE
Governing the Choice Based Credit System (CBCS) Semester
Scheme with multiple entry and exit options in
BACHELOR OF ARTS WITH STATISTICS
III Semester

As Per NEP – 2020 and Adapted from RCU Belagavi
Applicable from the Academic Year 2024-25

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	--------- ---------	Languages	40	60	100	4	-	-	3	2
L6	--------- --------- --------- --------- ---------	Languages	40	60	100	4	-	-	3	2
DSC3	126BAB03STADSC05T	Exact Sampling Distributions and Statistical Inference	40	60	100	3	-	-	3	2
	126BAB03STADSC06T	Sampling Techniques	40	60	100	3	-	-	3	2
DSC3	-	Another Department Course Title	40	60	100	3	-	-	4	2
			40	60	100	3	-	4	2	2
SEC2	126COM03XXXSEC01T	Artificial Intelligence	25	25	50	1	-	2	2	2
VBC5	126COM03XXXVBC05T	NCC/NSS/R&R(S&G) / Cultural	25	-	25	-	-	2	1	-
VBC6	126COM03XXXVBC06B	Physical Education Sports	25	-	25	-	-	2	1	-
OEC3	126BAB03STAOEC03T	Data Analysis With SPSS	40	60	100	3	-	-	3	2
			Total Marks		**800**	**Semester Credits**			**25**	

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):
: **Title of Paper: EXACT SAMPLING DISTRIBUTIONS AND STATISTICAL INFERENCE**

Year	II	**Course Code:** 126BAB03STADSC05T	**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: 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. Mukhopadhyay, 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 :: SAMPLING TECHNIQUES

Year	II	**Course Code:** 126BAB03STADSC06T **Course Title: SAMPLING TECHNIQUES**	**Credits**	03
Sem.	III		**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 sampling.

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: : 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 : : Data Analysis With SPSS

Year	II	**Course Code:** 126BAB03STAOEC03T	**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 : : 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 Marylee's Miller, John E. Freund's (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.