BAGALKOT UNIVERSITY

Mudhol Road, Jamkhandi-587301 Dist: Bagalkot

PROGRAM /COURSE STRUCTURE AND SYLLABUS FOR

STATISTICS

as per the Choice Based Credit System (CBCS)
designed in accordance with Learning Outcomes-
Based Curriculum Framework (LOCF)

For

Bachelor of Science
(STATISTICS)

(General Degree)

I and II Semester

w.e.f.

Academic Year 2024-25

Preamble for UG Syllabus of Bagalkot University

Bagalkot University Jamkhandi has been established by the Government of Karnataka and has started functioning from the academic year 2023-24. All the degree colleges other than engineering and medical colleges in the district of Bagalkote, are affiliated to this university as per the Karnataka State Universities Act 2000, as modified by the 26th Act of 2022. The students taking admission to any of the colleges in the district of Bagalkote, from the academic year 2023-24 will be students of Bagalkot University. The Government of Karnataka has instructed all the Universities to revise the under graduate syllabus as per the Government order no. ED 166 UNE 2023 Bengaluru Dated 08-05- 2024 from the academic year 2024-25.

Hence the Bagalkot University has revised the syllabus as suggested by its Board of Studies and approved by Academic Council and Syndicate. The subject code format for all the subjects of the new syllabus is also revised.

The subject code format is described in the following.

Subject Code Format

1	2	3	4	5	6	7	8	9	10
VER	DEGREE	SEM	DISCIPLINE			SUB. TYPE	SL. NO. FOR SUB. TYPE		TH/LAB/F
2	A	1	C	H	E	M	0	1	T
2	B	1	P	O	L	M	0	1	T

[1] The Version information gives the version of the syllabus. It can take values1,2..9,a,b,...

[2] The UG degree codes to be provided as / The code applicable to all degrees

Sl. No	Degree Code		Degree
1	B.Sc.	A	Bachelor of Science
2	B.A	B	Bachelor of Arts
3	B.Com.	C	Bachelor of Commerce
4	BBA	D	Bachelor of Business Administration
5	BCA	E	Bachelor of Computer Applications
6	BSW	F	Bachelor of Social Work
7.	----------	S	Applicable to all degrees

[3] The Semester Information is provided as

Sl. No	Semester
1	1
2	2
3	3
….	

[4-6]The Discipline Information to be provided as

Sl No	Degree	Discipline Code
1	B.Com.	XXX
2	BCA	XXX
3	BBA	XXX
4	BSW	XXX
5	B.A	'HIS', POL',GEO','KAN', 'HIN' etc. The detailed list is to be provided
6	B.Sc.	'PHY','CHE', 'BOT','ELE' etc. The detailed List is to be Provided

[7] The Subject Type to be provided as

Sl. No.	TYPE	Description
1	Major	M
2	Language	L
3	Constitutional Moral Values	C
4.	Elective	E
5.	Skill / Practical based learning	S
6.	Mini Project	P
7.	Internship	I
8.	Case study/ Survey usingprinciples of Research methodology	R

[8-9] The Running Serial Number is to be provided for a particularSubject type 01 to 99

[10] This character specifies the category of the subject namely, T=Theory, L-Practical, P-Project Work, F-Field work, Viva-V, I-Internship, Dissertation-D

PROGRAM STRUCTURE

Syllabus and Credits Structure under Choice Based Credit System [CBCS] General Degree for the Three Years B.Sc. with Statistics Undergraduate Programme with effect from 2024-25

First Semester B.Sc. (Statistics) Scheme

SEMESTER-I											
Category	**Course code**	**Title of the Paper**	**Marks**			**Teaching hours/ week**			**Credits**	**Duration of Exam** (Hrs)	**Teaching Department**
			IA	**SEE**	**Total**	**L**	**T**	**P**			
L1	-----	Language 1	20	80	100	3	-	-	3	3	-
L2	-----	Language 2	20	80	100	3	-	-	3	3	-
Major	2A1STAM01T	Descriptive Statistics and Probability Theory	20	80	100	3	-	-	3	3	Statistics
	2A1STAM01L	Practical I	10	40	50	-	-	4	2	3	Statistics
Major	-----	Major Subject 2	20	80	100	3	-	-	3	3	---
	-----	Practical	10	40	50	-	-	4	2	3	---
Major	-----	Major Subject 3	20	80	100	3	-	-	3	3	---
	-----	Practical	10	40	50	-	-	4	2	3	---
Common	2S1XXXC01T	Constitutional Values	10	40	50	2	-	-	2	2	Constitutional Values: Political Science
	2S1XXXC02T	Environment studies									Environmental Studies: Chemistry/ /Geography/ Botany
Total Marks					**700**	**Semester Credits**			**23**		

L1 & L2: Languages

Second Semester B.Sc. (Statistics) Scheme

	SEMESTER-II										
Category	**Course code**	**Title of the Paper**	**Marks**			**Teaching hours/ week**			**Credits**	**Duration of exams (Hrs)**	**Teaching Department**
			IA	**SEE**	**Total**	**L**	**T**	**P**			
L3	-----	Language 3	20	80	100	3	-	-	3	3	-
L4	-----	Language 4	20	80	100	3	-	-	3	3	-
Major	2A2STAM02T	Bivariate data Analysis and Theoretical distributions	20	80	100	3	-	-	3	3	Statistics
	2A2STAM02L	Practical II	10	40	50	-	-	4	2	3	Statistics
Major	-----	Major Subject 2	20	80	100	3	-	-	3	3	---
	-----	Practical	10	40	50	-	-	4	2	3	---
Major	-----	Major Subject 3	20	80	100	3	-	-	3	3	---
	-----	Practical	10	40	50	-	-	4	2	3	---
Common	2S1XXXC01T	Constitutional Values	10	40	50	2	-	-	2	2	Constitutional Values: Political Science
	2S1XXXC02T	Environment Studies									Environmental Studies: Chemistry/Geography/ Botany
Total Marks					**700**	**Semester Credits**			**23**		

L3 & L4 : Languages

Regulations and Syllabus
For
STATISTICS
In
Three Year B. Sc. Course(SEP 2024)

Regulation and Scheme of Instructions:

Regulations for governing three years semeteries Bachelor degree Programme of Bagalkot University, Jamkhandi in Statistics major subject with effect from academic year 2024-2025.

I. Goals and Objectives:

The following aims have been kept in view while designing the syllabus of Bachelor's Programme (B.Sc.)in Statistics as one of the major subject.

1. To create an aptitude and bring statistical awareness among the students.
2. To train promising learners to teach Statistics effectively at various level in the educational institutions.
3. To provide adequate Statistical knowledge and skills as required for the competitive examination.
4. To enrich and enhance analytical skill through Statistical techniques.
5. To make the subject student friendly, socially relevant and to cultivate research culture among the students.

II. Admission criteria:

Any candidate who have passed PUC/10+2 with any subjects are eligible to choose Statistics as one of the major subject at the under graduate course. The other rules for admission are as per the university

and government notifications from time to time.

III. Medium of Instruction:

The medium of instruction will be in English.

IV. Attendance:

A minimum of 75% of attendance in each semester is compulsory.

V. Scheme of Instruction:

1. The M.A/M.Sc./M. Stat. Master degree holders in Statistics can only teach Statistics major subject at UG level.
2. Statistics is an major subject at UG level which consists of six semesters. There will be one theory paper for 100 marks and one practical paper for 50 marks each semester . The duration of teaching hours will be 3 hours per week for theory paper and 4 hrs for practical.

VI. General Pattern of Theory Question Paper :

1. Theory course shall carry 100 marks of which 80 marks allotted for semester end examination and 20 marks for internal assessment.
2. Practical shall carry 50 marks of which 40 marks allotted for semester end examination and 10 marks for practical internal.

Paper Code: 2A1STAM01T	**Paper Title :**Descriptive Statistics and Probability theory
TeachingHours:3Hrs/Week**TeachingHours:42Hrs**	**Marks:**Theory-80+IA-20
	Credits:03

Course Outcomes (COs)

At the end of the course the student should be able to:

1. Get the knowledge of Statistics and its applications in various fields.
2. To present the numerical data through diagrams and graphs.
3. Get knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion.
4. Conceptualize the probabilities of events including frequentist and axiomatic approach and will learn the notion of conditional probability including the concept of Bayes' theorem.

Paper Code: 2A1STAM01T **TeachingHours:**3Hrs/Week**TeachingHours:42Hrs**	**Paper Title:** Descriptive Statistics and Probability theory **Marks:**Theory-80+IA2 **Credits:03**

UNITI

Introduction: Definition and scope of Statistics, concept to population and sample. Data-qualitative and quantitative, variables and attributes. Measurement scales - nominal,ordinal,intervalandratio.Presentation-classification&tabulation,frequencydistribution.Diagrams-simple,multiple,subdividedandpercentage.Graphs–histogram,frequencypolygon,frequencycurve,ogives. **10Hours**

UNITII

Measures of Central tendency :Purpose of measures of location ,definition of A.M,G.M, H.M& their properties(with proof),median and mode. Partitioned values-quartiles, deciles and percentiles .Measures ofDispersion:Absoluteandrelativemeasures-range,quartiledeviation,meandeviation,standarddeviationandcoefficientofvariation.Moments,skewnessandkurtosis. **12Hours**

UNITIII

Probability: Introduction, random experiments, sample space, events and algebra of events .Definitions of probability–classical,statistical,andaxiomatic.Conditionalprobability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications. **10Hours**

UNITIV

Random variable: Discrete and continuous random variable,p.m.f.,p.d.f.and c.d.f., illustrations and properties of random variables ,univariate transformations with illustrations. Two dimensional random variables: discrete and continuous type ,joint, marginal and conditional p.m.f ,p.d.f.,and c.d.f.,independence of variables, bivariate transformations with illustrations. **10Hours**

Books for Reference:

1. GoonA.M.,GuptaM.K.andDasguptaB.(2002):FundamentalsofStatistics,Vol.I&II,8th Edn.The World Press, Kolkata.
2. Miller,IrwinandMiller,Marylees(2006):JohnE.Freund'sMathematicalStatisticswith Applications, (7thEdn.),Pearson Education, Asia.
3. Mood,A.M.Graybill,F.A.andBose,D.C.(2007):IntroductiontotheTheoryof Statistics,3rdEdn.,(Reprint),TataMcGraw -HillPub .Co.Ltd.
4. Gupta S.C and Kapoor V.K.: Fundamentals of Mathematical Statistics- Sultan Chand &Sons publications.
5. Hogg.R.V.andCraig.A.T(1978):IntroductiontoMathematicalStatistics.Amerind Publishing Company.
6. Ross S. M. (2014). Introduction to probability and Statistics for Engineers and Scientists. 5th Edition, Academic Press.
7. Rohatagi, V. K.: An introduction to probability theory and mathematics statistics. Wiley Eastern Ltd, New Delhi.

B.SclSemester-Statistics

Paper Code: 2A1STAM01L	**Paper Title:**PRACTICAL-I
PracticalHours:4Hrs/Week	**Marks:**Practical-40+IA-10**Credits:02**

List of Practical
(Computing all the practical manually and using MS Excel)

1. Construction of frequency distribution and graphical representation.
2. Measures of central tendency-I Computation of AM, GM and HM
3. Measures of central tendency-II Computation of positional averages and partition values.
4. Measures of dispersion– I
5. Measures of dispersion– II
6. Moments, skewness and kurtosis for a frequency distribution.
7. Probability – I
8. Probability – II
9. Plotting pmf and sketching of pdf.
10. One dimensional random variables and two dimensional random variables.

Practical Examination

Duration:3Hrs

- Practical Examination - 30 Marks
- Viva Voce - 05 Marks
- Record /Journal - 05 Marks

Total - 40 Marks

Internal Assessment for Practical Paper

- Attendance - 05 Marks
- Test - 05 Marks

Total - 10 Marks

Paper Code: 2A2STAM02T **Paper Title :** Bivariate Data Analysis and Theoretical Distributions

Teaching Hours :3Hrs/Weeks **Marks :** Theory- 80 + IA -20
Teaching Hours :42Hrs**Credits :** 03

Course Outcomes (COs)

1. Learn concept of expectation and moments.
2. Perceive the knowledge of correlation, regression analysis
3. Able to understand and gain practical knowledge of discrete probability distributions.
4. Able to understand and gain practical knowledge of Continuous probability distributions.

Paper Code: 2A2STAM02T **Paper Title :** Bivariate Data Analysis and Theoretical Distributions

Teaching Hours :3Hrs/Weeks **Marks :** Theory- 80 + IA -20
Teaching Hours :42Hrs**Credits :** 03

UNITI

Mathematical Expectation of single and bivariate random variables its properties. Addition and multiplication theorem of expectation .Moments and Cumulants. MGF and CGF-their properties ,conditional expectation,variance,covariance,meanandvarianceoflinearcombinationofrandomvariables.

10Hours

UNITII

Bivariate data: Definition, scatter diagram, simple, Karl Pearson's correlation coefficient, Spearman's Rank correlation coefficient, Properties, concept of errors, principles of least squares, simple linear regression and its properties, fitting of regression lines ,coefficient of determination .Multivariate (Tri variate) Data Analysis :Multivariate data visualization: Mean vector and Dispersion matrix, Multiple linear regression, multiple and partial correlation coefficients. Residuals and their properties. **12Hours**

UNITIII

Discrete probability Distributions :Bernoulli, Binomial, Poisson, Negative Binomial ,Geometric and Uniform, distributions - definition, mean, variance and m.g.f., c.g.f and moments up to fourth order only. Hyper geometric distribution: definition, mean and variance. Recurrence relation for probabilities and moments of Binomial and Poisson distributions. Approximations of binomial, negative binomial and hyper geometric distributions. **10Hours**

UNITIV

Continuous Probability Distributions: Uniform, Gamma, Beta, Exponential, Normal andCauchydistributions-Mean,variance,moments,MGFandProperties.**10Hours**

Books for reference:

1. Hogg,R.V.,Tanis,E.A.andRaoJ.M.(2009):ProbabilityandStatisticalInference,SeventhEd,PearsonEducation,NewDelhi.
2. Miller,IrwinandMiller,Marylees(2006):JohnE.Freund'sMathematicalStatisticswithApplications,(7thEdn.),PearsonEducation,Asia.
3. Myer,P.L.(1970):IntroductoryProbabilityandStatisticalApplications,Oxford&IBH Publishing, New Delhi.
4. Gupta S.C and Kapoor V.K.: Fundamentals of Mathematical Statistics- Sultan Chand &Sons
5. Ross S. M. (2014). Introduction to probability and Statistics for Engineers and Scientists. 5th Edition, Academic Press.
6. Rohatagi, V. K.: An introduction to probability theory and mathematics statistics. Wiley Eastern Ltd, New Dlehi.
7. Mukhopadya P. (1996) Mathematical Statistics, New central Book agency (P) Ltd, Kalkatta.

B.Sc II Semester-Statistics

Paper Code: 2A2STAM02L	**Paper Title :**PRACTICAL-II
PracticalHours:4Hrs/Week	**Marks:**Practical-40+IA-

List of Practical

(Computing all the practical manually and using MS Excel)

1. Problems on Mathematical Expectation.
2. Bivariate distributions: Computation of marginal and conditional distributions.
3. Correlation: Computation of Karl Pearson's correlation coefficient,
4. Correlation: Computation of Rank correlation coefficient.
5. Fitting of regression equations.
6. Partial correlation
7. Multiple correlation.
8. Fitting of Binomial distributions
9. Fitting of Poisson distributions.
10. Fitting of normal distribution.

Practical Examination

Duration:3Hrs

- Practical Examination - 30 Marks
- Viva Voce - 05 Marks
- Record /Journal - 05 Marks

Total - 40 Marks

Internal Assessment for Practical Paper

- Attendance - 05 Marks
- Test - 05 Marks

Total - 10 Marks

ASSESSMENT METHODS

Formative Assessment for Theory

Evaluation Scheme for Internal Assessment: Continuous Internal Assessment (CIA)

Assessment Criteria 20 marks		
1st Internal Assessment Test for 20 marks of 1 hour duration after 8weeks and later marks should be reduced to 5	CIA : C1	5 Marks
2nd Internal Assessment Test for 40 marks 2 hours duration after 15weeks and marks should be reduced to 10	CIA : C2	10 Marks
Assignment/ Activity	CIA : C3	05 Marks
Total		20 Marks

Summative Assessment for Theory:

SEMESTER END EXAM : SEE	C4	80 Marks

Formative Assessment for Practical:

Assessment Criteria 10 marks		
Internal Test including basic understanding of the concept, Viva Voce, Journal. Test should be conducted for 50 marks and later itshould be reduced for 10 marks	CIA : C1	10 Marks

Summative Assessment for Practical:

SEMESTER END EXAM : SEE	C2	40 Marks

Summative Assessment: Scheme of Evaluation for Practical Examination

SL. No	Particulars	Marks Allotted
1.	Basic formula with description, nature of graph if any & indication of unit	04
2.	Tracing of schematic ray diagram/Circuit diagram with description	04
3.	Tabulation	04
4.	Experimental skill & connection	04
5.	Record of observation and performance of experiment	08
6.	Calculation including drawing graph	06
7.	Accuracy of result with unit	02
8.	Journal assessment	04
9.	Oral performance	04
	Total	40

Instructions to set the question paper and question paper pattern :

Instruction to set the question paper.

1. Question number 1 has 12 sub questions consisting of 3 questions from each unit. Eachquestion carries two marks. Student has to answer any ten questions.
2. Question number 2 to 7 are from unit I to IV.
   Each question carries five marks. Student has to answer any four questions
3. Question number 8 to 12 are from unit I to IV.
   Each question carries ten marks. Student has to answer any four questions

Question Paper pattern

First Semester

B.Sc. Degree Examination (SEP)

Electronics

Time: 3 hours Max. Marks: 80

		Part- A	
1.		**Answer any <u>TEN</u> questions**	**10 x 2 = 20**
	a)		
	b)		
	c)		
	d)		
	e)		
	f)		
	g)		
	h)		
	i)		
	j)		
	k)		
	l)		
		Part-B	
		Answer any <u>Four</u> questions	**4 x 5 = 20**
	2		
	3		
	4		
	5		
	6		
	7		
		Part-C	
		Answer any FOUR questions	**4 X 10 = 40**
	8		
	9		
	10		
	11		
	12		