SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI

Faculty of Humanities

As Per National Education Policy -NEP-2020

Syllabus

Three Years- Six Semesters Bachelor's Degree Programme

Degree of Bachelor of Arts

B.A. Semester-III & IV

Level - 5.0

Department Specific Core (DSC) /Subject- Major / Minor - Statistics

(DSC-Code 665)

Effective from Academic year -2025-26

(Board of Studies Statistics, Faculty of Humanities)

Sant Gadge Baba Amravati University

Three Year Six Semesters Programme :Bachelor's of Arts (B.A.) With Major- **Statistics** and Minor - **Statistics** (NEP)

Faculty: Humanities, B. A. Second Year -Semester - III (NEP), Level - 5.0

Department Specific Core (DSC) /Subject- Major / Minor - **Statistics** **DSC Code-665**

Scheme - Teaching - Learning -Examination

S No.	Vertical	NEP Vertical Type	Code	Course	Teaching Scheme Hours			Learning		Teaching Work Load Hours	Marks / Examination		
					L	P	Total	Total Hours	Credit Offered		External	Internal	Total
1	a	Major – DSC -Statistics	**665211**	Major - III (Theory) -Probability and Random Variable	2	--	2	2	2	2	30	20	50
2			**665212**	Major - III (Practical)	-	4	4	4	2	4 x No of batch	25	25	50
3			**665213**	Major - IV (Theory)- Statistical Systems in India	3	--	3	3	3	3	60	40	100
4		Major – IKS - DSC - Statistics	**665271**	Major- IKS - Statistic Paper- I	1	--	1	1	1	1	--	25	25
5	b	Minor – DSC – Statistics	**665251**	Minor -III (Theory)- **Central Tendency and Dispersion-**	2	-	2	2	2	2	30	20	50
6			**665252**	Minor -III (Practical)	-	4	4	4	2	4 X No of batch	25	25	50
7	e	Value Education Course VEC	751201	**VEC- I (A)** - Understanding India	1	--	1	1	1	1	--	25	25
8			751202	**VEC- I (B) - Environmental Education-I**	1	--	1	1	1	1	--	25	25
9	d	**II) Skill Enhancement Courses(SEC)**	751203	**SEC- life Skills - III- Universal Human Value** (love, and Compassion, Truth, Non-Violeance, Righteousness, Pease, Service, Renunciation (Sacrifice) Tyag)	1	---	1	1	1	1	--	25	25
10			751204	**SEC life Skills - III- Leadership & Management skills** (Leadership skills, Management skills Entrepreneurship, Innovative Leadership and Design Thinking, Ethics and Integrity)	1	--	1	1	1	1	--	25	25
11	c	Generic/Open Elective(OE) – DSC – Statistics	**665214**	**OE-5 Measures of Dispersion** (Statistics)	2	--	2	2	2	2	30	20	50
12			-----	OE-6 (Other than faculty of Hiumanities)	2	--	2	2	2	2	30	20	50
13	f	Co-CurricularCourses	NSS/UBA/ NCC cultural / sports /Yoga stc			4	4	4	2	4			
									22				

L:Lecture,T:Tutorial,P:Practical/ Practicum Total Credits offered : 22(Max),Total credits to be earned:20(Min)/ Batch-size (16)

Sant Gadge Baba Amravati University

Three Year Six Semesters Programme :Bachelor's of Arts (B.A.) With Major- **Statistics** and Minor - **Statistics** (NEP)

Faculty: Humanities, B. A. Second Year -Semester - IV (NEP), Level - 5.0

Department Specific Core (DSC) /Subject- Major / Minor - **Statistics** **DSC Code-665**

Scheme - Teaching - Learning -Examination

S No.	Vertical	NEPVertical Type	Code	Course	Teaching Scheme Hours			Learning		Teaching Work Load Hours	Marks / Examination		
					L	P	Total	Total Hours	Credit Offered		External	Internal	Total
1	a	Major – DSC – Statistics	**665216**	Major- V (Theory) - Correlation and Regression	2	--	2	2	2	2	30	20	50
2			**665217**	Major Paper V (Practical)	-	4	4	4	2	4 x No of batch	25	25	50
3			**665218**	Major - VI (Theory)- Theoretical Distributions & Testing of Hypothesis	5	--	5	5	5	5	60	40	100
4		IKS Major – DSC – Statistics	**665272**	Major - IKS -Statistic – Paper II	1	--	1	1	1	1	--	25	25
5	b	Minor – DSC – Statistics	**665253**	Minor - IV (Theory) - Study of Bivariate Data	2	-	2	2	2	2	30	20	50
6			**665254**	Minor - IV (Practical)	-	4	4	4	2	4 X No of batch	25	25	50
7		Minor Elective – DSC – Statistics (Student Selected Any one)	**665255**	Minor -Elective - V (A) (Theory) Elective – SQC & Demand Analysis	4	-	4	4	4	4	60	40	100
8			**665256**	Minor Elective -V (B) (Theory) – Elective-- Testing of Hypothesis									
9	e	Value Education Course (VEC)	751205	i) Digital and Technological Solutions	1	--	1	1	1	1	--	25	25
10			751206	ii) Environmental / Education-II	1	--	1	1	1	1	--	25	25
11	f	Co-Curricular Courses	NSS/UBA/ NCC cultural / sports /Yoga stc		-	4	4	4	2	4	--	--	--
									22				

L:Lecture,T:Tutorial,P:Practical/ Practicum Total Credits offered : 22(Max),Total credits to be earned:20(Min)/ Batch-size (16

Class	Vertical Type	Course Code	Credit Offered	Marks			Exam Duration
				External	Internal	Total	
SEM - 3	a Major III (Theory)	665211	2	30	20	50	2 Hours
	a Major III (Practical)	665212	2	25	25	50	2 Hours
	a Major IV (Theory)	665213	3	60	40	100	3 Hours
	e Major- IKS	665271	1	15	10	25	1 Hour
	b Minor III (Theory)	665251	2	30	20	50	2 Hours
	b Minor III (Practical)	665252	2	25	25	50	2 Hours
	c OE 5	665214	2	30	20	50	2 Hours
	c OE 6	---	2	30	20	50	2 Hours
	e Value Education Course		2				
	f Cocurricular Course		2				
	d SEC		2				
	Total		22				
SEM - 4	a Major V (Theory)	665216	2	30	20	50	2 Hours
	a Major V (Practical)	665217	2	25	25	50	2 Hours
	a Major VI (Theory)	665218	5	60	40	100	3 Hours
	e Major- IKS	665272	1	15	10	25	1 Hour
	b Minor IV (Theory)	665253	2	30	20	50	2 Hours
	b Minor IV (Practical)	665254	2	25	25	50	2 Hours
	b Minor V (A) Theory Elective	665255	4	60	40	100	3 Hours
	b Minor V (B) Theory Elective	665256					
	e Value Education Course		2				
	f Cocurricular Course		2				
	Total		22				

Sant Gadge Baba Amravati University

As Per National Education Policy (NEP)-2020 Syllabus

B.A. Semester- III & IV Major / Minor-IKS -DSC - Statistics

Important Notes

a. The strength of batch of practical for UG classes in statistics shall be 16 with an addition of 10% with the permission of Honorable Vice Chancellor.

b. For theory 1 credit shall mean 1 hour teaching per week per semester (Total 45Hrs / semester). The duration of 1 teaching period will be 60 minutes.

c. For practical 1 credit shall mean 2 Hrs teaching per week per semester (Total 30 Hrs / semester).

d. For examination and evaluation for theory course, 40% marks shall be assigned to Internal Examination and 60% marks shall be assigned to end semester External University Examination.

Instructions to Paper Setter

The examination in Statistics in BA Part II Semester III & IV will comprise of theory papers, internal assessments and practical examination .

Pattern of question paper

* For Sem III – Major III (T), Minor III (T), OE5 (T), OE6 (T) and
For Sem IV – Major V (T), Minor IV (T) Examination

BA (Semester III / Semester IV) Examination
DSC Statistics
Course Name ----------

Time (2Hrs / 3Hrs) Max Marks (30/60)

Note : All questions are compulsory.

Two questions of long answer type: Q) Solve any one question of the following.

a) 7 marks
b) 7 marks

Two questions of short answer type Q) Solve any two questions of the following

a) 4 marks
b) 4 marks
c) 4 marks
d) 4 marks

* For Sem III – Major IV (T)
For Sem IV – Major VI (T) , Minor V (A) (T) Elective and Minor V (B) (T) Elective

BA (Semester III / Semester IV) examination
DSC Statistics
Course Name ----------

Time (2Hrs / 3Hrs) Max Marks (30/60)

All questions are compulsory.

Two questions of long answer type. Q) Solve any two questions of the following

a) 6 marks
b) 6 marks
c) 6 marks

Three questions of short answer type. Q) Solve any three questions of the following

a) 4 marks
b) 4 marks
c) 4 marks
d) 4 marks
e) 4 marks

Sant Gadge Baba Amravati University

As Per National Education Policy (NEP)-2020

Faculty of Humanities

Syllabus

B. A. Semester- III (NEP) Level - 5.0

Major- DSC -Statistics

Course Code- 665211

Course Title - Major- III (Theory) - Probability and Random Variable

Level	Semester	Vertical Type	Course Code	Course Name	Credits	Teaching Hours	Total Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester III	Major-DSC Statistics	**665211**	**Major-III (Theory)** Probability and Random Variable	2	2	30	2 Hrs	Ext+Int = Total 30 + 20 = 50

Course Objective :

To make students able to :

1. Understand the basic concepts of random experiment, random variable, probability, etc.
2. Use concept of probability in real life situations.
3. Compute probability of real-life events.
4. Identify the nature o f data using moments.
5. Check the dependency of events using probability or conditional probability.

Course Outco

1 Understand the basic concepts of randomexperiment,randomvariable,probability,
2 Use concept of probability in real lifesituations.
3 Compute probability of real-life events.
4 Identify the nature o f data using moments.
5 Check thedependency of events using probability or conditional probability.

Theory Syllabus

Serial No.	Contents	Workload Allotted	Weightage of Marks Allotted
Unit I	Introduction to Probability 1.1 Deterministic and probabilistic phenomenon with example, 1.2 basic terminology in probability 1.3 Mathematical and Statistical probability – and limitations 1.4 Simple theorems on probability of events	7 Hrs	7 Marks
. **Unit II**	2.1Axioms.of probability. 2.2 Addition theorem of probability (only statement) with diagram 2.3Multiplication theorem of probability (only statement) with diagram 2.4 Simple problems on probability	7 Hrs	7 Marks

Unit III	Random variable and Distribution Function 3.1: Random variable- discrete, and continuous with example. 3.2: Probability mass function and probability density function. 3.3 Simple problems on probability mass function. 3.4 Distribution Function: Concept , definition and properties of distribution function	8 Hrs	8 marks
Unit IV	Mathematical Expectation and MGF 4.1: Definition of mathematical expectation for discrete and continuous random variable. Properties of mathematical expectation 4.2 Addition and multiplication theorem of expectation. Simple problems on mathematical expectation. 4.3 Definition of mgf . Limitations of mgf (statements) 4.4: Simple theorems on mgf with proof. Uniqueness theorem of mgf.	8 Hrs	8 Marks
	Total	30 Hours	30 Marks

Internal Assessment: 20 Marks : Unit Test 20 Mcq

References : Text books and Reference books:**Course Material/Learning Resources**

1 मूलभूत सांख्यिंकी - प्रा. राम देशमुख, विद्दया प्रकाशन.

2 संख्यात्मक तंत्रे - प्रा. राम देशमुख, विद्दयाप्रकाशन.

3 सांख्यिंकी मूलभूत तंत्रे : प्रा. पुरूषोत्तम नवघरे

4 Bhat B.R. Shrivenkataraman T and Rao Madhava K.S. (1996) : Statistics: A Beginners's Text Vol.1, New Age International (P) Ltd.

5 Goon A.M., Guptam M.K., Dasgupta B: Fundamental of Statistics, Vol 1, 2, World Press Calcutta.

Syllabus (Practical)- Course Code- 665212 Course Title - Major- III (Practical)

Level	Semester	Course Code	Course Name	Credits	Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester III	665212	**Major- III (Practical)**	2	4 per batch	2Hrs	Ext+Int = Total 25 + 25 = 50

Course Outcomes By the end of the Lab/Practical Course, students should be able to:

1. Understand the basic concepts of random experiment, random variable, probability,etc.
2. Use concept of probability in real lifesituations.
3. Compute probability of real-life events.
4. Identify the nature o f data using moments.

*** List of Practical/Laboratory Experiments/Activities etc.**

1	Evaluation of probabilities- simple problems
2	Evaluation of probabilities using addition theorem.
3	Evaluation of probabilities multiplication theorem
4	Simple problems on mathematical expectation.
5	Calculation of mean using mathematical expectations
6	Calculation of variance using mathematical expectations
7	Simple problems on moment generating function.

Internal Assessment: 25 Marks . Practical Record Book 15,Attendance: 10 marks

External Assessment 25 marks. Problem solving: 20 marks ,Viva Voce: 5 marks

Syllabus

B. A. Semester- III (NEP) Level - 5.0

Major- DSC -Statistics

Course Code- 665213

Course Title - Major- IV (Theory) - Statistical Systems in India

Level	Semester	Type NEP	Course Code	Course Name	Credits	Teaching Hours	Total Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester III	Major DSC- Statistics	**665213**	**Major- IV (Theory)** Statistical Systems in India	3	3	45	3 Hrs	Ext+Int = Total 60 + 40 = 100

Course Objective : To make students able to;

1. Students developed with basic knowledge about Statistics and its scope in various fields.
2. Become familiar with mortality and fertility.
3. Can express the vast and diverse data into compact and more specific manner
4. Enable to estimate the trends in vital events like births and deaths.

Course Outcomes : After completing this course students will be able to

1. Students developed with basic knowledge about Statistics and its scope in various fields.
2. Become familiar with mortality and fertility.
3. Can express the vast and diverse data into compact and more specific manner
4. Enable to estimate the trends in vital events like births and deaths

Theory Syllabus

Serial No.	Contents	Workload Alloted	Weightage of Marks Alloted
Unit I	Population Statistics 1.1Meaning and definition of population statistics and its sources. 1.2::Meaning and definition of official statistics. 1.3 : Sources of obtaining official statistics. 1.4: De Jure and De Facto method with merits and demerits	9Hrs	12Marks
Unit II	Statistical Organizations in India 2.1: Names of various statistical originations 2.2: CSO and its functions. 2.3: NSSO and its function. 2.4 IPPS and its functions	9Hrs	12 Marks

Unit III	Principal publications 3.1 Agricultural Statistics and its publications 3.2: Industrial Statistics and it's publications 3.3 Transportation Statistics and its publications 3.4 Educational Statistics and it's publications.	9Hrs	12 Marks
Unit IV	Vital Statistics –Mortality 4.1 Definition and use of Vital Statistics 4.2 Sources of Vital Statistics 4.3 Measurement of mortality : Crude Death Rate(CDR) with merits and demerits, Specific Death Rate(SDR) with merits and Demerits. 4.4 Infant Mortality Rate	9Hrs	12 Marks
Unit V	Vital Statistics - Fertility 5.1 Fertility – Meaning, definition and its importance. 5.2 Crude Birth Rate 5.3 Specific Fertility Rate, General Fertility Rate & Total Fertility 5.4 Measurement of Population growth	9Hrs	12 marks
	Total	45 Hours	60 Marks

Internal Assessment : 40 marks. Home assignment: 20 marks Unit test: 20 marks

References:Course Material/Learning Resources

6 मूलभूत सांख्यिंकी - प्रा. राम देशमुख, विद्दया प्रकाशन.

7 संख्यात्मक तंत्रे - प्रा. राम देशमुख, विद्दयाप्रकाशन.

8 सांख्यिंकी मूलभूत तंत्रे : प्रा. पुरूषोत्तम नवघरे

4. Bhat B.R. Shrivenkataraman T and Rao Madhava K.S. (1996) : Statistics: A Beginners's Text Vol.1, New Age International (P) Ltd.

5. Goon A.M., Guptam M.K., Dasgupta B: Fundamental of Statistics, Vol 1, 2, World.

6. CroxtonF.E. , Cowden D.J.and Kelin S: Applied Generatl Statistics, Prentice Hall India

7. Gupta S.C. , Kapoor V.K. : Fundamental of Mathematical Statistics; S. Chand & Company

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Syllabus

B. A. Semester- III (NEP) Level - 5.0

Major-IKS- DSC -Statistics

Course Code- 665271

Course Title - Major- IKS - Statistics Paper I

Level	Semester	Type NEP	Course Code	Course Name	Credits	Teaching Hours (Perweek)	Total Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester III	Major IKS-DSC-Statistics	**665271**	Major-IKS-Statistics Paper I	1	1	15	Class Test I Hours	Ext +Int = Total 15 + 10 = 25

Course Objective

1. To understand the brief history of statistics
2. the importance of statistics igovernmentorganization
3. To understand the basic knowledge of statistics which will be useful for the competitive Examination
4. To improve the statistical reasoning of ability

Course Outcomes

1 Student will able to understand the brief history of statistics of India pre independence and after independence.

2. Student becomes familiar with the contribution of Indian Statisticians.

Theory Syllabus

Serial No.	Contents	Workload Alloted	Weightage of Marks Alloted
Unit I	1.1 Simple Definition of Statistics 1.2 Historic Development of Statistics 1.3 Statistical Systems in British Period in India	7 Hrs	7 Marks
Unit II	Architects of Modern Statistics in India 2.1 Prof. P.C.Mahalanobis and his work 2.2 Prof. C.R.Rao and his work 2.3 Prof. P. V. Sukhatme and his work	8 Hrs	8 Marks
	Total	15 Hours	15 Marks

Class Test -15 Marks / Internal Assessment: 10 / Total 25 Marks

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Syllabus

B. A. Semester- III (NEP) Level - 5.0

Minor- DSC -Statistics

Course Code- 665251

Course Title - Minor-III (Theory) - Central Tendency and Dispersion

Level	Semester	Type NEP	Course Code	Course Name	Credits	Teaching Hours (Per week)	Total Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester III	Minor DSC-Statistics	**665251**	**Minor-III (Theory)** Central Tendency and Dispersion	2	2	30	2 hrs	Ext+Int = Total 30 + 20 = 50

Course Objective To make students able to;

1. Students developed with basic knowledge about Statistics and its scope in various fields.
2. Become familiar with handling of data.
3. Can express the vast and diverse data into compact and more specific manner

Course Outcomes After completing this course students will be able to

1. Students developed with basic knowledge about Statistics and its scope in various fields.
2. Become familiar with handling of data.
3. Can express the vast and diverse data into compact and more specific manner

Theory Syllabus

Serial No.	Contents	Workload Allotted	Weightage of Marks Allotted
Unit I	1.1 Central Tendency: Concept, definition and measures. Characteristics of ideal measure, Def^{n}, merits, demerits and uses of arithmetic mean Properties of am. 1.2 Definition, merits, demerits and uses of, median and mode. 1.3 Definition merits, demerits and uses of geometric mean. Definition, merits, demerits and uses of harmonic mean 1.4 Relation between am, gm and hm.	8 Hrs	8 Marks
Unit II	3.1 Meaning, definition and need of dispersion. 3.2 Characteristics of ideal measure of dispersion. 3.3 Range, quartile deviation and mean deviation, 3.4 Standard deviation and variance.	7 Hrs	7 Marks
Unit III	4.1 Coefficient of dispersion, coefficient of variation, and its uses 4.2 Partition Values quartiles, deciles and percentiles 4.3 :Moments: Definition of raw and central moments, 4.4 :relation between raw and central moments beta1 and beta2	8 Hrs	8 Marks
Unit IV	Skewness and Kurtosis 5.1 Skewness, meaning and types, positive and negative skewness with diagram. 5.2 Measures of skewness, absolute and relative measures, coefficient of skewness- Karl Pearson's, Bowley's and based on moments. 5.3 Kurtosis: Meaning and types with diagram. 5.4 Measures of Kurtosis.	7 Hrs	7 Marks
	Total	30 Hours	30 Marks

Internal Assessment : 20 Marks. Unit Test 20 MCQ

References:

1. मूलभूत सांख्यिंकी - प्रा. राम देशमुख, विद्दया प्रकाशन.
2. संख्यात्मक तंत्रे - प्रा. राम देशमुख, विद्दयाप्रकाशन.
3. सांख्यिंकी मूलभूत तंत्रे : प्रा. पुरूषोत्तम नवघरे
4. Bhat B.R. Shrivenkataraman T and Rao Madhava K.S. (1996) : Statistics: A Beginners's Text Vol.1, New Age International (P) Ltd.
5. Goon A.M., Guptam M.K., Dasgupta B: Fundamental of Statistics, Vol 1, 2, World Press Calcutta.
6. Gupta S.C. , Kapoor V.K. : Fundamental of Mathematical Statistics; S. Chand

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Syllabus (Practical)

Course Code- 665252 Course Title - Minor-III (Practical)

Level	Semester	Course Code	Course Name	Credits	Teaching Hours	Exam Duration	Max. Marks
5.0	III	**665252**	**Minor-III (Practical) -**	2	4 per batch	2 Hrs	Ext+Int = Total 25 + 25 = 50

Course Outcomes

By the end of the Lab/Practical Course, students should be a Students developed with basic knowledge about Statistics and its scope in various fields.

1. Become familiar with handling of data.
2. Can express the vast and diverse data into compact and more specific manner

*** List of Practical/Laboratory Experiments/Activities etc.**

1	Calculation of arithmetic mean of simple series of data
2	Calculation of arithmetic mean of discrete and continuous frequency distributions
3	Calculation of median of simple series of data
4	Calculation of median of discrete and continuous frequency distributions
5	Calculation of mode of simple series of data
6	Calculation of mode of discrete and continuous frequency distributions
7	Calculation of range of simple series and frequency distribution
8	Calculation of quartile deviation of simple series and frequency distribution
9	Calculation of mean deviation of simple series and frequency distribution
10	Calculation of standard deviation of simple series and frequency distribution
11	Calculation of coefficient of skewness and kurtosis

Internal Assessment: 25 Marks . Practical Record Book: 15 marks , Attendance: 10 marks

External Assessment 25 marks. Problem solving: 20 marks Viva Voce: 5 marks

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Sant Gadge Baba Amravati University

As Per National Education Policy (NEP)-2020

Faculty of Humanities

Syllabus

B. A. Semester- IV (NEP) Level - 5.0

Major- DSC -Statistics

Course Code- 665216

Course Title - Major- V(Theory) - Correlation and Regression

Level	Semester	Vertical Type	Course Code	Course Name	Credits	Teaching Hours	Total Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester IV	Major- DSC Statistics	**665216**	**Major-V (Theory)** Correlation and Regression	2	2	30	2 Hrs	Ext+Int = Total 30 + 20 = 50

Course Outcomes : After completing this course students will be able to

1. Understand the relationship between two variables.
2. Calculate and interpret correlation coefficient for bivariatedata.
3. Identify the difference between linear and non-linear regression models.
4. Apply the methods to real life situations ,draw valid conclusions and their interpretation

Theory Syllabus

Serial No.	Contents	Workload Alloted	Weightage of Marks Alloted
Unit I	Study of Bivariate Data 1.1: Meaning of Bivariate data, bivariate frequency table, covariance, 1.2: Correlation: Meaning, example, positive, negative and perfect correlation. 1.3: Measurement of correlation: Scatter diagram, 1.4 Karl Pearson's coefficient of correlation, its limits properties , assumptions.	7 Hrs	7 Marks
. Unit II	Correlation more than 2 variables 2.1: Rank Correlation: need, meaning, formula and limits. 2.2: Partial correlation:concept , formula of partial correlation coefficient, its limits. 2.3: Multiple correlation: concept, formula of multiple correlation coefficient, limits 2.4 properties of . multiple correlation Regression Analysis.	8 Hrs	8 Marks

Unit III	3.1: Concept, definition of Regression, principleof least square regression. 3.2 Lines of Regression 3.3: Lines of regression, fitting of regression X on Y, Y on X. 3.4: Coefficients of regression, their properties.	8 Hrs	8 Marks
Unit IV	Theory of Attributes. 4.1: Introduction, notations, dichotomy. 4.2: Classes, class frequency, order of class frequency. 4.3: Consistency of data, independence of attributes, criteria of independence. 4.4: Association of attributes, Yule's coefficient of association, coefficient of colligation.	7 Hrs	7 Marks

Internal Assessment: 20 Marks. Unit Test MCQ.

References :

1. मूलभूत सांख्यिंकी - प्रा. राम देशमुख, विद्दया प्रकाशन.
2. संख्यात्मक तंत्रे - प्रा. राम देशमुख, विद्दयाप्रकाशन.
3. सांख्यिंकी मूलभूत तंत्रे : प्रा. पुरूषोत्तम नवघरे
4. Bhat B.R. Shrivenkataraman T and Rao Madhava K.S. (1996) Statistics: A Beginners's Text Vol.1 New Age International (P) Ltd..
5. Goon A.M., Guptam M.K., Dasgupta B: Fundamental of Statistics, Vol 1, 2, World Press Calcutta**.**
6. Gupta S.C. , Kapoor V.K. : Fundamental of Mathematical Statistics; S. Chand & Company

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Syllabus (Practical)

Course Code- 665217 Course Title - Major- V (Practical)

Level	Semester	Course Code	Course Name	Credits	Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester IV	**665217**	**Major- V** Practical	2	4 per batch	2 Hrs	Ext+Int = Total 25 + 25 = 50

*** List of Practical/Laboratory Experiments/Activities etc.**

1	Study of correlation by scatter diagram
2	Calculation of Karl Pearson's coefficient of correlation for bivariate data
3	Calculation of Spearman's rank correlation coefficient for bivariate data
4	Calculation of Spearman's rank (repeated ranks) correlation coefficient for bivariate data
5	Problems on partial correlation
6	Problems on multiple correlation
7	Fitting of line of regression
8	Testing consistency of data
9	Problems on positive, negative association
10	Calculation of Yule's coefficient of association

Internal Assessment: 25 Marks . Practical Record Book: 15 marks Attendance: 10 marks

External Assessment 25 marks. Problem solving: 20 marks Viva Voce: 5 marks

Syllabus

B. A. Semester- IV (NEP) Level - 5.0

Major- DSC -Statistics

Course Code- 665218

Course Title - Major- VI (Theory) - Theoretical Distributions & Hypothesis Testing

Level	Semester	Vertical Type	Course Code	Course Name	Credits	Teaching Hours	Total Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester IV	**Major- DSC Statistics**	**665218**	**Major- VI (Theory)** Theoretical Distributions & Hypothesis Testing	5	5	75	3 Hrs	Ext+Int = Total 60 + 40 = 100

Course Objective : To make students able to

1.develop with basic knowledge about discrete distributions.
2. Become familiar with handling of data.
3. Can express real life situation following certain distribution
4. Enable to estimate the trends mean and variance life events

Course Outcomes :

After completing this course students will be able to

1. Students develop with basic knowledge about discrete distributions.
2. Become familiar with handling of data.
3. Can express real life situation following certain distribution
4. Enable to estimate the trends mean and variance life events

Theory Syllabus

Serial No.	Contents	Workload Alloted	Weightage of Marks Alloted
Unit I	. Binomial Distribution 1.1Concept and definition of Binomial distribution with example. Physical conditions foBinomial distribution 1.2 Mean ,variance and mgf of BD 1.3 Additive property and recurrence relation 1.4 Simple problems on binomial distribution.	12 Hrs	12 Marks
. **Unit II**	Poisson Distribution 2.1Concept and definition of Poisson distribution with example. Physical conditions for Poisson distribution 2.2 Mean ,variance and mgf of Poisson distribution 2.3 Additive property and recurrence relation 2.4 Simple problems on Poisson Distribution	12 Hrs	12 Marks

Unit III	Negative Binomial Distribution 4.1Concept and definition of Negative Binomial distribution with example 4.2 Physical conditions for Negative Binomial distribution 4.3Mean ,variance and mgf of Negative Binomial distribution	12 Hrs	12 Marks
Unit IV	Normal Distribution 5.1Concept and definition of Normal distribution with example 5.2 Physical conditions for normal distribution 5.3Mean ,variance and mgf of normal distribution 5.4 Chief characteristics and area property of normal distribution	12 Hrs	12 Marks
Unit V	Testing of Hypothesis. 5.1: Introduction, simple and composite hypothesis, test of hypothesis. 5.2: Null hypothesis, alternate hypothesis, critical regions, types of errors. 5.3: Level of significance, power of test. 5.4: Steps in solving testing of hypothesis problems.	12 Hrs	12 Marks
	Total	75 Hours	60 Marks

Internal Assessment : 40 marks. Home assignment: 20 marks. Unit test: 20 marks

References :

1.मूलभूत सांख्यिंकी - प्रा. राम देशमुख, विद्दया प्रकाशन.

2.संख्यात्मक तंत्रे - प्रा. राम देशमुख, विद्दयाप्रकाशन.

3.सांख्यिंकी मूलभूत तंत्रे : प्रा. पुरूषोत्तम नवघरे

4.Bhat B.R. Shrivenkataraman T and Rao Madhava K.S.: StatisticBeginners'Text

5.Goon A.M., Guptam M.K., Dasgupta B: Fundamental of Statistics,Vol 1,2

6.Gupta S.C. , Kapoor V.K. : Fundamental of Mathematical Statistics; S.

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Syllabus

B. A. Semester- IV (NEP) Level - 5.0

Major-IKS- DSC -Statistics

Course Code- 665272

Course Title - Major- IKS - Statistics Paper II

Level	Semester	Type NEP	Course Code	Course Name	Credits	Teaching Hours (Perweek)	Total Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester IV	Major IKS-DSC-Statistics	**665272**	Major-IKS-Statistics Paper II	1	1	15	Class Test I Hours	Ext +Int = Total 15 + 10 = 25

Course Objectives

1.To know the importance of statistics in government organizations

2.To improve the statistical reasoning of ability.

Course Outcomes

1. Student improve their knowledge about application of statistics in different government organization.
2. Statistical reasoning of student will get improved through the understanding.

Theory Syllabus

Serial No.	Contents	Workload Alloted	Weightage of Marks Alloted
Unit I	1.4 **Statistics in Government Organizations** : Use of Statistics in central and state government i.e In five year plan, agricultural development, health program, socio economic development of India, Industrial development, family welfare. Statistics in Indian Research Institute	7 Hrs	7 Marks
Unit II	**Statistical reasoning** : Analytical evidence and empirical evidence, Designing research, Develop an understanding of data using graph in statistics, Statistical tools used in the scientific methods, Statistical reasoning process in data	8 Hrs	8 Marks
	Total	15 Hours	15 Marks

Class Test -15 Marks / Internal Assessment: 10 / Total 25 Marks

Note1. Internal Assessment will be of 10 marks. (Unit test or Seminar)

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Syllabus

B. A. Semester- IV (NEP) Level - 5.0

Minor- DSC -Statistics

Course Code- 665253

Course Title - Minor-IV (Theory) - Study of Bivariate Data

Level	Semester	Vertical Type	Course Code	Course Name	Credits	Teaching Hours	Total Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester IV	Minor DSC Statistics	**665253**	**Minor-IV (Theory)** Study of Bivariate Data	2	2	30	2 Hrs	Ext+Int = Total 30 + 20 = 50

Course Outcomes : After completing this course students will be able to

1. Understand the relationship between two variables.
2. Calculate and interpret correlation coefficient for bivariate data.
3. Identify the difference between linear and non-linear regression models.
4. Apply the methods to real life situations ,draw valid conclusions and their interpretation.

Theory Syllabus

Serial No.	Contents	Workload Alloted	Weightage of Marks Alloted
Unit I	Bivariate Data 1.1: Meaning of Bivariate data with example, bivariate frequency table, covariance, 1.2: Correlation: Meaning, example, positive, negative and perfect correlation. 1.3: Measurement of correlation: Scatter diagram,	7 Hrs	7 Marks
. **Unit II**	Correlation Coefficient 2.1.Karl Pearson's coefficient of correlation, its limits 2.2Properties and , assumptions underlying Karl Pearson's coefficient of correlation. 2.3: Rank Correlation: need, meaning, formula and limits. 2.4.Rank correlation with repeated ranks	7 Hrs	7 Marks
Unit III	Regression Analysis 3.1.Rank correlation with repeated ranks 3.2 Line of best fit 3.3: Concept, definition of Regression, 3.4 Principle of least square regression.	8 Hrs	8 Marks

Unit IV	4.1: Lines of regression, fitting of regression X on Y, Y on X. 4.2: Angle between lines of regression 4.3 Coefficients of regression, their properties	8 Hrs	8 Marks
	Total	30 Hours	30 Marks

Internal Assessment: 20 Marks. Unit Test MCQ.

References :

1. मूलभूत सांख्यिंकी - प्रा. राम देशमुख, विद्या प्रकाशन.
2. संख्यात्मक तंत्रे - प्रा. राम देशमुख, विद्याप्रकाशन.
3. सांख्यिंकी मूलभूत तंत्रे : प्रा. पुरूषोत्तम नवघरे
4. Bhat B.R. Shrivenkataraman T and Rao Madhava K.S. (1996) : Statistics: A Beginners's Text Vol.1, New Age International (P) Ltd.
5. Goon A.M., Guptam M.K., Dasgupta B: Fundamental of Statistics, Vol 1, 2, World Press Calcutta.
6. Croxton F.E. , Cowden D.J.and Kelin S: Applied Generatl Statistics, Prentice Hall India
7. Gupta S.C. , Kapoor V.K. : Fundamental of Mathematical Statistics; S. Chand

Syllabus (Practical) - Course Code- 665254 - Minor-IV (Practical)

Level	Semester	Course Code	Course Name	Credits	Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester IV	**665254**	Statistics Minor IV Practical	2	4 per batch	2 Hrs	Ext+Int = Total 25 + 25 = 50

*** List of Practical/Laboratory Experiments/Activities etc.**

1	Study of correlation by scatter diagram
2	Calculation of Karl Pearson's coefficient of correlation for bivariate data
3	Calculation of Spearman's rank correlation coefficient for bivariate data
4	Calculation of Spearman's rank (repeated ranks) correlation coefficient for bivariate data
5	Problems on Correlation Coefficient.
6	Fitting of line of regression
7	Problems on regression coefficients

Internal Assessment: 25 Marks, Practical Record Book:15 marks Attendance:10 marks

External Assessment 25 marks. Problem solving: 20 marks Viva Voce: 5 marks

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Syllabus

B. A. Semester- IV (NEP) Level - 5.0

Minor-Elective- DSC -Statistics

Course Code- 665255

Course Title - Minor-Elective- V (A) (Theory) - SQC and Demand Analysis

Level	Semester	Vertical Type	Course Code	Course Name	Credits	Teaching Hours	Total Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester IV	Minor Elective DSC Statistics	**665255**	**Minor-Elective- V (A) (Theory)** SQC and Demand Analysis	4	4	60	3 Hrs	Ext+Int = Total 60 + 40 = 100

Course Objective :

1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

Course Outcomes : After completing this course students will be able to

1. Students develop with basic knowledge about statistical quality control
2. Become familiar with handling of industrial data.
3. Can express the vast and diverse data into charts

Theory Syllabus

Serial No.	Contents	Workload Alloted	Weightage of Marks Alloted
Unit I	Statistical Quality Control 2.1: Concept,definition, purpose of SQC 2.2 : Uses of SQC 2.3: Chance and assignable causes of variation, 2.4 : Process and production control.	9 Hrs	12 Marks
. **Unit II**	Control Charts 2.1: General theory of control charts and 3 -sigma control limits, 2.2control charts for variables X bar chart 2.3 : control charts for variables R chart	9 Hrs	12 Marks

Unit III	3.1 : control charts for attributes p, chart 3.2 : control charts for attributes d -chart 3.3 : control charts for attribute c-chart	9 Hrs	12 Marks
Unit IV	Acceptance Sampling Plan 3.1: Acceptance of sampling by attributes 3.2: Concept of AQL,LTPD ,AOQL ,ATI 3.3: Producer's risk and consumer's risk 3.4: Single, double sampling plan , OC curve	9 Hrs	12 Marks
Unit V	Demand Analysis 3.1: Necessities, luxuries, demand and supply Laws of demand and supply, equilibrium price. 3.2: Price elasticity of demand, general principles of elasticity, price elasticity of supply. 3.3: Engel's law and Engel's curve 3.4: Pareto's law of income distribution.	9 Hrs	12 Marks

Internal Assessment : 40 marks. Home assignment: 20 marks Unit test: 20 marks

References :

1. मूलभूत सांख्यिंकी - प्रा. राम देशमुख, विद्दया प्रकाशन.
2. संख्यात्मक तंत्रे - प्रा. राम देशमुख, विद्दयाप्रकाशन.
3. सांख्यिंकी मूलभूत तंत्रे : प्रा. पुरूषोत्तम नवघरे
4. Bhat B.R. Shrivenkataraman T and Rao Madhava K.S. (1996) : Statistics: A Beginners's Text Vol.1, New Age International (P) Ltd.
5. Goon A.M., Guptam M.K., Dasgupta B: Fundamental of Statistics, Vol 1, 2, World Press Calcutta.
6. Gupta S.C. , Kapoor V.K. : Fundamental of Mathematical Statistics; S. Chand

Syllabus

B. A. Semester- IV (NEP) Level - 5.0

Minor-Elective- DSC -Statistics

Course Code- 665256

Course Title - Minor-Elective- V (B) (Theory) - Testing of Hypothesis & Small sample test

Level	Semester	Vertical Type	Course Code	Course Name	Credits	Teaching Hours	Total Teaching Hours	Exam Duration	Max. Marks
5.0	B. A. Semester IV	Minor Elective DSC Statistics	**665256**	**Minor-Elective- V (B) (Theory)** Testing of Hypothesis & Small sample test	4	4	60	3 Hrs	Ext+Int = Total 60 + 40 = 100

Course Outcomes :

After completing this course students will be able to

1. Students develop with basic knowledge about statistical hypothesis and testing

2. Become familiar small sample tests3. Can express the vast and diverse data into compact and more specific manner.

Theory Syllabus

Serial No.	**Contents**	**Workload Alloted**	**Weightage of Marks Alloted**
Unit I	Hypothesis. 1.1: Introduction, simple and composite hypothesis, test of hypothesis. 1.2: Null hypothesis, alternate hypothesis, critical regions, types of errors. .31: Level of significance, power of test. 1.4: Steps in solving testing of hypothesis problems.	9Hrs	12 Marks
. **Unit II**	Chi square-Distribution 2.1: X^2-variable, definition and distribution function(without derivation). 2.2: Mean, modeof X^2 variable 2.3: Variance and skewness of X^2 variable. 2.4: Additive property of X^2 variable.	9Hrs	12 Marks
Unit III	X^2-test. 3.1 : equation of X^2-test 3.1: Conditions for validity of X^2-test. 3.2: Applications of X^2-distribution. And X^2-test	9Hrs	12 Marks

Unit IV	t Distribution 4.1: Introduction, definition of Student's t, Fisher'st, their constants. 4.2:Applications of t distribution 4.3 : Assumptions for t test	9Hrs	12 Marks
Unit V	F Distribution 5.1 Definition of F-statistics, F-distribution and its constants. 5.2 :Applications of F distribution. 5.3 : Relation between t and f, F and X^2.	9Hrs	12 Marks
	Total	60 Hours	60 Marks

Internal Assessment : 40 marks. Home assignment: 20 marks. Unit test: 20 marks

References :

1. मूलभूत सांख्यिंकी - प्रा. राम देशमुख, विद्दया प्रकाशन.
2. संख्यात्मक तंत्रे - प्रा. राम देशमुख, विद्दयाप्रकाशन.
3. सांख्यिंकी मूलभूत तंत्रे : प्रा. पुरूषोत्तम नवघरे

Reference Books:

1. Bhat B.R. Shrivenkataraman T and Rao Madhava K.S. (1996) : Statistics: A
2. Beginners's Text Vol.1, New Age International (P) Ltd.
3. Goon A.M., Guptam M.K., Dasgupta B: Fundamental of Statistics, Vol 1, 2,
4. World Press Calcutta.
5. CroxtonF.E. , Cowden D.J.and Kelin S: Applied Generatl Statistics, Prentice Hall India

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