

**SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI**

**Faculty : Humanities**

**Programme :Bachelor of Arts**

**Part - A**

**POs:**

PO1.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.

PO2.Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3. Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4. Effective Citizenship: Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO5. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO6. Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

PO7. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

**Employability Potential of the Programme:**

*“Statistics is a term which relates to the study of the analysis, collection, presentation and organization of numerical data. Statistics can interpret aggregates of data which are too large to be understood by ordinary observation”.*

Professionals, who use statistics to design, collect and interpret data in different fields of industry called “Statisticians”.

After studying and completing this course students are able to understand various job titles available in the field of Statistics and can use statistics in various fields such as business, industry, agriculture, government, private, computer science, Scientific, health sciences and other disciplines. In an increasingly data-driven world, being able to translate information into meaningful insights that can be used by companies and organizations is a valuable skill for the following job titles;

Statistician  
Econometrician  
Research Analyst  
Biostatistician  
Biometrician  
Epidemiologist  
Data Scientist  
Sport Statistician  
Medical Statistician  
Statistical Investigator  
Statistical Quality Controller  
Market Researcher

And the job areas are; Census, Ecological, Medical, Election, Crime, Education, Film, Cricket, Tourism, etc. Duties of Statistics are listed below;

- Collecting and analyzing the data.
- To design experiments or surveys to collect the required data.
- Applying statistical methods to solve practical problems in business, science and other fields.
- Writing reports and articles of their analysis.
- Presenting results to clients or authorities.

**Part - B**  
**Syllabus Prescribed for -Second---Year UG Programme**  
**Programme : Bachelor of Arts**  
**Semester - III**

Code of the Course/Subject	Title of the Course/Subject	(Total Number of Periods)
1121	Statistics S3 Correlation and Theoretical Distribution-	5 period per week

**Cos :**

**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
4. Enable to estimate the trends in vital events like births and deaths
- 5 Understand the working of federal and private Statistical office local to their residence.

The examination in Statistics in BA Part II Semester III will comprise of one theory paper, internal assessment (skill enhancement module) and practical examination .Theory paper will be of three hours duration and carry 60Marks.The internal assessment will be of 20 marks and practical examination will be of 20marks.

**Time**

Theory : 3 Hrs.

Practical : 2 Hrs./Batch

**TotalMarks:100**

Theory : 60

Practical : 20

Int.Ass. : 20

The distribution of Marks will be as follows:

- Theory Examination : Multiple Choice Questions : 20 Marks  
Descriptive Type Questions : 40 Marks.  
Total : 60 Marks.
- Practical Examination : Practical problems : 10 Marks  
Practical record duly certified : 05Marks.  
Viva voce : 05 Marks.  
Total : 20 Marks.
- Internal Assessment (SEM) : As per given activities  
(Home assignments/field survey) : 10 Marks.  
Viva Voce : 10 Marks.  
Total :20 Marks.

The syllabus of statistics in Semester III is based on the basis of five theory periods per week and six practical periods (2 Practical of 3 Periods each)per batch per week.

SantGadge Baba Amravati University, Amravati  
Format and Template for Courses (Theory) of UG/PG Programmes

Unit	Content	
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, Karl Pearson's coefficient of correlation, its limits properties, assumptions. 1.4: Rank Correlation: need, meaning, formula and limits.	12 periods
Unit II	Regression Analysis. 2.1: Concept, definition of Regression, principle of least square regression. 2.2: Lines of regression, fitting of regression X on Y, Y on X. 2.3: Coefficients of regression, their properties. 2.4: Partial correlation: concept, formula of partial correlation coefficient, its limits. 2.5: Multiple correlation: concept, formula of multiple correlation coefficient, limits and properties.	12 periods
Unit III	Random variable and mathematical expectation. 3.1: Random variable- discrete, and continuous with example. 3.2: Probability mass function and probability density function. 3.3: Mathematical expectation-addition and multiplication theorem of expectation. 3.4: Simple problems on mathematical expectation.	12 periods
Unit IV	Study of theoretical distribution function. 4.1: Introduction of distribution function, Bernoulli distribution. 4.2: Binomial distribution- definition, mean and variance (without derivation), examples of binomial distribution. 4.3: Poisson distribution- definition, mean and variance (without derivation), examples of Poisson distribution. 4.4: Normal distribution- definition, mean and variance (without derivation), examples and properties of normal curve.	12 periods
Unit V	Economic Statistics. 5.1: Introduction to index numbers, concept, definition. 5.2: Problems in construction of index numbers, errors in construction. 5.3: Calculation of index numbers-unweighted and weighted method Laspeyre's, Paasche's and Fisher's index numbers. 5.4: Criteria of a good index number. 5.5: Uses and limitations of index numbers.	12 periods
<b>*SEM</b>		15 periods
COs: At the end of this SEM students would be able to 1. Apply various techniques of collection of data 2. Prepare of questionnaire for various studies. 3. Distinguish between primary and secondary data. 4. Make use of Statistical tool (Excel, SPSS)		
<b>**Activities</b>		

**Course Material/Learning Resources :**

**Text books:**

- 1) मुलभूत सांख्यिकी प्रा. राम देशमुख विद्याप्रकाशन
- 2) संख्यात्मक तंत्रे प्रा. राम देशमुख विद्याप्रकाशन
- 3) सांख्यिकीमुलभूततंत्रे : प्रा.पुरुषोत्तम नवघरे

**Reference Books:**

- 1) MulbhutSankhiyki- Ram Deshmukh.
- 2) Fundamentals of Mathematical Statistics-S.C.Gupta, V.K.Kapoor.
- 3) Fundamentals of Mathematical Statistics- D.N.Elhance.
- 4) Fundamentals of Statistics-Goon, Gupta, Dasgupta, World Press Calcutta.
- 5) Fundamentals of Applied Statistics-S.C. Gupta, V.K.Kapoor.

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**SantGadge Baba Amravati University, Amravati**  
**Syllabus Prescribed for ---Second Year UG Programme**  
**Programme: Bachelor of Arts**  
**Semester - III**

Code of the Course/Subject	Title of the Course/Subject (Laboratory/Practical/practicum/hands-on/Activity)	(No. of Periods/Week)
1121	Statistics S3-Lab	6 Periods <b>per week/per batch</b>

**Cos :**

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

1. Represent collected data with the help of graphs and diagram..
2. Calculate various measures of central tendencies.
3. Present the data in frequency table.
4. Analyze the demographic data using death rate

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

1	Study of correlation by Scatter diagram.
2	Calculation of Karl's Pearson's correlation coefficient.
3	Calculation of Spearman's rank correlation coefficient
4	Problems on Partial and Multiple correlations.
5	Fitting of straight line, by least square method.
6	Sample problems on mathematical expectations.
7	Fitting of Binomial Distribution.
8	Fitting of Poisson Distribution.
9	Calculation of Laspeyre's, Paasche's and Fisher's index numbers.

**List of Equipments and instruments.**

1. Twelve digit Desk Model calculators.
2. Biometrica Tables volume I and II.
3. Logarithmic tables.
4. Statistical posters and charts.

**Syllabus Prescribed for –SecondYear UGProgramme**

**Programme: Bachelor of Arts**

**Semester - IV**

Code of the Course/Subject	Title of the Course/Subject	(Total Number of Periods)
1121	Statistics S4 ;Testing of Hypothesis & N P Methods	5 period per week

**Cos :**

**After completing this course students will be able to**

1. Probabilistic knowledge of students would be developed.
2. Compare the data in terms of variability.
3. Enable to measure the seasonal effects and trends in economics
4. Enable to determine premium while obtaining the life insurance policy
5. Students are able to distinguish between primary and secondary data

The examination in Statistics in BA Part II Semester IV will comprise of one theory paper, internal assessment (skill enhancement module) and practical examination .Theory paper will be of three hours duration and carry 60Marks.The internal assessment will be of 20 marks and practical examination will be of 20marks.

**Time**

Theory : 3 Hrs.

Practical : 2 Hrs./Batch

**TotalMarks:100**

Theory : 60

Practical : 20

Int.Ass. : 20

The distribution of Marks will be as follows:

- Theory Examination : Multiple Choice Questions : 20 Marks  
Descriptive Type Questions : 40 Marks.  
Total : 60 Marks.
- Practical Examination : Practical problems : 10 Marks  
Practical record duly certified : 05Marks.  
Viva voce : 05 Marks.  
Total : 20 Marks.
- Internal Assessment (SEM) : As per given activities : 10 Marks.  
(Home assignments/field survey) : 10 Marks.  
Viva Voce : 10 Marks.  
Total : 20 Marks.

The syllabus of statistics in Semester IV is based on the basis of five theory periods per week and six practical periods (2 Practical of 3 Periods each)per batch per week.

Unit	Content	
Unit I	Theory of Attributes. 1.1: Introduction, notations, dichotomy. 1.2: Classes, class frequency, order of class frequency. 1.3: Consistency of data, independence of attributes, criteria of independence. 1.4: Association of attributes, Yule's coefficient of association, coefficient of colligation.	12 periods

SantGadge Baba Amravati University, Amravati  
Format and Template for Courses (Theory) of UG/PG Programmes

Unit II	Testing of Hypothesis. 2.1: Introduction, simple and composite hypothesis, test of hypothesis. 2.2: Null hypothesis, alternate hypothesis, critical regions, types of errors. 2.3: Level of significance, power of test. 2.4: Steps in solving testing of hypothesis problems.	12 periods
Unit III	Chi square-Distribution and Chi square-Test 3.1: $X^2$ -variable, definition and distribution function(without derivation). 3.2: Mean, mode variance and skewness of $X^2$ variable. 3.3: Additive property of $X^2$ variable. 3.4: Conditions for validity of $X^2$ -test. 3.5: Applications of $X^2$ -distribution.	12 periods
Unit IV	t and F Distribution 4.1: Introduction, Student's t, Fisher's t, their constants. 4.2: Applications of t distribution, assumptions for t test 4.3: Definition of F-statistics, F-distribution and its constants. 4.4: Applications of F distribution. 4.5: Relation between t and f, F and $X^2$ .	12 periods
Unit V	Non-Parametric methods 5.1: Meaning of statistic, parameter, parametric and non-parametric methods. 5.2: Advantages and disadvantages of N-P methods over parametric methods. 5.3: Run test. 5.4: Median test. 5.5: Sign test.	12 periods
<b>*SEM</b>		15 periods
COs: At the end of this SEM students would be able to 1. Apply various techniques of collection of data 2. Prepare of questionnaire for various studies. 3. Distinguish between primary and secondary data. 4. Make use of Statistical tool (Excel, SPSS)		
<b>**Activities</b>		

**Course Material/Learning Resources**

Text books:

- 4) मुलभूत सांख्यिकी प्रा. राम देशमुख विद्दयाप्रकाशन
- 5) संख्यात्मक तंत्रे प्रा. राम देशमुख विद्दयाप्रकाशन
- 6) सांख्यिकीमुलभूततंत्रे : प्रा. पुरुषोत्तम नवघरे

**List of Equipment and instruments.**

1. Twelve digit desk method calculators.
2. Biometric tables-Volume I and II.
3. Logarithmic tables.
4. Personal computer with printer.
5. Statistical posters and charts.

**References.**

1. Fundamentals of Mathematical statistics- S.C.Gupta, V.K.Kapoor, S.Chand Publications.
2. Fundamentals of statistics – Goon, Gupta, Das Gupta Vol I and II.
3. Non-parametric Tests- Shastry.

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**Syllabus Prescribed for Second Year UG Programme**  
**Programme: Bachelor of Arts**

**Semester - IV**

<b>Code of the Course/Subject</b>	<b>Title of the Course/Subject</b> (Laboratory/Practical/practicum/hands-on/Activity)	<b>(No. of Periods/Week)</b>
1121	Statistics S4-Lab	<b>6 Periods per week / per batch</b>

**Cos**

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

5. Students develop basic knowledge about Statistics and able to obtain data from various fields.
6. Become familiar with handling of data and can present in summary format
7. Student can express the vast and diverse data into compact and more specific use.
8. Students are able to estimate trend value in vital events like births and deaths.
9. Understand the working of Statistical organization like State District Statistical office, State Economic and Statistics office, CSO, NSSO and obtain relevant data as per requirement.

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

1	Testing Consistency of data.
2	Testing independence of attributes.
3	Calculation of Yule's coefficient.
4	Application $X^2$ -test: Goodness of fit.
5	Application of t-test: For single mean.
6	Application of t-test: For difference of means.
7	Application of F-test: For equality of population variance.
8	Examples on run test, sign test.