Sant Gadge Baba Amravati University, Amravati

Part A

Faculty:------Humanity----------

Programme:------BA----------

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 centred 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 analysing 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 -Third---Year UG Programme

Programme: BA

Semester VI

Code of the Course/Subject	Title of the Course/Subject	(Total Number of Periods)
--------1121------	---Statistics S6 Sampling Method & Operational Research---------	----------5 period per week (Theory) and 6 periods per week per batch (Practical)

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 III Semester V 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 20 marks.

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 VI 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 SAMPLE SURVEYS 1.1 Introduction parameter and statistic, population and sample, complete enumeration and sample surveys. 1.2: Principal steps in sample survey, sampling and non sampling errors. 1.3: Advantages of sampling over complete census, limitations of sampling. 1.4: types of sampling-subjective, probability and mixed sampling.	12 periods
Unit II	SIMPLE RANDOM SAMPLING 2.1: SRS – definition, SRS with and without replacement basic theorems on SRS. 2.2: Selection of simple random sample- lottery method, random number method, mean and variance in SRSWOR. 2.3: Comparisons of SRWOR and SRSWR, merits and demerits of SRS.	12 periods
Unit III	STRATIFIED RANDOM SAMPLING 3.1: Introduction, need and advantages of stratified random sampling, drawing a stratified sample, stratification factor. 3.2: Sample mean and variance of sample mean in stratified sampling. 3.2: Allocation of sample size proportional and optimum allocation, comparisons of SRS with proportional, Neyman with proportional and Neyman with SRS.	12 periods
Unit IV	OPERATIONS RESEARCH AND LINEAR PROGRAMMING PROBLEM 4.1: Introduction to OR, definition of OR origin and development of OR, OR in India. 4.2: Advantages, applications, limitations and uses of operations research. 4.3: Linear programming problem –Introduction. Definitions of LPP, GLPP, objective function, non negative restrictions, constraints, solution, feasible solution, optimum solution. 4.4: Canonical and standard form of LPP solution to LPP by graphical method.	12 periods
Unit V	TRANSPORTATION PROBLEM 5.1: Introduction and LP formation, transportation table, loops in TP 5.2: Solution of transportation problem, initial basic feasible solution 5.3: Northwest corner room, row minima method, column minima method, matrix minima method, Vogel approximation method 5.4: Degeneracy in transportation problem, unbalanced transportation problem.	12 periods
***SEM**		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)	
**Activities		

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

1	Drawing a random sample by random number method.
2	Estimation of population mean and variance using random sampling.
3	Estimation of population mean and variance using stratified random sampling.
4	Proportional allocation in stratified sampling.
5	Neyman allocation in stratified sampling.
6	Solution to LPP by graphical method.
7	7.Solution to transportation problem by i) North West Corner Rule, ii) Row minima method, iii)Colunn minima method iv)Matrix minima method, v) Vogel's method

LIST OFEQUIPMENTS

1. Twelve digit desk model calculators.
2. Biometrics tables vol I, vol II
3. Logarithmic tables
4. Statistical posters and charts.

REFERENCES

1. Fundamentals of mathematical statistics- S C Gupta and V K Kapoor.
2. Fundamentals of applied statistics- S C Gupta and V K Kapoor.
3. Mulbhoot Sankhyiki – Ram Deshmukh
4. Sankhyiki Tantre – Kolte
4. Statistical Quality Control – E. L. Grant
5. Sample surveys: Methods and Appplication _B.V> Sukhatme.
6. Operations Research_ Kantiswaroop, P.K. Gupta, Man Mohan.