B. Sc. Statistics (Faculty of Science)
Multi/Inter Disciplinary
Second Year Semester (III/IV)

Course Code	US03IDSTA01	Title of the Course	INDEX NUMBERS AND VITAL STATISTICS
Total Credits of the Course	02	Hours per Week	02

Course Objectives:	1. To explain the problems arising in the construction of index numbers, importance of an index numbers. 2. To perform basic demographic analyses using various techniques. 3. To learn the main theories used to understand population studies.

Course Content		
Unit	Description	Weightage* (%)
I	Index numbers : Introduction, Uses of index number, Steps for construction of index numbers, Problems in the construction of index numbers, Methods of constructing index numbers, Simple (Unweighted) Aggregate method, Weighted Aggregate method, Laspeyre's Price Index, Paasche's Price Index, Fisher's Price Index, Marshall Edgeworth Price Index, Tests of consistency of Index number, Time reversal test, Factor reversal test, Cost of living index numbers	50%
II	Vital Statistics : Uses of Vital statistics and methods of collecting vital statistics, Measurement of Mortality: Crude Death Rate (CDR), Specific Death Rate (SDR), Standardized Death Rate (STDR) Measurement of Fertility: Crude Birth Rate (CBR), General Fertility Rate (GFR), Specific Fertility Rate (SFR), Total Fertility Rate (TFR) Measurement of population growth, Methods of measuring population growth, Crude rate of natural increase, Vital index, Gross Reproduction Rate (GRR), Index of Industrial Production (IIP)	50%

Teaching-Learning Methodology	Interactive Class Lectures, ICT Tools, hand on experience in problem solving through practical sessions.

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand the uses of index numbers.
2.	Understand role of vital statistics in study of family and health of Indian population.
3.	Understand the uses GDP, CPI and IIP.

Suggested Text Books/ References:	
Sr. No.	Text Books
1.	B. L. Agarwal (2006). Basic Statistics, Revised 4th Ed., New Age International Publishers. Chap. 18.
2.	Gupta S.C. : Fundamentals of Statistics, Himalaya Publishing House
3.	Gupta S.C. and Kapoor V.K.: Fundamentals of Applied Statistics, Sultan Chand and sons
4.	Ken Black : Business Statistics

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B. Sc. Statistics (Faculty of Science)
Multi/Inter Disciplinary
Second Year Semester (III/IV)

Course Code	US03IDSTA02	Title of the Course	PROBLEM SOLVING IN INDEX NUMBERS AND VITAL STATISTICS
Total Credits of the Course	02	Hours per Week	02

Course Objectives:	1. Learn to solve the problems arising in the construction of index numbers, importance of an index numbers. 2. Learn to carry out demographic analyses using various techniques. 3. Learn to apply appropriate formula calculate population, industrial indices.

List of Practical Using MS Excel / Pascal	
1	Unweighted Index numbers, Weighted Index numbers
2	Test of consistency of Index numbers: Unit test, Time Reversal test and Factor Reversal test
3	Cost of Index numbers
4	Referring MoSPI NSSTA report for GDP, CPI and calculating them
5	Referring MoSPI NSSTA report for IIP and calculating IIP
6	Measurements of Mortality: CDR, SDR and Standardized Death Rate (STDR)
7	Measurements of Fertility: CBR, GFR, SFR, TFR
8	Measurement of population growth, Methods of measuring population growth, Crude rate of natural increase, Vital index, Gross Reproduction Rate (GRR)

(Bachelor of Science in Statistics) (Bachelor of Science)
(B. Sc.) (Statistics) Semester (III)

Course Code	US03SESTA01	Title of the Course	ELEMENTS OF PROBABILITY IN BIOSTATISTICS
Total Credits of the Course	02	Hours per Week	02

Course Objectives:	1. Understand the basic principles of probability theory 2. Understand the basic concepts of probability distributions to learn concepts of testing of hypothesis

Course Content		
Unit	Description	Weightage* (%)
1	Some Basic Probability Concepts: Operations on events and probability, Elementary properties of probability, Calculating the probability of an event, Conditional probability, Bayes' theorem, diagnostic tests – sensitivity and specificity	50
2	Discrete Probability Distributions: Binomial and Poisson and its applications in the field of Biosciences. Continuous Probability distribution: Normal distribution, Definition, Properties (without proof), Area under normal curve, Applications	50

Teaching-Learning Methodology	

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage

1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Apply the concepts of probability distributions applied in the field of bioscience.
2.	Understand and use of Binomial and Poisson distributions in real life.
3.	Understand and use of Normal distribution in real life.

Suggested References:	
Sr. No.	References
1.	Mahajan B.K : Methods in Biostatistics for Medical students and Research workers, Jaypee Brothers Medical Pub.
2.	Sancheti D.C. and Kapoor V.K. : Statistics
3.	Wayne W. Daniel: Biostatistics – A Foundation for Analysis in the Health Sciences, seventh edition, Wiley India edition.
4.	Marcello Pagano: Principles of Biostatistics, Second edition, by Cengage learning, India edition.

On-line resources to be used if available as reference material
On-line Resources

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