Darrang College (Autonomous), Tezpur-784001

Syllabus for FYUGP Statistics (SEC)

Approved by :

Board of Studies meeting held on 26th July, 2025

&

Academic Council vide Resolution no. 04, dated- 12/08/2025

AIMS OF FOUR-YEAR UNDER GRADUATE PROGRAMME (FYUGP) IN STATISTICS:

The aims of Four-Year under Graduate Programme (FYUGP) in Statistics are:

- The UG Programme in Statistics is structured to develop analytical, critical, and logical thinking skills in students.
- It emphasizes the application of mathematical reasoning in solving real-world problems.
- Students are introduced to diverse and practical statistical concepts throughout the course.
- The programme prepares students for roles like data scientist, statistician, strategic banker, researcher, and biostatistician.
- Graduates can pursue careers in industries, government agencies, public sector units, finance, business, and research.
- The curriculum includes both mathematical and applied statistics topics for well-rounded learning.
- Practical training is provided through hands-on sessions in the Computer Lab.
- Students gain experience using statistical software such as MS Excel, C/C++, R, and SPSS.
- Coding skills and software usage are integrated to deepen understanding of statistical methods.
- The programme aims to equip students with the necessary tools for success in research and industry.

Programme Outcome:

By the end of the programme a UG student of Statistics should be able to know about:

- **Statistical Knowledge**: Gain a strong foundation in theoretical and applied statistics to analyze and interpret data effectively.
- **Mathematical Reasoning**: Develop the ability to use mathematical tools and logical thinking for solving real-life and research-oriented problems.
- **Data Handling Skills**: Acquire skills in data collection, cleaning, visualization, and analysis using modern software and statistical techniques.

- **Computational Proficiency**: Learn to use programming languages and statistical software such as R, Python, SPSS, and C/C++ for data analysis and modeling.
- **Critical Thinking**: Enhance the ability to critically evaluate data sources, methods, and interpretations in a wide range of applications.
- **Research Competence**: Build capability to design and conduct statistical investigations and contribute to interdisciplinary research.
- **Problem Solving**: Apply statistical methods to solve practical problems in domains such as business, health, economics, environment, and public policy.
- **Communication Skills**: Develop effective written and verbal communication skills to present statistical findings clearly to both technical and non-technical audiences.
- **Ethics and Responsibility**: Understand the ethical issues in data handling, privacy, and responsible use of statistical results.
- **Career Readiness**: Prepare for careers in data science, analytics, government services, research institutions, finance, and further academic studies.

Teaching Learning Process:

The programme supports the application of multiple pedagogical approaches in both classroom and computer lab environments.

- Focus on learner-centric and outcome-based teaching methods.
- Use of both traditional lectures and digital tools for content delivery.
- Emphasis on conceptual clarity and practical application.
- Interactive sessions including discussions, quizzes, and problem-solving.
- Regular hands-on training using statistical software like R, SPSS, and Excel.
- Continuous internal assessment through tests, assignments, and presentations.
- Integration of project-based learning for real-life data analysis.
- Opportunities for internships and field work for practical exposure.
- Interdisciplinary approach connecting statistics with other domains.
- Inclusion of soft skill development and ethical value-based activities.

Teaching Learning Tools:

- Blackboard and Whiteboard Teaching – For explaining concepts, formulas, and derivations.

- Power Point Presentations – To visually present data, graphs, and theoretical concepts.
- Statistical Softwares – Tools like R, SPSS, Python, Excel for data analysis and practical's.
- ICT Tools – Projectors, Google Classroom
- Graphs and Charts – Manual and digital graph plotting for visualization.
- Problem-Solving Sessions – Interactive numerical sessions to enhance analytical skills.
- Case Studies – Real-life statistical data applications to encourage critical thinking.
- Group Discussions

Assessment/Evaluation Methods:

- A variety of subject-specific assessment procedures will be used to monitor student progress.
- Continuous evaluation will determine the final grade.
- Evaluation includes both In-semester assessment and End semester examination.
- In-semester evaluation methods include:
    - Class tests
    - In-semester Sessional exams
    - Home Assignments
    - Group Discussions
    - Attendance
- Assessment techniques include:
    - Tutorials
    - In-semester assessment
    - Problem-based assignments
    - Lab reports for practicals
    - Individual project reports
    - Oral presentations (including seminars)
    - Viva-voce
    - End Semester examinations (Theory and Practical)

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FYUGP Structure as per UGC Credit Framework

Year	Semester	Course Code	Title of the Course	Total Credit
1st Year	**1st Semester**	STA-MJ-01014	Introductory Statistics and Probability	4
		STA-MN-01014	Introductory Statistics and Probability	4
		STA-SEC-01013	Statistical Data Analysis Using Excel	3
		VAC		2
		MDC		3
		AEC		4
	Total			**20**
	2nd Semester	STA-MJ-02014	Intermediate Probability Theory	4
		STA-MN-02014	Intermediate Probability Theory	4
		STA-SEC-02013	Statistical Data Analysis Using SPSS	3
		VAC		2
		MDC		3
		AEC		4
	Total			**20**

B.A./B.Sc. IN STATISTICS PROGRAMME (FYUGP)

DETAILED SYLLABUS OF FYUGP 1st SEMESTER

Title of the Course	Statistical Data Analysis Using Excel
Course Code	STA-SEC-01013
Nature of Course	Skill Enhancement Course
Total Credit	03 (Theory -02 + Practical - 01)
Contact Hours	30 (Theory) + 30 (Practical)
Distribution of Marks	End Semester (30) + In Semester (20) + End sem Practical (25)

Course Objectives: This course will review and expand upon core topics in probability and statistics, particularly by initiating the beneficiaries of the course to at least one of the software packages viz., Microsoft Excel for statistical computing.

Learning Outcomes: At the end of this course, the students will be able to solve real life problems by applying the statistical tools and techniques using the software skills imparted through this course.

Course Outcomes:

CO1: Learn how to load data, plot a graph viz. histograms (equal class intervals and unequal class intervals), box plot, stem-leaf, frequency polygon, pie chart, ogives with graphical summaries of data

CO2: Generate automated reports giving detailed descriptive statistics, correlation and lines of regression.

CO3: Compute auto-covariance and auto correlation function of a time series, fitting auto-regressive series.

Unit	Content	L	T	P	Total hrs
I	**Graphical Representation:** Introduction to MS Excel**,** Basics of statistical tools, Preparation of frequency table**.** Learn how to load data, plot a graph viz. histograms (equal class intervals and unequal class intervals), box plot, stem-leaf, frequency polygon, pie chart, ogives with graphical summaries of data	08	02	-	10
II	**Report Generation:** Generate automated reports giving detailed descriptive statistics, correlation and lines of regression.	08	02	-	10
III	**Statistical Analysis:** Simple analysis of different measure of central tendency and dispersion, create and manage statistical analysis projects, import data, Fitting of polynomials and exponential curves.	08	02	-	10
IV	**Practical:** Based on Unit I, II and III	-	-	15	30

SUGGESTED READING:

1. Moore, D.S. and McCabe, G.P.and Craig, B.A. (2014): Introduction to the Practice of Statistics, W.H. Freeman.
2. Schmuller, J. (2013). Statistical analysis with Excel for dummies. John wiley & sons.

B.A./B.Sc. IN STATISTICS PROGRAMME (FYUGP)

DETAILED SYLLABUS OF FYUGP 2nd SEMESTER

Title of the Course	Statistical Data Analysis Using SPSS
Course Code	STA-SEC-02013
Nature of Course	Skill Enhancement Course
Total Credit	3 (Theory -2 + Practical - 1)
Contact Hours	30 (Theory) + 30 (Practical)
Distribution of Marks	End Semester (30) + In Semester (20) + End sem Practical (25)

Course Objectives: This course will review and expand upon core topics in probability and statistics, particularly by initiating the beneficiaries of the course to at least one of the software packages viz., Microsoft Excel for statistical computing.

Learning Outcomes: At the end of this course, the students will be able to solve real life problems by applying the statistical tools and techniques using the software skills imparted through this course.

Course Outcomes:

CO1: Learn how to load data, plot a graph viz. histograms (equal class intervals and unequal class intervals), box plot, stem-leaf, frequency polygon, pie chart, ogives with graphical summaries of data

CO2: Generate automated reports giving detailed descriptive statistics, correlation and lines of regression.

CO3: Apply the various schemes to draw samples with and without replacement using SPSS sample design and estimate the population parameters under these schemes along with their variance.

CO4: Compute auto-covariance and auto correlation function of a time series, fitting auto-regressive series.

Unit	Content	L	T	P	Total hrs
I	**Graphical Representation:** Introduction to SPSS, Description of menu bar, split files, select file, compute variable. Learn how to load data, plot a graph viz. histograms (equal class intervals and unequal class intervals), box plot, stem-leaf, frequency polygon, pie chart, ogives with graphical summaries of data. Cross tabulation.	08	02	-	10
II	**Report Generation:** Generate automated reports giving detailed descriptive statistics, correlation and lines of regression.	08	02	-	10
III	**Statistical Analysis:** Simple analysis of different measure of central tendency and dispersion, create and manage statistical analysis projects, import data. Application Problems based on fitting of suitable distribution, Normal probability plot.	08	02	-	10
IV	**Practical:** Based on Unit I, II and III	-	-	15	30

SUGGESTED READING:

1. Moore, D.S. and McCabe, G.P.and Craig, B.A. (2014): Introduction to the Practice of Statistics, W.H. Freeman
2. Cunningham, B.J (2012): Using SPSS: An Interactive Hands-on approach
3. Field, A. P. (2000). Discovering statistics using SPSS for Windows: Advanced techniques for the beginner. Sage.