**CURRICULUM**

**B.Sc.(H) STATISTICS**
**CHOICE BASED CREDIT SYSTEM**
**STUDENTS LEARNING OUTCOMES**

Statistics is the study of the collection, organization, analysis, interpretation and presentation of data. It is built up from the field of mathematics known as probability. Statistics opens doors in engineering, business, finance, computing, data sciences, health sciences, environmental sciences and public policy. Recent discoveries in the mathematical sciences have played an essential role in internet search algorithms, disease control, communications technology, climate modeling and much more. Statistics is among the most important disciplines in today's complex world, in part because it serves as the common language of science. Statistical course will teach students on the basic concepts of logic, mathematics, statistical reasoning, analyze data, evaluate data and research methods.

The B.Sc(H) Statistics, undergraduate degree MODULE, is a 3-year (6 semesters) full time program. The program is generic in nature. The curriculum and syllabi of B.Sc(H) Statistics Program conform to Learning Outcome Based Education supplemented by learner's ability enhancement for a flexible and structured choice based Credit system. In general, THE STUDENT OUTCOMES have been identified and the curriculum and syllabi have been chosen in such a way that each of the modules meets one or more of these outcomes. Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program. Further, each module in the program spells out clear instructional objectives which are mapped to the student outcomes.

**Student Outcome**

At the end of the B.Sc(H) Statistics Program, the students shall

- Be able to demonstrate the **versatility** to work effectively in a broad range of analytic, scientific, government, financial, health, technical and other positions.
- Be able to possess a **broad background** in Mathematics and Statistics, an appreciation of how its various sub-disciplines are related,
- Be able to use techniques from different areas, and an **in-depth knowledge** about topics chosen from those offered through the department.:
- Be able to recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines;
- Be able to demonstrate familiarity with a variety of examples where mathematics or statistics helps accurately explain abstract or physical phenomena;
- Be able to recognize and appreciate the connections between theory and applications

- be able to independently read mathematical and statistical literature of various types, including survey articles, scholarly books, and online sources
- be life-long learners who are able to independently expand their mathematical or statistical expertise when needed, or for interest's sake.

# Faculty Of Physical Sciences
# Department of Statistics

## B. Sc. (Hons.) Statistics
## Semester: I

| SNO | Module | Module CODE | TEACHING SCHEDULE PERWEEK | | | | CREDITS | EVALUATION SCHEME | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | TOTAL | | INT. | EXT. | TOTAL |
| 1 | English Communication | ENGL0103 | 2 | 0 | 0 | 2 | 2.0 | 40 | 60 | 100 |
| 2 | Descriptive Statistics | STAT1101 | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 3 | Descriptive Statistics Lab | STAT1102 | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 4 | Calculus | STAT1103 | 6 | 0 | 0 | 6 | 6.0 | 50 | 100 | 150 |
| 5 | Fundamentals of Computer | CSEN0306 | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 6 | Fundamentals of Computer Lab | CSEN0307 | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 7 | Foreign Language<br>French<br>German<br>Spanish | <br>LANF0101<br>LANG0102<br>LANS0103 | 2 | 0 | 0 | 2 | 2 | | | |
| | | **Total** | **16** | **0** | **12** | **28** | **22** | | | **550** |

# Faculty Of Physical Sciences
# Department of Statistics

## B. Sc. (Hons.) Statistics
## Semester: II

| S No | Module | Module Code | Teaching Schedule per week | | | | Credits | Evaluation Scheme | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | Total | | Int. | Ext. | Total |
| 1 | Environmental Science | ENVS0102 | 2 | 0 | 0 | 2 | 2 | 40 | 60 | 100 |
| 2 | Probability and Probability Distributions | STAT1104 | 4 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 3 | Probability and Probability Distributions Lab | STAT1105 | 0 | 0 | 4 | 4 | 2 | 15 | 35 | 50 |
| 4 | Algebra | STAT1106 | 6 | 0 | 0 | 6 | 6 | 50 | 100 | 150 |
| 6 | Introduction to Programming(GE) | CSEN0328 | 4 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 7 | Introduction to Programming Lab(GE) | CSEN0329 | 0 | 0 | 4 | 4 | 2 | 15 | 35 | 50 |
| 8 | Foreign Language<br>French<br>German<br>Spanish | <br>LANF0104<br>LANG0105<br>LANS0106 | 2 | 0 | 0 | 2 | 2 | | | |
| | | **Total** | **16** | **0** | **12** | **28** | **22** | | | **550** |

# Faculty Of Physical Sciences

## B. Sc. (Hons.) Statistics
## Semester: III

| S No | Module | Module Code | Teaching Schedule per week | | | | Credits | Evaluation Scheme | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | Total | | Int. | Ext. | Total |
| 1 | Sampling Distributions | STAT2101 | 4 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 2 | Sampling Distributions Lab | STAT2102 | 0 | 0 | 4 | 4 | 2 | 15 | 35 | 50 |
| 3 | Survey Sampling and Indian Official Statistics | STAT2103 | 4 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 4 | Survey Sampling and Indian Official Statistics Lab | STAT2104 | 0 | 0 | 4 | 4 | 2 | 15 | 35 | 50 |
| 5 | Mathematical Analysis | STAT2105 | 6 | 0 | 0 | 6 | 4 | 50 | 100 | 150 |
| 6 | New Venture Planning-Entrepreneurship (SEC) | MGMT0103 | 2 | 0 | 0 | 2 | 2 | 25 | 50 | 75 |
| 7 | Data Base Management Systems (GE) | CSEN0304 | 4 | 0 | 0 | 4 | 4 | 40 | 60 | 100 |
| 8 | Data Base Management Systems Lab (GE) | CSEN0305 | 0 | 0 | 4 | 4 | 2 | 15 | 35 | 50 |
| 9 | Apptitude-I | VALU0119 | 2 | 0 | 0 | 2 | | 25 | 50 | 75 |
| 10 | Professional Communication-I | VALU0123 | 2 | 0 | 0 | 2 | 2 | 25 | 50 | 75 |
| 11 | Yoga/NCC/NSS | VALU0118<br>VALU0121<br>VALU0122 | 2 | 0 | 0 | 2 | 2 | 25 | 50 | 75 |
| 9 | Minor Project | STAT2106 | | | | 4 | 2 | | | 50 |
| | | **Total** | **22** | **0** | **12** | **34** | **30** | | | **900** |

# Faculty Of Physical Sciences

## Semester: IV

| SNO | Module | Module CODE | TEACHING SCHEDULE PERWEEK | | | | CREDITS | EVALUATION SCHEME | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | TOTAL | | INT. | EXT. | TOTAL |
| 1 | Statistical Inference | STAT2107 | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 2 | Statistical Inference Lab | STAT2108 | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 3 | Linear Models | STAT2109 | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 4 | Linear Models Lab | STAT2110 | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 5 | Statistical Quality Control | STAT2111 | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 6 | Statistical Quality Control Lab | STAT2112 | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 7 | Basics of IT (SEC) | CSEN01XX | 2 | 0 | 0 | 2 | 2.0 | | | 50 |
| 8 | Computer network and Internet (GE) | CSEN0330 | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 9 | Computer network and Internet Lab (GE) | CSEN0331 | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| | Professional Communication-II | VALU0123 | 2 | 0 | 0 | 2 | 2 | 25 | 50 | 75 |
| | Apptitude-II | VALU0119 | 2 | 0 | 0 | 2 | | 25 | 50 | 75 |
| | Yoga/NCC/NSS | VALU0118 | 2 | 0 | 0 | 0 | 2.0 | 25 | 50 | 75 |
| 10 | Minor Project | STAT2113 | | | | 4 | 2.0 | | | 50 |
| | | **Total** | **22** | **0** | **12** | **34** | **30** | | | **900** |

# Faculty Of Physical Sciences

## B. Sc. (Hons.) Statistics
## Semester: V

| SNO | Module | Module CODE | TEACHING SCHEDULE PERWEEK | | | | CREDITS | EVALUATION SCHEME | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | TOTAL | | INT. | EXT. | TOTAL |
| 1 | Stochastic Processes and Queuing Theory | STAT3101 | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 2 | Stochastic Processes and Queuing Theory Lab | STAT3102 | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 3 | Statistical Computing Using C/C++ | STAT3103 | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 4 | Statistical Computing Using C/C++ Lab | STAT3104 | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 5 | DSE-I | STAT32.. | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 6 | DSE-I Lab | STAT32.. | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 8 | DSE-II | STAT32.. | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 9 | DSE-II Lab | STAT32.. | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| | | **Total** | **16** | **0** | **16** | **32** | **24** | 220 | 380 | **600** |

# Faculty Of Physical Sciences

## B. Sc. (Hons.) Statistics
## Semester: VI

| SNO | Module | Module CODE | TEACHING SCHEDULE PERWEEK | | | | CREDITS | EVALUATION SCHEME | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | TOTAL | | INT. | EXT. | TOTAL |
| 1 | Design of Experiments | STAT3105 | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 2 | Design of Experiments Lab | STAT3106 | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 3 | Multivariate Analysis and Nonparametric Methods | STAT3107 | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 4 | Multivariate Analysis and Nonparametric Methods Lab | STAT3108 | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 5 | DSE-III | STAT32.. | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 6 | DSE-III Lab | STAT32.. | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| 8 | DSE-IV | STAT32.. | 4 | 0 | 0 | 4 | 4.0 | 40 | 60 | 100 |
| 9 | DSE-IV Lab | STAT32.. | 0 | 0 | 4 | 4 | 2.0 | 15 | 35 | 50 |
| | | **Total** | **16** | **0** | **16** | **32** | **24** | 220 | 380 | **600** |

**Discipline Specific Elective Papers (Credit: 6 each) (4 papers to be selected)**

**DSE-1**

STAT3201 Time Series Analysis(Theory)
STAT3202 Time Series Analysis LAB

**OR**

STAT3203 Demography and Vital Statistics (Theory)
STAT3204 Demography and Vital Statistics LAB

**DSE-II**

STAT3205 Operations Research(Theory)
STAT3206 Operations Research LAB
**OR**
STAT3207 Econometrics(Theory)
STAT3208 Econometrics LAB

**DSE-III**

STAT3209 Actuarial Statistics(Theory)
STAT3210 Actuarial Statistics LAB
**OR**
STAT3211 Survival Analysis and Biostatistics(Theory)
STAT3212 Survival Analysis and Biostatistics LAB

**DSE-IV**

STAT3213 Financial Statistics(Theory)
STAT3214 Financial Statistics LAB
**OR**
STAT3215 Project Work (Sixth Semester)