CURRICULUM & SYLLABUS

CHOICE BASED CREDIT SYSTEM (CBCS)

FOR
BACHELOR OF SCIENCE (B.Sc. - HONORS)

(3 Year Undergraduate Degree Programme)

IN

STATISTICS

[w. e. f. 2021-22]

FACULTY OF SCIENCE & HUMANITIES
SRM UNIVERSITY DELHI-NCR, SONEPAT
39, Rajiv Gandhi Education City, Sonepat Haryana-131029

SRM UNIVERSITY DELHI-NCR, SONEPAT (HARYANA)

VISION

SRM University Delhi – NCR, Sonepat, Haryana aims to emerge as a leading world - class university that creates and disseminates knowledge upholding the highest standards of instruction in Medicines & Health Sciences, Engineering & Technology, Management, Law, Science and Humanities. Along with academic excellence and skills, our curriculum imparts integrity and social sensitivity to mould our graduates who may be best suited to serve the nation and the world.

MISSION

- To create a diverse community campus that inspires freedom and innovation.
- Promote excellence in educational & skill development processes.
- Continue to build productive international alliances.
- Explore optimal development opportunities available to students and faculty.
- Cultivate an exciting and rigorous research environment.

DEPARTMENT OF MATHEMATICS

VISION

The broad vision of the Department is to carry out high quality research in the different areas of Mathematics, Statistics and Computing so that we can produce proficient graduates, engineers and scientists to contribute significantly in the development of the society. Excellence, integrity, innovation, entrepreneurship and leadership are priorities of the Department. The vision is to become a leading department of global excellence in research and education in all discipline of Mathematics.

MISSION

The Department supports the University's mission by empowering students to:

- Provide excellent knowledge of Mathematical Sciences as well as Statistics for suitable career and groom them for institutional, state, national and international recognition.
- Discover, mentor, and nurture mathematically inclined students, and provide them a supportive environment that fosters intellectual growth.
- Train the students for interdisciplinary applications and research.
- Train the students with Mathematical and Statistical tools for industries as well as research organizations.
- Provide professional services based on our diverse mathematical and statistical expertise.
- The scientific, technical, and educational community.
- Achieve excellence in the subject as well as overall development of the student to strive in a competitive society.

B.Sc. (H) STATISTICS GRADUATE EMPLOYABILITY ATTRIBUTES

- Sound knowledge and understanding of the domain area.

- Analytical & critical thinking and problem-solving skills.

- Scientific Temperament Towards Research & Innovation for the Betterment of Society.

- Efficient Communication & Presentation Skills.

- Dependability, reliability, responsibility, and independent leadership abilities.

PROGRAM EDUCATIONAL OBJECTIVE (PEO)

B.Sc. (H) Statistics is a three-year undergraduate program with specialization in statistics. The programme fosters interdisciplinary approach to the study of Statistics, Mathematics, and Computers aiming to promote holistic education useful in handling social, economics, engineering, physical and bio-sciences problems. The curriculum is dispensed using a combination of classroom teaching, project-based learning, practical's, group discussions, presentations, home assignments, industry interactions and exposure, internships and fieldwork. The programme has a unique and innovative course structure which engenders creative out of the box thinking.

The objectives of the course are

- To familiarize students with basic to high-level statistical concepts
- Be able to work effectively in the area of analytic, scientific, government, financial, health, technical and other positions.
- Be a life-long learner who are able to expand their statistics and data analytics expertise.
- Have a rigorous training in fundamental concepts of Statistics, Mathematics & Computers which make a strong foundation in Data Science turf.
- To teach/strengthen students' knowledge of spreadsheets, programming languages and statistical packages.
- To promote application-oriented pedagogy by exposing students to real world data.
- To make students do projects, which prepares them for jobs/markets.

PROGRAM LEARNING OUTCOME (PLO)

At the end of the program in B.Sc. (H) Statistics, a student will

- Interpret data outcomes effectively to any audience orally, visually as well as in written formats.
- Have the adaptability to work effectively in a wide range of data analytics.
- Have a wide background in Statistics and Data Analytics, an appreciation of how its different sub-disciplines is interrelated.

- Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a variety of disciplines;
- Use appropriate models of analysis, assess the quality of input, derive insight from results, and investigate potential issues.
- Apply computing theory, languages and algorithms, as well as mathematical and statistical models, and the principles of optimization to appropriately formulate and use data analyses.
- Formulate and use appropriate models of data analysis to solve hidden solutions to business-related challenges.
- Be able on effective Research Methods and Research writing.

Mapping matrix of PEO's and PLO's

PLO / PEO	01	02	03	04	05	06	07	08
01	✓							
02		✓						
03		✓	✓					
04				✓				
05				✓				
06					✓	✓		
07							✓	✓

B.Sc. (H) STATISTICS
SEMESTER-I

Code	Category	Course	L	T	P	C
21STBS101	CC	Descriptive Statistics	4	0	4	6
21STBS102	CC	Calculus	5	1	0	6
	OE	Open Elective – I	3	0	0	3
	OE	Open Elective – II	3	0	0	3
21CS151A	SEC	Elementary IT Skills	0	0	4	2
21AEEN101	AECC	Professional English	4	0	0	4
Total			19	1	8	24

SEMESTER-II

Code	Category	Course	L	T	P	C
21STBS201	CC	Probability and Probability Distributions	4	0	4	6
21STBS202	CC	Linear Algebra and Matrices	5	1	0	6
	OE	Open Elective – III	3	0	0	3
	UOE	Indian Constitution and Polity	3	0	0	3
21SS251A	SEC	Effective Communication Skills	0	0	2	1
21ESUG201	AECC	Environmental Studies	3	1	0	4
21STBS261	SEC	LaTeX	0	0	2	1
21STBS271	SEC	Live project I & Industrial Visit	0	0	0	1
Total			18	2	8	25

B.Sc. (H) STATISTICS

SEMESTER-III

Code	Category	Course	L	T	P	C
21STBS301	CC	Sampling Techniques	4	0	4	6
21STBS302	CC	Sampling Distributions	4	0	4	6
21STBS303	CC	Statistical Inference I	4	0	4	6
21SS351A	SEC	Teamwork and Interpersonal Skills	0	0	2	1
	OE	Open Elective – IV	3	0	0	3
	UOE	Entrepreneurship & New Venture Management	3	0	0	3
21STBS371	SEC	Live Project II & & Industry Visit	0	0	0	1
Total			18	0	14	26

SEMESTER-IV

Code	Category	Course	L	T	P	C
21STBS401	CC	Elements of Stochastic Processes	4	0	4	6
21STBS402	CC	Statistical Quality Control	4	0	4	6
21STBS403	CC	Statistical Inference II	4	0	4	6
21SS451A	SEC	Presentation and Speaking Skills	0	0	2	1
	OE	Open Elective – V	3	0	0	3
	UOE	Management & Organizational Behavior	3	0	0	3
21STBS471	SEC	Live Project III & & Industry Visit	0	0	0	1
21STBS472	AECC	Summer Internship	0	0	0	4*
Total			18	0	14	26+4*

B.Sc. (H) STATISTICS

SEMESTER-V

Code	Category	Course	L	T	P	C
21STBS501	CC	Multivariate Analysis	4	0	4	6
21STBS502	CC	Design of Experiment	4	0	4	6
	DSE	Discipline Specific Elective-I	4	0	4	6
	DSE	Discipline Specific Elective-II	4	0	4	6
21SS551A	SEC	Professional Writing Skills & GDPI Process	0	0	2	1
21STBS571	SEC	Live Project IV & & Industry Visit	0	0	0	1
Total			16	0	14	26

SEMESTER-VI

Code	Category	Course	L	T	P	C
21STBS601	CC	Demography	4	0	4	6
21STBS602	CC	Time Series Analysis	4	0	4	6
	DSE	Discipline Specific Elective-III	4	0	4	6
	DSE	Discipline Specific Elective-IV	4	0	4	6
21STBS661	SEC	R Programming	1	0	2	2
Total			17	0	18	26

SUMMARY OF CREDITS

Category	I Sem	II Sem	III Sem	IV Sem	V Sem	VI Sem	Total	%
CC	12	12	18	18	12	12	84	53.50
OE	6	6	6	6	-	-	24	15.28
SEC	2	2	1	1	1	4	8	5.73
AECC	4	4	-	-	-	-	8	5.09
DSE	-	-	-	-	12	12	24	15.28
Live Projects		1	1	1	1		8	5.09
Internship				4				
Total	24	25	26	30	26	26	157	100

LIST OF OPEN ELECTIVES (OE)

Code	Category	Course	L	T	P	C
Open Elective-I						
21OEFT001	OE	Food Processing and Preservation	3	0	0	3
21OEPH001	OE	Quantum Mechanics	3	0	0	3
21OECY001	OE	Physical Chemistry-I	3	0	0	3
Open Elective-II						
21OEFT002	OE	Food Safety and Regulations	3	0	0	3
21OECY002	OE	Inorganic Chemistry	3	0	0	3
21OEPH002	OE	Thermal Physics and Statistical Mechanics	3	0	0	3
Open Elective-III						
21OEFT003	OE	Fundamentals of Food Chemistry	3	0	0	3
21OECY003	OE	Physical Chemistry-II	3	0	0	3
21OEPH003	OE	Waves and Optics	3	0	0	3
Open Elective-IV						
21OECY004	OE	Analytical Chemistry	3	0	0	3
21OEPH004	OE	Solid State Physics	3	0	0	3
Open Elective-V						
21OECS005	OE	Operating Systems	2	0	2	3
21OEST006	OE	Differential Calculus	3	0	0	3

LIST OF SKILL ENHANCEMENT COURSES (SEC)

Code	Category	Course	L	T	P	C
Semester– I						
21CS151A	SEC	Elementary IT Skills	0	0	4	2
Semester – II						
21SS251A	SEC	Effective Communication Skills	0	0	2	1
21STBS261	SEC	LaTeX	0	0	2	1
21STBS271	SEC	Lice Project I & Industrial Visit	0	0	0	1
Semester– III						
21SS351A	SEC	Teamwork and Interpersonal Skills	0	0	2	1
21STBS371	SEC	Lice Project II & Industrial Visit	0	0	0	1
Semester– IV						
21SS451A	SEC	Presentation and Speaking Skills	0	0	2	1
21STBS471	SEC	Lice Project III & Industrial Visit	0	0	0	1
Semester– V						
21SS551A	SEC	Professional Writing Skills & GDPI Process	0	0	2	1
21STBS571	SEC	Lice Project IV & Industrial Visit	0	0	0	1
Semester– VI						
21MABS651	SEC	R Programming	1	0	2	2

LIST OF DISCIPLINE SPECIFIC ELECTIVES (DSE)

Code	Category	Course	L	T	P	C
Discipline Specific Elective-I						
21STBS503	DSE	Research Methodology	5	1	0	6
21STBS504	DSE	Statistical Computation with C++	4	0	4	6
21STBS505	DSE	Econometrics	4	0	4	6
Discipline Specific Elective-II						
21STBS506	DSE	Operations Research I	5	1	0	6
21STBS507	DSE	Financial Statistics	4	0	4	6
21STBS591	DSE	Project I	0	0	0	6
Discipline Specific Elective-III						
21STBS603	DSE	Basics of MATLAB	5	0	2	6
21STBS604	DSE	Numerical Methods	5	1	0	6
21STBS605	DSE	Non-Parametric Statistics	5	1	0	6
Discipline Specific Elective-IV						
21STBS606	DSE	Modelling and simulation	5	1	0	6
21STBS607	DSE	Actuarial Statistics	4	0	4	6
21STBS608	DSE	Discrete Mathematics	5	1	0	6
21STBS691	DSE	Project II	0	0	0	6