Integrated M.Sc. Programmes (2026 - 27)

ABOUT THE PROGRAMME

A place to learn; a chance to grow

Integrated M.Sc. Computational Statistics and Data Analytics (5 Year)

Programme Educational Objectives:

- To train the next generation of statisticians with a focus on the field of data analytics.
- The students will learn the principles and methods of statistical analysis and put them into practice using a range of real-world data sets.
- To provide a unique and coherent blend of modern statistical methods together with the associated computational skills.
- To use computational tools on problems of applied nature.
- To offers training in modern statistical methodology, computational statistics and data analysis from a wide variety of fields, including financial and health sectors.
- To learn advanced level of statistical knowledge and data analytical skills.

Scope of Employment:

- Data Analyst
- Business Analyst
- Data Visualisation Engineer
- Data Science Consultant
- Data Analyst roles in all sectors

Course Content:

Fundamentals of Mathematics/ Linear Algebra and Applications / Real Analysis and Applications / Discrete Mathematics / Computational Thinking / Problem Solving with Object Oriented Programming / Basic English / Communicative English / Foreign Language / Environmental Studies / Ethics and Values / Lean Start-up Management / Introduction to Soft Skills / Introduction to Personal Skills / Fundamentals of Aptitude / Introduction to Business Communication / Reasoning Skill Enhancement / Soft Skill / SET Conference / Research Methodology / Comprehensive Examination / Master's Thesis.

Programme Core:

Fundamentals of Statistics / Probability and Random Variables / Basic Statistical Methods / Distribution Theory / Sampling Techniques / Theory of Estimation / Testing of Hypothesis / Regression Analysis and Predictive Models / Design and Analysis of Experiments / Operation Research / Statistical Quality Control / Time Series analysis and Forecasting / Multivariate Data Analysis / Stochastic Processes and Applications / Reliability Theory and Survival Analysis / Statistical Methods for Data Mining / Econometric Analysis.

University Elective:

Algorithms: Design and Implementation / Big Data Analytics / Database Systems: Design and Implementation / Machine Learning.

Programme Elective:

Python Programming for Data Science / Programming for Data Science using R / Programming for Data Science using SPSS / Programming for Data Science using SAS / Programming for Data Science using MATLAB / Programming for Data Science using MINITAB / Queuing Theory and Network Analysis / Non-Parametric statistics / Bio-statistics / Advanced Operation Research / Actuarial Statistics / Bayesian Inference / Total Quality Management and Six sigma / Statistics for Management sciences / Statistics for Financial Modelling / Inventory Models / Statistical Methods for Bio-informatics / Demography and Official Statistics / Statistical Process Control / Statistical Consulting / Statistics for Biological and Earth Sciences / Statistics for Social and Behavioral Sciences / Statistics for Research, industry and Community Development / Statistics for Forensic Sciences.

Integrated M.Sc., Food Science and Technology (5 Year)

About the Programme:

To develop innovative, creative and vibrant professionals and researchers by imparting contemporary knowledge and technical skills to cater to the dynamic needs of food sciences industry. The programme also focuses in fostering the spirit of innovation and creativity in the young minds in solving the real time problems arising in the society and industry. The programme instils confidence, ethics, values and employability skills to mold an ethically conscious individuals who focus on sustainable growth of the economy by providing hygienic food products for the well-being of the society.

Programme Educational Objectives:

Graduates will be practitioners and leaders in their chosen field

Graduates will function in their profession with social awareness and responsibility

Graduates will interact with their peers in other disciplines in their work place and society and contribute to the economic growth of the country

Graduates will be successful in pursuing higher studies in their chosen field

Graduates will pursue career paths in teaching or research

Programme Outcome:

Having a clear understanding of subject-related concepts and contemporary issues

Having an ability to design and conduct experiments, as well as analyse and interpret data.

Having an ability to use techniques, skills and modern tools required for scientific career.

Having problem-solving ability for social issues.

Having adaptive thinking and adaptability.

Having a clear understanding of professional and ethical responsibility.

Having cross-cultural competency exhibited by working in teams.

Having a good working knowledge of communicating in English.

Having good cognitive load management skills.

Having interest in lifelong learning.

Curriculum

CREDIT INFO		
S.no	**Category**	**Credit**
1	Foundation Core	56
2	Discipline Core	71
3	Discipline Elective	27
4	Projects and Internship	17
5	Open Elective	12
6	Ability Enhancement	9
7	Skill Enhancement	8
8	Non-graded Core Requirement	12
Total Credits		200

Foundation Core	
Course Code	**Course Title**
TBIT101L	Biological Science
TBIT102L	Bioethics and Biosafety
TBIT103L	Cell Biology
TBIT104L	Molecular Biology
TBIT105P	Cell and Molecular Biology Lab
TBIT106L	Biochemistry
TBIT106P	Biochemistry Lab
TBIT107L	Industrial Unit Operations
TBIT107P	Industrial Unit Operations Lab
TBIT208L	Industry Standards and Guidelines
TCHY101L	Chemistry
TCHY101P	Chemistry Lab
TCSE101L	Computer Programming : C
TCSE101P	Computer Programming : C Lab
TCSE207L	Computer Programming: Python
TCSE207P	Computer Programming: Python Lab
TFLE200L	Foreign Language - 2021
TMAT101L	Mathematics
TMAT201L	Probability and Statistics
TMAT201P	Probability and Statistics Lab
TPHY101L	Physics
TPHY101P	Physics Lab
TRES102L	Research Methodology
TSSC201L	Critical Thinking
TSSC202L	Intra and Interpersonal Skills

Discipline Core	
Course Code	**Course Title**
TFSI201L	Principles of Food Science
TFSI202L	Food Chemistry
TFSI203L	Food Microbiology
TFSI203P	Food Chemistry and Food Microbiology Lab
TFSI204L	Physiology and Nutrition
TFSI205L	Food Additives
TFSI206L	Food Quality and Analysis
TFSI207L	Food Preservation Technology
TFSI207P	Food Analysis and Preservation Lab
TFSI301L	Food Engineering
TFSI302L	Food Packaging
TFSI302P	Food Engineering and Packaging Lab
TFSI303L	Milk and Milk Products Technology
TFSI304L	Nutraceuticals and Functional Foods
TFSI305L	Food Toxicology and Safety
TFSI305P	Food Toxicology and Safety Lab
TFSI306L	Animal Products Technology
TFSI306P	Animal and Milk Products Lab
TFSI401L	Food Laws and Regulations
TFSI402L	Food Equipment Design and Automation
TFSI403L	Baking and Confectionary Technology
TFSI403P	Baking and Confectionary Lab
TFSI404L	Food Process Technology
TFSI405L	Production Technology of Spices and Plantation Crops
TFSI406L	Grain Science and Technology
TFSI406P	Grain, Spices and Plantation Products Lab

Discipline Elective	
Course Code	**Course Title**
TFSI208L	Food Adulteration
TFSI307L	Fruit and Vegetable Processing Technology
TFSI308L	Nutrition and Dietetics
TFSI309L	Industrial Enzymology
TFSI310L	Beverage Processing Technology
TFSI390J	Student Project
TFSI391J	Technical Answers to Real Problems Project
TFSI392J	Design Project
TFSI393J	Laboratory Project
TFSI395J	Computer Project
TFSI397J	Special Project
TFSI407L	Crop Production Concepts and Practices
TFSI408L	Food Fermentation and Symbiotic Technology
TFSI409L	Food Nanotechnology
TFSI410L	Food Forensics
TFSI411L	Food Rheology
TFSI412L	Technology of Fats and Oils

Discipline Elective	
Course Code	**Course Title**
TFSI208L	Food Adulteration
TFSI307L	Fruit and Vegetable Processing Technology
TFSI308L	Nutrition and Dietetics
TFSI309L	Industrial Enzymology
TFSI310L	Beverage Processing Technology
TFSI390J	Student Project
TFSI391J	Technical Answers to Real Problems Project
TFSI392J	Design Project
TFSI393J	Laboratory Project
TFSI395J	Computer Project
TFSI397J	Special Project
TFSI407L	Crop Production Concepts and Practices
TFSI408L	Food Fermentation and Synbiotic Technology
TFSI409L	Food Nanotechnology
TFSI410L	Food Forensics
TFSI411L	Food Rheology
TFSI412L	Technology of Fats and Oils

Non-graded Core Requirement	
Course Code	**Course Title**
TEXC101N	Co-curricular Activities
TEXC102N	Extracurricular Activities
TEXC103N	NSS / NCC
TFSI101N	Introduction to Science
TSSC102N	Essence of Traditional Knowledge
TSSC103N	Indian Constitution

3. About the programme

Integrated M.Sc. Biotechnology (5 Year) with exit option B.Sc. Biotechnology (3 Year) or B.Sc. Biotechnology (Hon) (4 Year)

Programme Educational Objectives:

- Excel in professional career and/or higher education by acquiring a solid foundation in science, mathematics, and advanced communication engineering and technologies
- Develop and apply engineering solutions for solving contemporary, social and human issues with realistic constraints suitable for the present need through the use of modern tools.
- Exhibit professional and ethical standards, effective communication skills, teamwork spirit, multi-disciplinary and trans disciplinary approach for successful careers and to be able to compete globally, function as leaders, as entrepreneurs, and manage information efficiently and to engage in lifelong learning

Programme Outcome:

- A clear understanding of the subject related concepts and of contemporary issues
- Problem solving ability- solving social issues and engineering problems
- A clear understanding of professional and ethical responsibility
- Interest in lifelong learning
- Adaptive thinking and adaptability
- Cross cultural competency exhibited by working in teams
- An ability to design and conduct experiments, as well as to analyze and interpret data
- A good working knowledge of communicating in English
- An ability to use techniques, skills and modern engineering tools necessary for engineering practice
- A good cognitive load management [discriminate and filter the available data] skills

Programme Specific Outcome:

- Gain and apply knowledge to plan, analyze and find innovative solutions in the field of biological sciences
- Explore problems and provide valid solutions through the industry-academia interactions.
- Acquire interdisciplinary knowledge in the areas of biological, chemical, environmental and technical sciences for the benefit of society.

Scope of Employment:

- Graduates will have a broad scope in the field of biotechnology.
- The opportunities are enormous in India and abroad.
- The field of biotechnology is expected to grow exponentially in the coming years offering opportunities in the field of research, engineering, industry, consultancy, and entrepreneurship.

Programme Core Courses:

Molecular biology / Bioprocess Technology / Immuno-technology / Enzyme Technology / Analytical Instrumentation / Pharmaceutical Biotechnology / Genetic Engineering / Animal Biotechnology / Plant Biotechnology.

Elective Courses:

Biomedical Engineering / Tissue Engineering / Management Bioethics.

Integrated M.Sc. Physics (5 Year)

with exit option B.Sc. Physics (3 Year) or B.Sc. Physics (Hon) (4 Year)

Programme Educational Objectives

- Excel in professional career and/or higher education by acquiring a solid foundation in science, mathematics, and advanced communication engineering and technologies
- Develop and apply engineering solutions for solving contemporary, social and human issues with realistic constraints suitable for the present need through the use of modern tools.
- Exhibit professional and ethical standards, effective communication skills, teamwork spirit, multi-disciplinary and transdisciplinary approach for successful careers and to be able to compete globally, function as leaders, as entrepreneurs, and manage information efficiently and to engage in life-long learning

Programme Outcomes

- Having a clear understanding of the subject related concepts and of contemporary issues
- Having an ability to be socially intelligent with good SIQ (Social Intelligence Quotient) and EQ (Emotional Quotient)
- Having Sense-Making Skills of creating unique insights in what is being seen or observed (Higher level thinking skills which cannot be codified)
- Having design thinking capability
- Having computational thinking (Ability to translate vast data in to abstract concepts and to understand database reasoning)
- Having Virtual Collaborating ability
- Having problem solving ability- solving social issues and engineering problems
- Having a clear understanding of professional and ethical responsibility
- Having interest in lifelong learning
- Having adaptive thinking and adaptability
- Having adaptive thinking and adaptability
- Having cross cultural competency exhibited by working in teams
- Having an ability to design and conduct experiments, as well as to analyze and interpret data
- Having an ability to use the social media effectively for productive use

- Having a good working knowledge of communicating in English
- Having an ability to use techniques, skills and modern engineering tools necessary for engineering practice
- Having critical thinking and innovative skills
- Having a good cognitive load management [discriminate and filter the available data] skills
- Having a good digital footprint

Scope of Employment

- Students after successful completion of BSc, BSc. Honours and Integrated MSc will have the opportunity for Campus Placement.
- A few companies are visiting campus exclusively for Science students.
- Students will have a few elective courses to improve the employability.
- The courses are designed so as to have foundation in Physics to clear National Level Eligibility Test and preparing suitable for Higher Education.

Programme Core Courses

Physics of Waves , Mechanics-I, Heat & Thermodynamics, Properties of Matter, Electricity & Magnetism, Mechanics-II, Mathematical Physics-1, Optics, Modern Physics, General Physics Lab-I, Electronics Lab, Spectroscopy, Introduction to Solid State Physics, Mathematical Physics-II, Digital Electronics, General Physics Lab-II, Digital Electronics Lab, Computer Programming, General Physics Lab-III, General Physics Lab-IV, General Physics Lab-V, Computational Physics Lab.

Programme elective courses

Microprocessor, Nuclear and Particle Physics, Microcontroller, Programming Languages (Java), Data structure and Algorithm (Basic), Data structure and Algorithm (Advanced), Classical Mechanics - I, Quantum Mechanics - I, Statistical Physics, Classical Mechanics - II, Quantum Mechanics - II, Condensed Matter Physics, Electromagnetic Theory, Nanomaterials and its applications, Photonics, Laser Physics, Non Linear Dynamics, Characterization of Materials.

Integrated M.Sc. Chemistry (5 Year)

with exit option B.Sc.Chemistry(3 Year) or B.Sc. Chemistry (Hon) (4 Year)

Programme Educational Objectives

- Graduates will be practitioners and leaders in their chosen field.
- Graduates will function in their profession with social awareness and responsibility.
- Graduates will interact with their peers in other disciplines in their work place and society and contribute to the economic growth of the country.
- Graduates will be successful in pursuing higher studies in their chosen field.
- Graduates will pursue career paths in teaching or research.

Programme Outcomes

- Having a clear understanding of the subject related concepts and of contemporary issues.
- Having an ability to be socially intelligent with good SIQ (Social Intelligence Quotient) and EQ (Emotional Quotient).
- Having Sense-Making Skills of creating unique insights in what is being seen or observed (Higher level thinking skills which cannot be codified).
- Having design thinking capability.
- Having computational thinking (Ability to translate vast data in to abstract concepts and to understand database reasoning).
- Having Virtual Collaborating ability.
- Having problem solving ability- solving social issues and engineering problems.
- Having a clear understanding of professional and ethical responsibility.
- Having interest in lifelong learning.
- Having adaptive thinking and adaptability.
- Having cross cultural competency exhibited by working in teams.
- Having an ability to design and conduct experiments, as well as to analyze and interpret data.
- Having an ability to use the social media effectively for productive use.
- Having a good working knowledge of communicating in English.
- Having an ability to use techniques, skills and modern engineering tools necessary for engineering practice.

- Having critical thinking and innovative skills.
- Having a good cognitive load management [discriminate and filter the available data] skills.
- Having a good digital footprint

Scope of Employment

- The curriculum and syllabi of Integrated M Sc Chemistry are formulated to orient the students to breadth and depth of experimental techniques using modern instrumentation with hands-on training.
- To equip our Integrated PG students for '2026 workforce of our nation' through proper training and resource utilization

Jobs in Private Sector-through placement cell, VIT

- Placement opportunities will be provided through the PAT (placement and training) office, VIT.
- As of now 20-30% of our PG students are hired by the pharmaceutical, analytical and other companies as Junior Executive-R&D, QC- Executive Trainee, Subject expert, Analyst etc.

The companies visited last year are:

- Dr. Reddy's laboratory
- Hindustan Unilever R & D
- Mitsui Kinzoku Components India Pvt. Ltd
- Ramky Enviro engineers ltd
- Six Red Marbles, Chennai
- Sterile Gene Life Science Pvt Ltd, Puducherry
- DSK Inno Sciences Pvt. Ltd
- Madras Pharmaceuticals
- Arco Lab Private Limited

- After the successful completion of this programme the students will be able to find lots of job opportunities in private sector through offline sessions too.
- The various employment opportunities for Integrated MSc Chemistry programme are Research Scientist, High school teacher, Quality control chemist, Chemist, Quality assurance Quality manager, Laboratory assistant, Operations manager, Quality control inspector, Application Specialist.

Jobs in Government Sector

- There are a huge scope and employment available to Integrated MSc chemistry graduates as there is a huge scope for research in various government facilities.
- The various government job opportunities are Chemist, Research analyst, Assistant professor, Research engineer, Production supervisor, Senior research associate, Quality control analyst, Research officer etc.

Programme Core

General Chemistry-I, II, Lab, Inorganic Chemistry-I, II, III, IV, Lab I, II, Organic Chemistry-I, II, III, IV Lab I, II, III, Physical Chemistry-I, II, III, Lab I, II, III, Analytical Chemistry-I, Research Methodology.

Programme Electives

Introduction to Biochemistry, Computer-II, Bioinformatics, Spectroscopy-I, II, Physical Chemistry-IV, Advanced Organic Chemistry-I, II, Lab I, Advanced Inorganic Chemistry-I, II, Lab I, Advanced Physical Chemistry-I, II, Lab I, Computational Chemistry, Advanced Analytical Chemistry-I, Organic/ Medicinal Chemistry Practical, Inorganic/Material Chemistry Practical, Analytical/Physical/VAC1836.

Integrated M.Sc. Mathematics (5 Year)

with exit option B.Sc. Mathematics (3Year) or B.Sc. Mathematics (Hon) (4 Year)

Programme Educational Objectives

- Having a clear understanding of the subject related concepts and of contemporary issues.
- Having an ability to be socially intelligent with good SIQ (Social Intelligence Quotient) and EQ (Emotional Quotient).
- Having Sense-Making Skills of creating unique insights in what is being seen or observed (Higher level thinking skills which cannot be codified)
- Having an ability to design a component or a product applying all the relevant standards and with realistic constraints.
- Having computational thinking (Ability to translate vast data in to abstract concepts and to understand database reasoning).
- Having problem solving ability- solving social issues and engineering problems.
- Having an ability to design and conduct experiments, as well as to analyse and interpret data.
- Having an ability to design and conduct experiments, as well as to analyse and interpret data.

Programme Outcomes

- Provide knowledge of a wide range of mathematical techniques and application of mathematical methods/tools in other scientific and engineering domains.
- Provide advanced knowledge on topics in pure mathematics, empowering the students to pursue higher degrees at reputed academic institutions.
- Imbibe effective scientific and/or technical communication in both oral and writing.
- Having problem solving ability- to assess social issues (societal, health, safety, legal and cultural) and engineering problems
- Having adaptive thinking and adaptability in relation to environmental context and sustainable development
- Having a clear understanding of professional and ethical responsibility

Programme Additional Outcomes

- Continue to acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in mathematical sciences
- Having Sense-Making Skills of creating unique insights in what is being seen or observed (Higher level thinking skills which cannot be codified) (University Elective)
- Articulating ideas and strategies for addressing a research problem.
- Effectively communicating research, through journal publications and conference presentations,