MIT SCHOOL OF ENGINEERING





"Science is Curiosity , Testing , Experimenting.. "

Specialization: Data Science / Operation Research

Specialization: Medicinal Chemistry / Nano chemistry

M.Sc. Program in Applied Statistics

...In pursuit of Arts, Science and Technology to culminate in wisdom.





MIT Group of Institutions, Pune

MIT Group of Institutions, Pune is one of the most prestigious groups in the academic sector known for its unique blend of value-based professional education in the areas of Technology, Medicine & Health Care, Schools, Management & so on.

Maharashtra Institute of Technology, the flagship institute of MIT Group of institutions, Pune was established in the year 1983, under the aegis of Maharashtra Academy of Engineering and Educational Research or better known as MAEER, Pune. MIT is one of the first nine private Engineering institutions in Maharashtra. It is the culmination of Hon'ble Dr. Vishwanath D.Karad's vision, the Founding Father of MIT Group of Institutions, Pune that quality education should reach masses and be made available to every merit holder irrespective of one's class, creed or religion.

The four-decade long journey of MAEER's MIT epitomizes the relentless pursuit of quality and excellence in the name of commitment and dedication, the nutriment of value and discipline, the quest of science and spirituality and in the enrichment of research and education. The academicians associated with MIT are committed not only to imparting knowledge but also augment the proficiency in their various fields.

MIT guides students to achieve their dreams and potential in this multi-disciplinary institute that weaves a mosaic of integrity, commitment and dedication. Carrying forward the baton of a new tomorrow and contributing to the industrial and economic growth of the society and nation at large, MAEER's MIT continues to build the gateway to student's successful careers.

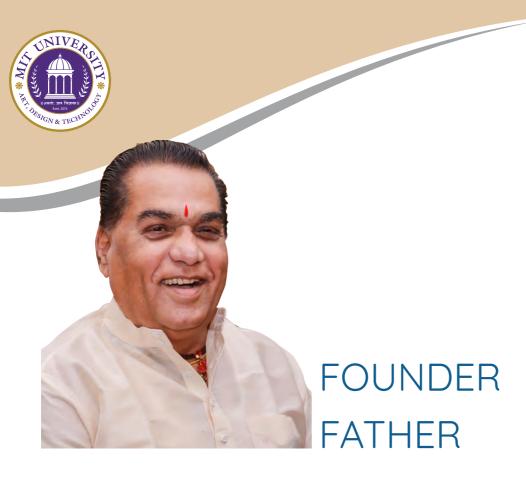
4 Universities

75 Academic Institutions

50,000+ Students Per Year

36+ Glorious years of Excellence

1,55,000+ Alumni...



A True Source of Inspiration

Hon'ble Prof. Dr. Vishwanath D. Karad President

MIT Art, Design & Technology University, Pune

Our truest source of inspiration, Hon'ble Dr. Vishwanath D. Karad, the founding father of MIT Group of Institutions, is a renowned educationalist. Hon'ble Dr. Vishwanath D. Karad is admired for his exemplary work in the field of human rights, spiritual sciences and spiritual advice. He has driven the MIT Group of Institutions to reach out to over 50,000 students across 75 institutions & 4 Universities. A true visionary, Hon'ble Dr. Vishwanath D. Karad has initiated some of the most ground-breaking activities under the banner of MIT Group of Institutions. Some of his initiatives include the International Robocon, Shri Saint Dnyaneshwar World Peace Prize, enhancement of pilgrimage centres at Alandi, Dehu, Pandharpur, etc. His relentless efforts and valuable contribution towards Human Rights and Democracy have resulted in Maharashtra Institute of Technology, receiving a UNESCO chair in 1998 from UNESCO Paris.

A staunch follower of Swami Vivekananda, Hon'ble Dr. Vishwanath D. Karad represented India in 'Parliaments of World's Religions' at the prestigious Salt Palace Convention, Salt Lake City, Utah (USA) in 2015. The convention was attended by over 10000 people. representing over 50 different faiths from over 80 Nations. Hon'ble Dr. Vishwanath D. Karad has also orchestrated a unique mission of establishing the world's largest dome as "World Peace Center & Library", spread across 160 feet in diameter and reaching 269 feet in height at the University campus. His vision 'to build a nation of competent individuals' is at the heart of MIT-ADT University. We aim at providing value-based education for academic excellence with various technical as well as cultural initiatives that fuel leadership qualities among our students.



EXECUTIVE PRESIDENT

Prof. Dr. Mangesh T. KaradExecutive President,
MIT Art, Design & Technology University, Pune



"Nurturing Globally Employable Technocrats"

At the MIT Art, Design and Technology University, Pune, we know that the work we do here matters to the world. We are committed to providing an intellectually stimulating environment for students to discover fields of knowledge that complement each student's major domains of study.

Our programme takes a holistic approach where every student undertakes Yoga, Physical Training, Creative & Performing Arts, Foreign Language's Training, Value Added Programmes and Industry Internship with strong interaction and engagement components. MIT—ADT University, Pune students consider fundamental questions about science, technology, engineering, arts, humanities, culture, and sciences from interdisciplinary perspectives via an exciting, distinctive curriculum offered across the schools of MIT-ADT University, Pune.

MIT School of Engineering, Rajbaug , Pune is a new generation school which promotes unique industry relevant, technologically advanced specialized B.Tech, and super specialized M. Tech. programs. Apart from these programs, MIT School of Engineering conducts M.Sc. in applied physics, applied chemistry and applied statistics with specialization in nano technology and quantum technology, medicinal chemistry, and data science, operation research respectively.

The school has been excelling with the vision to produce globally competent technocrats and innovators to lead

and have a greater impact on society. MIT ADT University is at the forefront in promoting and encouraging entrepreneurship development amongst the students and established the Atal Incubation Centre under NITI Aayog, Govt. of India for incubating the idea into viable products. Our vision is to produce first-generation entrepreneurs who will be capable of replicating the model of Facebook, Google & Microsoft.

Even during the unprecedented times of COVID-19, teaching-learning at MIT-ADT University was uninterrupted through the concerted efforts by our enthusiastic faculty team through our Digital Learning Management System.

At MIT School of Engineering, Pune you will have the chance to be mentored and taught by our outstanding and accomplished faculty members. And you'll join passionate students from across Maharashtra and India. Whichever program you choose, you will be surrounded by a highly-diverse, engaged, and supportive community, dedicated to transforming lives through education.

We look forward to you have you on-board with us at the new generation university where the pursuit of excellence begins.





VISION

Develop a Center of Excellence in Micro-specialized, cutting edge technology areas to recognize them as a world class community of next generation technocrat, educators, researchers who will fulfil the socio-economic needs of our nation and the world at large.

MISSION

- To develop high quality technical education institution with emphasis on technical academic excellence, innovative research & development programmers with core human values.
- To develop a unique culture that instills responsibility and accountability in partnership with various stakeholders such as parents, society, business and education community,
- 3 To develop the potential of human resources to meet the requirements of cutting edge technology.
- 4 To instill discipline in students and make them technologically superior and ethically strong
- 5 To prepare all students for successful careers based on Strong Moral & Ethical Foundation.
- To enable the students to develop their own abilities & talents in order to discover their teaming potential to the fullest under the privilege guidance of highly qualified and dedicated faculty
- 7 To create a work culture where teacher enjoys facilitation and learner enjoys learning for Research & Development as well as takes initiatives.

HIGHLIGHTS

- 1 All courses under MIT ADT University are UGC approved
- 2 Awarded Best campus award by ASSOCHAM, Delhi in 2017
- 3 Proficient faculties with research experience having Ph.D from reputed institutes/universities in India
- 4 Exhaustive practical exposure and problem solving based learning
- 5 Project and dissertation work to develop cognitive research skills
- 6 Industry and research laboratory visits
- 7 Special Emphasis on personality development, enhancement of communication and presentation skills.
- 8 Value added training for national level exams like CSIR-UGC NET, JEST and GATE
- 9 Incubation Center for entrepreneurial ideas & networking opportunities.

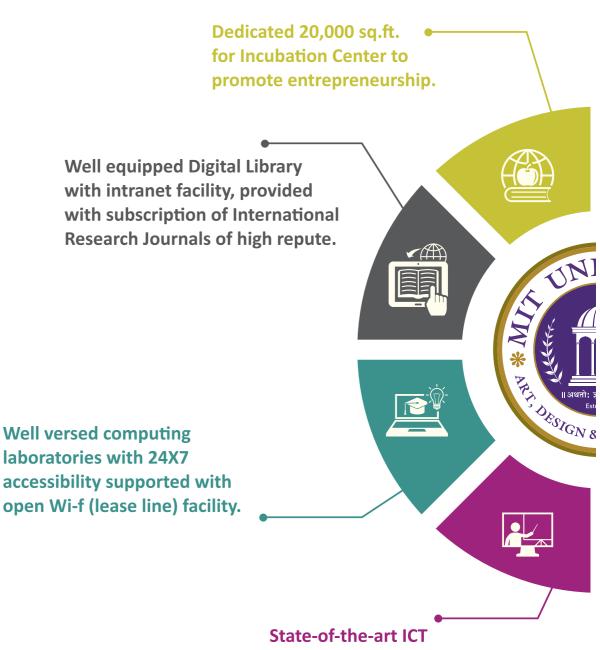




MIT School of Engineering was formed with a goal to find solutions to the greatest technological and social problems of the 21st century. The students here are trained to become future leaders who will have the capability to lead giant organizations in the emerging corporate landscape. MITSOE is dedicated to provide students with real world and practical academic exposure that will transform them into successful professionals.

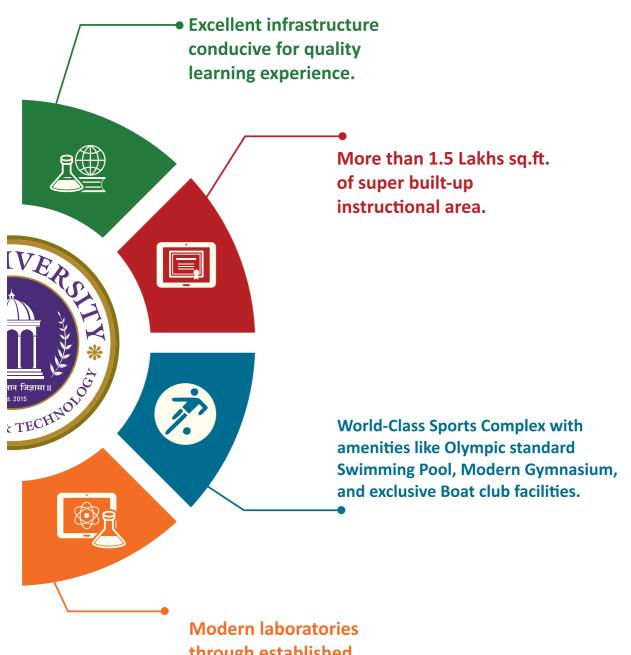
MIT School of Engineering is motivated by the vision of the late & respected President of India Dr. APJ Abdul Kalam. His vision of India 2020 – A Vision For a New Millennium empowers us to produce quality engineers who will satisfy the demand for talented manpower in the country.

Why to choose **MIT School of Engineering?**



State-of-the-art ICT enabled class rooms for effective delivery.





through established tie-ups with the Industries.





Applied Sciences & Humanities

The Department of Applied Sciences and Humanities executes the M.Sc. courses in Physics, Chemistry and Statistics. An excellent infrastructure in terms of well-equipped laboratories supported by highly qualified staff provides students with an environment conducive for studying. We firmly believe that given the right direction and support, every individual has the ability to excel. With this line of thought, we as faculty members take up the responsibility of being a friend, philosopher and guide to students. Each student is assigned a mentor teacher. Hence the faculty becomes an integral part of the students overall development and performance. Faculty members have completed their Ph.D. and are actively involved in research work. Apart from academics, students are provided with the opportunities to participate in various co-curricular and extracurricular activities. To inculcate social values in students, national level events are organised with their active participation in Samarth Bharat Abhiyan, tree plantation, medical check-up, blood donation camps, visits to orphanages, old age homes and rehabilitation centres, etc. In addition, Applied Science and Technology Club (ASTECH) club provides a platform for continuous nurture of potential young talents and unlock their passion in engineering and sciences. Here the students get the best platform to explore them to excel in all domains of life. In line with the mission of MIT School of Engineering, the department propels the students to exploit these resources to the maximum and evolve as hard core professionals with the valued principles.

Courses Offered

M. Sc. Applied Physics

(Duration 2 Years) Intake - 30

M. Sc. Applied Chemistry (Duration 2 Years) Intake – 30

M. Sc. Applied Statistics (Duration 2 Years) Intake – 30

Applied Chemistry

Applied chemistry is the application of the principles and theories of chemistry to answer a specific question or solve a real-world problem, as opposed to pure chemistry, which is aimed at enhancing knowledge within the field. Let's say your aim is to find a cure for a disease - Parkinson. You work hard in the laboratory creating a drug that stops tremor, muscular rigidity from setting in. This would be an example of applied chemistry, since you used chemistry to solve a specific, real-world problem. Applied chemistry, like other fields of science, follows the scientific method. The scientific method is composed of techniques and guidelines for conducting research that help scientists ensure their results are accurate.

Applied Physics

Applied physics is the application of the principles of physics to solve real world problems. It is different from pure physics in which the efforts are directed towards understanding the basic principles and phenomena of nature. The applied physics is concerned with use of physics principle to develop some practical devices and technologies. For example, the medical physicists in radiation therapy departments of hospitals measure and calculate the radiation doses given to cancer patients. Research on improving dosimetry for the treatment plans of cancer patients is considered an applied physics job. Another example will be development of the advanced solar cells using principles of quantum physics and solid state physics. These solar cells will have higher efficiency and may have some interesting properties such as flexibility or transparency. Some other examples are development of efficient batteries using the principles of nano physics, development of nuclear reactors to produce electricity, development of sensors to detect air and water pollution or to detect toxic gasses or explosive devices.

Applied Statistics

Applied statistics is the root of data analysis, and the practice of applied statistics involves analyzing data to help define and determine business needs. With today's increased access to big data, companies are looking for statisticians, data analysts, data scientists, and other professionals with applied statistics knowledge who can visualize and analyze data, make sense of it all, and use it to solve real-world problems. Companies have so much data, and properly analyzing it can lead to increased efficiency and profitability. Government agencies, nonprofits, and other organizations can use data to help prevent disease, collect important demographic information, steer political campaigns, and test potential life-saving pharmaceutical products. Data is a huge asset, and its growth has led to the overwhelming demand for statisticians and other professionals with advanced applied statistics skills.



Vision

To mould Young Minds to be Winning Personalities by laying a Strong Foundation of Applied and Engineering Sciences along with Holistic Education.

Mission

To Empower Students to succeed in higher levels of Engineering and Science Curriculum through Technology Enabled and Problem Solving based Learning Environment.





M. Sc. Applied Chemistry



Course Description

M.Sc. applied chemistry course is a full-time program spanning over two years and has been specially designed to provide the exposure to students of the industries and equip them for all career prospects available in India and abroad. The syllabus for M.Sc. under Choice Based Credit System (CBCS) having 60:40 Pattern spreads over four semesters. Curriculum is designed in such a way that in 1st and 2nd semesters students could acquire thorough fundamental knowledge of chemistry, learn and get acquainted with laboratory techniques and synthesis of various compounds along with other Ability and Skill Enhancement Courses. The 3rd and 4th semesters emphasis on elective courses selected along with the related advanced laboratory techniques. A special paper on research methodology is part of the curriculum and a hands-on training through projects/dissertations in multidisciplinary fields would be carried out in the 4th semester.

Preamble

M.Sc. applied chemistry program offered by MIT School of Engineering, MIT ADT University, Pune is a flagship program uniquely designed to bridge the gap between industry and academia. Along with equipping the students for the career prospects in Government/PSU sectors, Non-profit organisations, higher education opportunities of the country and abroad, the program being mainly industry oriented provides ample opportunities for the students to get career prospects in diverse fields like Research and Development, Quality Control/Regulatory boards and manufacturing wings of various industries in Pharma, Agrochemicals and Speciality Chemicals, API Manufacturers, Contract Research Organisations (CROs) for drug discovery and development (as research scientist in R&D/QC/QA/Chemist); as nano-scientist in semiconductor manufacturing industry for photovoltaic and lasing applications, pharmaceutical industry for the development of nanomedicines etc. The program enriches students with blend of theoretical as well as practical skills through class room-lab sessions, projects, internships, industry and research laboratory visits and guest lectures.



M. Sc. **Applied Chemistry**



Program Objective

- To develop knowledge of scientific theories and methods, analytical and technical skills to work effectively in the various fields of chemistry to address scientific questions independently.
- To develop critical thinking and analysis skills to solve complex chemical problems, e.g., data analysis, synthetic logic, spectroscopy, structure and modelling, interpret experimental results, perform calculations on these results and draw reasonable, accurate conclusions, team-based problem solving, etc.
- To develop the ability to synthesize, separate and characterize compounds using published reactions, protocols, standard laboratory equipment, and modern instrumentation.
- To develop competence in relating chemical structure to spectroscopic data.

- To develop cognitive research skills which is indeed forms the foundation for doctoral programmes and to pursue higher education, beside that it prepares them to tackle the intricacies that will follow in R & D laboratories.
- To train students to make them confident and capable of addressing challenge in chemistry, and work efficiently in interdisciplinary environment, either independently or in team, and demonstrate scientific leadership in academia and industry.
- To guide students for qualifying national level exams like CSIR-UGC NET and GATE exams.
- Develop communication and presentation skills; verbally and written, for the purposes of conveying chemical information to both professional scientists and to the public.

Career Prospects



Education & Research Sector



Pharmaceutical Sector



Agrochemical Sector



Oil & Chemical Sector



Textile & Mining Sector



Forensics Sector





M. Sc. Applied Chemistry



Eligibility Criteria

- An Indian or Foreign National Student can apply for this course.
- Aspiring candidates need to have successfully completed a B. Sc. Degree from any recognized university or college with Chemistry as the major/one of the subjects.
- The candidate should essentially get a minimum of 50% marks at the graduation level, while reserved category candidate can apply with minimum 45% of Marks.

Syllabus

1st Year

Sem I

Physical Chemistry, Inorganic Chemistry, Organic Reaction Mechanism, Laboratory courses:Separation & Durification of Organic Compounds, Synthesis and Analysis in Inorganic Chemistry, Communicative English.

Sem I

Physical Chemistry, Biochemistry, Synthetic Organic Chemistry, Research Methodology, Organic Synthesis Laboratory, Software used in Chemistry & Dications.

2nd Year

Advanced Separation and Hyphenated Techniques in Analytical Chemistry, Stereo, Structural Characterization of Molecules, Elective I-IV, Advanced Synthesis Lab-I & II, Dissertation/Project. Elective Courses are focused on developing cognitive research skills to enhance career opportunities in research institutions/organizations in public and private sectors working on diverse fields viz. Medicinal, Pharmaceutical, Specialty Chemicals, Agrochemicals, Forensic, Materials and Nanochemistry.



M. Sc. Applied Physics



Course Description

M. Sc. Applied Physics Program is a full time program spanning over two years and has been designed to provide the students with exposure to research and industry culture. The program is spread over four semesters. The first two semesters focus on building a strong foundation in core areas of physics along with skill enhancement courses in research methodology, communication, programming, technical seminars. This will include learning theoretical concepts through lectures and tutorial session and hands on experience in the laboratory session. The laboratory course will contain modern experiments related to the topics covered in the theory sessions. In the last two semesters the students can specialize in the area of their interest by choosing the elective subjects. The student will also get practical experience by working on mini project in third semester and major project and dissertation in fourth semester.

Preamble

M. Sc. Applied Physics Program offered by MIT School of Engineering, MIT ADT University is a flagship program uniquely composed to offer knowledge of areas of physics at frontiers of research and industry and to provide the skills which are required in these fields. The program aims to prepare the students for ample opportunities available in the fields of Nano technology and Quantum technologies in education and research in India and abroad, Research and Development departments of industries in the areas such as Nano electronics, Nano bio sensors, Agriculture, Energy and Environment, Defense technologies, Quantum Materials with novel properties and applications, Quantum computers, Quantum Communication, Quantum Key Distribution and Cryptography. The program provides sufficient mix of theoretical as well as practical learning to the students through class room sessions, laboratory sessions, projects and technical guest lecture sessions

Objectives

- To equip the students with theoretical understanding and experimental skills required in the areas of Nano technology and Quantum technologies.
- To develop critical thinking and analytic skills such as experimental design, data analysis, mathematical modeling to solve complex real life problems.
- To provide the basic understanding of nanomaterials to the students.

- To impart the knowledge of fabrication of nano materials.
- To provide the students the analytic skill required for characterization and analysis of nano materials
- To familiarize the students with application of pano materials in various fields
- To give the basic understanding of the concepts of quantum computation.
- To enable the students to understand quantum circuits and algorithms.
- To make the students proficients in programming for quantum computers
- To guide the students for national level qualifying exams such as CSIR-UGC NET, JEST, GATE.
- To develop research aptitude in students and motivate them to pursue doctoral research programs.
- To prepare the students for the challenges of the research and development in the industries in the areas of Nano technology and Quantum technologies.



M. Sc. Applied Physics



Career Prospects







Energy & Environment Sector

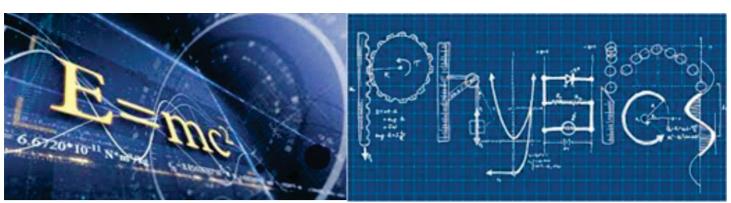


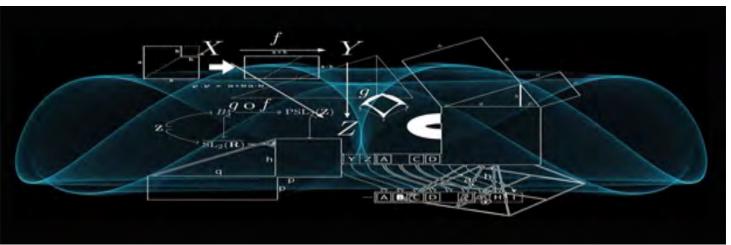
Defence & Security Sector





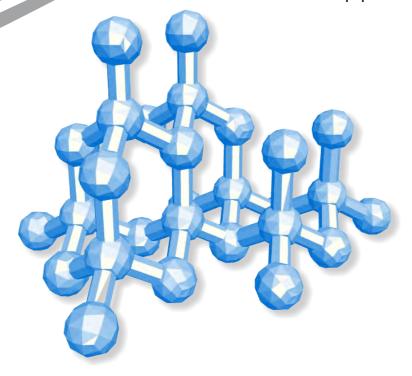








M. Sc. Applied Physics



Eligibility Criteria

- An Indian or Foreign National Student can apply for this course.
- The Candidate must have successfully Completed (Passed) B. Sc. Degree in Physics with minimum 50% marks from a recognized university.
- The reserve Category candidate must have successfully completed (Passed) the B. Sc. Degree in Physics with minimum 45% of Marks from a recognized university.

Syllabus

The course consists of Core Courses, General Electives, Discipline Specific Electives, Ability Enhancement Courses and SEC-Skill Enhancement courses

1st Year

Sem I

Classical Mechanics, Quantum Mechanics I, Analog and Digital Electronics, Mathematical Methods in Physics, Physics Lab I, Communicative English

Sem II

Solid state physics, Thermodynamics and statistical Mechanics, Quantum Mechanics II, Research Methodology, Technical Seminar 1, Physics Lab II, Programing with Python

2nd Year

Atomic and Molecular Physics, Electrodynamics, Nuclear and Particle Physics Elective I-IV, Advance synthesis Lab-I & II, MiniProject and Major Project. Elective courses are focused on developing cognitive research skills to enhance career opportunities in research institutions/organizations in public and private sectors working on diverse fields viz. Material Science, Nanoscience and Characterization, Nanophotonics, Nanomaterials and Applications, Fundamentals of Quantum Information, Quantum Logic gates and Circuits and Quantum algorithm and Applications.





M. Sc. Applied Statistics



Course Description

M.Sc. Applied Statistics course is a full-time program spanning over two years and has been designed to provide students with first-hand experience of corporate culture. The program is spread over four semesters. M.Sc. (Statistics) program is under CBCS-PG Scheme. Apart from teaching core Statistics subjects, the students are also trained to handle real life problems through the practical classes. As a part of the course the students are taught programming in R and Python.

Preamble

M.Sc. Applied Statistics Program offered by MIT School of Engineering, MIT - ADT University is a flagship program uniquely composed to blend Statistical-Managerial-Computing skill set which is today's every Multinational and Information Technology Companies needs in Artificial Intelligence and Data Science globally. The program being industry integrated provides enough opportunities to Mathematics, Statistics, Computer Science graduate for experiential learning. The Program provides sufficient mix of theoretical as well as practical learning to students through class room sessions, Case studies, Projects and Technical Guest Lectures. The program includes computational implementations on real data sets and learning key theoretical concepts. The program provides students with necessary skills required for professional positions in data analysis and statistics.





M. Sc. Applied Statistics



Program Objective

- 1. M.Sc. Applied Statistics program offers advance level training in the theory, methods and applications of Statistics along with specialized training in selected areas of Statistics and allied fields. Depending on the area of specialization, students would be able to pursue an academic/research career in Statistics, Mathematics, Economics, Computer Science and allied fields.
- 2. To inculcate and develop aptitude to apply statistical tools at a number of data generating fields in real life problems.
- 3. To train students to handle large data sets and carry out data analysis using software and programming language.
- 4. To teach a wide range of statistical skills, including problem-solving, project work and presentation so as enable students to take prominent roles in a wide spectrum of employment and research.
- 5. To Provide a sound foundation and exposure to statistical ideas. To steer students towards developing a keen interest in statistical thinking.
- 6. To instill the rational that Statistics is important for scientific research which forms the basic grounds of decision making in every aspect of life.
- 7. The candidate can appear for CSIR-UGC NET exam which is a test being conducted to determine the eligibility 'For Junior Research Fellowship (JRF) and for Lectureship/Assistant Professor' in Indian universities and colleges subject to fulfilling the eligibility criteria laid down by UGC.
- 8. Student can pursue M. Phil or PhD.
- 9. Student can get opportunities in Research and development. Statisticians design experiments for product testing and development. For instance, they may help design experiments to see how car engines perform when exposed to extreme weather conditions. Statisticians may also help develop marketing strategies and prices for consumer goods. They would be able to work competently as Statisticians and specialists in research institutions and scientific laboratories: CSIR, ICAR, DRDO, IMO. etc., government departments: Defense-statistical office, IT industries & software companies.
- 10. Upon successful completion of this program, student can get opportunities to work in government sector. One can appear for Indian Statistical Services or Indian Forest Services, RBI grade B statistical officer competitive exams.



M. Sc. Applied Statistics



Career Prospects









conomic Sector Academic & Research
Sector

Healthcare Sector

Software Sector





Banking & Scurity Sector



Communication & Media Sector



Sports Sector

Eligibility Criteria

For M. Sc. in Statistics following candidates are eligible.

- All Indian or Foreign can apply for this course.
- Candidates who have passed B.A./B.Sc. securing minimum 50% in aggregate and having Statistics as one of the subjects at the UG level from Recognized University.

Syllabus

Ist Year

Sem I

- Linear Algebra
- Mathematical Analysis
- Distribution Theory
- Statistical Testing in Data Analysis
- Sampling Techniques
- Advanced Lab I (Programming with R)
- Communicative English

Sem I

- Probability Theory
- Stochastic Process
- Advanced Statistical Inference
- Linear Models & Designs of Experiment
- Applied Regression Analysis
- Advanced Lab II (Programming with Python)

IIndYear

Multivariate Analysis, Financial Statistics/ Actuarial Statistics, Time Series Analysis, Elective I-IV, Technical Seminar (Based on Internship), Mini Project and Major Project. Elective courses are focused on developing cognitive research skills to enhance career opportunities research institutions/organization in public and private sectors working on diverse fields viz, Computer Science: Data Science, Machine Learning, Artificial Intelligence, Mathematics, Statistics, Operations Research, Economics and allied fields.



ADMISSION PROCESS HOW TO APPLY?



Apply Online

The eligible candidates are required to register on http://www.mituniversity.edu.in/applynow



Eligibility Check

The candidate should fill the Online Application Form with true & correct information. Upload the necessary documents



Merit List

Merit List of eligible candidates will be displayed on www.mituniversity.edu.in



Admission Confirmation

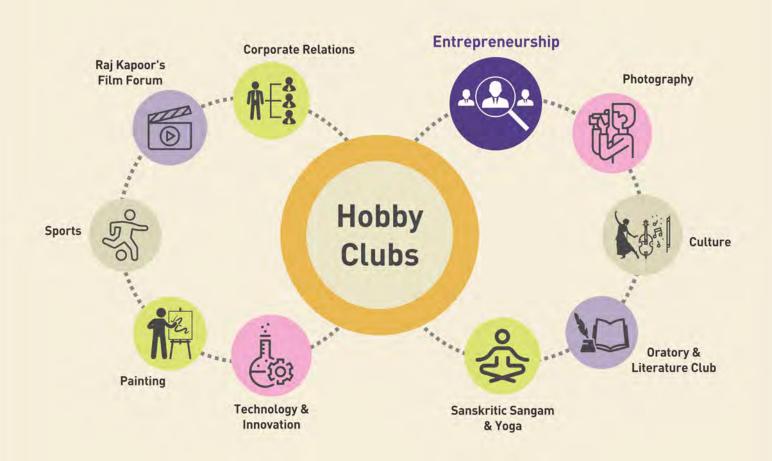
The shortlisted candidates as per merit list has to confirm the admission by paying the fees through DD



Personal Interview & Counselling

Counselling Round against vacancies at Admission Facilitation Cell













MIT Art, Design & Technology University

Vishwarajbaug, Loni Kalbhor, Pune - 412 201, India.

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