



**MANIPAL INSTITUTE OF TECHNOLOGY**  
**MANIPAL**  
*(A constituent unit of MAHE, Manipal)*

# Research @ MIT





# MANIPAL INSTITUTE OF TECHNOLOGY

## MANIPAL

(A constituent unit of MAHE, Manipal)

### MIT, Manipal:

The Manipal Institute of Technology (MIT), Manipal was established in 1957 as one of the first self-financing engineering colleges in the country

MIT offers a Bachelor's and Master's program in engineering streams. It also gives students the option to carry out full-time or part-time research. The minimum duration for postgraduate qualified PhD students is three years for full-time, and four years for part-time. There is a one-year relaxation for applicants with an MPhil degree.

The institute undertakes sponsored research programs supported by funding agencies such as DST, CSIR, AICTE, and the Ministry of Environmental Sciences. It has collaborative research programs in association with premier research laboratories and institutes in India and abroad.

### Engineering and Sciences

#### Electrical Stream

- Mechatronics
- Media Technology
- Biomedical Engineering
- Electrical & Electronics Engineering
- Electronics & Communication Engineering
- Electronics and Instrumentation Engineering

#### Computer Science Stream

- Data Science & Engineering
- Computer Science & Engineering
- Information & Communication Technology

#### Mechanical Stream

- Mechanical and Industrial Engineering
- Aeronautical & Automobile Engineering

#### Chemical Stream

- Chemical Engineering
- Biotechnology

#### Building Science Stream

- Civil Engineering

#### Basic Sciences

- Physics
- Chemistry
- Mathematics
- Humanities and Management



# Aeronautical and Automobile Engineering

## About the department:

The Department of Aeronautical and Automobile Engineering was established in 2008 with the objective of offering world-class education and cutting-edge research environment. The department strives for a healthy balance between teaching, research & development. Faculty of the department draws upon a long history of technical excellence, innovation and teaching performance, preparing graduates to contribute to the society with technically imaginative and commercially viable solutions. The mission is realized through its commitment to educational excellence, to the creation, development and application of the technologies critical to aerospace and automobile engineering.

This program aims to promote aeronautical & automobile engineering by establishing close linkages between education, industry and research activities. The department has highly successful Centers of Excellence program to research best practices in unified approach to teaching and learning.

## Major Research Areas:

- Advanced Composite Materials
- Bio mechanics
- Acoustic and Vibration
- Computational Fluid Dynamics
- Aerodynamics
- Avionics
- Battery Thermal Management

## Research data:

External grants	:	₹ 3 Crore
Publications	:	293
PhD awarded	:	09
PhD ongoing	:	14
Collaborations	:	88
Patents Filed	:	26
Patents Granted	:	02

## Advanced Instruments:



Stationary engine work station



Shock Tube



Wind Tunnel



Impedance Tube



Electrodynamic Shaker



Fatigue Testing Machine

**PURE link:**





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# Mechanical and Industrial Engineering

## About the department:

The Department of Mechanical and Industrial Engineering (MIE) (renamed on March 1, 2022) was established in the year 1960 as Department of Mechanical and Manufacturing Engineering (MME). It is the largest Department in the Institute, comprising two undergraduate; Mechanical Engineering and Industrial Engineering, and three postgraduate programs in the three core areas of the Mechanical domain. Over the years, the Department has developed to become a center of excellence, providing in-depth technical knowledge and opportunities for innovation and research. Innovative teaching methods, Industrial collaborations, and state-of-the-art infrastructural facilities are the strength of the Department. The Department has a strong research interest in diverse areas of Mechanical and Industrial Engineering and offers PhD Program as well. The focused research areas of the Department are Materials, Design, Thermal, Manufacturing, and Industrial & Systems Engineering. Moreover, it has a strong alumni base across the world.

## Major Research Areas:

- Composite materials
- Biomechanics and Tribology
- Green fuels and emission control
- Waste-to-energy conversion
- Heat treatment of metals and alloys
- Machining processes
- Solar thermal energy conversion, Turbo Machines
- Air conditioning and Refrigeration
- Heat transfer, computational fluid dynamics

## Research data:

External grants	:	₹ 2.37 Crores
Publications	:	1270
PhD awarded	:	25
PhD ongoing	:	50
Collaborations	:	22
Patents Filed	:	25
Patents Granted	:	04

## Advanced Instruments:



Abrasive water  
jet machine



Electro Discharge  
Machine



Pin on Disc Tribometer  
instrument



Wire cut EDM



Plastic Injection  
Moulding Machine



Vertical Machining Centre

PURE link:





## About the department:

The Department of Mechatronics at MIT Manipal offers a 4-year B. Tech course in Mechatronics since 2006 with an integrated curriculum to provide a broad-based education in the basic principles of electrical, electronics, computing, mechanical, robotics, and modern courses. The department also offers a 2-year M. Tech course in Industrial Automation and Robotics since 2015.

Mechatronics is a multi-disciplinary domain lying at the intersection of Mechanical, Electrical, Electronics, and Computer Science Engineering. objective of the department is to enable students with the potential to address the future challenges by laying a strong foundation of multidisciplinary knowledge in their intellect. The department is well-equipped with laboratories set up in collaboration with industries to enable the students integrate knowledge from various engineering disciplines and get used to various industrial cases through. The department emphasizes on the industry academic partnership which benefits students to work in professional sphere during graduation, provides graduates with the research background necessary for an academic career, provides insights to nurture the entrepreneurship ambitions, opportunities for industrial experience, and experiential learning.

## Major Research Areas:

- Robotics
- Automation
- Internet of Things (IoT)
- Energy Systems
- Smart Manufacturing
- Machine Learning
- Image Processing
- MEMS and Sensors
- Circuits and Systems

## Research data:

External grants	:	₹ 1.3 Crores
Publications	:	330
PhD ongoing	:	03
Collaborations	:	03
Patents Filed	:	10
Patents Granted	:	04
Collaborations	:	13

## Advanced Instruments:



Industrial Robot  
ABB- IRB 2600



Collaborative Robot UR5



LiDAR sensors, Depth sensing cameras



Universal Robotic  
Research Platform



TurtleBot



3D Printer

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# Electronics and Communication Engineering

## About the department:

Established in the year 1972, the department of Electronics & Communication Engineering has developed itself as a center of excellence in academics and research. The department has been working primarily on imparting basic knowledge and essential skills in Electronics and Communication Engineering to the students.

The department has 33 full-time faculties with Ph.D. qualifications from reputed universities and the remaining are pursuing their PhD study in India and abroad. The faculty are actively involved in research in the area of VLSI, Embedded Systems, MEMS and Nano- technology, Communication, Sensor Networks and Plasmonics. The department has active collaboration with reputed Institutions and the outcome of which have been published in reputed journals and conferences. Faculty from the department are involved in inter-disciplinary projects in collaboration with constituent units of Manipal Academy of Higher Education. One of our faculty has set up a new start-up, Kumudha Health Tech, Private Limited, Manipal, funded by BIRAC-DBT, Government of India, and incubated in University campus. The start-up is working towards excellence in the medical devices for health care application.

Department Full-time Ph.D. research scholars are working in diversified fields of Electronics and Communication Engineering. Research scholars are financially supported by scholarships from the University. Few research works are supported by DST / DBT. University encourage and sponsor faculty and students (UG, PG, and Research Scholar) to file patents. Department also has active collaboration with industries such as Schneider Electric, Samsung India. Department had an International consultancy project with a company based in France.

## Major Research Areas:

- Signal & Image Processing
- Communication
- Antenna Research
- VLSI
- Machine Learning
- Device Modelling
- Fabrication and Characterization
- Nanotechnology

## Research data:

External grants	:	₹ 2.71 Crores
Publications	:	625
Patents filed	:	05
PhD awarded	:	36
PhD ongoing	:	16
Collaborations	:	16 (9 national; 7 international)

## Advanced Instruments:



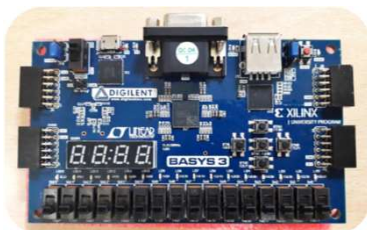
DC magnetron sputtering system



SP-150 Biologic Potentiostat



Vector Network Analyzer



FPGA Board Basys 3 Artix



Keithley Source Meter

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# Electrical and Electronics Engineering

## About the department:

Established in the year 1960, the Department of Electrical & Electronics Engineering has been at the forefront to produce well-groomed graduates, possessing sound technical skills and innovative ideas to cater to the ever-growing demands of the industry. The department is backed by a team of motivated, dedicated, and experienced teachers with expertise in key domains such as Control Systems, Power & Energy Systems, Artificial Intelligence, Embedded Systems and Lighting Science.

## Major Research Areas:

- Power & Energy Systems
- Control System
- Artificial Intelligence
- Embedded Systems
- Lighting

## Research data:

External grants	:	₹ 62 Lakhs
Publications	:	435
PhD awarded	:	16
PhD ongoing	:	14
Collaborations	:	3 (national)

## Advanced Instruments:



3 Phase Real time transmission line simulator test bench with SCADA



BLDC motor with Half effect sensor



Mini  
Environmental  
Chamber



Agilent multipurpose lab  
station



Multi-Product Calibration  
Fluke Meter



Programmable  
AC Source  
0~300V, 15~1kH  
z/1kVA, 1Ø

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# Instrumentation and Control Engineering

## About the department:

The Department of Instrumentation and Control Engineering was established in 2001 offering B.Tech in Instrumentation and Control Engineering. Today, the department offers B.Tech in Electronics and Instrumentation Engineering, M.Tech in Embedded Control and Automation. From 2022, the department started offering B.Tech in Cyber Physical Systems and M.Tech in Internet of Things. The department offers PhD in multidisciplinary areas.

The department has active MOU with reputed academic institutions and industries. Also good amount of funding received by the faculty toward research from reputed funding agencies like DST, AICTE etc. State of the art research facility is available for validating the theoretical research on real time applications. Faculty are pursuing collaborative research with experts from abroad and publishing quality articles regularly.

## Major Research Areas:

- Linear and nonlinear Controls
- Sensor (physical and Biosensors) design and fabrication
- Advanced Process and UAV Control
- Computer Vision and computer aided healthcare
- Sensor data fusion
- Cyber Physical System

## Research data:

External grants	:	12
Publications	:	468
PhD awarded	:	24
PhD ongoing	:	11
Collaborations	:	09
Patents Filed	:	26

## Advanced Instruments:



Pilot Plant Batch Reactor



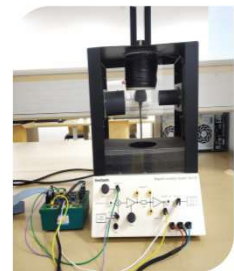
Pilot Plant Shell And Tube Heat Exchanger



Pilot Plant Batch Distillation Column



3 DOF Helicopter Simulator



Magnetic Levitation System



NI IC Controller IC-3173



Fluorescence Microscopy

**PURE link:**







## About the department:

The department of biomedical engineering was constituted as an independent department in the year 1999. The B Tech and the MTech program are one of the oldest engineering programs in the country. The department collaborates with Kasturba Medical College, Manipal (KMC) to train budding biomedical engineers and to conduct cutting edge research in biomedical.

The department is focusing on research in the fields of Physiological signal acquisition, Medical Imaging, Image Processing, Medical devices, Nanotechnology, Biomaterials and tissue engineering. The faculty members from the department have received funding of around five crores from different national grant agencies like SERB, DST, DBT, BIRAC and instrumental in several start-ups in medical devices. Major research activities in the area of Medical Devices & Rehabilitation Engineering are in rehabilitation devices, dialysis cartridges, smart walkers and around 3.2 crores of funding support are obtained from government agencies.

The main research activities in Image & Signal Analysis consists of Machine learning for Image & signal processing, Gait Analysis, Speech Analysis, Video-signal processing: Non-contact estimation/monitoring of vitals, ECG processing & analysis and Image Processing in Microscopy: TB-screening which are supported by financial support of 35 lakhs from national granting agencies.

The research in Biomaterials, Drug delivery and Nanotechnology attracted national funding of 80 Lakhs and specializes in Metal and semiconductor Nanomaterials, drug delivery, Biopolymer membranes, Microfluidics, Paper Channel, Synthesis of anticancer and antimicrobial molecules, and development of Nano sensors. The research and teaching facilities in the department are dedicated nanomaterials lab with instruments like FTIR, spectrophotometer, cell and tissue engineering lab, computation lab for signal/image/video processing and medical instrumentation lab with facilities like wireless medical signal acquisition systems.

## Major Research Areas:

- Physiological signal acquisition
- Signal/Image/Video Processing
- Medical devices
- Nanotechnology
- Biomaterials and tissue engineering

## Research data:

External grants	:	₹ 90 Lakhs
Publications	:	197
PhD awarded	:	05
PhD ongoing	:	10
Patents Granted	:	02

## Advanced Instruments:



Airfume hood



Autoclave



Centrifuge 8C plus



Bathsonicator



Biocane



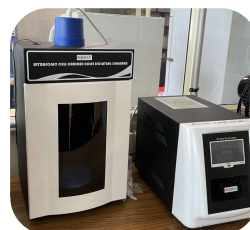
Biopac



Rotary evaporator



Vacuum oven



Probe Sonicator

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## About the department:

Since the inception of the Department in 1992, global communication has propelled us into the new millennium with engineering innovations and newer technologies to evolve into incorporating Electronic Media. The department provides comprehensive in-depth study in modern Graphic Arts Technology and Media Sciences. The focus areas are Media Production, Printing Technology, Packaging Technology, Printed Electronics, 3D Printing, Color Analysis and Management. The Vision of the department is to excel in Print and Electronic Media education through continuous learning, research and teamwork. The mission to impart excellent Print and Electronic Media education for professional roles in a changing and challenging technological world, to advance knowledge through quality research in important emerging areas in the discipline, and to build a strong relationship with industry, academia, and society.

## Major Research Areas:

- Printing Technology
- Packaging Technology
- Printed Electronics
- 3D printing
- Color Analysis and Management

## Research data:

External grants	:	NIL
Publications	:	01
PhD awarded	:	01
PhD ongoing	:	03
Collaborations	:	NIL
Patents Filed	:	NIL

## Advanced Instruments:



Screen Printing Machine



IGT Printability Tester



Panasonic AG-UX90 Professional Camcorder



Spectrophotometer



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# Computer Science and Engineering

## About the department:

The B.Tech degree program in Computer Science and Engineering was started in the year 1985 under the Dept. of Electronics and Communication. The Department of Computer Science & Engineering (CSE) came into existence as an independent department in 1988. Over the years, the department has developed to become a center of excellence providing in-depth technical knowledge and opportunities for innovation and research with well-equipped computer facilities and dedicated faculty. The department has tie-up with various industries and offers electives in collaboration with the industries. The department has strong research interest in diverse areas of Computer Science and offers a PhD program. Great emphasis is given on the emerging, interdisciplinary, cutting-edge areas of research in the department. The focus areas of research are High Performance Computing System.

Computer Vision, Software Engineering, Knowledge Engineering, Computer Networks and Security and Machine Learning. The research activities of the faculty members and the students have resulted in more than 500 publications in international conferences as well as journals. Students are encouraged to participate in co-curricular and extracurricular activities. The department coordinates the activities of the student clubs IE(CSE), Linux Users Group and ACM student chapter. Students are placed in reputed industries like Microsoft, Amazon, Deloitte, Goldman Sachs, Oracle, Cisco, Samsung etc.

## Major Research Areas:

- Artificial Intelligence
- Natural Language Processing, Model based Analysis
- Data Analytics
- Security, Machine Learning, IoT & Computer Vision
- Networks & Information Security
- Computer Aided Diagnosis & Assistive Technologies
- Biometrics, Software Engineering
- High Performance Computing Systems

## Research data:

External grants	:	₹ 2.75 Crores
Publications	:	546
PhD awarded	:	30
PhD ongoing	:	37
Collaborations	:	04
Patents Filed	:	06
Patents Granted	:	01

## Advanced Instruments:

- Super Computing Facility
- HPE Server
- DBSL server
- VOLTERRA 3D PRINTER
- SNAPDRAGON - IOT Boart + Adapter
- RASPBERRY-PI-2-MODB

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# Information & Communication Technology

## About the department:

The department of I&CT started in 2000 and has developed into a center of excellence, providing opportunities for innovation and research with well-equipped labs, an industry-ready program structure, and a dedicated faculty. The courses offered by the department are BTech in Information Technology, BTech in Computer and Communication Engineering, MTech in Computer and Networking Engineering, MTech in Software Engineering, and MTech in Machine Intelligence and Decision Science and PhD programs. BTech courses are accredited by the NBA until 2025.

## Major Research Areas:

- Computer Networks & Communications, Wireless Sensor Networks, VANET
- Cyber Security, Network Security, and Data privacy
- Artificial Intelligence, Machine learning, Computer Vision and Pattern Recognition
- Web Semantics, Recommendation Systems and Information Retrieval
- Cloud Computing, Big Data Analytics, Edge Computing and Blockchain Technologies, IoT Technologies, Software Engineering
- Healthcare Analytics, Healthcare Informatics

## Research data:

External grants	:	₹ 1.3 Crores
Publications	:	633
PhD awarded	:	12
PhD ongoing	:	23
Collaborations	:	06
Patents Filed	:	05
Patents Granted	:	01

## Advanced Instruments:

- PARAM SHAVAK Super Computing Hardware with Single Nvidia K40 GPGPU Card
- DGX server with 2 NVIDIA A100 GPU Tensor Cores with 82 GB RAM and 312 teraFLOPS (TFLOPS) of deep learning performance.



PARAM SHAVAK Super Computer

**PURE link:**





# Data Science and Computer Applications

## About the department:

The Department of Data Science and Computer Applications, MIT offers the following programs: B.Tech.(Data Science and Engineering), MTech.(Data Science) and MCA - Master of Computer Applications. The Department was started in 1998 as a part of the Department of Mathematics, affiliated to the Mangalore University. Subsequently, it was a part of the Department of Information and Communication Technology at MIT, Manipal Academy of Higher Education (MAHE then called the erstwhile Manipal University). Since 2009, this department has been functioning as an independent department at MIT, MAHE, offering the 2-year Master of Computer Applications program. Over the years, the department has evolved into a center for excellence providing opportunities for innovation and research with well-equipped computer facilities and dedicated faculty, who apart from their regular teaching schedule, are actively involved in pursuing research in various areas like Data Science, Image Processing, Video Coding, Network Security, Knowledge Engineering and Cloud Computing. The department has a good record of research activities with many publications in conferences and journals. The department has three research groups namely Data and Knowledge Discovery, Multimedia Computing and Communication, and Computer Vision. The groups are active and are conducting various activities such as workshops, seminars, and other events.

## Major Research Areas:

- Brain Tumor Classification
- Image Registration
- Computer-Assisted Surgery
- Human Detection Using UAV
- Cloud Computing
- Multiview Video Encoding
- Source Camera Identification
- Crowded Scene Analysis
- Face Recognition
- Person Re-Identification

## Research data:

External grants	:	₹ 0.8 Crores
Publications	:	134
PhD awarded	:	02
PhD ongoing	:	11
Collaborations	:	01
Patents Granted	:	02

## Advanced Instruments:

- Hardware Count – 03
  - GPU - GTX 1080
  - RAM – 8 GB
  - Storage Capacity – 1 TB

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## About the department:

The Department of Biotechnology, MIT, Manipal was established in 2005. The department has state-of-the-art infrastructure, an up-to-date curriculum, and a wide selection of electives to promote interdisciplinary research. The department is at the forefront of research and education, providing advanced degrees at the Bachelor's, Master's, and Doctoral levels in the field of Biotechnology. The faculty are highly qualified, competent, and experienced with research interests, in diverse and emerging areas of biotechnology.

The department is actively promotes advanced research supported by Department of Biotechnology (DBT), GOI, Indian Council of Medical Research (ICMR), GOI, Department of Science and Technology (DST), GOI, Science and Engineering Research Board (SERB), GOI, Vision Group of Science and Technology (VGST), GOK and several other industry partners. Department has received more than 2 crores of extramural funding both from Industry and government funding agencies.

## Major Research Areas:

- Bioinformatics
- Biopolymers, biofuels, and Bioprocess
- Biomicrofluidics
- Cancer stem cells
- Photoceutics for tissue repair and regeneration
- Drug design and delivery
- Phytoceuticals

## Research data:

External grants	:	₹ 3.70 Crores
Publications	:	353
Patents filed	:	08
PhD awarded	:	08
PhD ongoing	:	28
Collaborations	:	33

## Advanced Instruments:



Compression Tester



Concrete permeability tester



Total Organic Carbon (TOC) Analyser



Triaxial Shear Testing Machine



Prestressing Rig and Hydraulic Jack



Atomic Absorption Spectrometer (AAS)

**PURE link:**





## About the department:

The department of Chemical Engineering was established in 1969 and has distinguished alumni in industry, research and development centers, academia, and entrepreneurship across the world. The department offers B Tech, M Tech and PhD programs. The department has over 5350 research citations with an h-index of 36.

## Major Research Areas:

- Catalysis
- Computational Fluid Dynamics
- Renewable Energy
- Advanced Materials
- Biochemical Engineering
- Nanomaterials/Nanocomposites
- Biofuels
- Environmental Engineering
- Wastewater Treatment
- Molecular Simulations
- Adsorption
- Process Systems Engineering
- Drug Delivery Systems

## Research data:

External grants	:	₹ 43 Lakhs
Patents filed	:	03
Publications	:	325
PhD awarded	:	01
PhD scholars	:	09
Collaborations	:	33

## Advanced Instruments:



Photocatalytic Reactor



UV-VIS Spectrophotometer



High Speed Centrifuge



Thermo-Gravimetric Analyser



Atomic Absorption Spectrometer

PURE link:





## About the department:

The department of Civil engineering, born with the institute in 1957, has dedicated itself to imparting quality education, achieving academic excellence, and developing both community-oriented and industry-based research and consultancy. The department offers one undergraduate program, B. Tech. (Civil Engineering), since 1957, and three postgraduate programs: M. Tech. (Construction Engineering & Management) since 1989, M. Tech. (Structural Engineering) since 1993, and M. Tech. (Environmental Engineering) since 2010. In addition, it is also providing infrastructural support to the M. Sc. in the Department of Sciences' (MAHE) Geology program. With full-fledged laboratories, highly qualified faculty, advanced equipment and testing machines, and professional software, the department has been demonstrating remarkable progress in achieving its three principal goals: the best civil engineering education, quality academic research, and prolific community- and industry-based research and consultancy.

The department has created a platform for exchanging the research ideas by organizing National level conferences, workshops, seminars from time to time. The department ardently fosters the industry-academia collaborations by conducting invited lectures by eminent industry professionals. Department has got accreditation by National Board of Accreditation in the year 2001 for a period of 5 years, 2008 for a period of 3 years and 2016 and 2022, for a period of 3 years.

## Major Research Areas:

- Geotechnical Engineering
- Building materials
- Environmental and water resources
- Structural Engineering
- Environmental Geology
- Climate Change
- Soil-Structure interaction

## Research data:

External grants	:	₹ 3.12 Crores
Publications	:	325
Patents filed	:	10
PhD awarded	:	17
PhD ongoing	:	37
Collaborations	:	32)

## Advanced Instruments:



Compression Tester



Concrete permeability tester



Total Organic Carbon (TOC) Analyser



Triaxial Shear Testing Machine



Prestressing Rig and Hydraulic Jack



Atomic Absorption Spectrometer (AAS)

**PURE link:**







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# Humanities and Management

## About the department:

The Department of Humanities & Management, at Manipal Institute of Technology was established in May 2009. The department has two disciplines: Management and English. The department offers a Post Graduate Program (MTech) in Engineering Management and also provides support to other departments of the institute for handling the courses in Management and English domain. The department has expertise in system dynamics, modelling and simulation, organizational behavior, econometrics and marketing, research methodology, operations, Linguistics, English literature and communication, German language and cultural studies. The Department plays a distinctive role in molding the careers of engineers, as the spirit of scientific inquiry and application of technology need to be coupled with human values.

## Major Research Areas:

- Consumer Behavior
- Technology Management
- Operations Management
- Supply Chain Management
- Social Sciences

## Research data:

- Total number of PhD awarded : 05
- PhD students on roll : 21
- Total number of publications : 198

**PURE link:**





## About the department:

Department of Physics is one of the founder departments of the Institute. Currently, the department has grown and developed into a center of PG studies and research. Department has 22 faculty members specialized in experimental as well as theoretical Physics. Till 2022, the faculty have received a total external grant close to Rs. 525 lakhs from national agencies like DST, SERB, BRNS, DAE. With an h-index of 42 and citations over 8000, the department has published 600+ papers in internationally acclaimed peer reviewed journals indexed by Scopus/Web of Science. Through international and national collaborations, the faculty and students of the department keeps updated in the emerging areas of science and technology. The department offers minor specialization and open elective subjects to B.Tech. students apart from teaching Engineering Physics. So far, more than 29 candidates have obtained Ph. D. degrees since 2010. The Ph. D. students of the department, have also received prestigious national fellowships like Inspire, NET JRF/SRF, etc.

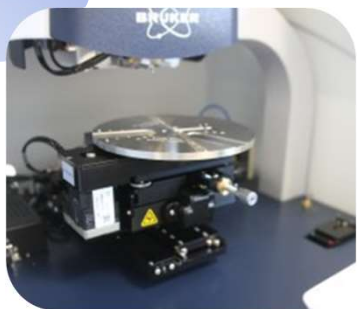
## Major Research Areas:

- Photovoltaic materials
- Nanomaterials
- High energy and particle physics
- Glasses and ceramics
- Thermoelectric
- Nonlinear optics
- Nuclear physics

## Research data:

- |                                   |                 |
|-----------------------------------|-----------------|
| • Total grant amount              | : ₹ 4.95 Crores |
| • Total number of publications    | : 707           |
| • Total number of PhD awarded     | : 40            |
| • PhD students on roll            | : 66            |
| • Total number of grants received | : 35            |
| • Patents Filed                   | : 01            |
| • Patents Granted                 | : 01            |

## Advanced Instruments:



Profilometer



Crystal puller



Spray-pyrolysis unit



Magnetron sputtering



Photodetector



Dual CVD system

**PURE link:**





## About the department:

The Department of Chemistry started in 1957 and is one of the oldest departments of MIT Manipal. Over these years, the Department has immensely contributed towards developing sustainable and innovative solutions for challenges in health/medicine, energy, materials science, and the environment by leveraging the broad expertise of esteemed Faculties.

The Department has eminent Faculties with expertise in interdisciplinary and application-oriented research in organic, inorganic, physical, and materials chemistry. To holistically address the research challenges, Faculties work closely with industrial partners, national labs/institutes, and also international research groups across the globe. The research output of the Department is evident in terms of high-impact publications, consultancy services, research grants, and knowledge transfer to industries.

The Department is at the forefront of nurturing and creating future leaders in Chemistry. The Department offers Engineering Chemistry courses for B. Tech. program, M.Sc. program with Organic/Applied Chemistry specializations, and Ph.D. in emerging areas of Chemistry.

## Advanced Instruments:



**Electrochemical workstation**



**DSC for thermal analysis**



**FTIR: ATR and transmission mode**

## Major Research Areas:

- Anti-microbial polymers
- Liquid Crystals
- Corrosion and its protection techniques
- Organic Chemistry (Medicinal chemistry, Drug-delivery for targeted molecules)
- Solar cell and super capacitors
- Electrochemical sensors and battery
- Flexible electronics
- Electro(photo)catalysis and fuel cells
- Hydrogen production and CO<sub>2</sub> conversion to chemicals

## Research data:

• Total grant amount	:	₹ 2 Crores
• Total number of publications	:	687
• Total number of PhD awarded	:	26
• PhD students on roll	:	60
• Collaborations	:	08
• Patents filed	:	06
• Patents granted	:	02

**PURE link:**





## About the department:

The Department of Mathematics at Manipal Institute of Technology was started in 1957 and provides the students with the mathematical foundation required to analyse all engineering and applied science courses. Apart from this, it also provides the mathematical methods to formulate, analyse and to solve the problems of engineering and management through the higher level and elective courses. The faculty members help students in acquiring a conceptual understanding of the nature and structure of mathematics, its processes, and applications. The department caters to undergraduate courses through regular and elective subjects, PG courses like M.Tech, MCA, M.Sc., as well as pure and applied mathematics in the other constituent institutions of Manipal Academy of Higher Education. In 2022, Department of Mathematics had started a new program Integrated MSc in Mathematics and Computing with three exit tracks.

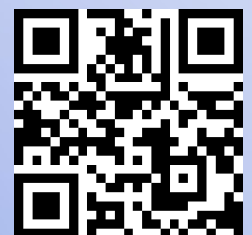
## Major Research Areas:

- Graph Theory
- Algebra
- Functional Analysis
- Number Theory
- Complex Analysis
- Topology
- Numerical Analysis
- Fluid Dynamics
- Statistical Inferences
- Reliability Theory
- Control & Optimization

## Research data:

External grants	:	₹ 3 Crores
Publications	:	455
PhD awarded	:	33
PhD ongoing	:	35
Collaborations	:	13
Patents filed	:	01

**PURE link:**



# Research @ MIT

## Research Output

113823	125	5442	1718	402	298	269
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## Collaborations



## UN Sustainable Development Goals



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