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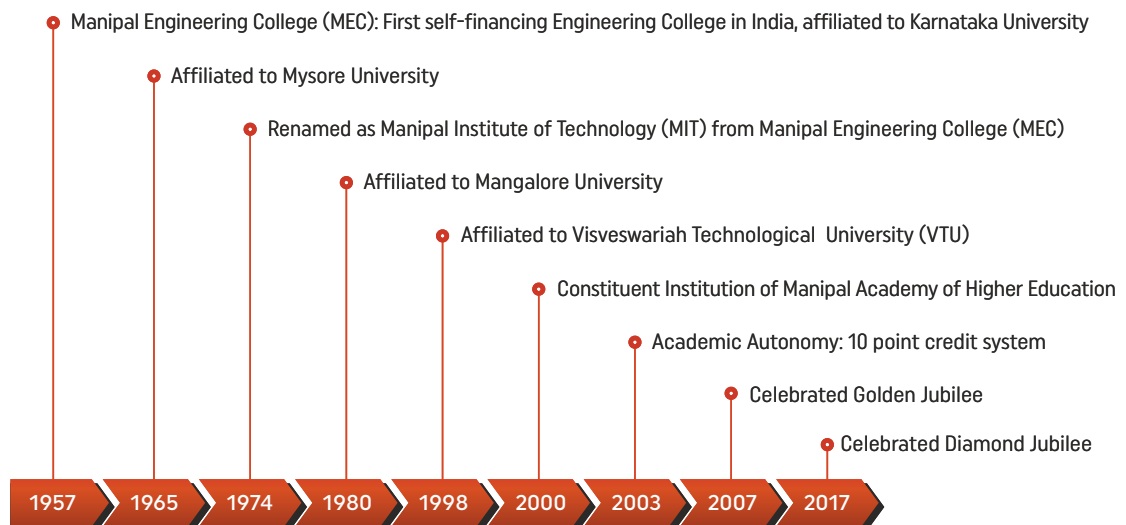*(A constituent unit of MAHE, Manipal)*

INFORMATION BROCHURE
2022

Campus of Experiential Learning

Manipal Institute of Technology

Manipal Institute of Technology (MIT), Manipal was established in the year 1957 as one of the first pioneering self-financing engineering colleges in the country. In the year 2000, it became a constituent institute of the Deemed University - Manipal Academy of Higher Education (MAHE). With a total student intake of about 2500 per year, and around 10,000 students, over 650 faculties, over 1000 support staff, over 30,000 alumni, the Institute provides the right ambience and platform for the students' all round development. It has the requisite student to teacher ratio. MIT has 18 undergraduate programs, 30 Masters Programs and Doctoral programs in all streams of Engineering and Science under 18 different departments. To promote innovation, incubation and entrepreneurship the Innovation Centre at MIT houses Manipal University Technology Business Incubator and Central Instrumentation Facility. The institute undertakes sponsored research programmes 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. The institute has an innovative flexible syllabus based programs that involve participation of all stakeholders like management, academia, students, alumni, industry to discuss updating of the course contents in a continual process. With state-of-the-art facilities and experienced faculty members, MIT is certainly one of the most preferred technical institutes in India.

MILESTONES

- Manipal Engineering College (MEC): First self-financing Engineering College in India, affiliated to Karnataka University
- Affiliated to Mysore University
- Renamed as Manipal Institute of Technology (MIT) from Manipal Engineering College (MEC)
- Affiliated to Mangalore University
- Affiliated to Visveswariah Technological University (VTU)
- Constituent Institution of Manipal Academy of Higher Education
- Academic Autonomy: 10 point credit system
- Celebrated Golden Jubilee
- Celebrated Diamond Jubilee

| 1957 | 1965 | 1974 | 1980 | 1998 | 2000 | 2003 | 2007 | 2017 |

Founder and Builder of Manipal

Padma Shri awardee Dr. T. M. A. Pai
30-04-1898 to 29-05-1979

Manipal is a place born out of one man's dream - Dr. Tonse Madhav Ananth Pai. It is a testimony to the fact that no matter how big a dream is, it can always turn into reality. The once barren hillock is now India's largest education township with more than 24 institutions of learning.

Manipal Academy of Higher Education is the result of the single-minded dedication of the founder Dr. T. M. A. Pai. It was his vision to see the bare hilltop of Manipal transformed into one of the premier centres of learning.

Manipal Academy of Higher Education was founded on one principle; one unshakeable belief - that it must make available the best of education to its students. The last six decades, have seen institutes at Manipal taking meticulous, small steps to build reservoirs of intellectual wealth and academic excellence.

In the process, Manipal Academy of Higher Education has created some of the country's best institutes across diverse streams like medicine, dentistry, engineering, pharmacy, hotel management and communication.

Each institution at Manipal Academy of Higher Education is geared to meet the ever changing demanding standards and to create professionals and citizens of values by inspiring them in multiple ways.

Leading the way...

Manipal Academy of Higher Education

Dr Ramdas M Pai
President and Chancellor

Dr H S Ballal
Pro Chancellor

Lt.Gen. (Dr.) M.D. Venkatesh
Vice Chancellor

Dr P L N G Rao
Pro Vice Chancellor
(Quality Assurance and
Faculty of Health Sciences)

Dr Venkatraya M Prabhu
Pro Vice Chancellor
(Health Sciences)

Dr C S Thammaiah
Pro Vice Chancellor
(Corporate Academia
Engagement)

Dr. Dilip G Naik
Pro Vice Chancellor

Dr Narayana Sabhahit
Registrar

Dr Vinod V Thomas
Registrar Evaluation

Administrators

Manipal Institute of Technology

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Director
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Dr Somashekara Bhat
Joint Director
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Content

Academics

Manipal Institute of Technology operates with 10 point relative grading system since 2003. The curriculum offers academic flexibility in terms of Program Electives which enables the student to get a Minor specialization within his/her domain. The Open Electives enable the student to get a flavor of other domains of his/her choice as well.

Curriculum Design and Development

- Curriculum design is aligned with institutional objectives – vision, mission statements and Outcome Based Education (OBE) guidelines of NBA

- Complete curriculum revision is done on periodic basis - once in four years

- Academic Audit has been initiated with academicians from premier institutions to get the feedback on curriculum structure, assessment, content and relevance

- "Curriculum Conclave" is conducted by inviting all stakeholders – academicians, industry partners, teachers, alumni and students

- Feedback from alumni is obtained on continuous basis to enrich the academic contents

- Involving industry officials as members of Board of Studies in the curriculum development to ensure the relevance of the content.

Curriculum Enrichment

- New academic programs are launched in emerging thrust areas

- Impact of the new curriculum is measured in terms of attainment parameters (as per NBA guidelines)

- Increased flexibility in terms of Program Electives, leading to Minor specialization, and Open Electives

- Audit Courses

- Formula / Data handbook for all courses

- Digital Paperless Examination

- Student mobility
  -Practice School
  -Semester abroad with credit transfer

- Access to value-added programs:
  - QEEE Direct to Student program and availability of NPTEL resources (IIT)
  - Online Courses through Coursera and other similar platforms

- Industry Initiated programs for students
  - Infosys, CISCO, EMC Corporation, Apple India supported programme electives
  - Cerner Healthcare, EMC Corporation, Intel and Apple India supported open electives
  - Honeywell and International Council on System Engineering supported minor specification in System Engineering
  - Bosch-Rexorth supported Laboratories
  - Shell support for research Laboratories and other academic facilities

- DRDO supported PG programme in Defense Technology

- Adjunct Faculty from Industry and Academia

- Alumni support in academics: MIT-KEF R & D Center

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Undergraduate PROGRAMS - B.Tech

> COMPUTER STREAM

- Computer Science & Engineering
- Computer Science & Engineering (AI&ML)
- Information Technology
- Computer & Communication Engineering
- Data Science & Engineering

> ELECTRICAL STREAM

- Electrical & Electronics Engineering
- Electronics & Communication Engineering
- Electronics and Instrumentation Engineering
- Mechatronics
- Biomedical Engineering
- Cyber Physical System

> MECHANICAL STREAM

- Mechanical Engineering
- Industrial Engineering
- Aeronautical Engineering
- Automobile Engineering

> BUILDING SCIENCE STREAM

- Civil Engineering

> CHEMICAL STREAM

- Chemical Engineering
- Biotechnology

Postgraduate PROGRAMS - M.Tech/MCA

> MECHANICAL STREAM

- Manufacturing Engineering
- Computer Aided Analysis and Design
- Thermal Sciences and Energy Systems
- Industrial Automation and Robotics
- Automobile Engineering
- Avionics
- Defence Technology
- Modeling and Simulation

> COMPUTER STREAM

- Computer Science & Engineering
- Computer Science & Information Security
- Computer Networking and Engineering
- Master of Computer Applications
- Machine Intelligence and Decision Sciences
- Data Science

> BUILDING SCIENCE STREAM

- Construction Engineering & Management
- Structural Engineering
- Environmental Engineering

> ELECTRICAL STREAM

- Electric Vehicle Technology
- Power Electronics & Drives
- Digital Electronics & Communication Engineering
- Microelectronics
- Embedded Control and Automation
- Internet of Things
- Biomedical Engineering
- Wireless and Mobile Communication

> CHEMICAL STREAM

- Industrial Biotechnology
- Chemical Engineering

> MANAGEMENT STREAM

- Engineering Management

Department of
Aeronautical and Automobile Engineering

The Department of Aeronautical and Automobile Engineering was established in 2008 with a vision 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 vision is realised through 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 Centres of Excellence program to research best practices in unified approach to teaching and learning.

The students will have abundant opportunities for working on projects and internships across the globe, taking advantage of established relationships with aerospace & automotive industries and research institutes. The students showcase their talent by developing several working models and presenting them in various prestigious national and international events. The students have won various awards at national and international level.

> Programs offered

Undergraduate Programs
- B.Tech in Aeronautical Engineering (2008)
- B.Tech in Automobile Engineering (2008)

Postgraduate Programs
- M.Tech in Automobile Engineering (2016)
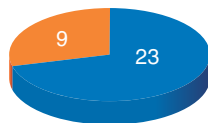- M.Tech in Avionics (2019)
- M.Tech in Defence Technology (2021)
- M.Tech in Modeling and Simulation (2022)

PhD

> Faculty Strength
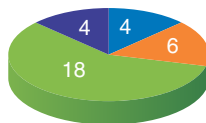
Qualification-wise
9
23
- PhD
- M.Tech/ME/M.Sc

Cadre-wise
4 4
18 6
- Professors
- Associate Professors
- Assistant Professors
- Adjunct Faculty

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Department of
Biomedical Engineering

Biomedical Engineering is a fascinating multidisciplinary field in which the principles of engineering are applied to solving problems in medicine, & gaining a deeper insight into life-sciences, towards providing an overall enhancement to health care. The Biomedical Engineering program was started at the MIT in 1989 with a P. G Program (M. Tech.), and subsequently a U.G. program (B. Tech.) was added in 1992. The proximity of the reputed Kasturba Medical College and Kasturba Hospital under the same umbrella of Manipal Academy of Higher Education offers a unique platform for training students in several fields, and renders the Biomedical Engineering program a very special one. Currently, the Department provides a variety of modern facilities to help the students acquire an in-depth technical knowledge in various topics in the field of Biomedical Engineering. The department encourages research activities in the students for which the physiological signal acquisition lab, Medical devices lab, Biomaterials & Tissue Engineering lab and Cell culture lab are set up for the purpose. Areas of interest of the Faculty at the department include: Medical Imaging, Image Processing, and Physiological Signal Processing, Biomedical Instrumentation, Medical Devices, Nanotechnology and Biomaterials. In summary, it has something to offer to everyone. Presently, the Headquarters of the Biomedical Engineering Society of India (BMESI) is at the Dept. of Biomedical Engineering.

> Programs offered

Undergraduate Program
• B.Tech in Biomedical Engineering (1992)
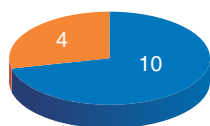
Postgraduate Program
• M.Tech in Biomedical Engineering (1989)
• M.Tech in Medical Informatics (2022)

PhD

> Faculty Strength

Qualification-wise
4
10
■ PhD
■ M.Tech

Cadre-wise
3
4
7
■ Professors
■ Associate Professors
■ Assistant Professors

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Department of
Biotechnology

The Department of Biotechnology launched B.Tech. program in Biotechnology, from the year 2005. The department also offers M.Tech in Industrial Biotechnology and full time PhD courses. The objective of the courses is to mold our students with all the technical skills needed for employment in the diverse areas of biotechnology, especially industry and research based careers. The curricula of the programs provide an equal weightage to the core principles of biological sciences, computational analysis and process engineering principles applied to biotechnology. Flexibility in the course curriculum is offered by means of providing minor specialization in the areas of environmental and pharmaceutical biotechnology. Being a multidisciplinary campus, the students have the advantage of conducting research in frontier areas of core life sciences, pharmaceutical sciences and medical biotechnology in the constituent institutions of MAHE.

Equipped with a total of thirteen laboratories, the department offers hands-on experience in most aspects of biotechnology. This course has been designed to provide the students with both theoretical knowledge and practical skills to keep pace with latest developments and to cater to the needs of industrial biotechnology sector. As regards the faculty composition, nearly 85% of our faculty members are doctorates and the rest are actively pursuing the same. The core competencies of our faculty lie in the fields of environmental biotechnology, bioinformatics, drug delivery, biopolymers, biofuels, animal and plant tissue culture.

> ### Programs offered

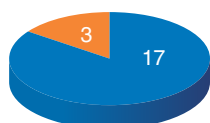**Undergraduate Program**
- B.Tech in Biotechnology (2005)

Postgraduate Program
- M.Tech in Industrial Biotechnology (2009)

> ### Faculty Strength

Qualification-wise

3
17

- PhD
- M.Tech/ME/M.Sc

Cadre-wise

3
11
6

- Professors
- Associate Professors
- Assistant Professors

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Department of
Chemical Engineering

Chemical Engineering explores the processing of materials and production or utilization of energy through chemical and/or biochemical routes. Chemical engineers design, innovate, research and troubleshoot processes and play a key role in the sectors of energy, agricultural chemicals, materials, pharmaceutics and biochemical processes, food and FMCG. Chemical engineers make use of their expertise in environmental remediation and find solutions to providing clean air, soil, water and sanitation. The scope of Chemical Engineering extends to design of greener products and processes.

The Department of Chemical Engineering was established in the year 1969 and celebrated its golden jubilee in 2019. The department has well equipped laboratories and research facility. It has qualified faculty with competencies in the following areas:

- Process Modeling and Simulation
- Fluid and Fluid-Solid Operations
- Drug Delivery Systems
- Environmental Pollution Control
- Catalysis and Nanotechnology
- Computational Fluid Dynamics
- Process Control
- Renewable Energy
- Advanced Materials

> Programs offered

Undergraduate Program
- B.Tech in Chemical Engineering (1969)

Postgraduate Program
- M.Tech in Chemical Engineering (2010)
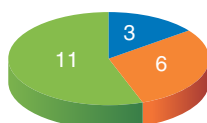
PhD

> Faculty Strength

Qualification-wise

4
18

- PhD
- M.Tech/ME

Cadre-wise

4
11
7

- Professors
- Associate Professors
- Assistant Professors

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Department of
Civil Engineering

Civil Engineering Department was established in the year 1957 with the inception of Manipal Institute of Technology. In the 64 years of its glorious existence, the Civil Engineering Department has evolved into one of the most matured and full-fledged departments in the institute.

The Undergraduate and Postgraduate program course curriculum have been designed aptly to cater to the ever expanding demands of research and industry, by continuously soliciting feedback from all stake holders. The department upholds excellent interaction with reputed academics in specialized areas, and also with industry professionals at national and international levels.

The department has created a platform for exchanging the research ideas by organizing conferences, workshops, seminars from time to time. The department ardently fosters the industry-academia collaborations by conducting invited lectures by eminent industry professionals. B.Tech (Civil Engg) program has consistently received accreditation by National Board of Accreditation in the year 2001 for a period of 5 years, and in the year 2008 for a period of 3 years and also in 2019 for a period of 3 years.

> Programs offered

Undergraduate Program
- B.Tech in Civil Engineering (1957)

Postgraduate Programs
- M.Tech in Construction Engineering and Management (1989)
- M.Tech in Structural Engineering (1992)
- M.Tech in Environmental Engineering (2010)
- MSc in Geology (2015)

PhD

> Faculty Strength

Qualification-wise

32 24

- ■ PhD
- ■ M.Tech/ME/M.Sc

Cadre-wise

37 10 9

- ■ Professors
- ■ Associate Professors
- ■ Assistant Professors

Aggregate Impact Test

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Department of
Data Science and Computer Applications

The department of Data Science and Computer Applications has been functioning as an independent department at MIT, located strategically in the Innovation Center of MIT. The department of Data Science and Computer Applications offers an undergraduate program, B.Tech in Data Science & Engineering. The emphasis is on core data science subjects along with the related computational mathematics, statistics, and computer science subjects. Students can also opt for a minor specialization in either business, finance or healthcare analytics. Besides this course, the department offers a 2-year Master of Computer Applications MTech course at the postgraduate level.

The department has a set of dedicated and experienced teachers with a doctoral degree in various topics of data science, image processing, security, and health informatics. The department has a vibrant research laboratory and several funded research projects. Numerous research scholars are currently working on a variety of topics such as machine learning, artificial intelligence, motion detection, video streaming, and medical image processing. The department houses the Center for Virtual Reality which focusses on the design and development of modules that can be used in medical education.

The department has formed a Curriculum committee consisting of IT industry experts and experienced faculty from various streams like computer science, mathematics, statistics, commerce, management, and health care. The committee is the right mix of industry and academia and will deliver the B.Tech course in Data Science & Engineering, over the next few years. The department offers open electives in topics like data analytics, virtual reality, databases for the B.Tech students. Adjunct faculty from the IT industry are currently teaching B.Tech electives on trending topics like enterprise data architecture and algorithmic trading.

The students of the department actively participate in international exchange programs like IAESTE and AIESEC. To ensure their holistic development of students, the department hosts student clubs such as the Open Source Technology Forum Club and a Socio-Technical Agri club called Lakshya. The department addresses the overall development of students through soft skill classes, workshops, and student fests.

> Programs offered

Undergraduate Program
• B Tech in Data Science and Engineering (2020)
Postgraduate Program
• Master of Computer Applications (1998)
• MTech in Data Science (2022)

PhD

> Faculty Strength
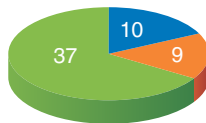
Qualification-wise

7 11

■ PhD
■ M.Tech/ME/MCA

Cadre-wise

2 2
14

■ Professors
■ Associate Professors
■ Assistant Professors

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Department of
Computer Science & Engineering

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 also 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 600 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.

> ## Programs offered

Undergraduate Programs
- B.Tech in Computer Science & Engineering (1985)
- B.Tech in Computer Science & Engineering [AI&ML] (2021)

Postgraduate Programs
- M.Tech in Computer Science and Engineering (1989)
- M.Tech in Computer Science and Information Security (2010)

PhD

> ## Faculty Strength

Qualification-wise

- PhD — 27
- M.Tech/ME — 37

Cadre-wise

- Professors — 9
- Associate Professors — 9
- Assistant Professors — 46

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Department of
Electronics & Communication Engineering

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 facilities such as MEMS design center for device simulation, fabrication and testing; ATMEL MCU Center; NOVOTON ARM Processor boards; development boards for embedded system; campus wide license for MathWorks tool; and CADENCE tool for VLSI design. To support co-curricular and extra-curricular activities, at the department level, we have IE, IEEE, ISTE student chapters.

In addition to regular teaching learning activity, faculty and student are involved in active research in the area of Image, Audio, and Speech Processing; Biomedical Instrumentation; Soft Computing Techniques; Source and Channel Coding; Cipher System; Sensor Networks; Plasmonics; Analog and Digital VLSI; Embedded Systems; MEMS and Nano technology, Carbon Nano Tubes, and Thin Film Technology. Student research and project work in these domains have resulted in Journal and Conference publications at National and International levels; and brought laurels at national and International level technical competitions. About 60 to 70 students from every passing out batch go abroad for their masters in reputed universities.

> Programs offered

Undergraduate Program
- B.Tech in Electronics and Communication Engineering (1972)

Postgraduate Programs
- M.Tech in Digital Electronics & Communication Engineering (1999)
- M.Tech in Microelectronics (2008)
- M.Tech in Wireless and Mobile Communications (2022)

PhD

> Faculty Strength

Qualification-wise
1
21
34

- PhD
- M.Tech/ME
- B.Tech/BE

Cadre-wise
8
31
17

- Professors
- Associate Professors
- Assistant Professors

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Department of
Electrical & Electronics Engineering

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 Power Systems, Power Electronics, Signal Processing, Illumination Technology, Renewable Energy, Electric Vehicle Technology, Artificial Intelligence, Data Analytics, etc.

The undergraduate program of the department offers a unique blend of core and elective courses. The laboratory exercises and mini projects are carefully designed to ensure synchronism with the curriculum, and exposure to relevant Software & Hardware packages related to the field of learning. The curriculum design enables the graduates to embark on a professional career or pursue higher studies in their area of interest.

The department also offers two post – graduate programs; M.Tech in Electric Vehicle Technology and M.Tech in Power Electronics & Drives. The department has well equipped and state of the art laboratories, such as Power & Energy Systems Lab (sponsored by Schneider Electric), Power Electronics Lab, Solid State Drives Lab, Lighting Lab. Research and Consultancy takes place in core competency area of the department such as Power Systems, Engergy Systems, Power Electronics, Renewable Energy, Control Systems, Lighting.

> Programs offered

Undergraduate Program
- B.Tech in Electrical & Electronics Engineering (1960)

Postgraduate Programs
- M.Tech in Power Electronics & Drives (2008)
- M.Tech in Electric Vehicle Technology (2022)

PhD

> Faculty Strength

Qualification-wise

30 24

- PhD
- M.Tech

Cadre-wise

7 9 38

- Professors
- Associate Professors
- Assistant Professors

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Department of
Instrumentation & Control Engineering

Department of Instrumentation and Control Engineering was established in the year 2001, offering B.Tech program in Instrumentation and Control Engineering. Since 2018, B.Tech program offered by the Department has been changed to Electronics and Instrumentation Engineering. The UG program offers courses in Electronics, Control Theory and Instrumentation providing specialization like Embedded Systems, Automation and Sensor Technology. The department has state-of-the art laboratories on Instrumentation, Process Control, Micro-controllers, Industrial Automation, Control Systems Simulation and Design along with requisite software like MATLab, LABView etc. All the programs offered by the department are AICTE approved.

The Department has expertise available in the field of Sensors, Robust Control, Neural Network and Fuzzy Logic, Bio-medical Instrumentation, Digital Signal Processing, Image Processing, Adaptive Control, Computer Vision, AI, MEMS, Electronic Instrumentation, Embedded Systems, Hybrid Systems, Automation etc. The Department is involved in numerous active research works in the aforementioned emerging fields. The department also organizes various research workshops and conferences. Control Instrumentation System Conference (CISCON) is an annual event organized under the auspices of Instrumentation and Control Engineering Department.

> Programs offered

Undergraduate Program
- B.Tech in Electronics & Instrumentation Engineering (2018)
- B.Tech in Cyber Physical Systems (2022)

Postgraduate Programs
- M.Tech in Embedded Control and Automation (2022)
- M.Tech in Internet of Things (2022)

PhD
in Allied disciplines

> Faculty Strength

Qualification-wise

12 16

- PhD
- M.Tech/ME

Cadre-wise

4 6 18

- Professors
- Associate Professors
- Assistant Professors

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Department of
Information & Communication Technology

Established in the year 2001, the Department has developed itself as a center of excellence, providing opportunities for innovation and research, with well-equipped computer laboratories and dedicated faculty.

The students and faculty are given freedom to organize workshops or seminars and are encouraged to take part in co-curricular and extra-curricular activities without compromising the quality of learning. The academic curriculum for the courses offered in the Department and the technical skills of the students have been appreciated by the industries who have visited MIT. Our alumni are working as software professionals in top industries like Google, Microsoft, Oracle, Cisco, IBM, Intel, Samsung R&D, Honeywell, Flipkart, Toshiba, KPIT Cummins, Deloitte etc., and such higher job offers per student testify the quality and excellence of the Department.

> Programs offered

Undergraduate Programs
- B.Tech in Information Technology (2000)
- B.Tech in Computer and Communication Engineering (2013)

Postgraduate Programs
- M.Tech in Computer Networking and Engineering (2005)
- M.Tech in Software Engineering
- M.Tech in Machine Intelligence and Decision Science (2022)

PhD

> Faculty Strength

Qualification-wise
26
23

- PhD
- M.Tech/ME

Cadre-wise
7
8
34

- Professors
- Associate Professors
- Assistant Professors

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Department of
Mechanical & Industrial Engineering

The Department of Mechanical and Industrial Engineering, established in the year 1960, offers two Undergraduate courses, four Postgraduate courses and also PhD programmes. The department is also recognized as a QIP center for Postgraduate courses and PhD. The department consists of experienced faculty members, who are also constantly engaged in undertaking research work and subsequent publications. The department conducts workshops, seminars or conferences every year. The department has very good industry – institute interaction and has conducted several short courses for working professionals from industry. The department provides adequate laboratory facilities and hands-on training to the undergraduate students both in the conventional subject as also in the modern trends.

The department has well established Computer Aided Design laboratory with state-of-the-art hardware and software. The basic laboratories such as Heat engines laboratory, Metrology laboratory, Heat transfer laboratory, Fuel testing laboratory, Machine tools laboratory, Material science laboratory, Vibration laboratory, Industrial engineering laboratory, Tribology laboratory and Energy laboratory have advanced equipments so as to impart quality education. The department has sprawling workshop situated on a 30000 sqft area comprising of machine shop, CNC shop, foundry, smithy, sheet metal, plumbing and welding sections. The practice school and internship opportunities provide an excellent industry exposure for students.

> ## Programs offered

Undergraduate Programs
- B.Tech in Mechanical Engineering (1960)
- B.Tech in Industrial Engineering (1975)

Postgraduate Programs
- M.Tech in Computer Aided Analysis and Design (2003)
- M.Tech in Manufacturing Engineering (2005)
- M.Tech in Thermal Sciences and Energy Systems (2013)

PhD

> ## Faculty Strength

Qualification-wise

31 | 53

- PhD
- M.Tech/ME

Cadre-wise

11 | 23 | 50

- Professors
- Associate Professors
- Assistant Professors

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Department of
Mechatronics

Mechatronics is a multidisciplinary domain lying at the intersection of Electronics, Mechanical, Electrical, and Computer Science Engineering. The necessity of automation in all walks of life (manufacturing, healthcare, space, military, civil work, agriculture, etc.) combined with artificial intelligence and data science demands skilled graduates in Mechatronics. The fundamental objective of the department is to enable students with the potential to address future challenges by laying a strong foundation of multidisciplinary knowledge in their intellect. The mechatronics department aims to provide education through a continuously evolving curriculum focusing on traditional teaching with a research approach, developing practical skills using modern software tools, and the latest hardware equipment with global connectivity features.

The department is well-equipped with laboratories set up in collaboration with industries which includes Industrial Hydraulics and Pneumatics Lab, Programmable Control Logic Lab, Drives and Control Lab, Sensorics Lab by Bosch Rexroth, Robotics Lab by ABB Bengaluru; Industrial Internet of Things lab by Beckhoff Automation India Pvt Ltd and Texas Instruments under the University program initiative and the Collaborative Robot (COBOT) by Universal Robots Pvt Ltd.

The necessity of seamless integration of different disciplines is effectively handled by the multidisciplinary team of young, dynamic, and well-motivated faculty specialized in areas like Robotics, Control Systems, Kinematics and Dynamics, Electric Drives, Machine Learning, Artificial Intelligence, Manufacturing, Data Science, Software applications, Computer Vision, Embedded Systems, etc.

The Maker's Space has been set-up in the Innovation Centre to promote an experiential learning for students and research scholars to work with their idea in the field of Mechatronics. MAHE-JanyuTech Centre for Robotics has been set up in the department for training and research among UG, PG students and research scholars. The department focuses on the areas of Mobile and Aerial Robotics, Robotic Vision, and Multi Robotic Systems as a part of the research. The department grew from strength to strength in a very short period, and hence the achievements of faculty and students resulted in the accreditation of the Mechatronics Program for six years starting in 2019, which is a feather on the cap of the department.

> Programs offered

Undergraduate Program
- B.Tech in Mechatronics (2006)

Postgraduate Program
- M.Tech in Industrial Automation & Robotics (2015)

PhD

> Faculty Strength

Qualification-wise

1
16
18

- PhD
- Pursuing PhD
- M.Tech

Cadre-wise

2 3
30

- Professors
- Associate Professors
- Assistant Professors

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Department of
Media Technology

Global communication sector has propelled us into the new millennium with engineering innovations and newer technologies. Electronic Publishing, Audio Visuals, Multimedia, Digital Data Transfer and Social Media are creating a new world of media market. Print media industry sees itself as media service and information processor.

Since 1992, Department has built a strong edifice to become one of the leading Print and Electronic Media Institute of the country and has one of the best infrastructures available for Print and Electronic Media Technology. Newly setup Studio Facility in the Department and Social Media Platforms have given abundant opportunities to excel with their creativity. Students have added advantage of getting hands on training & exposure on state of the art equipment in Manipal Technologies Limited, Manipal one of the leading Print and Media Organizations in the world.

> Faculty Strength

Qualification-wise

- PhD
- M.Tech/ME/MVA

Cadre-wise

- Professors
- Assistant Professors

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Department of
Physics

The Department offers a compulsory course on Engineering Physics and Engg. Physics Lab (PHY1051/PHY1061) to all branches of first year B.Tech and also offers open electives to students of B.Tech. The department offers P.G. program in physics leading to M.Sc. physics in five specializations viz. Condensed Matter Physics, Optoelectronics, Nuclear Physics, Electronics and Theoretical Physics. The Department offers Ph.D program in physics in different areas like radiation and nuclear physics, nanomaterials, glasses and polymeric materials, thermoelectric materials, thin film based devices, solar cells, spectroscopy, non-linear optics and high energy physics.

The department has received several externally funded projects from Government of India and State Government (Rs. 485 lakhs). Currently about 60 Research Scholars are pursuing their PhD in Physics. Department has published more than 290 scopus indexed research papers in the last 5 years. The department laboratories are equipped with sophisticated instruments like vacuum coating unit (PVD and sputtering), SILAR, spin and dip coating units, spray pyrolysis coating, crystal growth unit, optical closed cycle variable temperature cryogenic system, He: Ne laser, Z - Scan System, XRD, UV-visible NIR spectrophotometer, spectrofluorometer, Keithley source/multimeters, particle detectors and thickness profilometer.

> Programs offered

Postgraduate Program
- M.Sc in Physics

PhD

> Faculty Strength

Qualification-wise

20

- PhD

Cadre-wise

4

10

6

- Professors
- Associate Professors
- Assistant Professors

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Department of
Chemistry

Chemistry department started its functioning since the inception of MIT. The department has made significant contribution in education and research in all areas of chemistry and allied branches. It offers M.Sc. and PhD programs in major areas of chemistry. Dept. offers engineering chemistry for undergraduate students of engineering. Students are provided with comprehensive practical and theoretical exposure of the subject. Research in the areas such as Synthetic Chemistry, Medicinal Chemistry, Green Chemistry, Corrosion control, Polymers, Super capacitors, Natural Products, Liquid crystals, Pervoskite based solar cells and Green hydrogen are being pursued. The faculty members have published large no. of research articles in Scopus indexed journals.

> **Programs offered**

Postgraduate Program
- M.Sc in Chemistry (since 2009)

PhD

> **Faculty Strength**

Qualification-wise

1
20

- PhD
- MPhil/M.Sc

Cadre-wise

3
6
11
1

- Professors
- Associate Professors
- Associate Professor-Research
- Assistant Professors

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Department of
Mathematics

The Department of Mathematics at Manipal Institute of Technology was initiated in the year 1957 with a mere strength of three faculty members. Currently the department has grown and developed into a status of eminence both in terms of number and quality of its academic output. The department has a long tradition of excellent teaching and supporting environment for students and it is a resourceful academic department among others at MIT, with highly qualified, experienced and motivated faculty members who are committed for the advancement in every field of Mathematics. The department has 45 faculty members with 7 Professors, 17 Associate Professors and 21 Assistant Professors of which 41 members have Ph.D. Research strength of the department includes Numerical Methods, Graph Theory, Fluid Dynamics, Algebra, Topology, Number Theory, Functional Analysis, Fuzzy logic and Complex Analysis. Further, a substantial number of faculty members are pursuing their Ph.D. degree. A few faculty members have also obtained Post-Doctoral fellowship in specialized areas of Mathematics.

Faculty of the Department teach Mathematics to UG/PG students of all constituent institutions of Manipal Academy of Higher Education. The department has started a M.Sc. programme in Applied Mathematics and Computing in the year 2009 and is going to start an integrated M.Sc program in Mathematics and Computing in the year 2022. The curriculum designed by the department provides a sound grounding in underlying mathematical theory, emphasizes a variety of useful mathematical techniques, and helps students to develop proficiency in using computers and computational methods.

> Programs offered

Postgraduate Program
- M.Sc in Applied Mathematics and Computing (2009)

PhD

> Faculty Strength

Qualification-wise

4

41

- PhD
- M.Sc

Cadre-wise

7

17

21

- Professors
- Associate Professors
- Assistant Professors

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Department of
Humanities & Management

The Department of Humanities & Management, MIT was established in May 2009. The department has two disciplines: Management and English. The department has expertise in System Dynamics Modeling and Simulation, Organizational Behavior, Econometrics and Marketing, Research Methodology, Linguistics, English Literature, German Language, Cultural Studies, and English Communication.

The modules delivered at the undergraduate and post-graduate courses aim at making the engineering students develop an awareness of social, cultural, economic, ethical and human values. The department offers minor programs in Business Management, Entrepreneurship, Fintech Services, People Management, Finance & Investments, Modern Literature and Professional Communication. It also offers wide variety of open electives in Management and Humanities. The Department of Humanities & Management plays a distinctive role in moulding the careers of engineers, as it provides an opportunity for students to learn managerial skills, communication skills and group dynamics so as to make them fit into the multi-cultural environment of the industry.

> Programs offered

Postgraduate Program
- M.Tech in Engineering Management (1989)

PhD

> Faculty Strength

Qualification-wise

10, 17

- PhD
- M.Tech/ME/M.Sc

Cadre-wise

4, 6, 17

- Professors
- Associate Professors
- Assistant Professors

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Office of Industry Liaison, Placements & Practice School (IL,P&PS)

Manipal Institute of Technology (MIT) Manipal has always been very proactive in placing the students into their preference profiles. The institute has a well-organised placement team headed by the associate director, three assistant directors, and faculty and student coordinators from each department. 300+ recruiting teams, including 50+ Fortune 500companies, visit MIT Manipal for UG and PG campus placements and internships recruitment every year.

> B.Tech. Placements and Internships Statistics

Total Offers and Placements

* Ongoing process
** Possible convertible internships

No. of offers No. of Placed

> Recruiting Team Visits

MCA   MTech   BTech   TOTAL

* Ongoing process   ** Anticipated

> Global Fortune 500 Vs Total Companies

Global Fortune 500   Total Companies

* Ongoing process   ** Anticipated

> Core Offers vs. ITES Offers

Core   ITES   Total Offers

* Ongoing process

> CTC in LPA

Maximum   Average

* Ongoing process

Campus Placements
2021-2022

Company Name	Type	CV	BT	CH	CS	CC	IT	BM	EC	EE	IC	AE	AU	IP	ME	MT	PMT	Total
A Treds Ltd	P				1													1
Accenture	P						1		1									2
Accolite Digital	P+I					1			3	1								5
AcmeGrade	P+I	3	1	1		1			2	2	2						1	13
Adani Group	P														1			1
Aditya Birla Capital	P				1				1									2
Aditya Birla Group	P										2							2
Adobe PPO	P										1							1
Age Graphics	P+I																1	1
Amadeus Labs	P+I				1	2				1	1							5
Amazon	P+I				1	1												2
Ather Energy	P+I								2									2
Atkins Global PPO	P									2								2
Axxela	P					1			1									2
Bain Consulting	P	1																1
Bajaj Finserv	P				8	7	3		2	5						1		26
Bank of America	P				10	6												16
Baxter	P+I				2			3	2	1					2			10
Beghou Consulting	P+I		1							2					1			4
Bosch Global Software	P								1	1	1							3
Boston Consulting	P							1							1	1		3
Brillio	P				1				1									2
Byjus	P								1	1					1			3
Capgemini (ITES)	P		1	1	1	2	1		7	7	4		2	1	3			30
Capgemini Core	P+I								2	1								3
Carl Zeiss	P				1		1											2
Carl Zeiss	P							4	1		3							8
Cashfree Payments	P+I								1		1							2
Cerner	P+I				2		1											3
ChargeBee	P					1	2			1								4
CIBC	P													1				1
Cisco Systems	P+I				5	1	1											7
Citrix R&D	P+I				3													3
Cloudera	P+I				1	1	2											4
Cloudwick	P+I				1													1
Cognizant (ITES)	P+I	11	2	3	4	3		2	20	11	7	4	3	8	30	1		109
Cognizant GenC Next	P+I									1								1

Company Name	Type	CV	BT	CH	CS	CC	IT	BM	EC	EE	IC	AE	AU	IP	ME	MT	PMT	Total
Cogoport	P+I								1									1
Cohesity	P+I				1		1											2
Collins Aerospace	P+I				1													1
Colorjet Group	P																1	1
Commvault	P+I				2	2												4
Commvault(I2P)	I2P				1	1												2
Consilio	P				1						1							2
Crompton Greaves	P									1					2			3
Danaher	P				1													1
Danske IT	P+I					1												1
DBOI PPO	P				5	1	1											7
Dell Technologies	P+I				1					1	1							3
Deloitte (USI Consulting)	P+I	4		4	7	9	1		22	12	10				11			80
Deloitte (USI RFA)	P+I				2	1	2		4	4	2	1	2		2			20
Deloitte India	P+I		1		2	6	2	2	8	7	3				1	3		35
Deutsche India Pvt Ltd (DBOI)	P				4	1												5
Eco Lab	P					2			1	1								4
Enquero Global	P+I				2	2				3	1							8
Ericsson	P+I				4	1	1											6
Ericsson Global	P+I								2									2
Ernst & Young	P						2											2
Exicom Telesystems	P									1								1
EXL Services	P					1			1	2								4
Falabella	P+I								4	2								6
Fastenal	P+I				4	2			3									9
FIAT India	P									1	1							2
Fidelity Investment PPO	P+I				5	2	3											10
Forbes Marshall	P															2		2
Fractal Analytics PPO	P														1			1
Ganit Business	P+I		2	1					1	1		2				2		9
GenY Medium	P+I														2			2
Goldman Sachs	P+I					1	2		1									4
Goldman Sachs PPO	P+I				6	2	1		1									10
HashedIn	P+I					1												1
HCL Technologies	P					1									2			3
Hevodata	P+I				2	1												3
Honeywell(I2P)	I2P				3	1	4											8
HPE	P+I				2	3			2	1								8
HPE Green Lake	P				1	2												3
IBM	P+I				1	1			1	1	1							5

Company Name	Type	UG (B.Tech.) Branches																
		CV	BT	CH	CS	CC	IT	BM	EC	EE	IC	AE	AU	IP	ME	MT	PMT	Total
ICICI Bank	P	3									1		4			3		11
ICICI Lombard	P+I				2				1									3
ICICI Lombard	P									1								1
ICICI Securities	P				1	1	1		1	1	1				1			7
Impact Analytics	P+I			1					1									2
Infosys PPO	P				1		1											2
ITC Ltd	P														3			3
JLL	P+I						1		1	2								4
JP Morgan PPO	P+I				2	1	1											4
JSW	P	1		2											1			4
Juniper Networks	P+I				1	3	1											5
Kantar Analytics	P	1								1	1					1		4
Kantar Analytics	P			1							1							2
Komprise	P+I				1	2												3
KPMG	P+I	4		5	2	5	1	4	11	7	9	1	1	10	14	12		86
KPMG Global Services	P								3									3
L&T ECC	P	4													1			5
L&T Technology Services	P														1			1
LeadSquared	P+I	3							1				1		2			7
LimeChat	P+I			1									1		1			3
Maruti Suzuki	P														6			6
MBRDI	P+I				1				4									5
McKinsey	P+I				2		3		3									8
Microsoft	P+I				11	4	4		2									21
Microsoft PPO	P+I				11	2	1											14
Mindtree	P												2	1	1			4
More Retail	P				1													1
Mphasis	P				1	2	1		2	3	3							12
MU Sigma (ITES)	P											1			1	1		3
Natwest	P					1			5									6
NCR Corporation	P				1	1										1		3
Ninjacart	P+I															1		1
Optum	P				3	4	2		3	2								14
Optum PPO	P				1	1	1											3
Oracle	P+I				5	5	3		2									15
Oracle GBU	P				1													1
Oyo Rooms	P+I				2				3									5
Precise PrintPack	P																1	1
PWC	P+I					1			1									2
RedSeer Consulting	P			1							1		1					3

Company Name	Type	CV	BT	CH	CS	CC	IT	BM	EC	EE	IC	AE	AU	IP	ME	MT	PM	Total
Reliance Industries	P			6							2				9			17
Rippling	P												1					1
Royal Enfield	P												2					2
Sabre Travels	P+I					1	1		1									3
Samsung Noida	P+I				1	1												2
SAP Labs	P+I				1	2	1											4
SAP Labs PPO	P+I				3		1											4
Schneider Electric	P+I									1								1
Schneider Electric Digital	P+I				2		1		4		1							8
Schneider Electric PPO	P+I				1				1	2								4
Schneider Electric R&D	P+I					1									1			2
Searce	P+I								1		4				2			7
Siemens Healthineers	P+I				2				1	3								6
Standard Chartered PPO	P					1												1
Steel Strips	P														1			1
Suez Water PPO	P	1																1
Tata Electronics	P			2														2
Tata Technologies	P								1	1			3		4			9
TCS Digital	P					1	2				1					2		6
TCS Ninja	P				1		1	1		2	5		1	1	1			13
TE Connectivity	P+I								1									1
TE Connectivity	P															1		1
Tejas Networks	P+I				4	2	7											13
Texas Instruments	P+I				1													1
The Math Company	P+I	1								1			1		2			5
The Smart Cube	P								1	1				1	1			4
Total Environment	P	3								1								4
Tredence Analytics	P	1	2	1							1				1			6
UBS Business Solutions	P+I				1	2	5											8
UBS Business Solutions PPO	P+I				1	1	1											3
Ugam Solutions	P+I	5	3	3	2	2	3	1	6	1	7	2	3	1	6	4		49
Ugam Solutions PPO	P+I				2	1	1											4
UIDAI	P								1									1
Unilever	P					1												1
Valtech	P					1												1
Verizon	P+I					1												1
Visteon Corporation	P+I						1			2	1							4
VM Ware	P+I				4		1											5
WellsFargo	P+I				6	2	2		3									13
Western Digital	P+I				3				3									6

Company Name	Type	UG (B.Tech.) Branches																
		CV	BT	CH	CS	CC	IT	BM	EC	EE	IC	AE	AU	IP	ME	MT	PMT	Total
Wipro	P	4			4	3	2		6	10	7			1	3	1		41
Zee Entrtainment	P				1	1												2
Zensar Technologies	P										1							1
ZS Associates	P+I			1			1		3	1	1			1	1	1		10
Total Placement & Internship Offers		50	13	34	189	112	103	18	177	119	89	11	28	26	124	38	4	1135
Total Students Placed		47	10	31	183	108	98	16	153	102	73	11	24	20	103	37	4	1020

Note: P+I – Placement + Internship Offer, P – Placement Offer, I – Internship Offer, I2P – Internship converted to Placement, PPO – Summer Internship converted to Pre-Placement Offer

Diversified Career Profiles

- Manufacturing Operations Engineer, Project Engineer, Business Development Engineer, Web Development
- Member Technical Staff
- C++/VC++, linux
- Management Trainee
- Associate Software Engineer / Full Stack Engineer
- Software Developer
- Graduate Engineer Trainees
- Software Engineer, QA Engineer
- Area Manager, Operations Manager, Program Manager, Business Analyst
- Software Development Engineer
- Software Development, Support, Testing
- Data Scientist / Software Developer
- Trainee Analyst
- Analyst Trainee
- Engineering Graduate
- Java, Spring Boot, Mongo DB, Node Js, JavaScript, CSS3, BootStrap, React/ Angular, React Native
- Business Development Associate
- Business Analyst
- Associate Editor
- Analyst / Senior Analyst
- AI / ML / Data Science / Front End / Back End development in open source tech preferably MEAN stack.
- Software Engineer, Business Analyst, Network Engineer
- Business Development
- Site Reliability Engineer
- Research Intern
- Very Good Communication Skills & Knowledge in Dassault products like CATIA, DELMIA, SIMULIA Etc
- Analyst, Business Intelligence
- GDAS, PSLM, Consulting, Risk & Financial Advisory
- Data Science Interns
- Associate Professional/ Service Delivery Consultant
- CAE Project Engineer
- Non Data Science / Data Science
- Graduate Engineer Trainees - R&D Profile
- Graduate Engineer Trainees
- Associate Software Developer or Associate Quality Engineer
- Data Engineer Trainee
- Imgineer (Campus Program)
- Graphic Design Intern
- Developer, Software Engineer
- Operations Analyst
- Services Role
- Full Stack Development
- Statistical Programming Intern
- Software Development

- Intern Engineer/ Mobile App Development/Web Development
- R&D Engineer
- Associate Developer
- Engineering, Quality Assurance
- Developer - Cloud Technologies/Machine Learning
- Data Scientist
- Software Development, Automation Testing, Devops Support- Java/J2ee, Devops, Cloud, Bigdata, Technical Support
- Engineering Trainee
- Software Developer, Analyst
- Software Developer, Software Test Engineer
- Programming & Testing
- GRC / RC ITA
- Electrical Engineering Graduates
- Product Support, Operations, Product Management and Analytics
- Operations, Product Management and Analytics
- Intern
- Junior Data Engineer
- Graduate Engineer Trainees - IT Department
- Developer
- Software Develper, Business Development
- Analyst, Tech
- Trainee Decision Scientist
- Operations Executive
- Business Development Manager
- Software Development, Technical Sales & Support
- java / Python / Go, DA & Algo, Cloud environment
- Associate - NBS-IT
- Mobile Developer, Front End Developer, SDET
- Systems Reliability Engineer
- Design Develop / Software Developer
- Supply Chain, Manufacturing & Procurement
- Business Development, Sales, Marketing, Consumer Awareness
- Project Trainee
- Dev OPS Engineer

- Associate Software Development Engineer
- Specialists, Associates and Interns
- Business Analyst, Data Engineer, Machine Learning Engineer, Software Developer, Platform Engineer
- Trainee Engineer
- Management Team
- Associate Software Developer / Business Analyst / QA Engineer / Product Specialist / Product Analyst
- Research & Development Team
- Senior Engineer - Software
- Software Engineer Trainee, Cloud Consultant Trainee, Cloud Engineer Trainee, Cloud Solutions Engineer- Trainee
- Software Development, Product Support & Product Implementation
- Computer Vision Engineer, Market Research Analyst
- Business Associate, Technology Associate
- Full Stack, ML/NLP, Vision
- Production Department
- Analyst, Developer
- Manufacturing/Plant Operations/ Sales
- Lead Engineer Trainee
- Full Stack Developer, DevOps Engineers, Data Scientists, Product Engineers, Systems Research Engineers
- Engineer R&D (Hardware & Software)
- Software Engineer, Embedded Systems Engineer
- Technical Marketing, Graphic Designing
- Graduate Engineers Apprentice Scheme
- Admissions Counselor - FOS
- Software Developers, Business Analyst, Business Development Executive
- Dev/QE/Dev OPS
- Business Development Associate, Software Development Associate, Product Engineer
- Project Engineer
- Digital Marketing Analyst
- Decision Analytics Associate; Business Analytics Associate; Technology Analytics Associate

> Practice School

The concept of Practice School is one of the unique features of the curriculum at Manipal Institute of Technology, Manipal. It provides the students with an opportunity to spend quality time in the industry during their last semester of B. Tech. Programme. Students spend 4 - 6 months in their eighth semester in an industry to gain valuable ground exposure by being part of teams handling live and challenging projects. It enables them to work in the area of mutual interest, improve self-confidence and develop core competence.
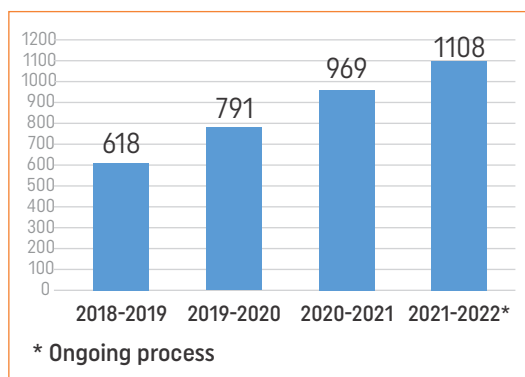
Further, the students are encouraged to do summer internships during the summer or winter breaks of the second and third year, which help them plan the Practice School project in an organisation during the final semester. In addition to this, industries offer in-semester projects to the students. During the programme, these projects help the students be abreast of the latest developments and tools used in the industrial field. All these initiatives help the students in preparing for the final year Practice School project of their choice.

The final semester of Practice School exposure provides the students with a platform to work in a competitive environment and deal with real-time problems. This experience enables students to develop their competence in problem-solving skills and demonstrate the knowledge of professional and ethical responsibilities.

They get to adapt to the industry environment better and faster. It also ensures that they are productive from day one of their professional working careers. This concept is encouraged and appreciated by most industries, as it is a win-win situation for the industry and the institute. Industries of repute have been recruiting our students for internship in increasing numbers over the years. Most of the students translate their convertible-internship opportunities into full-time employment (FTE) offer. The students are encouraged to do summer internships during the summer or winter breaks of the second and third year, which help them plan the Practice School project in an organisation during the final semester. In addition to this, industries offer in-semester projects to the students. During the programme, these projects help the students be abreast of the latest developments and tools used in the industrial field. All these initiatives help the students in preparing for the final year Practice School project of their choice.

Following is data of Practice school internships of B Tech students.

> B.Tech. Practice School Internships
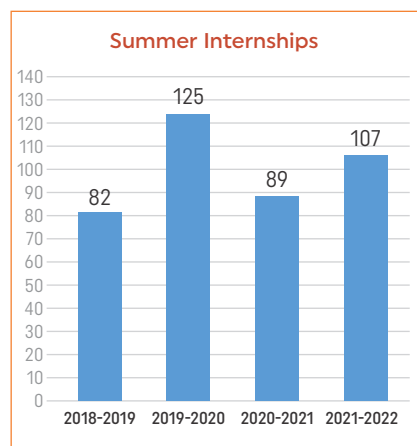

* Ongoing process

> Summer Internships

The students are encouraged to do summer internships during the summer or winter breaks of the second and third year, which help them plan the Practice School project in an organisation during the final semester. In addition to this, industries offer in-semester projects to the students. During the programme, these projects help the students be abreast of the latest developments and tools used in the industrial field. All these initiatives help the students in preparing for the final year Practice School project of their choice.

Company Name	CS	CC	EC	EE	IT	ME	Total
Adobe Customer Experience Intern	1						1
Adobe Technical Consultant Intern	2	1					3
Akamai Technologies	2						2
American Express	1	1	1	1			4
DBOI	1				2		3
Dell Technologies	1				1		2
Deloitte	9	1			4		14
Fidelity	3				3		6
Goldman Sachs	4	2					6
JP Morgan	1				3		4
Microsoft	10	3	2	1	4		20
Persistence One					1		1
Salesforce	2	1					3
SAP Labs	1	3			1		5
Schlumberger		1					1
Schneider Electric			4			2	6
Ugam Solutions	5	3			4		12
Unilever	1	1	1				3
Wellsfargo	10	1					11
Total	54	18	8	2	23	2	107

Summer Internships

Year	Count
2018-2019	82
2019-2020	125
2020-2021	89
2021-2022	107

* Ongoing process

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Student Testimonials

Serving as the President of MIT Student Council has been one of the greatest learning experiences I have had so far. In the 4 year stint at MIT, you begin to inspire a style of life which is not just self-satisfying but is unique to this beautiful University town. Studying here turns one into a well-rounded person as learning is beyond the four walls of classroom. The MIT culture helped me find new dimensions and realize my full potential. These four years would definitely be one the best times of my life.

Darshan Nandekar
Trainee Decision Scientist
Mu Sigma Inc.
Chemical Engineering, MIT - Batch 2014-18

Diverse students, plethora of technical and cultural events, great infrastructure, a beautiful campus and an awesome administration, MIT has it all. Joining MIT was the best decision of my life. MIT has surely played an important role in transforming me into a much more sorted and a confident human being. The college has always provided us with the best that can be expected in every sphere.

Being a part of the Student Council for two consecutive years and serving as the President for one year was definitely the best part of my college life. The change it brought in me is just amazing and can't be put into mere words. It made me a lot more responsible, optimistic and overall helped in developing a better me. I can never stop thanking my parents for sending me to Manipal and giving me the best four years of my life.

Aakar Jain
Business Technology Analyst
Deloitte
Electrical Engineering, MIT - Batch 2013-17

The best 4 years of my life were spent at Manipal. The focus on the holistic development of students alongside academic excellence is something MIT is known for. Enriched with diverse student-managed clubs spanning across technology, robotics, entrepreneurship, sports, performing arts, literature, etc., Manipal not only gives you the right platform to showcase your talent but also gives you the confidence to experiment and identify your passion.

Being a part of the student council was an amazing experience for me. At an early age, it helped me hone my personality and learn essential life skills. The support and the guidance from the administration and faculty members was commendable. Stepping into our first jobs, the corporate culture can get overwhelming at times due to the spike in the responsibilities entrusted upon us. My student council experience at MIT helped me transition easily into the corporate world as I was fortunate to have been in similar situations during my tenure. That is the level of professionalism and self-confidence that MIT builds in you if you leverage the plethora of opportunities it has in store for you.

As they rightly say, you can take anMITian out of Manipal but not Manipal out of an MITIian. This small town in Udupi has etched a very special mark on all our lives :)

Althaf Ibrahim Para
Program Manager, Amazon India Operations
President, MIT Student Council 2018-19
Vice President, MIT Student Council 2017-18

Student Testimonials

Nothing can express the wave of emotion washed over me when I found out I was selected in the Manipal Institute of Technology to pursue B.Tech in the field of Mechanical Engineering. Here at Manipal, amidst state-of-the-art infrastructure accompanied by highly intellectual, experienced and supportive faculties, I have witnessed my skill and competence rising to a zenith. The learner centric environment encouraged me to go above and beyond to pursue my interest in Data Analytics alongside the daily curriculum. Opportunities provided here to represent the college across various multitudes provided me the necessary industry exposure and helped me in becoming an independent individual. The sheer focus on application based learning was quintessential in bagging a job at ZS Associates Pvt. Ltd. for which I'm forever in debt to this institute. I was once told that college would be the best years of your life and looking back I'm certain that joining MIT was the best career decision of my life.

Archit Agrawal
Batch of 2020
Business Operations Associate
ZS Associates Pvt. Ltd.

The decision of going to Manipal was one of the best decisions that I have made. The institute has a reputation and also a lot of scopes to learn new things. The highlight is the plethora of technical and cultural clubs present that helps a person to learn a lot of life skills. The faculty was extremely helpful with everything. The skills that were taught in the labs are relevant to my job as well. College life is no cakewalk, but with the right surrounding, it can develop our personality and make college life worthwhile. Working as a part of the Student Council was the best experience in my Manipal life. I had the opportunity to work with the best team and learn a lot about leadership and teamwork. Part of being a member of the council was an opportunity of a lifetime.

Alolika Chakravarty
Associate Developer
SAP Labs
Information Technology, MIT Batch 2015-19

From being an avid follower to paving a path for others to follow, it was an enthusiastic path of retuning the quintessential mindset of fear of leading. Any student who steps through the gates of MIT is exposed to a wide array of opportunities. My journey as an undergraduate at MIT has uncovered me to various situations with invaluable learning experiences, and one such opportunity which triggered a holistic development was being elected as the General Secretary of Student Council.

I walked into the lap of this lush green university town of Manipal as a confused individual. But, during these four years at MIT, I was guided by competent and friendly faculty, and the professionally managed environment helped to transform myself into a confident, skilled, professionally groomed engineer. These numerous learning opportunities not only served me to secure a role I was aspiring for but also prepared me to face the corporate world.

Rohith Reddy A.
Business Intelligence Analyst
Dell Global Analytics
Dell Technologies

Alumni and International Relations

It is the endeavour of the Alumni Relations of MAHE to bring all the Alumni on one platform to create a global group of Manipalites called 'ONE MANIPAL'. We at Manipal are working towards creating opportunities to network, share nostalgic moments, help the juniors and be partner in the growth of the Alma Mater.

With ever growing importance of Alumni in the development of the Institute, the Alumni Relation Office was set up at MIT in the year 2004. The objective is to gather the information of our Alumni and to create a database that will serve to improve interaction between the Alumni and the Institute. As on date, MIT has produced over 52 thousand graduates. The Office of Alumni relations tries to maintain an abiding life-long relationship among the faculty, Alumni and Alma mater.

Responsibility of the Office is to maintain close relations with the alumni keeping them abreast with the ongoing developments through emails, social media and personal connect. The Office hosts annual reunions for the graduates who are celebrating their golden and silver jubilees of graduation. In December 2017, 1200 Alumni attended the meet to be a part of "Diamond Jubilee" of the institute. Till date 22 annual meets have been held. These meets help the batch mates to reunite and reconnect and over the years the number of alumni attending have gradually increased.

MIT is proud of producing several distinguished Alumni who have graduated from the portals of the Institution. Leading the top corporates in the world which are listed in the Fortune 500's, our alumni have also shown that they are capable of leading the nations by being members of Parliament, Government agencies like NITI Aayog, Indian Foreign services and so on.

Most of the alumni have reconnected with their alma mater and are leading to guide the current generation by setting up world class research facilities, mentoring student major projects, engaging classes as adjunct faculty, creating bursary to provide recognition to meritorious juniors and are also part of developing curriculum for future needs.

The Office of the International relations strives to support and achieve the goals of MAHE by providing both outgoing and incoming opportunities for students. Students can explore the options of Semester Abroad, Integrated Masters', summer schools, dual degree at Master's level, and also internships through student bodies like IAESTE and AISEC. Several scholarships are available under the memorandum of understanding with top universities in the world to carry our research projects or have mentors to guide projects. Till date more than 200 students have been to various universities to pursue their semester or internships and even integrated masters'. Around 150 students from different partner universities have carried out their semester at Manipal and have enjoyed the rich culture.

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Nurturing Global Leaders Since 1957

Satya Nadella
[E&C 1988]
President, Microsoft Corporation

Rajeev Suri
[E&C 1989]
CEO - Inmarsat

Banmali Agrawala
[MECH 1984]
President - Infrastructure,
Defence and Aerospace, Tata Sons

Sandeep Sinha
[I&P 1996]
Chief Executive Officer at TAFE

Faizal E Kottikollon
[CIVIL 1986]
Chairman, KEF Holdings, Dubai

Bikram Bedi
[E&C 1993]
Google Cloud's Managing Director
for India business.

Kushagra Nandan
[E&E 2002]
Co-founder and President of
SunSource Energy

Sanjay Goel
[E&C 1990]
Executive Vice President, Tower Corp

Mythili Belle Kamath
[E&C 1998]
Director, Flight Systems COE
Aerospace, Honeywell

Sandeep Maini
[I&P 1985]
Chairman at Maini Group

Saurabh Sabhlok
[I&P 2013]
Indian Foreign Service (IFS) GoI

Manipal Universal Technology Business Incubator (MUTBI)

MANIPAL UNIVERSAL
TECHNOLOGY BUSINESS INCUBATOR
Supported by NSTEDB, Dept. of Science & Technology, Govt. of India and MAHE, Manipal

Manipal Universal Technology Business Incubator (MUTBI) is an initiative of Manipal Academy of Higher Education (MAHE), an Institution of Eminence, and is supported by National Science and Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology (DST), Government of India. Multidisciplinary Research & Innovation ecosystem at MAHE, provides a conducive environment for the development of products, technology, and patent. Objective of MUTBI is to provide incubation services to students, faculty members, alumni, and others. MUTBI encourages aspiring entrepreneurs to start their own venture, nurtures entrepreneurial skills, creates self-employment, facilitate product development and manufacturing in line with the social objectives of Government of India.

Operational since 2010, MUTBI focuses on thrust areas like Info Tech, Health Tech, Agri Tech, Clear Tech and other emerging areas. Since its inception, MUTBI has supported 34 startups and 43 NIDHI-EIRs, till date. MUTBI operates from its state-of-the art 10,000 sq. ft. new facility located within MAHE campus.

> Facilities and Support Services

MAHE ecosystem include Technology Business Incubators (TBIs), Innovation Center, Central Instrumentation and Intellectual Property (IP) & Technology Transfer Office (IP &TTO). Central Instrumentation include 3D Printers, Laser Cutting Machine, Atomic Force Microscope, Microgravure, Nanofiber Electrospinning Unit, Thermal Camera, Injection Moulding Machine, and other facilities. IP & TTO supports commercialization of Innovation /Research, after assessing market potential. MUTBI provides incubation space, mentoring, support services and financial support to startups. Incubator infrastructure includes maker space, coworking & dedicated space, and common meeting rooms.

Finance: MAHE supports innovations through funding during initial stages and pre-incubation. MUTBI financial support include seed money to startups as soft loan or against equity up to Rs. 25 lakh for product development/commercialization/scale up.

Programs: Faculty development program, webinars, interaction with entrepreneurs, and masterclasses are organized for students & faculty members to keep them abreast of startup ecosystem. During Manipal Entrepreneurship Summit (MES), industry experts and entrepreneurs, participate in panel discussion and pitch session

In conversation with Co-founders of PharmEasy on 20 August 2021

Pre-Incubation: This is for 3-6 months and is during initial stage of product development and startup formation. Co-working space and mentoring would be provided. Based on the progress and need, funding will be offered.

Incubation: Proposals from good team with appropriate prototype, innovation and traction would be considered for incubation. Dedicated space, mentoring and other support would be provided against incubation service charges and equity. Initial period of incubation is 18 months and upon request it would be further extended to 36 months.

> NIDHI-EIR

National Initiative for Developing and Harnessing Innovation (NIDHI) - Entrepreneur In Residence (EIR) program is DST funded fellowship program for graduates who are aspiring to become entrepreneurs. Fellowship amount upto Rs. 3.6 lakh for 12-18 months, would be given to the selected candidate. MUTBI has supported 43 candidates, among them 13 startups have been registered and fund worth Rs. 9Cr has been raised. Medical grade portable refrigerator, Vehicle tracking device, Automatic seed sowing machine, 3D printed customizable orthosis, 3D bioprinting of skin graft, Converting plastic waste into tiles, Kit for converting scooter into electric scooter, App for medical consultancy, Crowd funding for the researchers,   Nutrition support resources platform, Online services for musicians, Market place for precious goods of jewelry sector, Reverse logistics mechanism for end of life Lithium Ion batteries, were the few projects supported through this program.

> NIDHI-PRAYAS

NIDHI-PRomoting and Accelerating Young and ASpiring technology entrepreneurs (PRAYAS), is a product development grant up to Rs. 10 lakh, especially to support young innovators to turn their ideas into proof of concept/prototype. The ideas and innovations should be based on technology and science and prototype must be developed for physical product within 18 months.

> Startups

During the last 12 years, 23 startups have graduated from MUTBI. These startups primarily worked on Healthcare, IT and Mechanical products. One such graduated startup is featured here:

Fractal Works Pvt Ltd is a graduated startup of MUTBI. It is founded by MIT Manipal alumni, Mr. Vijay Varada & Mr. Asil Rohit. It is a 3D printer manufacturing and product development firm that provides product design CAD services.
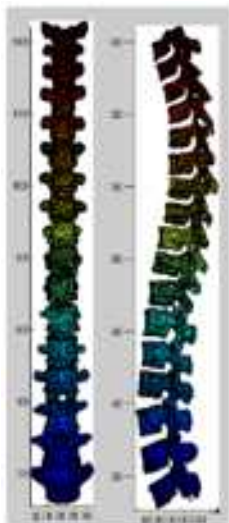

At present, 11 startups are incubated at MUTBI and they are working in the area of Healthcare and IT. Five such Startups are featured here:

Blackfrog Technologies Pvt Ltd is founded by MIT Manipal alumnus, Mr. Mayur Shetty & MITE Moodbidri alumnus, Mr. Donson D' Souza. The startup has developed "emvolio", a portable battery powered refrigerator that will maintain the preset temperature for up to 12 hours for last-mile transport of vaccines/test samples.

OSIND Medi Tech Pvt Ltd is founded by MIT Manipal alumnus, Mr. Mohammad Samheel. The startup has developed, a hand rehabilitation platform to facilitate the recovery training of stroke and neuromuscular deficit patients.

Kumudha Health Tech Pvt Ltd is founded by Dr. Sampath Kumar and Dr. Hareesha K S, faculty members from MIT Manipal. The startup has developed 3D diagnostic and treatment planning tool for the spinal deformities, SPINAK. It is an online tool which takes x-rays of the spine as input and produces 3D spine model.

Coworks Solutions Pvt Ltd is co-founded by MIT Manipal alumni Mr. Prashanth S N & Mr. Pradeep V K and others. Coworks is a tech startup developing a digital platform "Udyogasetu" to transform SME sector and "CampusNxt" a digitally connected campus for Academic Institutes. Udyogasetu help SMEs access to technology, functional consultants, academic institutes, students, suppliers and financial institutions. CampusNxt provides students / faculties an integrated mobile App for all university / campus activities.

Udupi eSamudaay Digital Services Pvt Ltd is co-founded by NITK Surathkal alumni Mr. Anup Pai & Mr. Ravichandar Haldipur and others. eSamudaay is a tech startup focusing on local e-commerce by building a network of digital entrepreneurs and empowering small businesses. DIY tool provides a kit for aspiring entrepreneurs to setup and scale up local commerce businesses. App offers products and services ranging from groceries, kitchen supplies, food, health and wellness.

> Manipal-Government of Karnataka Bioincubator

This is a joint venture between MAHE and Karnataka Biotechnology & Information Technology Services (KBITS), and is operational since January 2019. Bioincubator provides world class facilities, infrastructure, and services for the incubation of Startups in various domains of Biotechnology, Biomedical devices, Biopharma, Healthcare & Diagnostic, and Dental innovation. Currently 22 startups are incubated and it also offers Biotechnology Industry Research Assistance Council (BIRAC), Govt. of India supported BioNEST program. Both MUTBI and Bioincubator are operating from the same premises located in the Health Science campus of MAHE.

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Innovation Center: Accelerating Ideation to Startups

The Innovation Center @ MAHE nurtures Innovation and Entrepreneurial skills in our students, faculty and citizens of the region.

The Innovation Center provides a variety of resources and conducts various events to promote ideation to startups. The newly opened Idea Café in the Marena Recreational Complex encourages interdisciplinary teams to meet, network and brainstorm complex problems. We have regular seminars and workshops for our aspiring innovators and entrepreneurs to learn new concepts, network and share their ideas and challenges. These evening programs make it convenient for students across all colleges to participate.

Teams formed during ideation are provided collaborative, co-working space at Excelerate in the Innovation Center. Removed from the hustle and bustle of hostel life, here students from different MAHE Institutions can develop and test their ideas and turn them into viable projects in this modern co-working facility.

At the Makerspace we provide innovators with a wide range of tools and equipment to develop their proof-of-concepts and working prototypes. We also have several 3-D printers as part of our Center for Rapid Prototyping. Promising teams receive seed funding to defray the costs of developing prototypes.

In July 2018, the Innovation Center started the brand new, State-of-the-Art Apple Creative Studio. This is the home of the iOS Software development course offered to MIT and non-technology students as well. We offer training workshops for faculty and students across MAHE. Here students are encouraged to develop App with guidance from faculty trained at the Apple Training Center, Bengaluru, as well as regular interactions with experts from local iOS software companies.

When you are ready to start your own company, our Incubators (MUTBI and the BioIncubator) provides our budding entrepreneurs with all the resources and expertise needed to help them succeed.

Apple Creative

Makerspace

The Innovation Centre also hosts a well-resourced Central Instrumentation Facility (CIF) to support multi-disciplinary research areas in emerging frontier fields by our students and faculty. CIF includes large instruments such as Scanning Electron Microscope, Energy Dispersive analysis (EDAX), Nuclear Magnetic Resonance (NMR), X-Ray Diffractometer, Ion Chromatography, NIR-VIS Spectrophotometer and Nano Fiber Electrospinning Unit. These equipment support interdisciplinary research and innovation in Emerging areas of Material Science, Biotechnology, Printed photovoltaic, Plasmonic biosensors, and other.

> Innovation Center encourages student innovations with several events

We conduct a large number of Hackathons, Make-a-thons, and competitions to inspire students to participate in innovation. Our hackathons guide students through interdisciplinary team formation, ideation and early prototype development phases. Hackathons end with a short pitch to an interdisciplinary jury and awarding cash prizes and seed funding. During the past year we conducted the following events:

1 **Ideation Competitions:** we conduct numerous on-campus Ideation Competitions giving students opportunities to identify health and societal issues, convene interdisciplinary teams and develop creative solutions. We conducted in collaboration with Kasturba Medical College Manipal, MCODS Manipal, MCODS Mangaluru and MIT Manipal.

2 **MAHE Business Idea Competition:** This was a collaborative effort with the MAHE Department of Commerce.

3 **Innovation Festival:** is our annual event to inculcate the spirit of innovation among MAHE students & faculty, and create a common platform to showcase their innovation. Nearly fifty innovations were presented during this day-long gala at the Innovation Center.

4 **Manipal Grand Challenge:** The Innovation Center along with the Prasanna School of Public Health jointly conducted this competition for social entrepreneurs. While our students compete in national and international events, we encouraged them to use their creativity in developing innovative solutions to address local problems identified by the district administration.

5 **Provenance - MAHE's Annual Business plan competition.** It is the largest business plan competition in the region with prizes over 10 lakhs. Our primary goal is to encourage and foster the new generation of entrepreneurs. After a rigorous selection process, we identified three teams for further funding and pre-incubation services.

Competitions

Tech Incubator

MIT Innovation & Incubation

MIT has always been in the forefront of Innovation. The state-of-the-art laboratories, support systems, mentorship from academia, industry and the vibrant ecosystem consisting of engineering, medical, dental, pharmacy, commerce and management have fostered inter-disciplinary ideas. The culture of innovation is the core philosophy that defines MIT and has been vividly captured by the concept of 'Experiential Learning'. This is facilitated by providing open electives, opportunity to work in Major Student Projects, myriad of technical and non-technical clubs, hackathons, and final year projects. These initiatives are coupled with support from the Idea Café, Innovation Centre, Manipal Universal Technology and Business Incubator, and the Manipal - Government of Karnataka Bioincubator where MIT students have established several start-up companies. Apart from this, a few start-up ventures have been initiated on the voluntary basis by many students.

> Start-up as Final Year Project- A success saga

Now students at MIT can opt for the Start-up as their Final Year Project. This provision was enabled since 2020 and till date about 40 projects were identified and provided with pre-incubation status and accounted as final year project in the last 3 years. The outcomes of this initiative has resulted in formation of start-ups such as XeA Innovations Pvt. Ltd. Bangalore Assistaid Health Care Pvt Ltd, Bangalore, VAJRR, MUTBI Manipal, Pardus Camera Trap Solutions, SOCIIO Ichor- a social enterprise, Golden Bird Education (P) Ltd, Blue Owl Solutions (P) Ltd, HiranyaPathayee Technologies, IUVA Foods (P) Ltd, Nerd Nerdy and many more to come.

> Individual Start-up Initiatives

- Mr. Sohom Datta, a member of Cryptonite project team(From CSE Dept) has identified a bug and was rewarded $3133.70 by Google's Vulnerability Reward Program.They have a start-up named 'BugBase' which is now most sought after company in Cyber security.
- Atharv Tendolkar, 4th year ECE student has established his start-up "allskier". They design and implement Edge computing systems for the modern day needs. From IoT modules to advanced analytics services, they specialize in making customized solutions for their users.
- Mihir Rambhiya, 4th year Civil Engineering Student has started "Expify". The Curated Educational Experience by Expify is a one-of-its-kind student-oriented program. It has been designed to enhance their course-specific domain knowledge. Aspiring engineering students get to experience in real what it means to study an engineering course of their choice, even before they get an admission.
- Nifty Homes, started by MIT Manipal students, Khushal Agarwal (3rd year BTech Mechanical Engineering) & Sanskar Khandelwal (3rd year BTech CCE Engineering student) is a luxury home decor brand and is one of the fastest growing start-ups in the thriving decor industry. Founded in late 2020, Nifty Homes has helped furnish a number of homes by making luxury home decor affordable. All their products on offer, are backed with every technological initiative possible. The brand is very closely in line with the 'Vocal for Local' and 'Make in India' campaign that promotes the work of Indian handmade decor products.
- Soumith Ganji, B.Tech Third Year IT branch has developed the platform named DotFood which has gained over 3,600 downloads in a very short time. DotFood is a platform that unites students in MIT Manipal with the various food courts, food messes, food joints, juice lounges and restaurants within the campus. Aimed at reducing the wait to place an order, the DotFood app provides an easy-to-use interface to select from multiple restaurants and place an order within minutes.
- Dhruva Goyal and his team from MIT have established "bugbase" a bounty hunting platform. The success of this start up has been featured in many media outlets.
- Adit Luhadia, a second-year IT student at Manipal Institute of Technology. I have made an app called all MITy App, which is used by around 700+ second-year students at MIT.

Some highlights of Innovation & Incubation Activities

> MIT Innovation Fest 2022

As part of celebration of The National Innovation Day, on October 15, 2021 honouring the birthday of former President APJ Abdul Kalam, Manipal Institute of Technology in association with e-cell MIT Manipal organized the "MIT Innovation Fest 2021. The top three winners are nominated to MAHE INNOVATION FEST 2021. The Fest was open to submission from 4th October to 13 October 2021.

> Winners of MIT Innovation Fest 2021

AWARD	TEAM LEADER	TEAM NAME
FIRST (Rs 5000)	AYUSH GOYAL Sai Sravan Medicherla	W.A.R.D (waste Alert & response device)
SECOND (Rs. 3000)	MEGHANG NAGAVEKAR Naman More Garvit Gopalani Maanvi Singh	TOUCHLESS PUBLIC DEVICES
THIRD (Rs 2000)	SHUBHAM YADAV Shreyash Kumar Atharv Tendolkar Amit Choraria Anush Ravishankar	RIGHT LIGHT

> MIT & MUTBI: Awareness session on Technology Entrepreneurship - 17 March 2022

To promote the culture of innovation &startup among students of Higher Education Institutions, Ministry of Education (MoE) has come up with National Policy NISP 2019. Also, to sensitize on the awareness of innovation & entrepreneurship among our students, faculty and staff, MAHE has declared 2022 as Year of Innovation & Entrepreneurship (InE) on the occasion of 75th year of India's independence. Further, it is expected that all our post graduates, opt of different career track like industry jobs, higher studies, academics, entrepreneurship after their graduation, as per their interest.

An awareness session for all PG students (both 1st & 2nd year) of MIT, was jointly organised by MIT and MUTBI Manipal on 16 March 2022, 7 to 8 pm.

> UQ Engineering Design Challenge 2021: Flood Resilience in India

This is an initiative by the School of Civil Engineering and Faculty of Engineering, Architecture and Information Technology. MIT, Manipal team as they were selected to present their "Modular Underground Storm Surge Reservoir model for Udupi" design at the challenge Finale, and were awarded Runners Up in the challenge

Students: Hrisheekesh S. Sharma, Ashrith S. P. Kenja, AtmaJyoti, Rithu Maria and Riya Maria

Academic Mentors: Dr.Lathashri U A and Dr. Anish Kumar Warrier

> American Express Codestreet'21

The team "Ipseity" comprising four students from Manipal Institute of Technology –Mini Shail Chhabra (CSE Dept), Praseedha Praveen Kalbhavi (ICT Dept), Pratyaksh Gupta (EEE Dept), and Shreya Tewari (ECE Dept) – emerged as 1st Runners Up in the 3rd edition of CodeStreet'21 with the theme "Open Banking." .The hackathon started on 13th August and went on till 8th October. Over 9000+ students had participated in the hackathon, and 10 teams were selected after the ideation phase.

> e-Yantra Lab Community portal (e-LSI IIT Bombay)

Two students from ECE Department (Ayush Mittal, Krithik S) won 3rd Position national wide out of 251 teams.

> Women Transforming India 2021 Award

ChahatVasal, an eighth semester student of Mechatronics co-founded a startup, NerdNerdy. It is a research-driven, technology and product-oriented solution provider, aiming to bridge the various gaps in the special needs and education sector. She has been awarded the 'Women Transforming India 2021' award as the co-founder of NerdNerdy. This is a flagship event hosted by NITI Aayog (Govt. of India) along with the United Nations. In January 2022, the startup was declared as the finalists in the National Startup India Awards.

> MAHE Team comprising MIT Students wins National Innovation Contest

Dr. Mahima Mishra from Manipal College of Dental Sciences (MCODS), Mangaluru, and her team won the National Innovation Contest (NIC) conducted by the Central Ministry of Education. Her interdisciplinary team included Soumik Roy and Ruchit Bhakti, BTech students of MIT Manipal. The mentors were Dr. ArunShanbhag, Chief Innovation Officer, MAHE and Dr. Dilip G Naik Pro Vice-Chancellor MCODS, Mangaluru. NIC began with 9000+ prototypes scouted from more than 900 institutes across India. After multiple rounds of evaluation, mentoring, training and business plan development and pitching, 45 teams were shortlisted for funding and incubation linkage support.

> Arpit Baj Secures First Runner Up in Transformers 2021

Arpit Baj, second year student from Department of Electronics & Communication Engineering secured First Runner Up in TRANSFORMERS 2021 (global youth social innovation challenge), a social entrepreneurship competition organized by TALSCOUTS, a Santa Clara, California based organization. The challenge is mainly conducted in US, India, UK, Canada and Australia. It was a three month-long competition with over 4000+ participants across 350+ institutions

> Team MIT Secures Second Runners Up HACK'E'LTH 2021, GE Healthcare Digital Technology

Ishan Kumar, Information Technology, Pranshul Goyal, Computer Science Engineering, Rhea Adhikari, Computer Science Engineering and AditLuhadia, Information Technology. under the guidance of Dr. Ramya S., Associate Professor, Electronics and Communication, won the Second Runners up position in a national level competition HACK'E'LTH 2021 organized by GE Healthcare Digital Technology

> International Hackathon-FormulaAI Hack 2022

The team "MIT Boys" has secured global 2nd Place in the "FormulaAI Hack 2022" hackathon, conducted from 18 to 22 February 2022. The hackathon was a 4-day global competition event with over 2000 participants, 140 teams and a price pool of 60,000 AUD, held in celebration of the racing culture built by Red Bull Racing. The #FormulaAI 2022 Hackathon brought together innovators, mentors and sponsors to solve some real-world racing challenges. The team was led by Hariharan B (CSE). Rohan Prasad (CSE), Sankeerth Sankar (CCE), GautamPrabhu (CCE), and Ankush Nath (IT) were the team members

> LAKSHYA - The Agri Club at India Innovation Hub, World Expo, Dubai – 2020

The team of students led by Pratik Shewkani, President, Lakshya - The Agri Club, was invited to represent its works at the India Innovation Hub, World Expo 2020, Dubai on 3 March 2022. They displayed their works on hydroponics and showcased its developments to the global audience

> Smart India Hackathon 2022

Manipal Institute of Technology (MIT), Manipal Academy of Higher Education (MAHE) had organized an Internal Hackathon on 12th March 2022. This event was inaugurated by Director of MIT Commander(Dr) Anil Rana (IN Retd), in the presence of Dr. Somashekar Bhat, Joint Director, MIT, Manipal, Chief Guest Mr. Pradeep Udupi, senior Vice President - Engineering Global Technologies Pvt., Ltd., Dr. Smitha N. Pai, Head of the Department, Information & Communication Technology, MIT and Associate Professor of Information Communication Technology Dr. Sucheta V Kolekar, SPOC SIH 2022.Internal Hackathon for Smart India Hackathon (SIH 2022) was organized as a preliminary round to select and nominate best 15 teams. The nominated teams will be participating in the 5th edition of Smart India Hackathon (SIH 2022) during June-July 2022.

The Internal Hackathon was organized for a duration of 12 hours, from 8.00 AM to 8.00 PM, for MIT students. Total 26 teams (6 members per team with one female member compulsory) had participated in the event. Teams selected problem statements which are provided by various industries and government sectors. Among the 26 teams, 16 teams selected software domain problem statements and 10 teams selected problem statements of hardware domain.

Dr. Mohammad Zuber
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E-Cell MIT Manipal

Since its inception in 2021, the Entrepreneurship Cell of MIT has been striving to empower budding entrepreneurs of MAHE and build a vibrant ecosystem where their ideas can flourish. With the vision to inculcate the spirit of entrepreneurship among the student community of MIT, this non-profit organisation that students are running was formed. What started as a small venture with only seven students of MIT is now one of MIT's biggest student body, with over 150 bright young minds striving all around the clock to promote startup culture all over MIT over two years later.

The Entrepreneurship Cell is divided into seven departments that handle the day to day work– Startup Development, Corporate and Alumni Relations, Student Outreach, Events and Operations, SM and Marketing, Graphics and Content. These departments function together to weave a fully functioning Entrepreneurship Cell that works skillfully to promote the startup culture. The members of all the departments come together to organise events as big as MES.

The Startup Development team, which is part of the core of the organisation, has been in contact with over sixty startups, all of which were ideated and incepted by the students of MIT, Manipal. They endeavour to help startups in any way they can, from helping them as early as in the ideation stage to finding VCs to help fund the same ideas and everything that comes in between.

E-Cell's Corporate and Alumni Relations department contacts firms in the Corporate world to help build the E-Cell's network and collaborate with them for a few of their events when the necessity arises. They also focus on reaching out to the alumni of MAHE and help connect the bridge between the current and passed out students of MAHE.

Any E-Cell needs to have collaborations with other chapters of the same organisation. They help increase the network and also learn from each other. The Student Outreach department handles all these partnerships. They have contacted over eight other E-Cells in the past year and have signed four MoUs with the other chapters. This cooperation not only helps to grow MAHE's but also help our students to increase their learning curve.

One of its most essential teams is its Events and Operations department for any E-Cell. The members of this department are responsible for coming up with ideas for events and moderating them. They have already come with many events, from webinars with eminent personalities to organising primer business competitions like Idea Validation. They are also responsible for planning, scheduling and exciting all the activities held by E-Cell flawlessly.

The Social Media, Content and Graphics team works hand in hand inside the Entrepreneurship Cell of MIT. They are the minds behind the posts and blogs on their social media pages. They do extensive research on the startup world and develop content that is factually fascinating and accurate. The social media team also handles the marketing collaborations of E-Cell, MIT. They are responsible for advertising and promoting our events and collaborating with different student bodies to increase our outreach.

Events organized by E-Cell

> The Idea Validation

This business model event was held on the MS Teams Platform in the January of the current year. This event aims to equip young entrepreneurs with an apt skill set and knowledge to move in the direction of their startups. The competition was judged by eminent individuals having expertise in the industry, and they gave essential input to our startups on how to go about their ventures.

> A Perfect Pitch

Mr, Ritesh Shergill, Ex VP at J P Morgan and Chase and VP at Penny was the guest for the webinar which was focused to give the perfect insights in making an outstanding start-up idea pitch. The webinar also helped provide insights into angle invetor's, what they are looking for in a pitch and what is a successful pitch.

Date: 26th September 2021

> Decipher the Start-up Enigma

A talk on entrepreneurship by Mr Yash Mehta. Yash is the CEO and Founder of Dobby-a design-tech company focused on creating cutting-edge technology products. Immediately after graduation, he started a company in IoT Technology, ending the product development stage with five patents under his name. He also acquired strategic insights working as a technical and business consultant. During the pandemic, Yash and his team designed India's cheapest electronic N-95 mask.

Date: 3rd October 2021

> MIT Innovation Fest 2021

MIT Innovation Fest 2021 was an open for all event designed to attract the best of innovations from MIT to compete for MAHE Innovation Fest. This contest gives a unique opportunity for all participants to showcase their skills at tackling new challenges and coming up with innovative solutions

Date:- 8th October 2021

> MIT Ideation Competition

E-Cell MIT, Manipal jointly with Innovation Centre, MAHE organized the MIT Ideation Competition to overcome the problem with single-use plastics. Students ideated to find a long-lasting, sustainable solution to the problem of elimination of Single-Use Plastic.

Rewards worth a total of 1.45 lakh were awarded to winning start-ups

Date:- 25th August 2021

> An Insight Into Entrepreneurship

Vijay RaghavVarada, CEO & Co-Founder of Fracktal Works, author & TEDX speaker shared his experiences. Vijay started his company when he was just a student at MIT Manipal, but went on to take the entire 3D printing market in India by storm. This session helped many students towards entrepreneurial journey managing their academic requirements.

Date: 21st August 2021

> Manipal Entrepreneurship Summit

E-Cell held MAHE's flagship entrepreneurial summit from 17th March to 2nd April. The summit had over twenty events held in both online and offline modes. This spanned for over two weeks and generated a positive response. They collaborated with many student startups and ones incubated with MUTBI. Many students and startups took part enthusiastically in the competitions that were held. E-Cell also organised a panel discussion with six prominent alumni personalities who spearheaded innovation and entrepreneurship in their specific domains. They gave great insights into the challenges and aspects they faced on their journey to build their very own startups. Pitch Tank, Manipal's very own Shark Tank-style event was held where top start-ups from MIT showcased their product on the big stage and received cash prizes and future funding opportunities. The Innovation Mela—the event held on the summit's closing day showcased many Manipal-based startups and had a record three thousand footfall- first time in Manipal and finished the whole two weeks on a high note.

E-Cell Faculty Advisor:
Dr. Sriram K V (kv.sriram@manipal.edu)

Research Profile

Manipal Institute of Technology (MIT), Manipal encourages research, innovation, research publication, patent filing and technology commercialization at undergraduate and postgraduate level.

MIT has collaborative and interdisciplinary research programs in association with premier research laboratories and has secured research grants from government (both state and central), industries and international funding agencies. The faculty members are working on multiple research projects supported by a number of funding agencies such as Department of Science and Technology (New Delhi), Ministry of Environment and Forests (New Delhi), Department of Atomic Energy, AICTE (New Delhi), Vision Group on Science and Technology (VGST) Karnataka, Department of Biotechnology (New Delhi), Defence Research and Development Organization (New Delhi), Industries and MAHE.

> Research Output

No. of PhDs Awarded (after 2005)	289
No. of Research Scholars (ongoing)	372 (Full & Part time)
No. of PhD Guides / Co-guides	284
Sponsored Research projects (ongoing)	34
Research Grants (till date)	25 crores
No. of Patents Filed (after 2009)	27
No. of Patents Granted	10
Total No. of Publications - (Journal and Conference papers)	5200

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Faculty Development and Welfare

The office of the Associate Director - Faculty Development and Welfare, is established in January 2019 with the main objective of facilitating the overall professional development and welfare of the 650 faculty members and 1200 non-teaching staff on rolls at MIT Manipal.

The office organises regular programs on pedagogy, research orientation and leadership skills for overall development of the faculty members with an objective of enhancing their job satisfaction and help their career growth. Looking at the large number of young faculty members on the rolls at MIT Manipal, office of the Faculty Development and Welfare, also takes care of equipping them with the proper skill sets needed for the teaching-learning process and promoting good work culture at the Institute on a regular basis. Guest lectures from the eminent scholars and speakers will be arranged for helping the faculty members and students to keep up to date with the emerging trends. Moreover, regular workshops are conducted for the skill development of non-teaching staff to make them feel at home with their day to day activities in their offices.

The major activities of the office includes

- Organising Faculty Development Programs for imparting necessary skill sets for discharging their responsibilities as faculty members / staff, effectively throughout their career.
- Conduct Orientation program for newly joined faculty and staff
- Arrange Guest talks for the benefit of faculty and students.
- Conducting programs for skill development of non-teaching staff members.
- Programs for nurturing research culture amongst the faculty members
- Facilitation of Faculty recruitment, promotion and Performance appraisals
- Facilitate faculty grievances redressal

Dr. Shankaranarayana Bhat M
Associate Director
(Faculty Development & Welfare),
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Quality Assurance

The office of "Quality Assurance" (QA) formerly known as office of Quality & Compliance was established in January 2022 headed by Associate Director (QA). The main objective of QA is to ensure quality in teaching, learning, evaluation, curricula, research and administration, by implementation of quality measures and continuous monitoring of quality status by putting in place systems and procedures. In addition, QA also facilitates the implementation of Institute's vision and mission to attain excellence in technical education, research, and promotion of the development of ethical, rounded and skilled graduates who contribute towards the development of the local and global community. Quality Assurance provides administrative and substantive leadership, initiates quality activities at all levels of the institute and takes care of institutional/program accreditation processes.

IQAC Committee Meeting 2022

Awareness session to internal ISO auditors

In a nutshell, the major activities of the office include:
- Promote value and foster a culture of quality assurance
- Facilitate periodic academic and administrative audits
- Advise on policies and procedures for approval, monitoring and review of programmes
- Audit the effectiveness and operation of the quality assurance system so as to maintain quality
- Involvement of stakeholders to evaluate the set quality performance indicators.
- Feedback collection, analysis and dissemination of relevant information citing concerns where improvement measures should be taken
- To facilitate accreditation (NAAC, NBA, IET) and certification (ISO) processes
- Follow-up actions, continuous improvement of the academic and administrative quality
- Periodically conducting awareness session about ISO standard pertaining to the Quality, Environment and Energy systems
- Participating in various International & National Survey
- Managing AICTE annual Extension of Approval Process
- Facilitating documentation and uploading of National and International Activities organized under the guidelines of various Government & Private agencies (AzadiKaAmritMahotsav, AICTE Student Learning Assessment, ATAL initiatives, etc.)

Dr. Chandrashekhar Bhat
Associate Director Quality Assurance
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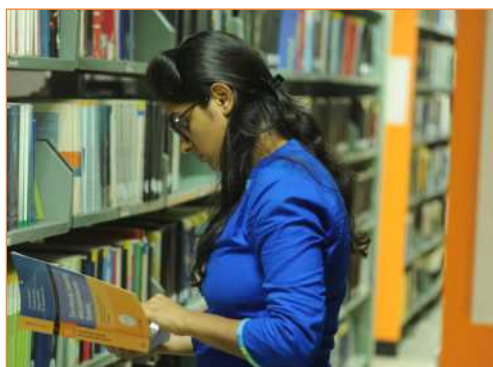Email: chandra.bhat@manipal.edu;
quality.mit@manipal.edu

MIT Central Library

The Institute has a sprawling air conditioned and Wi-Fi enabled central library with a total area of about 70,000 sq.ft. and a seating capacity of 950, catering the needs of all the academic programmes. Modern technologies like access controlled gate and CCTV surveillance has been implemented in the library.

The library has more than one lakh twenty thousand books and 50,200 e-books both technical and general. Library subscribes to more than two hundred print and nearly 2,750 online full text journals, 6 online databases magazines and standards for the use of faculty members and students.

Digital Library

E-books, Online journals, e-standards, e-question papers, NPTEL Video lectures, and Institutional repository are available in the digital Library. All electronic resources can be accessed remotely by using EZproxy technology. All the library activities are automated with the help of KOHA software. Books, bound volumes and book bank books all are bar coded. Barcoded / RFID enabled College ID Card can be used for all library transactions.

A student can check his/her dues, and search the availability of library resources using the title, author or any key words through library OPAC search anywhere in the campus.

A Link to access all library e-resources is given in Manipal Academy of Higher Education intranet portal http://muportal.

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MIT Hostels

MIT is a reputed institute with adequate hostel facilities for students studying in B.Tech./B.Arch. and various undergraduate and post-graduate courses.

MIT hostels provide accommodation for about 5328 boys and 2242 girls in 24 separate blocks. Single/double/triple occupancy AC/Non AC rooms are available. Boarding facilities include 6 messes and 2 Food Courts which can cater to about 8000 students.

> Hostel Facilities

All hostels provide 24 hour electricity and water supply, solar heated water, hot & cold drinking water, common telephone, common TV room and Sports facilities. All hostels have 24x7 Wi-Fi in all the rooms.

Excellent mess facilities are available for all students in different messes (Food Court 1 & 2/ Annapoorna/ Aditya/ Ashraya/ Aradhana/ Ananya Mess & Apoorva Mess). Students can choose to be members of any one of these messes and are free to change their mess anytime during the year. Membership in any one of these messes is compulsory for all students staying in hostels for the first year. 24x7 housekeeping is available in all the hostels.

All hostels have indoor games facilities like carrom, table tennis and chess and some hostels have gymnasium, volley ball and basketball along with other sports facilities.

Swimming pool, badminton courts, synthetic tennis courts, basketball courts, well-lit stadium, football grounds and hockey grounds are also available for all students. International standard Sports Complex (MARENA) is available for students. Excellent hospital care is available in Kasturba Hospital, Manipal with health insurance coverage.

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MIT Academic Block 1 - Aerial View

Department of Physical Education

Sports is an important part of college life and MIT Manipal caters to the needs of everyone from the recreational to highly competitive persons. It aims to develop the following in the students and staff of the college:

- Health
- Social interaction
- Personality development
- Stress relief
- Leadership
- Sense of discipline
- Fair play
- Team spirit

The campus has its own Swimming pool, Boxing Ring and a Gymnasium, Badminton Courts Indoor, Tennis Courts Floodlit facilities for those who wish to enjoy recreational sport in their free time. Students interested in gaining competitive experience in these events can avail excellent coaching facilities from well qualified trainers.

*Inter – section, Inter – branch, There are both indoor and outdoor sports facilities available in the campus which include Athletics, Aerobics, Badminton, Chess, Basketball, Cricket, Football, Hockey, Handball, Squash, Swimming, Tennis, Table tennis and Volleyball. All the sports events are administered by the Department of Physical Education, MIT, Manipal.

The new indoor sports complex "MARENA" is perhaps one of its kind in Asia. The complex has five Howa badminton courts, four squash courts, four table tennis courts, two tennis courts, a basketball court, gymnasium steam bath, Sauna bath, five a side football court, a jogging track and swimming pool & Boxing Ring.

Beside the sports facilities available on campus, the sports Council organizes sporting activities throughout the year such as:

- All India Inter Engineering College Sports Meet – REVELS CUP – 20
- Inter – Collegiate Sport Events
- Inter – year Sports Events and many other fun activities
- MIT Basketball League
- MIT Football League
- MIT Cricket League

Besides improving fitness, Sports help to create new and lasting friendships, develop teamwork skills and bring laurels to the institution.

The players of our institute represented the University team in Cricket, Chess, Table tennis, Squash, Handball, Badminton and Tennis in South Zone Inter and All India tennis inter University tournaments.

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B.Tech Program | Program Structure
First Year

> B.Tech Program Highlights

- Duration of the program is 8 semesters
- Flexible Total Credits: 160/168/180/188
- 160 – Base requirement for the award of B Tech degree
- 168 – If the students opt for minor specialization
- 180 – If the students are eligible and opt for B Tech – honours
- 188 – If the students opt for both minor specialization and
  B Tech – honours if eligible.
- Semester I & II: Common for all branches
- Optional change of branch in semester III against vacancies based on First Year performance
- First Year course materials available on Intranet
- Only program and open electives in VII semester
- VIII semester fully dedicated for Project work

- Live project experience through Practice school caters student mobility.
- Flexible Core - Choice Based Credit System (CBCS): Students could opt for a track with designated core courses during V and VI semesters of B Tech.
- Flexible curriculum: More elective courses including open electives from V to VII Semester
- Minor Specialization based on program electives chosen
- Mandatory Mini Project for Minor Specialization
- Continuous assessment: Equal weightage of in-semester & end-semester assessment
- Student Life Cycle Management System to provide seamless access to academic information through internet to all stake holders
- BTech (honours) for meritorious students

Physics Group

First Semester
- Engineering mathematics - I
- Engineering Physics
- Mechanics of Solids
- Basic Electronics
- Basic Mechanical Engineering
- Communication Skills in English
- Universal Human Values and Professional Ethics
- Engineering Physics Lab
- Workshop Practice
- Engineering Graphics - I
- Creativity, Problem Solving & Innovation

Second Semester
- Engineering mathematics - II
- Engineering Chemistry
- Biology for Engineers
- Basic Electrical Technology
- Problem Solving Using Computers
- Environmental Studies
- Human Rights and Constitution
- Engineering Chemistry Lab
- Problem Solving Using Computers Lab
- Engineering Graphics - II
- Creativity, Problem Solving & Innovation

Chemistry Group

First Semester
- Engineering mathematics - I
- Engineering Chemistry
- Biology for Engineers
- Basic Electrical Technology
- Problem Solving Using Computers
- Environmental Studies
- Human Rights and Constitution
- Engineering Chemistry Lab
- Problem Solving Using Computers Lab
- Engineering Graphics – I
- Creativity, Problem Solving & Innovation

Second Semester
- Engineering mathematics - II
- Engineering Physics
- Mechanics of Solids
- Basic Electronics
- Basic Mechanical Engineering
- Communication Skills in English
- Universal Human Values and Professional Ethics
- Engineering Physics Lab
- Workshop Practice
- Engineering Graphics - II
- Creativity, Problem Solving & Innovation

Computer Science Stream | Program Structure
Computer Science & Engineering

Third Semester
- Engineering Mathematics - III
- Computer Organization & Architecture
- Data Structures
- Digital System Design
- Object Oriented Programming
- Data Structures Lab
- Digital System Design Lab
- Object Oriented Programming Lab

Fourth Semester
- Engineering Mathematics - IV
- Formal Languages and Automata Theory
- Design and Analysis of Algorithms
- Embedded Systems
- Database Systems
- Database Systems Lab
- Algorithms Lab
- Embedded Systems Lab

Fifth Semester
- Essentials of Management
- Principles of Cryptography
- Software Engineering
- Operating Systems
- Computer Networks
- OE – Creativity, Problem Solving and Innovation
- Software Engineering Lab
- Operating Systems Lab
- Computer Networks Lab

Sixth Semester
- Engineering Economics and Financial Management
- Parallel Computer Architecture and Programming
- Compiler Design
- Program Elective – 1 / Minor Specialization
- Program Elective – 2 / Minor Specialization
- Open Elective – I
- Parallel Programming Lab
- Compiler Design Lab
- Web Programming Lab

Seventh Semester
- Program elective – III/ Minor Specialization
- Program elective – IV/ Minor Specialization
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Computer Graphics & Visualization Computational Intelligence
- Internet of Things
- Data Analytics
- Cyber Security
- Computational Mathematics
- Business Management
- Financial Management
- Financial Technology
- Entrepreneurship
- People Management
- Literatures in English

Computer Science Stream | Program Structure
Computer Science & Engineering (AI&ML)

Third Semester
- Linear Algebra And Logic
- Digital Systems and Computer Organization
- Data Structures
- Introduction to Data Analytics using Python
- Object Oriented Programming
- Formal Languages and Automata Theory
- Data Structures Lab
- Digital Systems Design Lab
- Object Oriented Programming Lab

Fourth Semester
- Probability and Optimization
- Database Systems
- Design and Analysis of Algorithms
- Artificial Intelligence
- Operating Systems
- Open Elective – I
- Algorithms Lab
- Database Systems Lab
- Artificial Intelligence Lab

Fifth Semester
- Essentials of Management
- Machine Learning
- Artificial Neural Network
- Foundation of Computer Vision
- Parallel Computer Architecture and Programming
- Open Elective – II
- Computer Vision Lab
- Parallel Programming Lab
- Machine Learning Lab

Sixth Semester
- Engineering Economics and Financial Management
- Deep Learning
- Big Data Analytics
- Program Elective – I
- Program Elective – II
- Open Elective – III
- Deep Learning Lab
- Internet Technologies Lab
- Big Data Analytics Lab

Seventh Semester
- Program Elective – III
- Program Elective – IV
- Program Elective – V
- Program Elective – VI
- Program Elective – VII
- Open Elective – IV

Eighth Semester
- Industrial Training
- Project Work/Practice School

Minor Specializations
- AI in Healthcare
- Computer Vision
- Internet of Things
- Applied Natural Language Processing
- Cyber Security
- Business Management
- Material Science
- Business Management
- Computational Mathematics

Computer Science Stream | Program Structure
Information Technology

Third Semester
- Engineering Mathematics – III
- Data Structures
- Object Oriented Programming
- Digital Systems and Computer Organization
- Principles of Data Communication
- Data Structures Lab
- Object Oriented Programming Lab
- Digital Systems Lab

Fourth Semester
- Engineering mathematics – IV
- Database Systems
- Design and Analysis of Algorithms
- Embedded Systems
- Computer Networks
- Database Systems Lab
- Embedded Systems Lab
- Network Programming and Simulation Lab

Fifth Semester
- Essentials of Management
- Information Security
- Operating Systems
- Software Engineering
- Flexible Core – 1 (A/B/C)
  A) Data Structures for Databases
  B) Software Project Management
  C) Theoretical Foundations of Computer Science
- OE – Creativity, Problem Solving and Innovation
- Information Security Lab
- Operating systems lab

Sixth Semester
- Engg Economics and Financial Management
- Flexible Core – 2 (A/B/C)
  A) DDBMS (NOSQL)
  B) Software verification and validation
  C) Compiler Constructions
- Data Mining
- Program elective – I / Minor Specialization
- Program elective – II/ Minor Specialization
- Open Elective – I
- Advanced Technology Lab
- Data Mining Lab

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II
- Mini Project (Minor specialization)

Eighth Semester
Industrial Training
Project work/Practice school
Project Work (B Tech – honours)* (V - VIII sem)
B Tech – honours Theory – 1* (V semester)
B Tech – honours Theory – 2* (VI semester)
B Tech – honours Theory – 3* (VII semester)

Minor Specializations
- Computational Intelligence
- Computer Graphics and Visualization
- Data Analytics
- Software System Design
- Cyber Security
- Financial Technology
- Entrepreneurship Development
- Business Management
- People Management
- Finance and Investments
- Modern Literature
- Professional Communication

Computer Science Stream | Program Structure
Computer & Communication Engineering

Third Semester
- Engineering Mathematics – III
- Data Structures
- Digital Systems and Computer Organization
- Object Oriented Programming
- Principles of Data Communication
- Data Structures Lab
- Digital Systems Lab
- Object Oriented Programming Lab

Fourth Semester
- Engineering mathematics – IV
- Data base management systems
- Design and Analysis of Algorithms
- Computer Networks and protocols
- Operating Systems
- Software Design Technology
- Database Systems Lab
- Operating Systems Lab

Fifth Semester
- Essentials of Management
- Information Security
- Embedded System Design
- Wireless Communication and computing
- Network Programming and Advanced Communication Networks
- OE – Creativity, Problem Solving and Innovation
- Embedded System Design Lab
- Information Security lab

Sixth Semester
- Engg Economics and Financial Management
- Flexible Core – 1 (A/B/C)
  A) Foundations of Internet of Things
  B) Statistical Data Analysis
  C) Web Technologies
- Flexible Core – 2 (A/B/C)
  A) Cloud Technologies
  B) Data Mining and Predictive Analytics
  C) Full Stack Web Development Tools
- Program elective – I / Minor Specialization
- Program elective – II/ Minor Specialization
- Open Elective – I
- Mobile Application Development Lab
- Network Design and Programming Lab

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II
- Mini Project (Minor specialization)

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Computational Intelligence
- Computer Graphics and Visualization
- Data Analytics
- Cyber Security
- Financial Technology
- Entrepreneurship Development
- Business Management
- People Management
- Finance and Investments
- Modern Literature
- Professional Communication

Computer Science Stream | Program Structure
Data Science & Engineering

Highlights
- Core Competency in Data Science, Computational Mathematics and Statistics
- Minor Specialization in Finance, Business, Health Care
- Multi-campus Model with student mobility in 4/5/6th semester
- Industry collaboration for the teaching-learning process
- The option of Semester Abroad
- The option of Integrated Master's Program with foreign universities

Third Semester
- Mathematical Foundations for Data Science-I
- Finance & Econometrics
- Introduction to Data Analytics
- Object-Oriented Programing
- Data Structures
- Computer System Architecture
- Data Analytics Lab
- Object-Oriented Programming Lab
- Data Structures Lab

Fourth Semester
- Mathematical Foundations For Data Science-II
- Database Systems
- Machine Learning
- Design & Analysis of Algorithms
- Data Communications and Networks
- Open Elective – I
- Database Lab
- Machine Learning Lab
- Design & Analysis of Algorithms Lab

Fifth Semester
- Mathematical Foundations For Data Science-III
- Deep Learning
- Operating Systems
- Natural Language Processing
- Cloud Computing
- Open Elective – II
- Deep Learning Lab
- Operating Systems Lab
- Web Technologies Lab

Sixth Semester
- Operations Research
- Artificial Intelligence
- Parallel Programming
- Big Data Analytics
- Data Privacy & Security
- Open Elective – III
- Artificial Intelligence lab
- Parallel Programming Lab
- Big Data Analytics Lab

Seventh Semester
- Program Elective - I
- Program Elective - II
- Program Elective - III
- Program Elective - IV
- Program Elective - V
- Open Elective – IV

Eighth Semester
- Industrial Training
- Project work/ Practice School

Minor Specializations
- Finance & Security Analytics
- Business Analytics
- Health Care Analytics
- Material Science
- Computational Mathematics
- Business Management

Electrical Stream | Program Structure
Electrical & Electronics Engineering

Third Semester
- Engineering Mathematics - III
- Electrical Circuit Analysis
- Digital System Design
- Electrical Machinery - I
- Electromagnetic Field Theory
- Microcontrollers
- Digital System Design Lab
- Microcontroller Lab

Fourth Semester
- Engineering Mathematics - IV
- Analog System Design
- Power Electronics
- Linear Control Theory
- Generation, Transmission & Distribution
- Electrical Machinery - II
- Analog System Design Lab
- Electrical Machinery Lab

Fifth Semester
- Essentials of Management
- Power System Analysis
- Digital Signal Processing
- Switchgear & Protection
- Flexible Core – 1 (A/B/C)
- A) Modern Power Converters
- B) Distributed Generation Systems
- C) Communications Systems
- OE – Creativity, Problem Solving and Innovation
- Power Electronics Lab
- Systems Simulation Lab

Sixth Semester
- Engg Economics and Financial Management
- Measurements & Instrumentation
- Flexible Core – 2 (A/B/C)
  - A) Solid State Drives
  - B) Smart Grid Technologies
  - C) Control System Design
- Program elective – I
- Program elective – II
- Open Elective – I
- Measurements & Instrumentation Lab
- Power System Lab

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Computational Intelligence
- Embedded Systems
- Signal Processing
- Illumination Technology
- Electric mobility
- Informatics
- VLSI Design
- Control Systems
- Systems Engineering
- Computational Mathematics
- Business Management
- Financial Technology
- Finance & Investments
- People Management
- Entrepreneurship
- Professional Communication
- Modern Literature
- Digital Marketing (COURSERA)
- Data Science (COURSERA)
- Fundamentals of Computing (COURSERA)

Electrical Stream | Program Structure
Electronics & Communication Engineering

Third Semester
- Engineering Mathematics - III
- Analog Electronic Circuits
- Network Analysis
- Signals & Systems
- Digital System Design
- Electromagnetic Waves
- Digital System Design Lab
- Electronic Circuits Lab

Fourth Semester
- Engineering Mathematics - IV
- VLSI Design
- Digital Signal Processing
- Analog Integrated Circuits
- Microwave Engineering
- Modern Control Theory
- VLSI Lab
- Electronic System Design Lab +
  Mini Project

Fifth Semester
- Engineering Economics and Financial
  Management
- Communication Theory
- Microprocessors
- Communication Networks
- OE – Creativity, Problem Solving and Innovation
- Flexible Core – 1 (A/B/C)
  A) Digital Computer Architecture
  B) VLSI Testing & Testability
  C) Satellite Communication
- Digital Signal Processing Lab
- Microprocessor lab + Mini Project Lab

Sixth Semester
- Essentials of Management
- Wireless Communication
- Flexible Core – 2 (A/B/C)
- A) System on Chip Design
- B) RF Circuit Design
- C) Information Theory & Coding
- Program Elective – I / Minor Specialization
- Program Elective – II / Minor Specialization
- Open Elective – I

- Communication Networks Lab
- Communication Systems Lab

Seventh Semester
- Program Elective – III / Minor Specialization
- Program Elective – IV / Minor Specialization
- Program Elective – V
- Program Elective – VI
- Program Elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Computational Intelligence
- Embedded Systems
- Signal Processing
- Communication Systems
- VLSI Design
- Control Systems
- Sensor Technology
- Illumination Technology
- Electric mobility
- Computational Mathematics
- Film production
- Packaging Technology
- Business Management
- Financial Management
- Financial Technology
- Entrepreneurship
- People Management
- Literatures in English

Electrical Stream | Program Structure
Electronics and Instrumentation Engineering

Third Semester
- Analog Electronic Circuits
- Digital Circuits & System Design
- Networks and Signals
- Sensors and Transducers
- Linear Control Theory
- Digital Circuits and Systems Lab
- Sensors and Circuits lab

Fourth Semester
- Engineering mathematics - IV
- Linear Integrated circuits
- Microcontrollers
- Industrial Instrumentation
- Digital Signal processing
- VLSI Design
- Analog systems lab
- Microcontroller Lab

Fifth Semester
- Essentials of Management
- Industrial Automation & Drives
- Communication Systems
- Process Instrumentation and control
- Flexible Core – 1
- Smart sensors
- Embedded System Design
- Modern Control Theory
- Creativity, Problem Solving and Innovation
- Industrial Instrumentation Lab
- Process instrumentation Lab

Sixth Semester
- Engg Economics and Financial Management
- Flexible Core – 2
- Micro Electro Mechanical Systems
- Internet of Things
- Digital Control System
- Flexible Core – 3
- Wireless sensor networks
- Artificial Intelligence
- Nonlinear control theory
- PE – 1 / Minor Specialization

- PE – 2 / Minor Specialization
- OE – 1
- Control and Signal Processing Lab
- Industrial automation Lab
- Virtual Instrumentation LAB

Seventh Semester
- PE – 3 / Minor Specialization
- PE – 4 / Minor Specialization
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
Control Systems
- Modern Control Theory
- Nonlinear control theory
- Digital Control Systems
- System Identification

Sensor Technology
- Sensor Design
- Biosensors and BioMEMS
- Multi Sensor Data Fusion
- Automotive Sensors

Systems Engineering
- Introduction to Systems Engineering
- System architecture and Design
- Introduction to SysML and MBSE
- System Verification and validation

Electrical Stream | Program Structure
Cyber Physical Systems

Third Semester
- Engineering Mathematics - III
- Analog Electronic Circuits
- Digital Logic Design
- Communication system
- Data Structures and Algorithm
- Sensors Technologies
- Communication lab
- Data Structure lab

Fourth Semester
- Engineering mathematics - IV
- Microcontroller
- Digital Transmission
- Introduction to Cyber Physical Systems
- Computer Architecture and Organization
- Control Systems
- Microcontroller lab
- Sensors and Circuit Lab

Fifth Semester
- Humanities I
- Cyber Physical System Design
- Data Communication and Networks
- Embedded System Design and Programming
- Flexible Core -I: Industry 4.0/ Smart Sensor/ VLSI Design
- OE- Creativity, Problem Solving and Innovation
- Cyber Physical Systems design Lab
- Embedded system programming lab

Sixth Semester
- Humanities -II
- Flexible Core - II: Unsupervised Intelligence in CPS/ Design of Safe Systems
- Flexible Core –III: CPS Interface/ Automation
- Minor Specialization -1
- Minor Specialization -2
- Networking lab
- CPS Interface Lab

Seventh Semester
- PE – 3 / Minor Specialization
- PE – 4 / Minor Specialization
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
Healthcare Monitoring Systems
- Wearable Health Monitoring Devices
- Biosensor and Bio MEMS
- Telemedicine
- Ambient Assistive Living Technologies
Smart Transportation Systems
- Automotive Electronics
- In-vehicle Networking
- Intelligent Transportation Systems
- Advanced Driver Assistance Systems

Electrical Stream | Program Structure
Biomedical Engineering

Third Semester
- Engineering Mathematics – III
- Anatomy and Physiology
- Electronics Circuits
- Digital System Design
- Network Analysis
- Signals & Systems
- Basic Programming Lab
- Electronics Circuits Lab

Fourth Semester
- Engineering mathematics - IV
- Basic Clinical Sciences I
- Biomedical Instrumentation
- Biomechanics
- Microcontrollers
- Digital Signal processing
- Signal Processing Lab
- Microcontroller Lab

Fifth Semester
- Engg Economics and Financial Management
- Basic Clinical Science II
- Medical Devices
- Biomaterials
- Flexible Core – 1 (A- Informatics/B- Materials)
- A- Artificial Neural Networks
- B - Basics of Cell and Molecular Biology
- OE – Creativity, Problem Solving and Innovation Biomaterials Lab
- Biomedical Instrumentation Lab

Sixth Semester
- Essentials of Management
- Flexible Core – 2 (A/B)
- Machine learning
- Electrical and magnetic materials
- Digital Image Processing
- Program elective – I
- Program elective – II
- Open Elective – I
- Digital Signal Processing Lab
- Digital Image Processing Lab

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specialization
I. Biomaterials
- Introduction to Biomedical nanotechnology
- Biomaterial Characterization Techniques
- Bio-fabrication
- Drug Delivery
II. Informatics
- Artificial Intelligence
- Biomedical Signal Processing
- Decision Support system
- Medical Imaging
Other Electives
- Bio-statistics
- Embedded Systems
- Fuzzy Logic Systems
- Pattern Recognition
- Physiological Control Systems
- Telemedicine
- Bioelectromagnetism
- Biometrics
- Rehabilitation Engineering
- Health Care Management
- Tissue Engineering
- Virtual Reality
- Prosthetics

Electrical Stream | Program Structure
Mechatronics

Third Semester
- Engineering Mathematics-III
- Data Structures and Algorithms
- Linear Integrated Circuits and Applications
- Mechanics of Robotics Systems
- Sensors and Instrumentation
- Industrial Robotics Lab
- Integrated Electronics Lab
- Manufacturing Processes Lab

Fourth Semester
- Engineering Mathematics-IV
- Automated Manufacturing Systems
- Design of Machine Elements
- Industrial Automation
- Linear Control Theory
- Microcontroller based System Design
- CAD and Kinematics' Simulation Lab
- Microcontroller Lab
- Sensors and PLC Lab

Fifth Semester
- Engineering Economics and Financial Management
- Digital Signal Processing
- Electric Drives
- Theory of Machines
- Flexible Core – 1 (A/B/C)
  A) Micro and Nano Fabrication of Electronic Devices
  B) Machine Learning
  C) Hydraulic and Pneumatic Systems
- Open Elective -I
- Drives, Controls and Modelling Lab
- Robot Operating System Lab

Sixth Semester
- Essentials of Management
- Flexible Core – 2 (A/B/C)
  A) Electric Vehicles
  B) Data Mining and Visualization
  C) Energy and Heat Transfer

- Flexible Core – 3 (A/B/C)
  A) Antennas, Radar and Navigation
  B) Cloud Computing
  C) Digital Manufacturing
- Program elective – I
- Program elective – II
- Open Elective – II
- Hydraulics Lab
- IIoT Lab
- Pneumatics Lab

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – III
- Mini Project (Minor Specialization)

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Electric Vehicle Technology
- Industrial IoT Systems
- Robotics and Automation
- Micro and Nano Systems
- Precision Agriculture Technology
- Computational Mathematics
- Business Management

Mechanical Stream | Program Structure
Mechanical Engineering

Third Semester
- Engineering Mathematics - III
- Kinematics and Dynamics of Machinery
- Manufacturing Processes -I
- Fluid Mechanics
- Mechanics of Materials
- Thermal Engineering
- Computer Aided Mechanical Drawing and Modelling Lab
- Workshop Practice – I

Fourth Semester
- Engineering Mathematics - IV
- Design of Machine Elements
- Materials Engineering
- Metrology & Measurements
- Turbomachines
- Manufacturing Processes - II
- Strength of Materials & Fluid MechanicsLab
- Workshop Practice – II

Fifth Semester
- Engg Economics and Financial Management
- Geometric Modelling
- Finite Element Methods
- Heat & Mass Transfer
- OE – Creativity, Problem Solving and Innovation
- Flexible Core – 1 (A/B/C)
  A) Design for Manufacture & Assembly
  B) Green Energy Technology
  C) Lean Manufacturing
- Mechanical Lab
- Metrology Lab

Sixth Semester
- Essentials of Management
- Flexible Core – 2 (A/B/C)
  A) Fatigue &Fracture
  B) Refrigeration & Air Conditioning
  C) Machine Tool Technology
- Flexible Core – 3 (A/B/C)
  A) Mechanical Vibrations

B) Computational Fluid Dynamics
C) Automation in Manufacturing
- Program elective – I
- Program elective – II
- Open Elective – I
- Finite Element Method Lab
- Heat Transfer & Solar Energy Lab

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations

- Design of mechanical systems
- Introduction to Continuum Mechanics for Engineers
- Lubrication and Rotor Dynamics
- Modeling and Simulation of Dynamic Systems
- Computer Integrated manufacturing
- Non-traditional Manufacturing Techniques
- Composite Mechanics & Manufacturing Techniques
- Industrial Automation and IoT
- Cryogenics
- Solar Thermal Systems
- Design of Heat Exchangers
- Jet Propulsion
- Processing of Polymers and Polymer Composites
- Heat Treatment of Metals and Alloys
- Metal and Ceramic Composite Materials
- Materials Characterization
- Automobile Engines and Combustion
- Design of Transmission Systems
- Hybrid Vehicle Propulsion
- Autotronics
- Fluid Drives & Control
- Mechatronic Systems
- Mechanical Handling Systems and Equipment
- Robotics: Mechanics and Control
- Statistical Quality Control
- Production Planning and Control
- Operations Research
- Total Quality Management
- Programming in Mechanical Engineering
- Advanced Metaheuristic Optimization Techniques
- Machine Learning & Applications

Mechanical Stream | Program Structure
Industrial Engineering

Third Semester
- Engineering Mathematics - III
- Industrial Internet of Things
- Data Analytics and Visualisation
- 3D Printing and Design
- Industrial Automation and Robotics
- Data Analytics and Visualisation Lab
- Automation and Robotics Lab

Fourth Semester
- Engineering Mathematics - IV
- Operations Research
- Work Systems Engineering and Ergonomics
- Supply and Logistics Management
- Design of Experiments
- Lean Manufacturing and Six Sigma
- Work Systems Engineering and Ergonomics Lab
- Computer Aided Operations Research Lab

Fifth Semester
- Engg Economics and Financial Management
- Simulation Modeling and Analysis
- Total Quality Management
- Engineering System Design
- OE – Creativity, Problem Solving and Innovation
- Flexible Core – 1 (A/B/C)
  A) Accountancy for managers
  B) Technology management
  C) Personnel management & IndustrialRelations
- Computer Aided Quality Engineering Lab
- Simulation Modeling and Analysis Lab

Sixth Semester
- Essentials of Management
- Operations Management
- Flexible Core – 2 (A/B/C)
  A) Statistics for Managers
  B) Project Management
  C) Organizational Behavior
- Program elective – I
- Program elective – II
- Open Elective – I
- Computer Aided Experimental Design Lab
- Computer Aided Operations Management Lab

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Industry 4.0
- Blockchain
- Artificial Intelligence
- Cyber Security
- Basics of computer organization
- Basics of Operating system
- Programming using Python
- Machine Learning

Mechanical Stream | Program Structure
Aeronautical Engineering

Third Semester
- Engineering Mathematics - III
- Introduction to Aircraft Structures
- Materials and Processing Techniques
- Engineering Thermodynamics
- Fluid Dynamics
- Introduction to Aerospace Engineering
- Fluid and Thermal Engineering Lab
- Structures Lab

Fourth Semester
- Engineering Mathematics - IV
- Incompressible Aerodynamics
- Air-Breathing Propulsion
- Linear Control Theory
- Aircraft Performance
- Advanced Aircraft Structures
- Aerodynamics & Propulsion Lab
- Numerical Computation Lab (MK + NH)

Fifth Semester
- Engineering Economics and Financial Management
- Flexible Core – 1 (A/B/C)
  A) Industrial IOT
  B) Finite Element Method
  C) Rocket Propulsion
- Flight Dynamics and Control
- Compressible Aerodynamics
- Avionics and Navigation System
- OE – Creativity, Problem Solving and Innovation** (MLC) - mandatory
- Geometric Modeling Lab
- Flight Dynamics and Control Lab

Sixth Semester
- Essentials of Management
- Flexible Core – 2 (A/B/C)
  A) Machine Learning and AI
  B) Computational Fluid Dynamics
  C) Theory of Vibrations
- Aircraft Design
- Program elective – I
- Program elective – II

- Open Elective – I
- Avionics Lab
- Structural Design and Analysis Lab

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Aerodynamics
- Avionics System Engineering
- Computational Mathematics
- Business Management
- Financial Management
- Financial Technology
- Entrepreneurship
- People Management
- Literatures in English

Mechanical Stream | Program Structure
Automobile Engineering

Third Semester
- Engineering Mathematics - III
- Strength of Materials
- Materials Science and Metallurgy
- Engineering Thermodynamics
- Fluid Mechanics
- Basics of I C Engines
- Geometric Modelling Lab
- Automobile Lab – I

Fourth Semester
- Engineering Mathematics - IV
- Automotive Component Design
- Manufacturing Techniques & Metrology
- Linear Control Theory
- Vehicle Transmission Systems
- Autotronics
- Materials Testing Lab
- Automobile Lab – II

Fifth Semester
- Engineering Economics and Financial Management
- Vehicle Chassis Systems
- Heat Transfer
- Electric Vehicle Technology
- OE – Creativity, Problem Solving and Innovation
- Flexible Core – 1 (A/B/C)
  A) Industrial IoT
  B) Finite Element Methods
  C) Advanced Engine Technology
- Simulation Lab
- Automobile Lab – III

Sixth Semester
- Essentials of Management
- Vehicle Dynamics and Control
- Flexible Core – 2 (A/B/C)
  A) Machine Learning and AI
  B) Computational Fluid Dynamics
  C) Theory of Vibrations
- Program elective – I
- Program elective – II

- Open Elective – I
- Automotive Design and Analysis Lab
- Vehicle Aerodynamics Lab

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Automotive System Engineering
- Vehicle System Design
- Computational Mathematics
- Business Management
- Financial Management
- Financial Technology
- Entrepreneurship
- People Management
- Literatures in English

Building Science Stream | Program Structure
Civil Engineering

Third Semester
- Engineering Mathematics - III
- Fluid Mechanics
- Surveying
- Building Materials
- Mechanics of Structures
- Water Supply Engineering
- Fluid Mechanics Lab
- Material Testing Lab

Fourth Semester
- Engineering Mathematics - IV
- Geotechnical Engineering
- Transportation Engineering
- Basic Reinforced Concrete Design
- Waste Water Management
- Water Resources Engineering
- Surveying Practice
- Environmental Engineering Lab

Fifth Semester
- Essentials of Management
- Basic Structural Steel Design
- Applied Soil Engineering
- Estimation, Costing and Project Management
- OE – Creativity, Problem Solving and Innovation**
  (MLC) - mandatory
- Flexible Core – 1 (A/B)
  A) Design of Pre-Stressed Concrete
  Structures
  B) Precast Technology
- Soil Mechanics Lab
- Computer Application Lab

Sixth Semester
- Engg Economics and Financial Management
- Flexible Core – 2 (A/B)
  A) Advanced Mechanics of Structures
  B) Contemporary Construction Practices and
  Sustainability
- Flexible Core – 3 (A/B)
  A) Design of Reinforced Concrete Structures

B) Environmental Ethics in Construction
- Program elective – I
- Program elective – II
- Open Elective – I
- Building Design and Modelling
- Structural Detailing and Drawing

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Advances in Concrete Technology
- Building Codes and functional Services
- Construction Materials and Quality Management
- Contract Management
- Air Pollution and Control
- Environmental Impact Assessment and Auditing
- Industrial Waste Water Treatment
- Solid Waste Management
- Structural Dynamics
- Design of Steel Structures
- Finite Element Method of Analysis
- Design of Foundation and Earth Retaining
  Structures
- Urban Mass Transport System
- Urban Transport Planning
- Pavement Material and Design
- Traffic Systems and Engineering

Chemical Stream | Program Structure
Chemical Engineering

Third Semester
- Engineering Mathematics - III
- Chemical Engineering Thermodynamics
- Chemical Process Calculations
- Momentum Transfer
- Mass Transfer I
- Physical and Organic Chemistry
- Physical and Organic Chemistry Lab

Fourth Semester
- Engineering mathematics - IV
- Transport Phenomena
- Mass Transfer -II
- Chemical Reaction Engineering
- Pollution Control and Safety in Chemical Industry
- Heat Transfer Operations
- Momentum Transfer Lab
- Numerical Methods for Chemical Engineers Lab

Fifth Semester
- Engineering Economics and Financial Management
- Process Dynamics and Control
- Process Modelling and Simulation
- Process Design of Chemical Equipment
- Flexible Core – 1 (A/B)
- A1- Particle Technology
- B1- Molecular Modelling and Simulation
- OE – Creativity, Problem Solving and Innovation
- Heat Transfer Lab
- Mass transfer Lab

Sixth Semester
- Essentials of Management
- Flexible Core – 2 (A/B)
- A2- Chemical Process Industries
- B2- Computer-Aided Simulations in Chemical Process Plants
- Flexible Core – 3 (A/B)
- A3- Chemical Reactor Theory
- B3- Artificial Intelligence and Machine
- Learning in Chemical Engineering

- Program Elective – 1
- Program Elective – 2
- Open Elective – 1
- Process Modelling and Simulation Lab Reaction Engineering and Process Control Lab

Seventh Semester
- Program elective – III
- Program elective – IV
- Program elective – V
- Program elective – VI
- Program elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Petroleum Engineering
- Pollution Control Engineering
- Renewable Energy Engineering

Chemical Stream | Program Structure
Biotechnology

Third Semester
- Engineering Mathematics - III
- Biochemistry
- Microbiology
- Cell and Molecular Biology
- Fluid flow operations
- Bioprocess calculations
- Biochemistry Lab
- Microbiology Lab

Fourth Semester
- Engineering Mathematics – IV
- Chemical and Biochemical Engineering Thermodynamics
- Downstream processes
- Genetic Engineering
- Principles of Heat and Mass transfer
- Immunology
- Unit Operations Lab
- Molecular Biology and Genetic Engineering Lab

Fifth Semester
- Engg Economics and Financial Management
- Bioinformatics
- Bioprocess Engineering
- Bio reaction Engineering
- Separation processes
- Open Elective (Creativity, Problem Solving and Innovation)
- Bioinformatics Lab
- Downstream Processing and Bioprocess Engineering Lab

Sixth Semester
- Essentials of Management
- Animal and Plant Biotechnology
- Bioethics and IPR issues
- Program Elective - I
- Program Elective - II
- Open Elective – I
- Bioreaction Engineering and Cell Culture Lab
- Modeling and Simulation Lab

Seventh Semester
- Program Elective – III
- Program Elective – IV
- Program Elective – V
- Program Elective – VI
- Program Elective – VII
- Open Elective – II

Eighth Semester
- Industrial Training
- Project work/Practice school

Minor Specializations
- Environmental Biotechnology
- Pharmaceutical Biotechnology

TECHSHILA –
A Manipal Model for Experiential Learning

With easy access to resources, today's children have ability for self-learning. They look for learning to be fun, hands-on, and experiential. Also, an engineering graduate is expected to have skillset to find solutions to problems of the society. Along with the domain specific knowledge, an engineer needs skills such as: Communication, Leadership, Teamwork, Problem Solving, Planning, Motivation & Enthusiasm, Adaptability & Flexibility, and Ability to Build Relationships.

With highly competitive market, human resource has become a critical resource. Corporates are looking at this resource to start contributing from day one. With knowledge-based economy, today's engineers are expected to demonstrate their ability for lifelong learning. All these mandates engineering education to be experiential, practical, relevant, and up to date.

In India, entry into engineering Institutions is highly competitive. With this, students have built-in competitive spirit. To foster this spirit, in 2007, Institute came up with the idea of 'Major Student Projects', wherein, institute provided infrastructure to build a technical project to compete in an international competition. Such an initiative was 'Formula Manipal', a student engineering project comprising of a group of undergraduate students aiming to conceptualize, design, fabricate, test and race a single seater, open-wheel Formula-style race car. Since its first competition in 2008, the team has participated in competitions in Italy, UK, Austria, Germany, and the Czech Republic.

The success of this has led to initiation of many more student teams. The year 2008 saw the stak of 'Team Manipal Racing', off-road racing club to design and fabricate All-Terrain Vehicles according to the rules laid by SAE BAJA. Year 2009, AeroMIT was initiated to design, manufacture, and fly a complex, stable, and pokable model aircrafl with minimal empty weight, maximum payload carrying capacity; RoboManipal was staked with an aim of taking pak in robotics competitions like Robocon. Parikshit Student Satellite Team staked in 2010 aims to build nanosatellites. Year 2011 was the beginning of 'Solar Mobil' with an aim of research & development of solar powered electric vehicle. Project Manas, aiming to develop an 'autonomous drive system for vehicles' optimized for Indian road and traffic conditions; Mars Rover Manipal, with a primary objective of building a Rover for University Rover Challenge was established in the year 2014.

Thrust MIT - working in the field of rocketry; R.U.G.V.E.D Systems - A.I. Defense Robotics team; DRONAID to provide engineering solutions to medical field using Drones; MotoManipal– building environment-friendly Electric Superbike; VISION - engaged in developing AR based applications; S.W.A.R.M - working towards development of Smart Wireless Autonomous Robots; Robotics and Circuits focused towards research and development in the field of robotics; Team Combat Robotics - working on combat robotics; Project AUV working on underwater robotics; Cryptonite - team of cyber security enthusiasts; IoopMIT - active on SpaceX Hyperloop, and Manipal BioMachines - working on synthetic Biology are the recent additions to this list.

All these teams are interdisciplinary in nature, having student representation from first to final year. In the process of getting into the team, and selecting the members to the team, students learn to face and conduct interviews. With the team size ranging from 25 to 50, students learn to work in group. By working under tight schedules, they learn to meet deadlines. By submitting Quarterly progress report, scheduling the task and by presenting budget required for the financial year, they hone their documentation, planning and presentation, skills. To generate the financial support, they need to sell their idea to possible sponsors. In the process, they learn the marketing, budgeting, and accounting skills. Thus, with this activity, we have taken the learning experience beyond the classroom.

Projects being innovative in nature, these activities have seen many publications and start-ups coming out of these ventures. Institution also envisages more scope for publication and IPs. To enable this, teams have added a research wing.

You are encouraged to go through the video to get the feel of these activity

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Formula Manipal

Formula Manipal, established in 2007, is the official Formula Student Team of Manipal Institute of Technology, MAHE, Manipal. It comprises a group of undergraduate students studying at Manipal Academy of Higher Education, Manipal who aim to design, conceptualize, fabricate, test and race a single-seater, open-wheel Formula style race car. Since its first competition in 2008, Formula Manipal has come a long way. The team has participated in international competitions like FS Italy, FS UK, FS Germany, FS Czech, FS Austria and national competitions like Formula Bharat. Being one of the highly-rated student projects of Manipal University and one of the best FSAE teams in India, Formula Manipal has scaled several heights on the student racing circuit.

The team has evolved into a multidisciplinary organization with students from all branches of MIT participating in making electric & combustion racecars. The team is also working on the development of a Driverless Racecar. The team of 60+ students working around the clock, often partnering up with Industry-leading companies such as MATLAB, FESTO, Simscale, Ricardo, Altair, Mouser etc. and active interactions with an alumni network comprising of 200+ members across the globe, makes sure that the team members acquire industry-relevant skills with an overall personality development which helps them orient towards a better career path in the future. Apart from these awards and collaborations, the team have also been commended by big names from the world of automotive and racing, such as Claude Rouelle and Michael Royce. Having so much to match up to, the team is full of energy and enthusiasm and embodies the philosophy of our tagline - 'ENGINEERED WITH PASSION.'

The team has published 8 papers in International Journals & 2 papers in Conferences, so far. In addition, the team has also applied for 2 patents titled "Universal Self-Aligning Gear Hobbing Fixture" and "Liquid Specimen Test Container & Method of Testing Liquid".

Achievements in Events:

- The Team is currently engaged in the development of Formula Style Racecars, Combustion & Electric version, for participation in the Formula Student Germany Event during August 2022 and Formula Bharat during January 2023, respectively.

- In the Formula Bharat Virtuals 2022, the team working on the combustion vehicle stood 1st position in the qualifying round of the competition, All India 3rd position in the Design Concept Awards, 3rd position out of 33 teams for the overall combustion category. The team working on the Electrical vehicle stood 1st position in the qualifying round of competition, All India 2nd position in the Design Concept Awards, 2nd position out of 13 teams for the overall electric category.

- In the Formula Bharat Virtuals 2021, the team working on Combustion Vehicle was the winner of Innovative Concept Award in the Business Plan Event, Winner of Best Presentation Delivery in the Business Plan Event, All India 3rd Place in Business Plan Presentation Event, 6th Place out of the 60 competing teams. The team working on Electric Vehicle was the winner of the Ather Energy Software Award for Vehicle Tech and all India 13th Place out of the 23 competing teams.

- FM20 & FM20e, went out to compete in Formula Bharat 2020. The combustion car FM 20 emerged as the Autocross Winners and the team also bagged 2 special awards presented by Ather Energy, Bangalore. Both the cars qualified in Formula Student Austria, Hungary & Czech Republic for the 2020 Season.

- FMX8, qualified and competed in Formula Student Austria. The car bagged 4 awards (1st in Business Presentation, 1st in Acceleration, 2ndin Design Event) in Formula Bharat 2019 along with standing 3rd overall among the 72 teams that participated. For the first time, our Electric car participated in Formula Bharat and stood second in the design event and 3rd overall among 22 teams.

- The season of 2016, FMX6 came 3rd in the Design event at Formula Bharat 2017 after the events at FSG and FS Czech in 2016.

- FMX4, the season of 2014 scaled new heights at Formula Student India-2015 winning seven trophies and making two national records in all, after its show in FSG and FS Czech 2014.

- FMX3 set the tracks blazing at FSG and FS Czech in 2013. With a personal best of 0-75m in 4.51 seconds, the FMX3 was the fastest Indian FSAE car. The team stood 2nd in the cost event at FSG, making Formula Manipal the first Indian team to achieve a podium finish at the competition. It was also the only Indian team to complete Endurance with Electro-pneumatic shifting.

- The FMXI team, which went to Italy in 2011, stood 16th in the cost event.

- In 2010, the FMX team came 4th in the cost event in FS Austria and was the lightest Indian FSAE car that was also given the award of 'Most Motivated Team'.

- 2009 saw the FM09 go to the UK, where the team stood 10th in the cost report.

- In 2008, the FM08 at Italy, received the Farthest travelled team award.

> Formula Manipal Team

1. **Sameer Hate** (Team Manager)
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2. **Shubham** (Team Leader - Combustion Vehicle)
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3. **Nainesh Patel** (Team Leader - Electric Vehicle)
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   For Combustion Team

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   For Electric Team

Links

🌐 https://www.formulamanipal.in/

📘 https://www.facebook.com/FormulaManipal/

💼 https://www.linkedin.com/company/formula-manipal/?viewAsMember=true

📷 https://www.instagram.com/formulamanipal/?hl=en

▶️ https://www.youtube.com/user/formulamanipal96

🐦 https://twitter.com/formulamanipal?lang=en

SolarMobil

SolarMobil founded in 2011, is the official Solar Car team of Manipal Institute of Technology, MAHE, Manipal, which is a team of passionate individuals who focus on the research and development of solar powered electric vehicles. The vision of the Team is to become a leading student center of research and development in the field of green transportation with a focus on Solar Passenger Vehicles in the next five years. Its mission is to fabricate a high-performance cruiser class Solar Electric Vehicle and at the same time focus on practicality and feasibility of the vehicle for daily use, building upon the success of past projects.

The team manufactures and assembles most of the parts required, in-house. Most of their financing comes from industrial collaborators and these funds are completely dedicated to sourcing parts and tools to build the solar vehicles and cover travel expenses to national and international competitions.

Tata Power Solar, CEAT tyres, LPS Bossard, Wilwood, CF Composites, Delfingen, Gigavac and NTF Pvt. Ltd. are some of the esteemed organizations which have supported them throughout their journey. Their work has been covered by major online and offline publications such as BBC Auto, Times of India, The Economic times and NDTV auto among others.

So far, SolarMobil Team has published 2 papers in international journals and 5 papers in conferences.

They have built four prototypes, so far, namely: Freyr-1, SERVe, SM-S1 and SM-S2.

> Team Achievements

- The team is currently putting their efforts into building a single-seater solar racing car in the Electric Solar Vehicle Championship (ESVC) conducted by the Imperial Society of Innovative Engineers, during June 2022, in the rally spanning over 3,000 kms. from Chandigarh to Pune.

- SM-S2 was invited to feature at the Champions of Champions 2019, Vijayawada and Future Mobility Show 2019, Bangalore by ISIE.

- SM-S1 got 3rd place in Anveshan 2017.

- SM-S1 was India's First 4-seater Solar Vehicle.

- SM-S1 won ASME SLDC 2016.

- SERVe won 1st prize under category UJJWAL in IIT-Bombay Tech fest.

- SERVe won QuESTIngenium 2015.

- SERVe won 3rd Prize at CII India Innovation Challenge among 1500 entries.

- SERVe was India's first 2-seater Solar Vehicle.

- Freyr1 won consolation Prize at Manipal University Innovation day.

- Freyr1 made SolarMobil the 3rd ever Indian Solar Car team to fabricate a solar car from scratch.

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Project Manas

Project MANAS, established in 2014, is the official AI and Robotics team of Manipal Institute of Technology, MAHE, Manipal. MANAS as quoted in Sanskrit scriptures means higher intelligence. The project aims to develop an autonomous drive system for vehicles optimized for Indian road conditions. The team is currently working on the development of an unmanned aerial vehicle for participation in the Association for Unmanned Vehicle Systems International (AUVSI) Student UAS (SUAS) Competition to be held at Webster Field, St. Inigoes, Maryland during June 2022.

In 2019, withover 259 applicants across the country from the finest educational institutions and professional start-ups applying for the "Driverless Car Challenge" as a part of Mahindra's Spark the Rise event, Project MANAS qualified several stages of the competition and is proudly among the top 13 teams today which won cash prize of 25 lakhs. The team is the only undergraduate team among the top 13 teams.

As driverless cars gain popularity worldwide, India has a long way to excel in this field. The globalization of this technology has raised questions regarding the safety of the cars on the Indian roads. Tackling problems with smart solutions with diligent work is the key motive of the team. It all began in 2014 when Mr. Kumar Ranjan came across Mahindra's One Million Dollar Challenge in which he wished to participate. The university has been very supportive and has provided a seed fund of 12 lakhs. Mahindra has also provided the Reva e2o on which the technology will be implemented.

Project MANAS was the grand prize winner and won the Lescoe Cup at Intelligent Ground Vehicle Challenge (IGVC) 2019, held in Michigan, USA. Progressing with new ideas and technology, the team aims to build an autonomous UAV and plan to participate in the next iteration on AUVSI SUAS competition at Maryland, USA.

In 2018, in the IGVC event, the team was placed in 8th position worldwide and 2nd in India.

Project Manas team has published 1 paper in international journals and 13 papers in conferences, so far.

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Mars Rover Manipal

Mars Rover Manipal (MRM), established in 2014, is a multi-disciplinary team of engineering undergraduate students of Manipal Institute of Technology, MAHE, Manipal, working on building a next generation Mars Rover that will work alongside humans and assist astronauts in Mars exploration. The team takes part in an annual competition called University Rover Challenge (URC), organized by Mars Society USA, conducted at Mars Desert Research Station, Utah, USA. The team was started by by Atharva Gupta, Saurabh Kumar and Akshay Saxena who developed the rover which successfully participated at URC 2016. The team cleared the Critical Design Review of URC 2016, was in the top 30 teams among 63 from over 12 countries, and the team was invited to the onsite competition held in June 2016. Since then, there has been no looking back.

The team is currently preparing for the event University Rover Challenge 2022 event at USA, to be held during June 2022. The team has been topping the charts in India consecutively for the past 4 years and has maintained under 10 ranking worldwide.

During 2021, the team achieved 3rd position out of 32 teams from 4 countries in the 3rd position out of 32 teams from 4 countries. The team also achieved 4th position out of 32 teams from 10 countries in the European Rover Challenge (ERC) Remote Edition,

jointly organized by The European Space Foundation, PolitechnikaŚwiętokrzyska, UrządMarszałkowski, WojewództwaŚwiętokrzyskiego, SpecjalnaStrefaEkonomicznaStarachowice and The Mars Society.

During 2020, the team achieved various technical milestones. The mechanical subsystem fabricated a custom 5 bar suspension helping the rover perform way better in ditches. The rover also featured a 3D-LiDAR, which was responsible for significantly improving its autonomous traversal capabilities, making it better than manual drive in many cases. The onboard science laboratory made the conduction of experiments faster and more reliable.

Owing to the excellent rover design, the team has cleared the System Acceptance Review of URC 2020 and stood 7th worldwide. URC 2020 was called off, due to the pandemic. During 2020, MRM also took part in Indian Rover Design Challenge (IRDC), organized by the Mars Society South Asia (MSSA), in the inaugural edition of the event, the team stood 1st among 28 teams from 7 different countries. The competition was first of its kind and saw participation from well-renowned universities like University of Michigan, National University of Singapore, Warsaw University of Technology, Indian Institute of Technology, and National Institute of Technology.

During the 2020 COVID-19 Pandemic, the team finished 1st and 3rd in the maiden editions of International Rover Design Challenge (IRDC) and International Mars Hackathon (IMH) respectively, held by MSSA. MRM also attained incredible scores in the e- Yantra Robotics Competition 2020 held by IIT Bombay. The team navigated the adversities brought on by the pandemic and remotely coordinated and completed the design and manufacturing of the rover for URC 2021, achieving some of our highest qualification scores till date.

Owing to its vast experience, MRM organized the Indian Rover Challenge in 2019, held at Manipal Institute of Technology. More than 150 delegates of 10

teams from 3 countries (India, Bangladesh, and Poland) participated in this event.

The team won the inaugural edition of the Indian Rover Challenge (IRC) held in 2018. It was ranked 8th worldwide and 1st in Asia in URC 2017.

The Research subsystem is actively engaged in making a 7 DOF robotic arm employing inverse kinematics. Since its inception in 2014, MRM has published 12 papers in various conferences. This past year, MRM has filed for a patent titled "Multi-Link Suspension System and Method for Off-Road and Extraterrestrial Exploration Vehicles". The team has

undertaken quality research in domains of Deep-fake Detection, Reinforcement Learning, Natural Language processing, Wireless Sensor Networks, Routing protocols and Swarm Robotics, producing 4 quality papers, all of which have been accepted to reputed Q1 journals and have been presented at some of the world's top conferences including NAACL-2021.

MRM currently boasts its largest ever team, with upwards of 50 members from various engineering disciplines working tirelessly to live up to MRM's motto, "Design to Discover".

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RoboManipal

RoboManipal, founded in 2009, is the official robotics team of Manipal Institute of Technology, MAHE, Manipal. Its 45+ odd members are a fusion of robotics passionates from multiple engineering streams. RoboManipal has been home to some of MIT's best and most innovative minds. The team specializes in robotic technology and works in synergy to continuously learn and effectively apply the acquired knowledge to innovate constantly.

It is currently preparing for the event ABU Robocon 2022, to be held during August, 2022. ROS Manipal of RoboManipal- A Team of MIT Manipal bagged Ist place in Vichesta- the ROS simulation competition category under Takshak2021 (organized by RoboISM-IIT ISM Dhanbad), the largest Robotics Fest of India, with 2500+ participants and 400+ teams from across the country, held during 1 October 2021. This event hosted a variety of competitions, workshops, tech talks, and battle nights during the six days.

Every year, RoboManipal represents the college nationally and internationally in various robotics competitions. The students brainstorm, design, construct and test robots based on unique problem statements derived from multiple fields. The team participates in the biggest robotics competition in

the Asia-Pacific region - ABU Robocon, which calls for multiple robots to work in synchrony in a given area to finish a predefined task in a stipulated period of time. World Robot Olympiad (WRO) is another major competition in which the team participates. This competition gives the team an opportunity to develop their creativity and problem solving skills in a fun and engaging way. It also participates in hackathons like the IICDC, a national innovation Hackathon by Texas Instruments.

Over the years, Robomanipal has represented and won laurels, commendations and has always persevered to improve its outlook and success. Apart from competitions, their members are also involved in many personal projects and are constantly incubating their unique ideas. Fracktal Works, Xes Automation, Virid, Strange Matter, etc., are some of the startups that originated in RoboManipal. The team has also diversified its footprint into the field of research-oriented projects.RoboManipal team has published 4 papers in the conferences, so far.

The team is also working on a series of research projects:

1. Laika – 12 DOF Quadruped: The objective of this project is to develop an agile and dynamic Quasi Direct-Drive Quadruped having 12 degrees of freedom. This project will provide a base for beginners to learn about legged robotics(quadruped) without actually manufacturing the bot. This project will be functional for many years, hence providing a platform to test out different types of software.

2. 6 DOF Serial Manipulator: This project aims to create an affordable, open-source manipulator without compromising its capability. The six degrees of freedom support a vast variety of functionalities and ensure rugged stability while maintaining a considerable level of dexterity.

3. BIPED - Project ATOM: For this project, the team has collaborated with companies and developed the world's first humanoid robot, almost entirely developed by undergraduate students, and is India's

first dynamic Humanoid Robot. By applying a unique technique to managing dynamic robots via reinforcement learning, our robot is capable of human-level mobility, agility, and with a short development time of just one year.
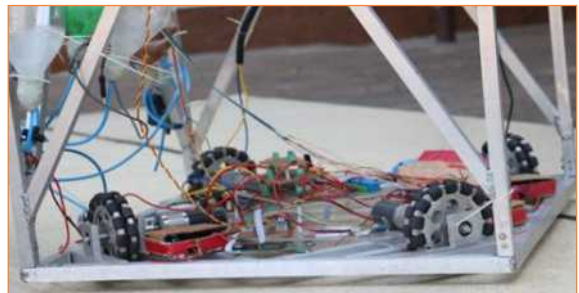
The upcoming projects include:

1. Autonomouscatcher: This project aims to create a system that can catch a projectile as it approaches the ground.

2. Segway: This project is Inspired by the Drift W1 segway boots; the aim is to design it in an economically feasible way with an attempt to maintain the same efficiency.

3. Autoturret Bot: It is a bot designed to have the capabilities to aim at any static or dynamic object and shoot at it with minimal human intervention.

The team has come a long way since its inception, integrating innovative solutions for complex problems with the motto: DREAM - BUILD – ACHIEVE.

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MotoManipal

MotoManipal, founded in 2018, is a team of passionate, selfless, and dedicated students from Manipal Institute of Technology, MAHE, Manipal, engaged in developing an efficient and environment-friendly Electric Superbike. The rise in global temperatures and the depletion of the ozone layer has caused a paradigm shift in global concerns for humanity's future. MotoManipal hopes to do its bit for the environment and is inspired to build a vehicle based on different technologies using power cells and Battery Management Systems, making it a rich tool for R&D in order to help shape the future of clean transport technologies. As a unified team of passionate and enthusiastic young students, we are determined to create a world-class superbike. Moto Manipal is focused on conducting research in various aspects of EVs and aims to participate in national and international competitions. MotoManipal Team has published 3 papers in the conferences, so far.

The team has finished as the Overall Winner and Best Business Plan award in the E-Bike Design Competition, Season-1 competition organized jointly by Sri Ramakrishna Institute of Technology, Coimbatore, and Mechatron Motors, during April 2022. The team is currently building an electric race bike to participate in MotoStudent India-Electric, which is to beheld at the Kari Motor Speedway, Coimbatore in 2022. The team has also registered for the bi-annual Moto Student International-Electric to be held at Aragon, Spain in October 2023 and will be one of the first

Indian teams to participate in this prestigious event.

MotoManipal also took part in the FMAE National Online E-Bike Design Competition, Season-2, in March 2021 and secured the First Position again, thus defending our crown. In October 2021, we achieved a podium position in NOEBDC Season-3, thus maintaining our strong showing in the competition.

Amidst the Coronavirus pandemic, the team participated in the National Online E-Bike Design Competition, Season-1, in September 2020 and was declared Champions. Moto Manipal is one of the few teams to make the most out of the pandemic by winning two back-to-back championships.

MotoManipal participated in the Asian E-Bike Challenge - 2019 in the month of September at Vishakhapatnam, Andhra Pradesh, where 35 teams from all over India participated. MotoManipal secured prizes in the following categories:

- Best Commercial Bike (Winners)
- Best Aesthetics and Ergonomics (Winners)
- Best Innovation (Winners)
- Best Innovative and Cleanest Pit (Winners)
- Engineering Design (Runners Up)
- Business Plan (2nd Runners Up)

We were featured in the esteemed daily - ' The Times of India ' for our exceptional performance. Additionally, renowned newspapers such as "Deccan Herald" and "Prajavani" also featured the team for the same.

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Team Manipal Racing

Team Manipal Racing, established in 2008, is the official Off-road racing team of Manipal Institute of Technology, MAHE, Manipal. Every year our goal is to design, manufacture & test an ATV (all-terrain vehicle) to participate in collegiate competitions organized by institutions like SAE. We apply concepts of engineering design, analysis & manufacturing that we learn in class in the real world.

TMR took up its first project, V1 which participated in SAE BAJA held in Wisconsin USA in 2011. It was the first Indian team to qualify for the competition and one of the two teams representing Asia. From V1 to V12 Team Manipal Racing has come a long way in making efficient and light weight ATV's. Each team in the competition works as a pseudo company and is judged on the basis of various static and dynamic events. Our team is split into subsystems, wherein different members would specialize in different aspects of the ATV, as a matter of shared responsibility. Every season we start off by considering the decisions which worked out well for the previous year, and also the ideas which would need further development. All of our ideas come together after rigorous planning. We start off by designing of all the custom parts for the buggy. After

multiple iterations and analyzing the part virtually for real world situations, we start fabricating. A large chunk of fabrication is done in our well-equipped college workshop itself, including the chassis, using various tools and machines. Over the years as the team collects data and upskills itself we are able to fabricate more of the vehicle inhouse using innovative techniques.

A lot of calculations go into the selection of parameters which govern the design. Taking it a step further, we have used Data Acquisition systems to retrieve data on a live car, to co-relate with our calculations, and validate them. This cycle repeats every year with new ideas and new challenges. It's not just a race on track, these collegiate design competitions are a much bigger race off track in terms of design.

From the year 2022, the team is starting a full electric power ATV team along with their combustion-based ATV, which brings more opportunities and areas of study.In the online event hosted by mBAJA SAE India during 2022, the Combustion team stood 28th overall out of 132 participating teams, while in the eBAJA (Electric) SAE India contest, the Electric team stood 3rd overall position out of 76 teams that participated.The Combustion Team participated in m-BAJA event organized by SAE India at Pithampur, MP during April 2022 and stood 2nd in Manfacturing& 3rd in Endurance category, out of 81 teams participated. The Electric Team is currently focusing on the fabrication of ATV for the physical event of e BAJA to be held during June 2022, at Pithampur.

The Combustion team of Team Manipal Racing V11 officially ended its thirteenth season bagging achievements at online mBAJA (Combustion) SAE India event, April 2021. Out of 150 colleges participating in the event, the team has secured 17th in design evaluation, 12th in manufacturing report presentation, 28th in sales presentation and 21st in CAE presentation. In the e BAJA event, the electric team stood 4th in Preliminary, 20th in Design Evaluation, 5th in Cost, 14th in Manufacturing 9th in

Sales, 16th in Computer Aided Engineering bagging 9th Overall.

Team Manipal Racing's V10 officially ended its twelfth season bagging achievements at BAJA SAE India NATRAX, Pithampur, MP in Jan 2020 where the team has secured 25th in overall statics, 6th in acceleration, 11th in business presentation, and at Enduro Student India, Feb 2020 where the team secured 5th overall, 2nd in business presentation, 3rd overall dynamics. The team also participated in the SAE BAJA International, Louisville, KY, USA in a virtual event and secured 19th in design report evaluation and cost presentation, and 25th overall.

The team has published 2 papers in the international journals, so far. The team has also applied for a patent titled "Dual Stage CVT: Engaging a higher bandwidth of Gear Ratios with minimal weight addition and maximize performance".

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AeroMIT

AeroMIT founded in 2009, takes immense pride in being the official Aeromodelling and Autonomous Aerial Robotics Team of Manipal Institute of Technology, MAHE, Manipal. They design and fabricate UAVs for various research and competitive applications.

The AeroMIT team consists over 30 interdisciplinary undergraduate students whose primary focus is to dive into the world of flight. Over the years, the Team has carried out extensive research and analysis and have had many significant achievements. Some of the projects completed in the past are Autonomous Flights, Vertical Take-Off and Landing aircraft, High Payload Flights, Object & Image Recognition and Blended Wing Body Aircraft.

AeroMIT consists of 5 interdependent subsystems;

1. The Advanced Drone Research does extensive work on various Autonomous Unmanned Aerial Vehicles having numerous real-world applications. The culmination of this research is the implementation of machine learning alongside cutting edge image processing technology.

2. Aerodynamics designs RC aircraft for various mission specifications utilizing the strong fundamentals of aircraft design philosophy and aerodynamic concepts. It is also tasked with documenting the design process of every project the Team undertakes.

3. The Inquisitive and innovative students of the Research and Development subsystem bring their prowess to the table through innovation and fluid thinking. These novel ideas are then implemented to solve real-world problems.

4. Structures and Composites are the highly skilled workforce that builds aircraft designed by Aerodynamics. Materials used in builds include fibre-reinforced polymers like carbon fibre, glass fibre, and hybrid fabrics.

5. Finally, Management ensures the smooth communication, coordination and collaboration of the Team through intelligent and efficient logistics handling. In addition, Management deals with the social media and finances of the Team, while simultaneously acquiring sponsorships from a vast network of industry contacts.

Every year AeroMIT takes part in the SAE Aero Design competition held in the USA. The team has achieved World Rank 2 overall, 1st rank in the Written Design Report, 2nd rank in the Mission Performance and 2nd rank in the Oral Design Presentation at SAE Aero Design 2022 West, a competition organized by SAE International at Van Nuys, California during April 2022.

In the online Aero Design Challenge 2021 organized by SAEISS (Society of Automotive Engineers India Southern Section), the team stood 1st position in the application report, out of total 48 teams participated.In the online SAE Aero Design event by Intl. SAE Aero Design, USA during 2021, the team stood 2nd position in the Oral Design Presentation and 5th position in the Written Design Report.

In the 2020 season, the Team secured 1st in the Technical Presentation with an overall world rank of 4. Prior to this, they have also achieved a worldwide rank of 5 and 7 in the 2019 and 2018 editions respectively. The Team also takes part in other national-level aeromodelling and flying competitions held at Sahyadri College of Engineering and IIT Bombay. Finishing at podium positions in the 2019 and 2020 editions respectively.

SkyRush- Only Aeromodelling and Flying competition held in Manipal, is also carried out by AeroMIT annually. This event saw participants from all over India and required them to build an RC Aircraft befitting to a Problem Statement that was released in advance. AeroMIT continually strives to evolve and achieve the unthinkable through their pioneering work in the field, taking forward a legacy built on the sole objective to Fly High.

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Parikshit

Parikshit Student Satellite Team was formed in 2010 with 40 student members from across the departments of Manipal Institute of Technology, MAHE, Manipal. Their aim was to explore the fields of space science and work on experiments that could be performed in space. It was a brave thought, an ambitious venture, and a daunting task, but the team forged ahead doggedly. Nanosatellite, or nanosat, is a relatively recent term used to describe artificial satellites with a mass of 1 to 10 Kgs. The term "nanosatellites" was introduced by NASA at around 2004. Nanosatellites are appealing because of their small size which makes them affordable and opens-up the potential for a swarm of satellites. From a military perspective, nanosatellites may be useful due to the redundancy it could offer.

Parikshit's satellite has two payloads. The primary payload is a thermal camera. A regular camera works in visible light; a thermal camera creates images using infrared radiations in a similar fashion. The second payload in the satellite is an electrodynamic tether. A tether is basically a long conducting wire which operates on electromagnetic principles. Current in the reverse direction will lead to the satellite de-orbiting. The team is divided into seven subsystems – Attitude Determination and Control,

Communication and ground station subsystem, Electrical Power Subsystem, On-board Data Handling subsystem, Payload, Structures, Thermals and Mechanisms and Management

The major domains of research undertaken by the project are in-house design and testing of all onboard mechanisms, Attitude Determination and control algorithms of satellite, Power management algorithms, Thermal control of sensitive components, sensor technology.

MIT student AdheeshBoratkar represented the University for testing Parikshit's Tether Deployment System in a zero-gravity parabolic flight at NASA. The team got a total of four flights of 30 parabolas in Zero-G to experiment with the payload; deployer testing is a crucial phase, and to do it at NASA was a great achievement for the team. At present the team is about to go for environment test and qualification model review. After the successful completion of the same, is likely to hand over the final flight model to ISRO soon. Parikshit makes it easy to believe that Manipal students not only aim for the sky but are just as capable of reaching it.

Parikshit Team has published 52 papers in international conferences, so far.

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thrustMIT

thrustMIT Team, established in 2016, is Asia's top student-run rocketry team in Manipal Institute of Technology, MAHE, Manipal, that builds sounding rockets to promote the passion and knowledge of high-powered rocketry in India. We aim to participate in the largest rocketry competition in the world, Spaceport America cup, held at Spaceport, New Mexico every year, which happens to be the biggest platform in the world for UG and PG students to showcase their Rocket Engineering skills. The competition also sees active participation from major aerospace companies.

From day one, the Team is doing what it does best, working to promote, spread, foster, and bring about technological innovations in the ingenious field of rocketry. The Team has come a long way since its inception and is continuously working towards perfection. What initially started as a group of 6 amateur rocket enthusiasts has now grown into a well-oiled team of more than 40+ Under-Graduate students working on continuous research and development of our current prototypes. We also engage in research and development and aim to obtain patents and publish scientific papers on various topics related to rocketry and are on the verge of creating the most powerful sounding rocket motor in India.

The Spaceport America Cup 2018 saw the debut participation of thrustMIT. The Team won the Spot award for the design of the rocket. We participated in the 10000 ft. category and used a COTS (Commercial of the Shelf) rocket motor. thrustMIT launched its first sounding rocket Vyom, (standing 8ft tall and weighing 26kg), at the competition in 2018. The rocket, which was entirely made in-house, reached an apogee of 4000 feet, moreover, was recovered successfully.

The team is currently engaged in the preparations for participation in Spaceport America Cup 2022, to be held during July, 2022.In 2021, the team participated in the Virtual Spaceport America Cup 2021 with the rocket Phoenix and stood 7th position out of 36 teams participated in the COTS category. The thrustMIT team has published 2 papers in the international journals, so far.

In 2019, our rocket Arya (8.2 ft tall and weighing 24 kgs) performed in the 10000 ft. COTS category and we were able to secure a spot award for Team Professionalism. Arya carried a functional payload used for testing vibration and damping effects of a non-Newtonian fluid using a MEMS accelerometer.

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Robotics and Circuits

Robotics and Circuits, popularly called as RnC Team, founded in 2010 is focused towards research and development in the field of robotics in Manipal Institute of Technology, MAHE, Manipal. With an ardour for teaching and a penchant for breathing life into novel ideas, the term "Engineering Creativity" is an apt description of the team that looks to make strides in robotics research. The members of the team stride to integrate their classroom knowledge with their creativity to make projects, in the field of robotics, which would leave an impact on the society.

Our team has a threefold vision EXPERIENCE, EXPLORE & INNOVATE. We ensure hands on experience in robotics and its allied fields to complement our course work and bridge the gap between imagination and innovation.

Our team has identified two competitions 'Virtual RobotX Challenge' and 'RoboCup Rescue' as the International Competitions we shall work continue to work towards in the long run. The team shall also focus on acing 'Micromouse Challenge' and 'E-Yantra Robotics Competition' by IIT Bombay. Being the Research and Development team of MIT, our aim is to develop and build project ideas that could be future market opportunities. The field of 'Automation', more precisely, 'Home Automation' has been identified as the research domain. We also consider participating in Hackathons around the country to maintain regularity and gain valuable experience. We hold

internal and external workshops round the year to educate our fellow students and introduce them to the world of robotics and allied fields.

Vedanth is RnC's annual technical exhibition and innovation contest where our members present their technical acumen and the project which were made all around the year, the contest is open to engineering students all over the nation. In the recent year, at Vedanth 9.0, we saw some great projects by our students, some of which are focused to solve major problems of the society. We displayed innovations like "Technofarm", a robot to help farmers analyse their crop quality, while "Cerebro", the mind-controlled wheelchair, designed to help the paralysed. The winning innovation of Vedanth 9.0 was another RNC project, the "Friction Profile Generator" for its highly accuracy results.

Despite covid, RnC successfully organized Vedanth 10.0 online where teams from across the country participated virtually. We displayed innovations like "University Companion Bot", an app to help students and teachers with attendance and other related work, while "Non-Touch Biometric App" was used to mark student's attendance in hostels with Facial Recognition. The winning innovation of Vedanth10.0 was another RNC project, the "University Companion Bot" for its highly accuracy results.

Currently, the team is engaged in training their junior team members, for the online event "Virtual Robotics", to be held during the next season.

In 2021, the technical fest of MIT – 'TechTatva', didn't happen. Nonetheless, the team made three projects for the same and uploaded simulations for Vedanth 11.0 on our website. "Automated Luggage Handling System", "ACE Drone" and "Micro-disinfecting Bot" were the three project ideas which stand true to our purpose of developing future market opportunities. 'Automated Luggage Handling System' is a revolutionary idea which is completely autonomous and reduces the time taken for the luggage to arrive, at the pick-up point, significantly. It also reduces the

chances of any belongings being damaged or misplaced. 'ACE Drone' is a terrain mapping quadcopter using SLAM technique and traversing in any environment. 'Micro-disinfecting Bot' is semi-autonomous robot that will spray repellents or pesticides or disinfectants in the easily inaccessible areas of a room or a 4-walled structure. The team continues to build on these ideas and conduct advance research on the same.Robotics and Circuits has been featured in various media platforms both online and offline like Times of India, for the projects done by our members.

The team has published 1 paper in the international journal, so far.

> RnC's team

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Project Vision

Project Vision is the first and only VR/AR student project in Manipal Institute of Technology, MAHE, Manipal. Our project deals with creating a wide variety of VR/AR apps for multiple platforms including but not restricted to the Oculus Quest 2, Mobile app development

Established in 2018, what was once started by two friends as a simple endeavor to understand and learn about this new technology, Vision is now a team of 30 members working on developing a Virtual Positioning System by integrating Machine learning and Augmented Reality.

The ultimate aim of the team is to develop its very own AR headset (something like the HoloLens or the Google Glass) that has a basic operating system of its own and apps that are powered by custom hardware designed by the students.

The team participated in the International AR VR online competition during April 2022, and the results are awaited. The team members have participated in numerous hackathons, one such virtual event was "Hack of Pi", where we have managed to reach the quarter finals with our app EduAR. It is an AR app for visualizing complex educational concepts by projecting 3D models in AR

We at Vision know, the pandemic has disrupted lives of numerous people and has impacted them in unimaginable ways, keeping that in mind, the student-run project has been working on such projects, which impact the lives of people in positive ways and help fight the pandemic from their home

The team is currently working towards participation in a Swedish based VR competition where they will build a nature experience for the OCULUS QUEST 2. With this project we plan to give the user an experience of being amidst the beauty of nature, when he/she puts on the headset at home. This would help improve mental health in times when we can't really get out of our house due to ongoing pandemic.

The team members are planning to participate in Image Processing competitions and Unity creator challenges from next year after developing the VR app.

The team has published 2 papers in the conferences, so far.

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R.U.G.V.E.D

R.U.G.V.E.D. Systems stand for Remote Unmanned Ground Vehicular Electronic Defense Systems, founded in 2017, is a multi-disciplinary team of highly motivated undergraduate students of Manipal Institute of Technology, M.A.H.E., Manipal. focused on constructing various robots for military defence and law enforcement applications powered by multiple cutting edge technologies. Striving for excellence in this field, we conduct research on the deployment of robots for intelligence gathering, ordnance disposal, logistics, and search and rescue as well as combat operations. Our primary competition is the Annual Intelligent Ground Vehicle Competition (I.G.V.C.) held at Oakland University, Michigan, U.S.A, and We have secured 8th position worldwide in the design challenge of I.G.V.C., 2018.

  Since the team's formation, the team has consistently performed spectacularly by winning a multitude of event such as the National level Tata Pioneer's Makerthon - UAV Challenge at the Techfest

2017 I.I.T. Bombay, designing an Auto-Leveling UAV Launchpad and again in 2018. Members from the team won 2nd place in G.M.E.Ford Hackathon, 2020. Prominent companies such as Nvidia, National Instruments, Sick, SBG Systems, Ansys, etc have contributed to the team by providing sponsorships. Currently, the team is working on their flagship project, W.A.L.R.U.S, an autonomous reconnaissance vehicle that can traverse on land and houses a detachable drone for aerial surveillance which can scout for enemy targets and topology observation to generate a detailed map to get a lay of the land. They are currently conducting research in the fields of Artificial Intelligence, Electric Vehicles, renewable energy, agriculture and will publish several papers and gain patents in the upcoming months.

Rugved Systems Team has published 1 paper in international journals and 3 papers in conferences, so far.

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Manipal BioMachines

Manipal BioMachines, founded in 2020, is the official synthetic biology and genetic engineering student project of Manipal Institute of Technology, MAHE, Manipal. The team strives to address pressing global issues by designing and building long term, efficient and environment-friendly solutions using their knowledge in the field of bioengineering.

Being the only project that explores the applications of engineering and biology together, Manipal BioMachines allows students to innovate alternate solutions to problems that could not be solved by conventional engineering or biological techniques.

Vision of the team is to make the world a cleaner, greener and a safer place to live in.Compete in the annually held iGEM (International Genetically Engineered Machine) competition amongst other Hackathons/Innovation Fests and other synthetic biology competitions to give a platform to our ideas.

Mission of the team is to selecta new problem statement each year and in efforts to bring out new and innovative solutions for the betterment of the society.

The team is currently engaged in preparations for iGEM Indian League online event to be held during August 2022 and iGEMInternational event during November 2022.

The team of 2021 was also placed in the top 10 teams in the Manipal Biotech haackathon'21.The team of 2021 participated in iGEM and was one among 90 iGEM teams awarded $2500 grant. Out of 350+ Teams participated that participated the team was one among the Bronze Medal Winners in the Undergraduate Category.

For 2021 – Our aim was to make an overall sustainable alternative to traditional chemical pesticides that is modular in nature through synthetic biology and genetic engineering.

Our project for the year was titled Cell-Tinel. We worked together in the field of synthetic biology and genetic engineering to find a way to curb the problem of stem borers in rice by using a novel approach!

This problem is a huge one because it can't be solved by traditional means like pesticides, and would

require a more sustainable approach that can avoid genetically modifying the plant. If we succeed, we will be able to improve rice yields significantly and aid the backbone of our primarily agrarian country: our farmers.

The team intends to use a biopesticide delivery system that involves endophytes- the naturally occurring microbes that live in synergy within plants without harming them. Our target bacterium is Bacillus subtilis, which shall be engineered to produce aproteinaceous toxin, commonly known as a cry toxin. The main aim is to prime the plant's immune system against a wide spectrum of pathogenic activity and employ a novel mechanism for the bacteria to produce the toxin only upon ingestion by the pest. The impact of this approach would immensely benefit an agrarian economy like ours and those of countries plagued by the pest, thereby improving farmer lives.

For 2020 - Our aim was to genetically engineer a bacterium that will be capable of converting methylmercury and other organic mercury compounds into elemental mercury in conditions prevalent inside the human gut.Hence provide a proof of concept for the use of such engineered bacteria for probiotic applications.In the Virtual Giant Jamboree Event, by iGEM 2020, the team was one among the Gold Medal Winner in Undergraduate Category.

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loopMIT

loopMIT, established in 2019, is a dedicated team of undergraduate students of Manipal Institute of Technology, MAHE, Manipal, from various fields of engineering working on designing, developing and building a sub scale prototype transport vehicle known as the Hyperloop Pod. The primary objective of the team is to partake in the "SpaceX Hyperloop pod design competition", where a number of student teams from across the world participate to demonstrate the technical feasibility of various aspects of the Hyperloop concept. We aim to be the first Asian team to enter the competition with a levitating pod.

A Hyperloop is a mode of passenger and freight transportation, used to describe an open-source vacuum tube train design released by a joint team from Tesla and SpaceX. Hyperloop is a sealed tube orsystem of tubes through which a pod may travel free of air resistance or friction conveying people or objects at high speeds efficiently, drastically reducing travel times over medium-range distances.

The concept was unveiled in 2013 by Elon Musk-founder of SpaceX and Tesla, in which he proposed a "fifth mode of transport" comprised of pressurized capsules riding on an air cushion driven by linear induction motors and air compressors. In 2015, a design competition was announced for teams to build Hyperloop pods to operate on a SpaceX sponsored track. If successful, this would revolutionize the field of transportation across the world. The team has published 4 papers in the international journals, so far.

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Project AUV

Established in 2019, Project AUV Manipal, Manipal Institute of Technology, MAHE Manipal is the official student team consisting of group of individuals brought together having a common interest in developing the Autonomous Under water Vehicle (AUV).

We aim to conceptualize, design and fabricate Remotely Operated Vehicles (ROVs) and Autonomous Underwater Vehicles (AUVs) for both research and competitive purposes.

AUVs are self-guiding and self-powered vehicles, making them attractive options for industries and fields of study that require venturing into depths not accessible to humans, such as ocean-based research. They can be configured with different sensors and communication systems to provide real-time information back on land or to a ship over the horizon. The challenge remains to make AUVs intelligent enough to perform their tasks, identify problems, and adapt to different situations.

Our prime focus in terms of research is development of autonomous vehicles and systems for defense applications, marine propulsion systems, usage of navigation systems for digital twinning, applications of metal matrix composites, under water photogrammetry and object modelling using cameras.

Currently, the team is engaged in the preparations for the flagship competition Robonation'sRoboSub 23, an international underwater robotics competition held in the United States of America. The problem statement given encourages us to further our research effort in the field while inculcating industry-level practices and professionalism. The behaviors expected of these experimental AUVs mimic those of real-world systems, currently deployed around the world for underwater exploration, seafloor mapping and sonar localization, amongst many others. Using the state-of-the-art tools and technology, the various subsystems have been working on the design and fabrication of our AUV and aim to have the first
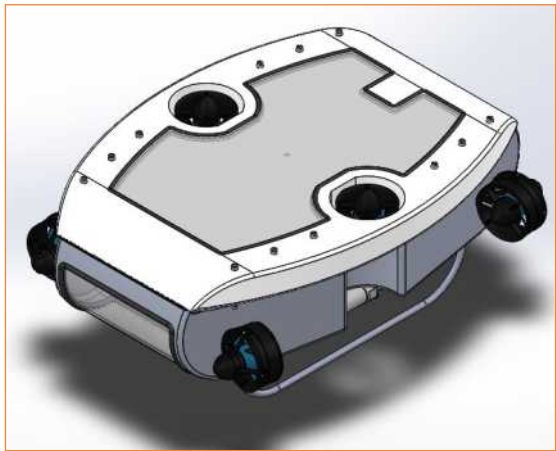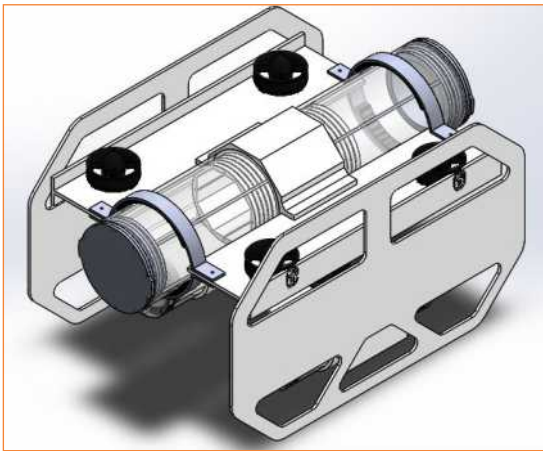
iteration manufactured by the end of 2022, in preparation for RoboSub 2023.

We also participate in SAUVC, a primary underwater robotics competition held in Singapore.

The team is divided into 4 sub-systems, namely – Mechanical, Electronics and Electrical, Artificial Intelligence and Coding, and Management.

In a short span of time, the team has seen tremendous growth in terms of knowledge acquired and imparted, and further aims to put this knowledge to good use and strive for greater heights in the years to come.

In the Flipkart Grid Challenge held during 2022, the team stood one among 50 out 1000 teams qualified for 2nd round.

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Team Combat Robotics

Team Combat Robotics, founded in 2018, is a team of enthusiast undergraduate students from different factions of engineering in Manipal Institute of Technology, MAHE, MAHE, working on building efficient combat capable robots. TCR has built the first horizontal bar spinning robot in southern India. Working with different sub-system, TCR manages to design, built and put together mechanical and electrical aspects of the bot in its own workshops. The vision of the team is to build the best bots, cause no unnecessary harm and to compete in various national and international robotics events held in India. Its mission is to be one of the technical student projects to design, fabricate and manufacture innovative combat robots and at the same time focus on the practicality and feasibility of the bots in the combat arena.

TCR has built bots for 3 event catalogs: RoboWars, RoboSoccer and RoboSumo, and participated in various events annually.

- The team participated in BITS Pilani Quark 2019 and made it to the quarter finals in the RoboSoccer event.
- In the 2019 MIT TechTatva the team reached semi semi-finals.

- The team has also participated in IIT Bombay Tech Fest.
- The team also participates in various local college tech fests around Manipal.

Builds:

TCR has managed to build several arena ready robots, that are strategically built with defensive and offensive features to ensure a thrilling match in the arena. The catalogue includes robots for:

RoboWars: Buffed and equipped with weapons, these metal piercing giants are designed sturdy for pure destruction and built to take a beating.

- Trigger: 45kg bot, equipped with a powerful drum weapon and an anti-wedge design, capable of lifting the opponent bot and feeding it to the drum spinner.
- Alpha Raptor: 40kg bot, equipped with a horizontal spinner weapon capable of delivering greater impact force.
- Viper: 30kg bot, has a zero-ground clearance knife edged wedge design.
- Aura: 15kg bot, equipped with a drum weapon powered by a propeller drive. It is the first wireless operable bot by TCR.
- Shadow: 15kg bot, equipped with a single tooth vertical spinner, and operable wireless through a RF controller.
- RoboSoccer: Sleek and light bots, designed for swift movements to tackle the opponent, control the ball and score a goal.
- Dark: 5kg bot, with a kick mechanism and operated wireless through a RF controller.
- Aryan: 5 kg bot, with a catch mechanism and operated wireless through a RF controller.
- RoboSumo: Tactical bots, built to hold one's ground and strategically through the opponent off balance.
- Nitro: 5kg bot, with a push mechanism and operated wireless through a RF controller.

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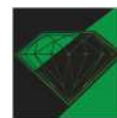
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Cryptonite

Cryptonite, founded in 2018 is the official ethical hacking and cybersecurity team of Manipal Institute of Technology, MAHE, Manipal. We focus our work in the fields of attack-defense, cryptography, cyber forensics, reverse engineering, binary exploitation and web exploitation. As a team, we strive to develop a keen interest in cybersecurity and to provide a conducive environment in order to hone the necessary skills required not only to compete in CTF (Capture the Flag) competitions with teams from all over the world throughout the year but also to carry out research.

We follow a three-stage development process for every recruit, the initial stage being an in-depth understanding of traditional methods and techniques, followed by their application and finally, we encourage them to incorporate other fields of science with cybersecurity.

The team is planning to participate in multiple national & international CTF events, in the near future. Cryptonite secured a national rank of 12 across all categories and 7 amongst academic teams on CTFtime for the year 2021. Some of our achievements which contributed to this ranking are mentioned below.

- Secured the 3rd place in Loki CTF 2021
- Amongst the top 15 teams from India which qualified for CSAW'21 Finals and went on to secure the 13th position in India in the finals.
- Placed 24th in the qualification round of Inctf and went on to secure the 31st rank in the finals.
- Placed 2nd in India in ASIS CTF Finals 2021
- The team hosted niteCTF– A 48hrs CTF competition which was rated 22.30/25 on CTFtime
- niteCTF is a flagship event of Cryptonite which saw 1200+ participants from 43 countries including 27 university teams. Teams from UIUC, UD, Delaware, and FIT, Florida were also in attendance.

Team has published 1 paper in the international journal and 8 papers in the conferences, so far.

Our Reverse Engineering Head, SohomDatta was rewarded 3133.70 USD/(~2 lakh INR) for identifying a bug in one of Google's front-end open source libraries as part of Google's Vulnerability Rewards Program. The Google Vulnerability Rewards program is a global initiative by Google to reward external contributors and security researchers that help in keeping their users safe.

Research in Cryptonite mainly focuses on cybersecurity and machine learning. Domains include privacy-preserving machine learning, Federated Learning, selective encryption and differential privacy are also being worked on.

Cyberbullying has become one of the most pressing concerns for online platforms, putting individuals at risk and raising severe public concerns. Recent studies have shown a significant correlation between declining mental health and cyberbullying. Automated detection offers a great solution to this problem; however, the sensitivity of client data becomes a concern during data collection, and as such, access may be restricted. This paper demonstrates FedBully, a federated approach for cyberbullying detection using sentence encoders for feature extraction. This paper introduces concepts of secure aggregation to ensure client privacy in a cross-device learning system.

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Dronaid

Dronaid, founded in 2017, is a one-of-a-kind student project initiated in Manipal Institute of Technology, MAHE, Manipal with an effort to make healthcare more accessible and hassle- free in India by means of incorporating artificial intelligence (AI), Unmanned Aerial Vehicles (UAV) and app development in building a network of healthcare systems and bring about practical clinical applications in accidents and emergency services at the community level.

In recent years, use of Unmanned Arial Vehicles (UAV) have shown transformative results in the field of farming, defense and energy production. Recognizing this development and in efforts to take it a step further, Project Dronaid was initiated, in a unique collaboration between the students of Manipal Institute of Technology and Kasturba Medical College.

The team is dedicated towards building an "Autonomous Drone System" (using an Artificial Intelligence (AI) configuration/interface) that not only navigates on its own but also can make important in-flight decisions like determining shortest route and terrain assistance. These independent drones can then be integrated into what we call a "drone network".

Applications:

- As a transport vehicle: To carry small loads like oxygen cylinders, drug kit with essential drugs, blood and IV fluids in appropriate containers to satellite areas.
- First aid kit with user manual or onboard instructions via webcam.
- Tourniquets to stop bleeding or inflatable splints to support fractured limbs, cervical immobilizers for trauma patients.
- Monitoring and procurement of water or air samples, for research in the field of public health.

What makes this project so unique?

- There is active research being carried out worldwide to integrate Artificial Intelligence and medicine and success of Dronaid will be a significant milestone in the same.
- Searching for solutions in the field of public health, which could boost up the status of the existing National Health Policies in practice, saving precious labor and financial resources.
- Monitoring of the trends of various seasonal diseases could be carried out more efficiently, hence enabling a prompt and effective administration of preventive public health measures.
- An overall improvement in the healthcare services provided

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S.W.A.R.M ROBOTICS

S.W.A.R.M Robotics, established in 2017, the team in Manipal Institute of Technology, MAHE, Manipal, is to make a collective of multiple autonomous entities which are virtually independent of each other but interact and communicate with each other to reach a common goal, which may be simple tasks like mapping an unknown environment or complex tasks like performing search and rescue tasks in high risk environments, hereby reducing the risk to human life.

Currently the team is working on advanced sensors and drivers being used by the team as a test bench for research in the field of autonomous swarms with a focus to make them more efficient and faster.

The team has published 2 papers in the conferences, so far.

> S.W.A.R.M ROBOTICS Team

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New Facilities

MIT Food Court - 2

Considering the increasing in number of students in campus, second Food Court construction has already started nearer to hostel blocks. Area: 32,270 SFT; capacity 1500 students with a project cost of INR 9 Crores.

MIT Ladies Hostel Block

With the increase in the number of girl students in campus, new hostel block for ladies has been constructed.

Area: 1,00,890 SFT,

Capacity: 500 students

Estimated Cost: INR 27 Crores

Student Plaza

Student Plaza (near Kamath Circle, MIT) is a place earmarked for cultural and extracurricular activities. It is expected to take the vibrant life of MIT to the next level with amenities such as the amphitheater and the student corner. Area: 26,000 SFT. with a project cost of INR 7 Crores.

New Facilities

MIT-KEF R & D Center

This is with support from one of MIT's distinguished alumni, Mr Faizal Kottikollon. In a move that will work towards providing a cutting edge research & development facility to upcoming civil engineering and architecture students, MIT has tied up with KEF Holdings, a Singapore-based multinational holding company that specializes in innovative offsite construction technology, to set up a state of the art R&D Center.

The R&D Center will provide budding engineers with practical know-how about offsite construction and would enrich the research and academic curriculum. Area: 28,000 SFT with a project cost of INR 16 crores, with an equal contribution from both partners. Expected to be ready by May 2019.

Electric Bicycles

MIT, MANIPAL has formally launched Electric bicycles on 30.04.2022. Honourable Vice-Chancellor of MAHE was the chief guest of this official launch. CEO of Indeanta, Faculty of MIT and MIT student's council members were present during this event. MIT has made MoU with Indeanta E-mobility private limited for providing electric bicycles and buggy at MIT campus. As per MoU Indeanta will provide: Vehicles, operator awareness, Software and cloud service. The operation of these buggies and bicycles are in operation from 2.05.2022. Students have expressed their happiness towards this green initiation

MIT TechShop

To encourage experiential learning, a new facility is proposed to house student major projects (like, Formula car, all- terrain vehicle, etc). This will also host industry competency center in the area of automobile engineering. Area: 91,000 SFT, cost: INR 30 Crores.

Student Welfare

The office of the Student Welfare is set up to look after the overall welfare of the students at MIT. With over 9500 students on the rolls at any given time, at MIT, it is imperative to have a support group to look after their interests both inside and outside the classroom.

The activities of the department cover wide ranging areas such as counselling, guidance and general wellness. It is constantly evolving ways to support and foster students' interest in the campus. A number of activities are held every year to ensure that the growth of students is not limited to class rooms alone.

The major activities of the office of the Associate Director (Student Welfare) are the following:
- Facilitate need based counselling to the students
- Mentoring and monitoring of students through Teacher-Guardian Scheme
- Motivating and enhancing the student achievements at individual and group level
- Conduct Technical, Cultural & Sports fests of the college
- Formation of Student Council and Publishing College Year book
- Encouraging and facilitating Student activities and events through students clubs.

Note:
There are three kinds of student clubs – Technical, Non-technical and Student Chapters. Membership in the clubs will help students to gain invaluable skills related to leadership and personal growth.

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Student Clubs / Chapters

> Technical Clubs

- ACM Manipal Student Chapter
- ACM-W Manipal Student Chapter
- AIESEC in M.A.H.E
- American Society of Civil Engineers, Manipal Chapter
- Apple Developer's Group
- American Society of Mechanical Engineers, Manipal Chapter
- Biomedical Engineering Society of India, Manipal Chapter
- Developer Student Clubs
- Economics and Finance Society of Manipal
- IAESTE, LC Manipal
- IE Aerospace Students' Chapter Manipal
- IEBT (Institute of Engineers - Biotechnology, Manipal Chapter)
- I.E. CIVIL
- IECSE
- IE E&E Students' Chapter Manipal
- IE-E&C The Manipal Chapter
- IEEE Student Branch Manipal
- IE Mechanical Students' Chapter Manipal
- IE Mechatronics Students' Chapter, Manipal
- Indian Institute of Chemical Engineers
- International Organization of Software Developers - Manipal
- International Society of Automation (ISA), Manipal Institute of Technology Student Section
- Indian Society for Technical Education Student's Chapter
- LAKSHYA
- Linux Users' Group, Manipal
- Manipal Information Security Team
- MIT Gaming Club
- Regex
- Student Entrepreneurship Cell
- Society of Automotive Engineers - India | Manipal
- Teach Code for Good
- The ASTRONOMY Club
- Open Source Technology Forum
- Manipal Open Source Society
- LeanIn Manipal

- Bioverse
- Enactus
- IEEE EMBS (Engineering in Medicine and Biology Science) - Manipal Chapter
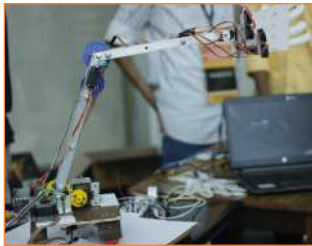- Research Society MIT

> Non Technical Clubs

- AAINA DRAMATICS
- ADA DRAMATICS
- THE ADVENTURER
- ARTPOD
- Blank 101
- Behind the Scenes
- BLITZKRIEG DANCE CREW INDIA
- CHORDS AND CO.
- CurioCity
- ECOLOGICAL CONSERVATION & HABITAT RESTORATION ORGANISATION
- EK SANGHARSH
- Evolve
- Glam&Glitz
- Goonj
- HUMAN POWERED ENDEAVOURS
- LDQ
- Leaders of Tomorrow
- Manga and Anime Club
- MiT Live
- Mudra
- MUSIC AND FINE ARTS CLUB (M.A.F.I.A.)
- NAQAAB FILMMAKING
- NUDI
- THE PSYCH CLUB, MANIPAL
- REDX
- ROTARACT CLUB OF MANIPAL
- SHOWSTOPPERS
- THE PHOTOGRAPHY CLUB MANIPAL
- THE THINK TANK
- YES!+ CLUB, MANIPAL
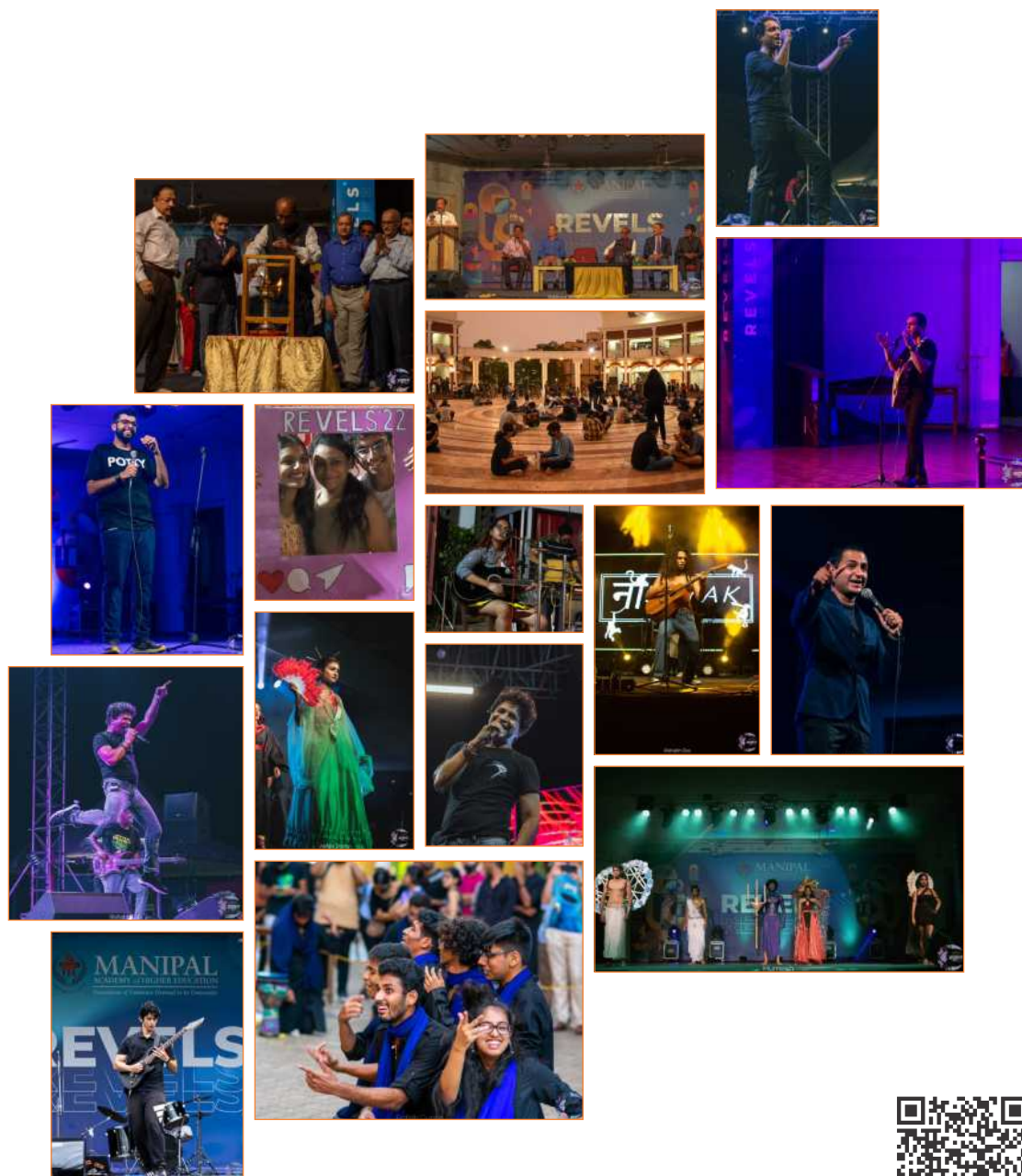- 180 DEGREE CONSULTING
- BURNING ICE

Students' Technical Fest - TECHTATVA

Students' Cultural Fest - REVELS

Students' Sports Fest - REVELS CUP

MANIPAL
ACADEMY *of* HIGHER EDUCATION
(Institution of Eminence Deemed to be University)

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