

PLACEMENT BROCHURE

2022-2023



INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI

ABOUT THE INSTITUTE

IIT Tirupati is one among the five 3rd generation IITs announced by the Government of India in 2014, which accepted the first group of undergraduate students in the four primary engineering specialties in August 2015. Today IIT Tirupati offers 5 B.Tech programs, 9 M.Tech programs, 3 M.Sc programs and PhD programs in all engineering, science and liberal arts branches. The Institute has experienced considerable growth since its founding in 2014 in terms of faculty recruitment, the launch of new academic programmes, research activities, and infrastructural expansion. IIT Tirupati has always moved forward with Research and Development as its primary motive. The student life at IITT offers a plethora of opportunities to choose from with incredible guidance and mentoring of a young & talented faculty group. IIT T has quickly established a top-notch research infrastructure with its Transit campus being operational since 2018 which was awarded the GRIHA Council Award and won the First Prize in the Green Buildings category of the 2018 HUDCO Design Awards. With a vibrant campus, IIT Tirupati offers a proper balance of academic, research & extracurricular activities for students to nurture themselves into great individuals both professionally and personally.

भारतीय प्रौद्योगिकी संस्थान तिरुपति



LEGEND:

- 01A MAIN GATE COMPLEX
- 01B NORTH GATE
- 01C SOUTH GATE
- 02A ADMINISTRATIVE BLOCK
- 02B ENGINEERING UNIT OFFICE
- 03A DEPARTMENT BLOCK-01
- 03B DEPARTMENT BLOCK-02
- 03C DEPARTMENT BLOCK (FUTURE)
- 04A LECTURE HALL COMPLEX-01
- 04B LECTURE HALL COMPLEX-02
- 04C LECTURE HALL COMPLEX-03
- 05 MULTIPURPOSE BLOCK
- 06 CENTRAL INSTRUMENTATION AND FACILITY
- 07 AUDITORIUM
- 08 LIBRARY
- 09 WORKSHOP
- 10 SCIENCE, MATHEMATICS & HUMANITIES DEPT.
- 11 HOSTEL & DINING BLOCK
- 11A BOY'S HOSTEL BLOCK
- 11B GIRL'S HOSTEL BLOCK
- 11C DINING BLOCK
- 11D STUDENTS UTILITY BLOCK
- 12 VISITOR'S HOSTEL
- 13 DIRECTOR RESIDENCE
- 14 FACULTY HOUSING
- 14B TYPE - B (HOUSING)
- 14C TYPE - C (HOUSING)
- 14D TYPE - D (HOUSING)
- 14E TYPE - E (HOUSING)
- 14F TYPE - F (HOUSING)
- 15 OPEN AIR THEATER
- 16 INDOOR GAMES FACILITY
- 17 FOOT BALL GROUND
- 18 CRICKET FIELD
- 19 HOCKEY GROUND
- 20 COMMUNITY CENTER
- 21 CRECHE
- 22 SCHOOL (K.V.)
- 23 POST OFFICE, SHOPPING, BANK
- 24 HEALTH CENTER
- 25 BUS YARD & WORKSHOP
- 26 EXISTING ORCHARD (MANGO)
- 27 WATER BODY / POND
- 28 SOLID WASTE
- 29 RAW & DOMESTIC WATER STORAGE WITH PUMP ROOM
- 30 STP
- 31 TRANSIT CAMPUS
- 32 UNDERPASS / CONNECTIVITY
- 33A TREATED WATER O.H. TANK
- 33B FLUSHING WATER O.H. TANK
- 34 ESS

MASTER PLAN

LEGEND:

- PHASE-1 STAGE-1A
- PHASE-1 STAGE-1B
- FUTURE

KEY PLAN

POCKET C
12 Acre

POCKET A
432.5 Acre

POCKET B
19.5 Acre



DIRECTOR'S MESSAGE

IIT Tirupati, since its inception in 2015 as one of the six third-generation IITs, has been keen on creating an appropriate and state-of-the-art academic and research infrastructure. The Institute currently offers five bachelor's degree (B. Tech) programs in various engineering disciplines, namely Civil, Chemical, Computer Science, Electrical, and Mechanical. Currently, there are four master's degree (M.Tech) Programmes offered by Civil Engineering, three in Electrical, and one each in Computer Science and Mechanical Engineering departments. MS and PhD programmes are offered in all the disciplines. In addition, M. Sc. programs are offered in Physics, Chemistry and Mathematics & Statistics. Further, a Masters's degree in Public Policy is being offered from 2022.

In the year 2015, the Government of Andhra Pradesh has given 548 acres of land for setting up the permanent campus. The construction of stage 1 of the permanent campus which caters to 2,500 students, 250 faculty members, and 275 staff members has been completed. Facilities including laboratories, classrooms, hostels, two departmental buildings, and a sports complex are fully operational from July 2022.

Along with young and dynamic faculty members who have joined after completing their doctoral programs and postdoctoral training from reputed Universities/Institutes across the world, IIT Tirupati has several senior faculty from other established IITs. Being energetic they are setting up world-class research facilities and programs at IIT Tirupati. This has allowed the students to get involved in these cutting-edge research initiatives. Students are also actively engaged in research opportunities inside and outside IIT Tirupati. As part of their curriculum, the graduating bachelor's degree completed their summer internship in renowned companies/ universities. This internship experience has provided them with an opportunity to connect the classroom knowledge with its real-world applications.



The Institute also provides an environment that fosters curiosity and creativity within and beyond the classroom. With a strong emphasis on theory and fundamentals, the students have participated in various technical events around the country like Smart India Hackathon and Inter IIT Tech meet. Along with academics, we encourage our students to participate in extra-curricular activities as well. Students, faculty, and staff of the Institute have always been zestful in organizing co-curricular and extra-curricular activities such as the celebration of Techno-Cultural festival Tirutsava, National Service Scheme activities, Institute day, etc. Rural engagement is a core activity for NSS volunteers of IIT Tirupati who adopted five villages to assist in improving the standards of life in those villages. They have been going to villages to spread awareness in respect of various government programs such as Pulse Polio Abhiyan, Swachh Bharat Abhiyan, etc. The students actively participate in numerous clubs such as adventure, photography, astronomy, music, chess, social outreach, etc. Students have taken up excellent initiatives to set up the sports and cultural events on campus that have helped the students to hone collective responsibility skills and leadership qualities.

Being a new Institute, IIT Tirupati is aggressively pursuing opportunities to collaborate with leading Indian & multinational companies, public sector organizations, financial institutions, and others. We highly value our partnership with the Industry and remain committed to making your recruiting experience with IIT Tirupati productive and positive.

We cordially invite you to IIT Tirupati for the on-campus placement process.

Prof KN Satyanarayana
Director



ABOUT CDC

Career Development Centre (CDC) at IIT Tirupati strongly focuses on providing students with excellent placement and internship opportunities and a strong emphasis on year-round career development and career guidance activities. CDC acts as a platform for students to interact with industry. The CDC has a dedicated team of faculty and staff to interact with various leading Indian and International organisations to facilitate career opportunities for the students. A dynamic student team is an integral part of the CDC, which helps organise and execute the activities.

The primary functions of the CDC are

- ✓ To invite industries and organisations of repute to facilitate employment/ internship opportunities for students and assist in the placement process at the IIT Tirupati campus.
- ✓ To arrange summer internships for BTech students after the 6th semester in partial fulfilment of their degree requirements.
- ✓ To conduct career guidance activities that provide information on various opportunities available and help them choose the one based on their interest.
- ✓ To organise career development activities such as lectures, workshops, and boot camps to enhance the skills necessary to face interviews and succeed in their chosen career.



CDC ACTIVITIES

- **Know your branch series**
by alumni and seniors of respective department
- **Mock Placement Session with Talerang**
- **DSA Series**
by Digital Wizards (Coding Club)
- **Industry placements and covid series**
by Shailesh Kumar, Head of University Relations at Qualcomm;
by Abhishek DE, Director & Global Head - Talent Acquisition at Browser Stack
- **Profile Building for Higher Education & Placements**
by PN Santhosh (Co-founder of BYJU's)
- **Art of Being an Entrepreneur**
by Sanjay Sehgal (Business & Life Coach), CEO- MSys Technologies
- **The CDC's Programming Sessions for Everyone**
by Dr. Panchatcharam Mariappan
- **Indian Navy - IN Step Session**
by Cmde Arun P Golaya
- **Workshop on How to have a success-focused job search**
by Vinod Aravindakshan, HR Leader
- **Civil Service as a Career Option**
by Sakthyakrishnan, IAS
- **Management as a Career**
by ARKS Srinivas, President & CEO, Career Launcher
- **Case Studies in Analytics**
by Chaitanya, CEO of Perceptive Analytics & Dr. Barry Devlin, Former Distinguished Engineer at IBM
- **All About GATE/ESE**
by Manimohan Trinath, GATE/ESE Trainer
- **Career Roadmap for Engineers**
by Unacademy by Ankit Goyal, Director (GATE), Unacademy
- **Preparation Strategy for UPSC Civil Services Examination**
by G. Chandeesh, IPS
- **Getting Better at interviews**
by Ugam Solutions, a Merkle Company

WHY **RECRUIT** AT IITT ?

- ✔ One of the most rapidly developing third-generation IITs with a wonderful academic infrastructure already in place.
- ✔ Our institute employs top notch faculty from reputed institutes in India and abroad and with an excellent teacher-to-student ratio, students spend more time interacting with faculty, learning more about practical areas, and being exposed to research in their chosen fields.
- ✔ As part of the curriculum, the graduating students completed their summer internship in reputed MNCs, national and international academic & research institutions.
- ✔ As we strive to meet the rapidly changing needs of companies today, our students can help you reach greater heights by combining classroom and real time experiences.
- ✔ A total of 40 MoUs have been signed with corporate firms, international universities and public sector organizations.



PLACEMENT PROCEDURE

भारतीय प्रौद्योगिकी संस्थान तिरुपति



The Career Development Centre (CDC) at IIT Tirupati invites recruiters with relevant information.

1



Recruiter registers on the online CDC web portal by creating an account

2



Recruiter fills the online job notification of the job profile using the portal

3



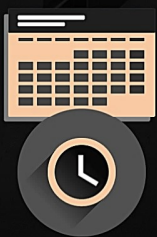
If the recruiter is interested in conducting a pre-placement talk they can send a request along with the preferred dates

4



The job notification form is made available online to all the eligible students. The students apply online to companies' job profiles

5



The CDC office informs the recruiters of the dates allotted for the on-campus placement process. The Placement at IIT Tirupati would begin from the second week of 1st September 2022 and will continue till the end of 2022-23 academic session

6



Recruiters visit the campus on the allotted date(s) and conduct the selection process

7



The recruiter is required to submit the list of selected and waitlisted (if desired) students to the CDC office soon after the completion of the selection process

8

ACADEMIC PROGRAMS

B.Tech

- Civil & Environmental Engineering
- Chemical Engineering
- Electrical Engineering
- Mechanical Engineering
- Computer Science and Engineering

M.Tech

- Mechanical Engineering
 - Design and Manufacturing
- Computer Science and Engineering
- Electrical Engineering
 - Signal Processing and Communication
 - Microelectronics & VLSI
 - RF and Microwave Engineering
- Civil & Environmental Engineering
 - Structural Engineering
 - Transportation & Infrastructure Engg.
 - Environmental & Water Resources Engg.
 - Geotechnical Engineering

M.Sc

- Mathematics and Statistics
- Chemistry
- Physics

MS

- Civil & Environmental Engineering
- Chemical Engineering
- Electrical Engineering
- Mechanical Engineering
- Computer Science and Engineering

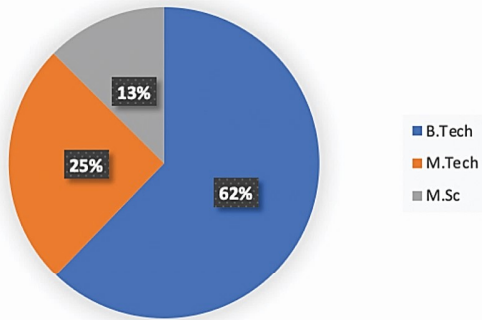
PhD

- Engineering
 - Civil & Environmental Engineering
 - Chemical Engineering
 - Electrical Engineering
 - Mechanical Engineering
 - Computer Science and Engineering
- Science
 - Chemistry
 - Mathematics and Statistics
 - Physics
- Humanities and Social Sciences

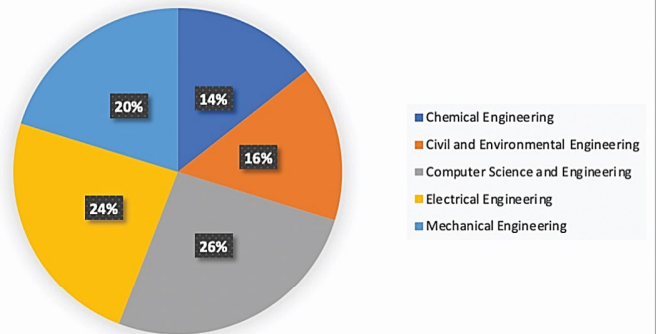


DEMOGRAPHY OF DISCIPLINES

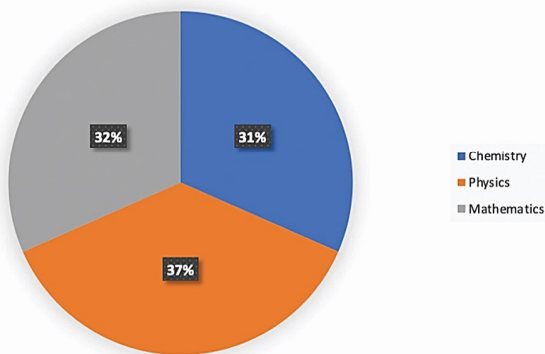
Demography of disciplines



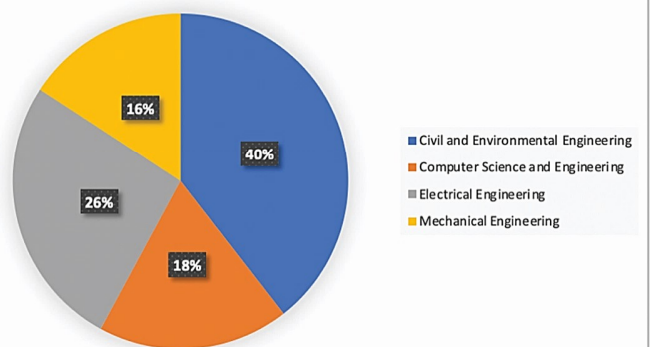
B.Tech



M.Sc



M.Tech



*MS/PhD are not time-bound courses





DEPARTMENTS



COMPUTER SCIENCE ENGINEERING

B.Tech Programme

Courses Offered*

- Computer System Design
- Artificial Intelligence
- Computer Networks
- Database Management System
- Machine Learning and Deep Learning
- Software Engineering
- Operating Systems
- Compiler Design
- Design and Analysis of Algorithms
- Theory of Computation
- Computer Organization
- Data Structures and Algorithms
- Discrete Mathematics
- Digital Systems
- Computational Geometry
- Artificial Neural Networks
- Industrial Data Science
- Distributed Systems
- Performance Evaluation of Computer Systems
- Stochastic Decision Processes
- Stochastic Network Optimization
- Parallel Computing
- Computational methods in optimization
- Deep Learning
- Introduction to Blockchain Technology

**Including Electives*

Laboratory Courses

- Computer Systems and Design Lab
- Software Engineering Lab
- Computer Networks Lab
- Operating Systems Lab
- Compiler Design Lab
- Intelligent Systems Laboratory
- Advanced Programming Lab
- Digital Circuits Lab

Project

- Duration: 1 Year

M.Tech Programme

Courses Offered*

- Advanced Data Structures and Algorithms
- Industrial Software Engineering
- Cloud Computing
- Computer System Architecture
- Distributed Systems
- Artificial Intelligence
- Machine Learning
- Linear Algebra and Probability Theory
- Computational Methods in Optimization

**This is not the exclusive list of courses offered*

Laboratory Courses

- Advanced Data Structures & Algorithms Lab
- Computer System Architecture Lab
- Artificial Intelligence & Machine Learning Lab
- Cloud Computing Lab
- Operating System Lab
- Computer Network Lab

Areas of Research

- Machine Learning
- Internet Of Things
- Big Data
- Delay Tolerant Networks
- Algorithmic Engineering
- Cloud Computing
- Software Engineering
- Reinforcement Learning
- AI for Software Engineering
- Approximation Algorithm
- Computer Architecture
- Parallel Computing
- VLSI Test & Verification
- Machine Learning for IOT
- Incremental Learning
- Computational Complexity

Project

- Duration: 1 Year

M.S Programme

Courses Offered

- Advanced Data Structures and Algorithms
- Industrial Software Engineering
- Cloud Computing
- Computer System Architecture
- Distributed Systems
- Artificial Intelligence
- Machine Learning
- Linear Algebra and Probability Theory
- Computational Methods in Optimization

Laboratory Courses

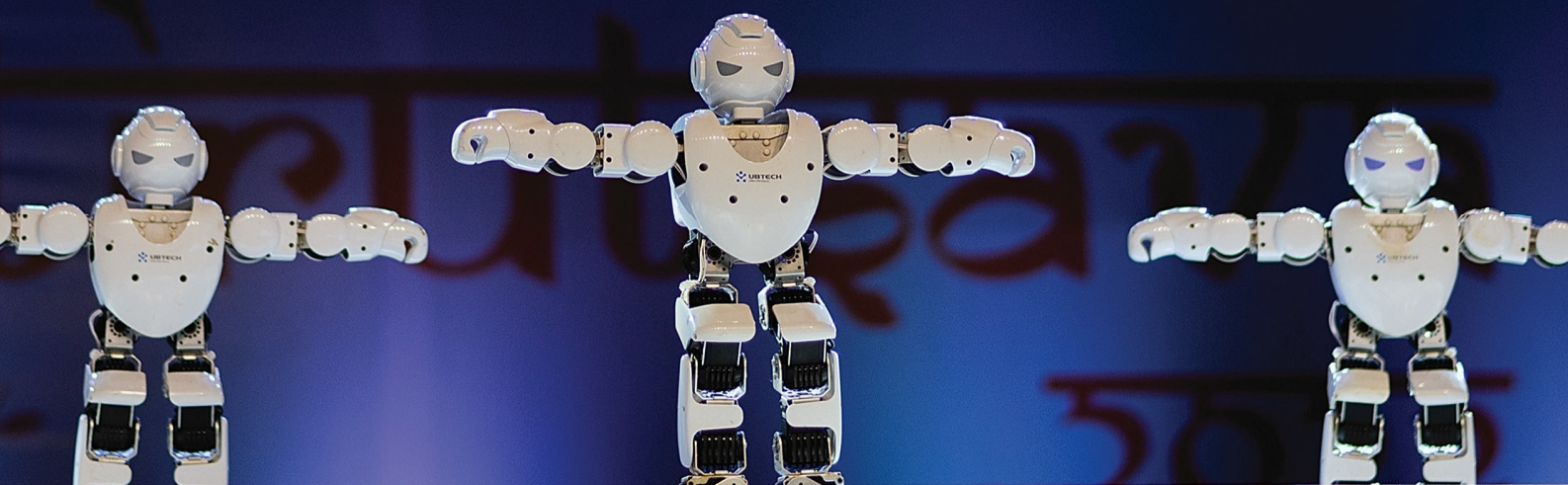
- Advanced Data Structures and Algorithms Lab
- Computer System Architecture Lab
- Artificial Intelligence and Machine

Areas of Research

- Machine Learning
- Internet Of Things
- Big Data
- Delay Tolerant Networks
- Algorithmic Engineering
- Cloud Computing
- Software Engineering

Note

- Every M.S scholar credits courses based on his/her research area.
- The duration of M.S course varies from 1.5 years to 3 years.



ELECTRICAL ENGINEERING

B.Tech Programme

Core Courses Offered

- Electric Circuits and Networks
- Signal and Systems
- Digital Systems
- Solid State Devices
- Digital Signal Processing
- Electrical Machines
- Communication Systems
- Electromagnetic Fields
- Analog Circuits
- Power Systems
- Control Engineering
- Power Electronics
- Principles of Measurement

Elective Courses

- Machine Learning for Image Processing
- Deep Learning: Theory and Applications
- Medical Imaging
- Computer Vision
- Statistical Signal Processing
- Queuing Theory
- Communication Networks
- Advanced Communications
- Information Theory and Coding
- Multivariable Feedback Control
- Robotics and Automation
- Compound Semiconductor Devices
- MOS Device Modeling and Characterisation
- CAD for VLSI Systems
- Transducers
- Embedded Systems
- VLSI Fabrication Principles
- Microwave Theory and Techniques
- Digital VLSI Design
- Optimal Control
- Advanced Power Electronics
- Electric Drives
- Modeling and Control of Electric Machines

B.Tech and M.Tech Project

- Duration: 1 Year

M.Tech - Microelectronics & VLSI

Courses Offered

- Digital VLSI Design
- Analog VLSI Design
- MOS device modeling and characterization
- Linear Algebra and Probability Theory
- Differential equations
- Statistics for Engineers
- Compound Semiconductor devices
- Physics & Modeling of Semiconductor Devices
- VLSI Fabrication Principles
- Transducers
- Compound Semiconductor Devices
- Nanoelectronic Devices
- Embedded Systems
- VLSI Circuits for Signal Processing
- RF Microelectronics
- RF & Mixed-Signal Design
- Testing & verification of VLSI Systems

M.Tech - Signal Processing and Communication

Courses Offered

- Machine Learning for Image Processing
- Advanced Digital Signal Processing
- Computer Vision
- Linear Algebra for Engineers
- Probability for Engineers
- Differential equations
- Advanced Communications
- Statistical Signal Processing
- Deep Learning: Theory and Applications
- Information Theory and Coding
- Communication Network
- Advanced Computer Networks
- Medical Imaging
- Queuing theory
- Statistics for Engineers
- VLSI Circuits for Signal Processing
- Wireless Communications
- Artificial Intelligence and Machine Learning
- Speech Signal Processing
- Optimal Control
- Robotics and Automation
- Multivariable Feedback Control

Labs and facilities

The Department of Electrical Engineering at IIT Tirupati has set up state-of-the-art lab facilities to provide practical exposure to students:

- ✓ The Signal Processing Laboratory is used for conducting digital signal processing, machine learning, wireless communication, medical imaging and many more core/elective courses.
- ✓ Advanced Electrical Engineering Laboratory is to introduce advanced topics in interdisciplinary engineering areas such as IOT, Robotics, Cloud Computing, Advanced Electro-hydraulics, Advanced Electro-Pneumatics, and Programmable controllers for industrial automation, Renewable Energy systems (Solar and Wind).
- ✓ The Electrical Machines Laboratory is equipped with various electrical machines (DC and synchronous machines), transformers (single-phase and three-phase) along with resistive load bank, rectifiers, DC/AC drives to experimentally demonstrate the working principle of these machines to teach our undergraduate students as well to conduct the research in this area.
- ✓ The Integrated Electronics Laboratory is well equipped with 30 workbenches consisting of a Tektronix function generator, Digital Storage Oscilloscope, a power supply, and a computer.
- ✓ Semiconductor devices lab is being established with an aim to complement the existing solid-state devices related courses.
- ✓ The WCN lab is equipped with Universal Software Radio Peripheral - Software Defined Radio (USRP-SDR) kit and high-end computing facilities to support academic requirements and to carry out research work.

Areas of Research

- Semiconductor Devices
- Computer Vision
- Medical Imaging
- Power Electronics & Drives
- VLSI Design
- Smart Grid Technology
- Sensors & Integrated Circuits
- Nanoelectronics
- Signal Processing with Deep Learning
- Distributed Networks
- Network Economics



MECHANICAL ENGINEERING

B.Tech Programme

Core Courses Offered*

- Materials and Design
- Kinematics and Dynamics of Machinery
- Manufacturing Technology
- Engineering Mechanics
- Strength of Materials
- Manufacturing Process
- Applied Thermal Engineering
- Design of Machine Elements
- Vibrations and Control
- Machine Drawing
- Fluid Dynamics and Hydraulic Machines
- Heat and Mass Transfer
- Mechatronics
- Industrial Automation

**This is not the exhaustive list of courses offered*

Elective Courses*

- Computational Fluid Dynamics
- Finite Element Analysis
- Mechanical Vibrations
- Design for Manufacturing and Assembly
- Composite Materials
- Additive Manufacturing

**Students are allowed to take interdisciplinary courses also, enabling creative solutions to complex problems*

Research Areas

- Solid mechanics and Design
- Advanced Manufacturing
- Design and Robotics
- Sustainable Energy and Tech.
- Food processing
- Fluid and Thermal Sciences
- Precision and Additive Manufacturing
- Development of cutting fluids and cutting tools
- Thermal study on Porous medium combustion and Metal Hydride Reactors
- Advanced welding techniques and numerical study
- Nano material composites
- Finite Element Computational study on Continuum mechanics
- Smart Manufacturing
- Nonlinear dynamic systems and vibrations
- Fibre reinforced composites and numerical study
- Robotics on underwater systems
- Hydraulic fracturing
- Robotic circuit systems

Laboratory Courses

- Applied Mechanics Lab
- Engineering Drawing & Machine Drawing
- Manufacturing Lab
- Hydraulics and Pneumatics Lab
- Heat Transfer Lab
- Metrology Lab

B.Tech Project

- Duration: 1 Year

M.Tech Programme

Core Courses Offered*

- Mechanical Vibrations
- Advanced Mechanics of solids
- Additive Manufacturing
- Product Design and Development
- Advanced Manufacturing Process
- Finite Element Methods in Engineering Mechanics

**This is not the exhaustive list of courses offered*

Elective Courses*

- Computational Fluid Dynamics
- Advanced Engineering Dynamics
- Composite Materials
- CAD/CAM
- Metallurgy and Computer Aided Inspection
- Vibrations of Discrete Systems
- Continuum Mechanics
- Mechanics and Robotic Manipulators
- Joining Technologies
- Abrasive Machining and Finishing Processes

**Students are allowed to take interdisciplinary courses also, enabling creative solutions to complex problems*

Research Areas

- Solid mechanics and Design
- Advanced Manufacturing
- Design and Robotics
- Sustainable Energy and Tech.
- Food processing
- Fluid and Thermal Sciences

M.Tech Project

- Masters Thesis Duration: 1 Year

Laboratory Courses

- Design and Manufacturing Laboratory-1
(Advanced manufacturing and Vibration Analysis)
- Design and Manufacturing Laboratory-2
(Finite Element Analysis)

Labs and facilities

The institute has set up laboratories with cutting technology to aid the students in practical learning and research.

- ✓ Applied mechanics lab gives students hands-on experience to comprehend essential solid mechanics, fluid mechanics, and dynamics standards.
- ✓ Applied thermal engineering lab provides practical learning on refrigeration systems, IC engines, and heat transfer concepts.
- ✓ Machine tools lab and Metrology lab provide support to the student projects and hands-on experience over advanced machining and measurement tools.
- ✓ Joining and Metallography(JAM) lab is developed to train students on the latest joining and metallography studies.
- ✓ As the students “learn-by-doing,” they map their theoretical knowledge to the practical world efficiently and develop the confidence to independently do their own projects.



CIVIL & ENVIRONMENTAL ENGINEERING

B.Tech Programme

Core Courses Offered

- Engineering Mechanics
- Strength of Materials
- Surveying
- Civil Engineering Materials and Construction
- Ecology and Environment
- Structural Analysis
- Geology and Soil Mechanics
- Fluid Mechanics and Hydraulics
- Basic Structural Steel Design
- Water Resources Engineering
- Environmental Engineering
- Basic Reinforced Concrete Design
- Geotechnical Engineering
- Transportation Engineering
- Estimation and Construction Management
- Functional Design of Buildings
- Earthquake and Wind Engineering
- Nondestructive Testing and Health Monitoring of Civil Structures
- Random Vibration and Structural Reliability
- Ground Improvement and Geosynthetics
- Soil Dynamics & Geotechnical Earthquake Engg.
- Advanced Concrete Technology
- Integrated Impact Assessment
- GIS and Remote Sensing
- Geotechnical Investigations & Foundation Design
- Air Pollution Control Engineering
- Advanced Concrete Technology

Elective Courses

- Groundwater Hydrology
- Integrated Impact Assessment
- Solid and Hazardous Waste Management
- GIS and Remote Sensing
- Nondestructive Testing and Health Monitoring of Civil Structures
- Rock Mechanics
- Unsaturated Soil Mechanics and Applications
- Geoenvironmental Engineering
- Advanced Mechanics of Solids
- Solid and Hazardous Waste Management
- GIS and Remote Sensing
- Finite Element Method in Engineering Mechanics
- Geotechnical Investigations & Foundation Design
- Earthquake and Wind Engineering

B.Tech Project

- Duration: 1 Year

M.Tech & M.S Programme

Core Courses Offered for each specialisation

Environmental & water resource engineering

- Physicochemical processes in water and waste water engineering
- Air pollution control engineering
- Surface water hydrology
- Groundwater hydrology
- Water Resource planning and Management
- Biological processes in wastewater engineering

Geotechnical Engineering

- Advanced Soil Mechanics
- Geotechnical Investigation & Foundation Design
- Pavement analysis and Design
- Ground Improvement and Geosynthetics
- Soil Dynamics and Geotechnical Earthquake Engg.

Structural Engineering

- Advanced design of concrete structures
- Advanced Mechanics of solids
- Structural stability and design
- Structural Dynamics
- Advanced design of metal structures
- Finite element methods in engineering mechanics

Transportation & Infrastructure Engineering

- Geotechnical investigation and Foundation design
- Traffic engineering and road safety
- Pavement analysis and design
- Traffic flow modelling and simulation
- Pavement materials and construction
- Ground improvement and Geosynthetics
- Statistical method for engineers

Areas of Research

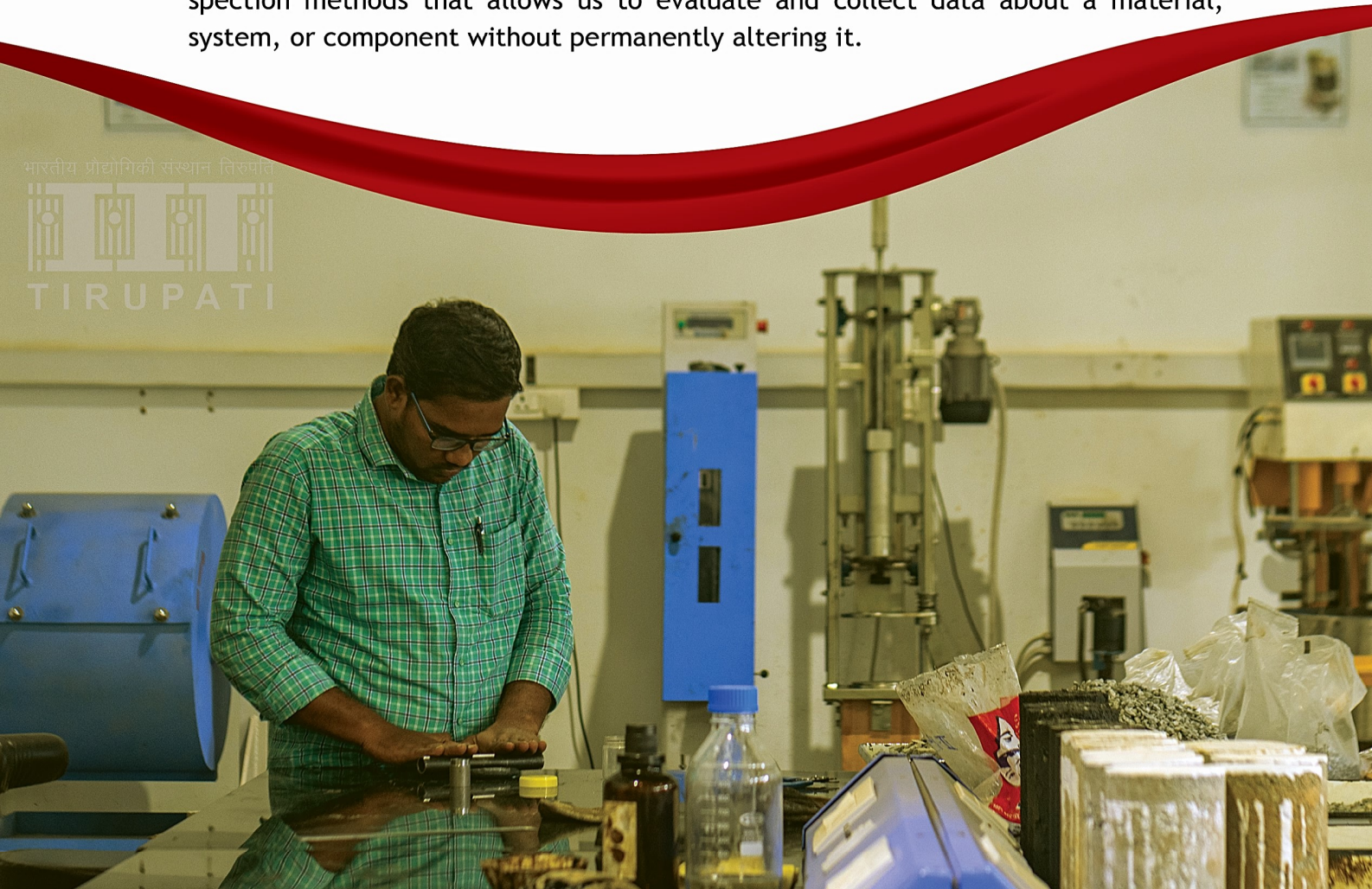
- Geotechnical engineering
- Water resources engineering
- Structural engineering
- Earthquake engineering
- Pavement materials
- Concrete engineering
- Traffic engineering
- Pollution
- Waste water treatments
- Groundwater stability
- Pavement asset management

M.Tech Project

- Masters Thesis Duration: 1 Year

Laboratory facilities

- ✓ **Structural Engineering Laboratory** It consists of state-of-the-art table-top equipment for undergraduate instruction and advanced equipment for research purposes.
- ✓ **Transportation Laboratory** The equipment housed in this laboratory allows for undergraduate teaching and postgraduate and doctoral research activities in the areas of sustainable transportation infrastructure and pavements/materials.
- ✓ **Building Material Laboratory** The main objectives of experimental studies on building materials and its components are to facilitate quality control and compliance with specifications.
- ✓ **Geotechnical Engineering Laboratory** The lab is equipped with basic and state-of-the-art equipment for Undergraduate and Postgraduate studies to characterize the physical, hydraulic, and mechanical properties of soils under static and seismic loading conditions.
- ✓ **Environmental Engineering Laboratory** The laboratory is equipped with state-of-the-art facilities to perform advanced water, wastewater, and air quality analyses.
- ✓ **Hydraulics & Water Resources Engineering Laboratory** This laboratory allows students to understand the various aspects of fluids at rest and in motion in engineering applications.
- ✓ **Surveying Laboratory** This lab is equipped with various equipment like Prismatic Compasses, Vernier Theodolites, Dumpy Levels, Plane Tables, and associated accessories like Ranging Rods, Cross Staff, Arrows, Pegs, etc.
- ✓ **Non Destructive Testing Laboratory:** In this lab students learn an array of inspection methods that allows us to evaluate and collect data about a material, system, or component without permanently altering it.



CHEMICAL ENGINEERING

B.Tech Programme

Professional Courses*

- Material and Energy Balances
- Momentum Transfer
- Chemical Engineering Thermodynamics
- Mechanical Operations
- Process Heat Transfer
- Fundamental of Mass Transfer
- Homogeneous Reaction Engineering
- Process control and Instrumentation
- Computational Techniques for Chemical Engineers
- Heterogeneous Reaction Engineering
- Separation and Purification Processes
- Process Equipment Design
- Transport Phenomena
- Process Synthesis and Economics
- Process Safety and Industrial Pollution
- Bioprocess Engineering

**Students are allowed to take interdisciplinary courses also, enabling creative solutions to complex problems*

Elective Courses

- Corrosion Engineering
- Oil and Gas Engineering
- Microscale Unit Operations
- Optimization Technique
- Air Pollution Control Engineering
- Machine Learning in Process Engineering
- Introduction to Colloids and Interface
- Food Processing Technology
- Air Pollution Control Engineering
- Computational Fluid Dynamics
- Introduction to Nano-science and technology
- Modern Process Control

B.Tech Project

- Duration: 1 Year

Areas of Research

- Granular Physics
- Forward Osmosis
- Animal Locomotion
- Computational Biophysics
- Polymerization in microreactor
- Multiphase flow, Microfluidics
- Machine Learning in Process Engg.
- Process Control
- Nanomaterials
- Food Colloids and Soft matter
- Extraction & incorporation of bioactives for nutrition and immunity
- Multi-scale molecular simulation

Labs and facilities

The Department is equipped with state of the art equipment and modern research equipment. Our existing experimental facilities are to demonstrate the fundamental chemical engineering principles and enable our undergraduate students to get hands-on experience with various equipment. As a part of our undergraduate curriculum, we have the following experimental laboratories

- ✓ **Momentum Transfer Laboratory:** It demonstrates the concepts such as Bernoulli's principle, frictional losses in pipes, Reynolds experiment, and flow measuring devices such as Orifice meter, Venturi meter, and rotameter.
- ✓ **Heat Transfer Laboratory:** It demonstrates the concepts such as heat conduction in metal rod, natural and forced convection, radiation, shell and tube heat exchanger and dynamics of cooling bodies.
- ✓ **Mass Transfer Laboratory:** It demonstrates concepts such as diffusion, distillation operations, etc.
- ✓ **Mechanical Operations Laboratory:** It demonstrates concepts such as grinding operation using ball mill, terminal settling velocity, sedimentation, packed and fluidized bed.

In addition to experimental facilities, we also possess computation infrastructure to strongly impart the design, simulation and computational skills to our students.

- ✓ **Computational Techniques Laboratory:** It enables students to implement the numerical algorithms and also trains them on built-in MATLAB solvers.
- ✓ **Process Equipment Design Laboratory:** It demonstrates a detailed design of individual process equipment such as heat exchangers, distillation columns using ASPEN PLUS. This lays the foundation to perform a complete flowsheet synthesis, simulation and cost evaluation.
- ✓ **Process Control and Instrumentation Laboratory:** It demonstrates concepts such as first and second order dynamics, flow and level control, controller tuning, etc.
- ✓ **Reaction Engineering Laboratory:** It demonstrates concepts such as kinetic studies using batch reactor, RTD studies in a packed bed reactor, etc.

MATHEMATICS & STATISTICS

M.Sc Programme

Courses Offered*

- Algebra
- Complex Analysis
- Design of Experiments
- Discrete Mathematics
- Linear Algebra
- Multivariate Statistical Analysis
- Numerical Analysis
- Ordinary Differential Equations
- Probability Theory
- Real Analysis
- Regression Analysis
- Sampling Theory
- Statistical Inference
- Stochastic Processes
- Time Series Analysis

Elective Courses

- Bayesian Statistics
- Biostatistics
- Categorical Data Analysis
- Continuum Mechanics
- Distributions and Sobolev Spaces
- Fixed Point Theory
- Fractal Geometry
- Functional Data Analysis
- Functional Analysis
- Generalised Linear Models
- Linear Integral Equations
- Mathematical Modelling
- Non-Parametric Statistics
- Number Theory
- Operation Research
- Partial Differential Equations
- Spatio -Temporal Modelling
- Statistical Analysis of Network
- Statistical Finance
- Statistical Learning Theory and Applications
- Statistical Simulations & Data Analysis
- Topology

Lab Courses

- Programming Laboratory Course (Python , C++ and Matlab).
- Project Work on development of Numpy library, Finite Difference Method Package, Linear Solver Package, Sudoku Game, Anti-Magic Square, Puzzles, Project Euler Problems.

Programming Skills in Coursework

- R Programming (Packages for Regression Analysis)
- Python Programming (Data Visualisation, Numpy and Pandas, Scikit-learn, TensorFlow, PyTorch)
- Latex (Project report writing)
- Microsoft Excel for Data Analysis
- SQL and Matlab for Data Science

M.Sc Project

- Duration: 1 Semester



PhD Programme

Courses Offered*

- Advanced Algebra
- Advanced Analysis
- Advanced Differential Equations
- Advanced Probability Theory
- Advanced Statistical Inference

Areas of Research

- Biostatistics
- Fixed Point Theory
- Fractals

- Generalized Linear Models
- Inverse problems
- Lattice Boltzmann Method
- Lie Algebra
- Hyperbolic Partial Differential Equations
- Machine Learning
- Multivariate Response Models
- Additive Number Theory
- Quantitative Finance
- Representation Theory
- Signal and Image Processing
- Spatiotemporal Statistics
- Vector Finite Element Method



PHYSICS

M.Sc Programme

Courses Offered (Core)

- Classical Mechanics
- Mathematical Physics
- Classical Electrodynamics
- Quantum Mechanics
- Applied Electronics
- Statistical Physics
- Condensed Matter Physics
- Computational Physics
- Atomic and Molecular Physics
- Nuclear and Particle Physics
- Classical and Quantum Optics

Electives Offered

- Advanced Computational Physics
- Advanced Statistical Mechanics
- Quantum Collision Theory
- Classical and Quantum Optics
- Physical Techniques in Material Science
- Introduction to Condensed Matter Theory
- Magnetism and Superconductivity
- Fundamentals of Laser Physics
- Basics and Applications of Plasma Physics
- Introduction to Quantum Entanglement and Quantum Computing
- Theory of atomic collision and spectroscopy

Lab Courses

- Physics Laboratory-I
- Physics Laboratory-II
- Advanced Physics Laboratory
- Computational Physics Lab
- Applied Electronics Lab

M.Sc Project

- Duration: 1 Semester

Areas of Research

- Strongly Correlated Electron Systems
- Geometrically Frustrated Magnets
- Low-Dimensional Quantum Magnets, Multiferroics
- Single Crystal Growth & Novel Material Discovery
- Precision Laser Spectroscopy
- Experimental condensed matter physics: magnetism and superconductivity
- Theoretical condensed matter physics
- Theoretical ultrafast physics
- Experimental Atomic, Molecular and Optical Physics (AMOP) - quantum optics and precision spectroscopy
- Plasma Physics - theory and experiments
- Quantum Computing, Quantum Information, Quantum communication and Quantum Sensing - theory and experiments
- Theoretical soft matter physics and statistical mechanics
- Conducting Polymer and Polymer nanofibers
- Theoretical high energy physics
- Photoabsorption Processes in Free/ Confined atoms molecules and ions



CHEMISTRY

M.Sc Programme

Courses Offered

- Quantum Chemistry and Chemical Bonding
- Transition Metals and Coordination Chemistry
- Reactions and Reagents in Organic Chemistry
- Thermodynamics and Chemical Kinetics
- Main Group and Organometallic Chemistry
- Principles of Spectroscopy
- Stereochemistry and Organic Synthesis
- Symmetry and Group Theory
- Bioinorganic and Environmental Chemistry
- Electrochemistry and Chemistry of Solids
- Applications of Spectroscopy in Inorganic and Organic Chemistry
- Biomolecules and Chemical Biology

Elective Courses

- Introduction to Polymer Science
- Statistical Mechanics
- Pericyclic Reactions and Photochemistry
- Computational Methods in Material Science

Laboratory Courses

- Organic Chemistry Laboratory
- Inorganic Chemistry Laboratory
- Physical Chemistry Laboratory
- Computer Programming and Numerical Methods in Chemistry

M.Sc Project

- Duration: 1 Semester

Research Areas

- Protein Hybrid Nanostructures of Diverse Applications
- Biomimetic Studies/ Drug discovery
- Organic Synthesis and Transition Metal catalysis
- Synthesis of Biologically Important/Active Organic Molecules
- Computational Modelling
- Geometric Information Engine
- Theoretical Investigation of Structure and Dynamics of Water/Aqueous Solutions
- Theoretical Physical Chemistry



CO-CURRICULAR & EXTRA-CURRICULAR ACTIVITIES

Along with academic pursuits, the Institute organizes various co-curricular and extracurricular activities planned and overseen by the students. Many clubs are formed to motivate students to explore their interests and learn new things.



Tirutsava

Four years ago, we at the Indian Institute of Technology Tirupati envisioned a fest that would give the student fraternity an experience to learn, enjoy and cherish a technical festival named “Anfang”. Soon we extended this into a holistic and rich techno-cultural festival and began the journey with the name TIRUTSAVA.

It makes days of absolute ecstasy, providing budding technocrats and artists with a platform in diverse fields such as music, dance, games and nail-biting technical events. The three-day extravaganza boasts various technical events like maze solver, RC car road rash, coding and hacking, etc.

Cultural events include fierce debates, geeky quizzes, mesmerizing dance nights, jaw-dropping musical duels and so on. There are many other events to cater to diverse interests like blind art, treasure hunt, foot bite, paintball (real-life shooting) etc.

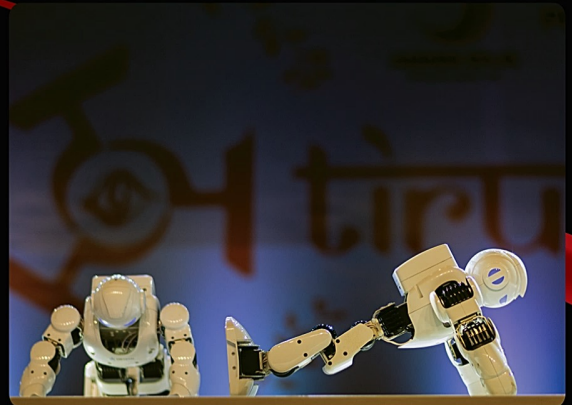
Digital Wizards

Students from various branches can participate in this club's encouraging, participatory environment. Students that are proficient in coding help their classmates. In coding competitions, faculty also lend a hand. The ability to code and accomplish various activities, including object identification, app creation, and web design, is taught to students.



TechManiacs (Robotics Club)

Students create and refine new solutions to challenges that already exist. The club assists in understanding current technologies, such as fusing AI and robotics to carry out jobs like agricultural surveillance for spotting plant diseases. By planning activities like seminars, workshops, and other opportunities where students can interact directly with robots, this group helps students comprehend the use and construction of robots.



Winged Voyage (Automobile Club)

The club is the college's Formula student team.

A group dedicated to understanding the development, production, and operation of automobile systems make up this club.



Gagan Vedhi

Astronomy and astrophysics are the club's primary interests. They frequently host a range of Talk Shows, Workshops, and Competitions. They also emphasize the engineering components of astronomy, such as space technology and rocket science.



Entrepreneurship Cell

The E-cell organizes regular talks on Entrepreneurship and workshops on current technologies. It also encourages students to devise innovative solutions to real-world problems by conducting competitions.

Literary, Sports, and other clubs

Students have actively participated in non-technical events like cultural and sports meets. Literary clubs like the Debate and Oratory club and the Quizzing club help the student by conducting several fun-filled, innovative & skill-building events. Sports Clubs like Aranya (adventure sports club of IIT Tirupati) and Fitness club help students not only relax but also take care of their fitness and enjoy.



ACHIEVEMENTS OF STUDENTS

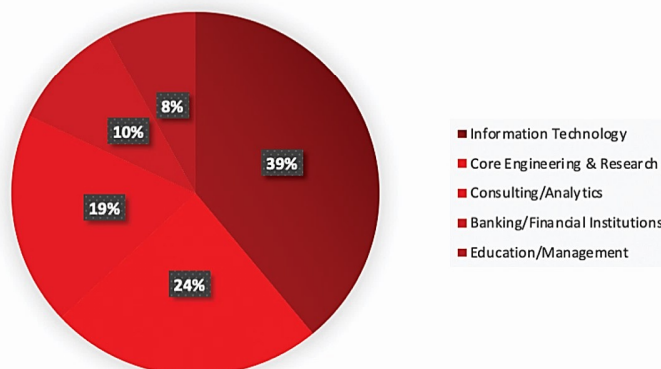
- ✓ Conference papers have been published that are to be presented at the INTER-NOISE conference.
- ✓ One of the 12 awardees for the IEEE INTERNATIONAL SYMPOSIUM ON WOMEN IN SERVICES COMPUTING (WISC) SCHOLARSHIP in Barcelona, Spain.
- ✓ Internship at the University of Waterloo, Ontario, Canada, through the MITACS internship program.
- ✓ Internship at GitHub Extern 2022: DeepSource.
- ✓ AiR, an android application is developed by our students that uses augmented reality to visualize air pollution.
- ✓ 2 journals and 10 conference publications have been published at top-most Software Engineering venues like ESEC/FSE 2021, CSCW 2021, IEEE VIS 2021, ASE 2021, ICSE Demo 2022, ACM ICPC 2022, and EASE 2022.
- ✓ A Bronze medal in the “Agrobot Design Innovation challenge” event held at the 9th Inter IIT Tech Meet hosted by IIT Guwahati.
- ✓ The Richard Lounsbery Foundation (USA) has funded a student project on “Survive Covid-19++”.



PLACEMENT RECRUITERS



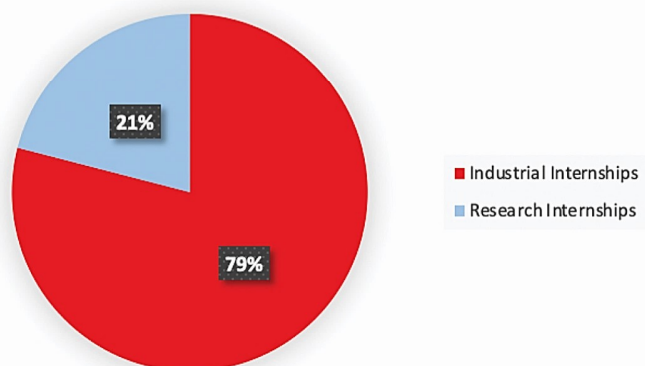
Placements 2021-22 (Domain-wise)



INTERNSHIPS RECRUITERS



Internships 2021-22



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