# Placement Brochure

## 2021–2022

IITH RANKED 8th in NIRF FOR ENGINEERING

भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

PLACE OF ORIGIN
Indian Institute of Technology Hyderabad,
Telangana, India

YEAR OF ORIGIN
2021

## OUR VISION

Indian Institute of Technology Hyderabad will be the cradle for inventions and innovations. It will advance knowledge and scholarship to students in science, technology and liberal arts, and equip them to handle the challenges of the nation and the world in the 21st century.

## OUR MISSION

IIT Hyderabad aims to be recognized as ideators and leaders in higher education, research and industry, and to develop human power with creativity, technology and passion for the betterment of India and humankind.

## OUR CORE VALUES

**Integrity:**
Honest, ethical and responsible behaviour will be fundamental to all our dealings and actions.

**Diversity of Ideas:**
We encourage plurality and diversity of ideas to create a robust and vibrant future.

**Enquiry:**
We foster the spirit of scientifc inquiry.

**Academic freedom:**
We ensure complete academic freedom in teaching and research.

**Service to the nation:**
We are committed to providing technology, solutions and trained manpower for the betterment of the people of India.

**Transparency:**
We exhibit transparency in all that we do.

**Environmental Stewardship:**
We are committed to developing and participating green technologies.

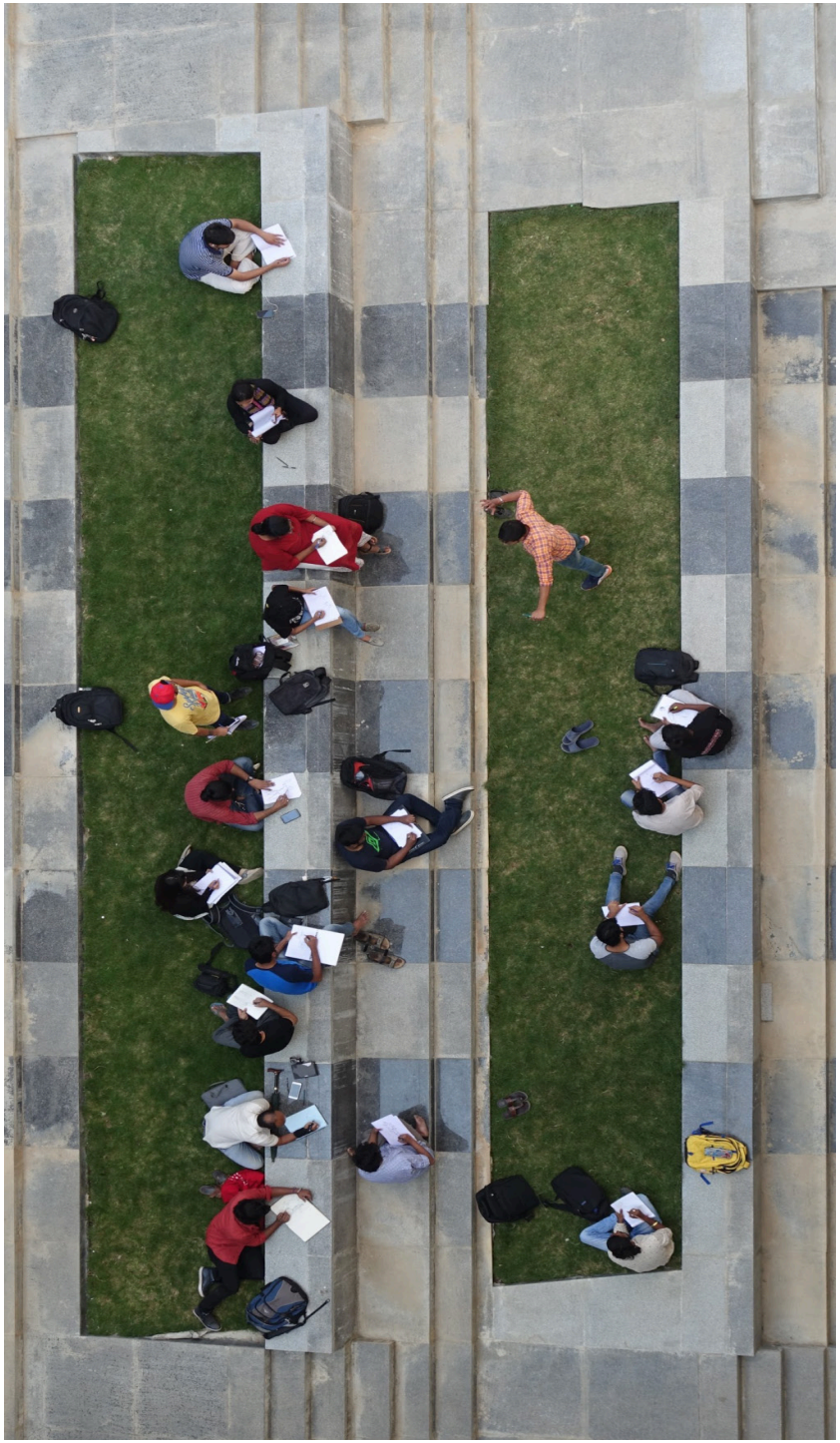
**Excellence:**
We endeavour to excel in research, education and student activities.

TABLE OF
# CONTENTS

ABOUT US

# IIT-HYDERABAD

IIT Hyderabad is one among the 2nd generation of IITs started by the Govt. of India. Today IITH offers 11 B.Tech programs, 1 B.Des Program, 3 M.Sc programs, 18 M.Tech programs, 1 M.Des program, 1 MA Program and 15 Ph.D. programs in all branches of engineering, science, liberal arts and design. IIT Hyderabad offers 2 years M.Tech Program to the foreign Nationals in 9 different departments. The very foundation of IIT Hyderabad is based on research and innovation. The vibrant research culture is evident from the number of patents and publications that IITH has. At IITH students are given with a plethora of choices, which they diligently choose with the help of a faculty advisor. Courses that last for a semester are almost a foregone story at IITH. From 14-15 academic year onwards all B.Tech programs started offering courses that are of smaller credits; called the fractal academics; very carefully designed to keep the enthusiasm of the students and to keep them in pace with the state of the art from 1st semester till 8th semester. IITH in the past couple of years has been highly successful in building tie-ups with leading academic institutions around the globe. IITH enjoys a very special relationship with Japanese Universities and Industries that goes beyond academic and research collaborations. In fact, some of the iconic buildings in IITH campus will carry the signature of Japanese architecture. IITH is creating a unique holistic educational ecosystem that offers interactive learning, a highly, flexible academic structure, cutting-edge research, strong industry collaboration, and entrepreneurship. It is providing an environment wherein students and faculty are not afraid to translate their dreams into realities.



FROM THE

# DIRECTOR'S DESK

***Education is the most powerful weapon, which you can use to change the world.***

– Nelson Mandela

*Dear friends,*

Indian Institute of Technology Hyderabad (IITH) welcomes you to the Dream Destination of Industry, Academic & Innovation leaders.

We are proud of preparing dynamic leaders, who make a difference to the world, with the skills that are nurtured here for a better tomorrow. As an Institute that has completed only 12 years of its existence, it is gratifying to note that we are doing well and are almost on par with some of the first-generation IITs. With the NIRF ranking of 8 among all the engineering institutes and 17th overall rank in the country and with being within the top 10 ranks among technical institutes from India in QS world rankings, we stand tall. This is essentially due to over 240+ dynamic young faculty of the institute with an average age of about 39, who work hard and take up challenges without the fear of failure, making IITH at the forefront of R&D innovations. A healthy faculty-to-student ratio of 1:14 and a good mix of UG and PG programs with UG to PG to PhD ratio of 40:30:30 (~3500 total students and ~1000 PhD scholars) makes IITH a unique place for teaching and research.

The strong research culture at IITH is reflected in around 500 sponsored research projects of Rs. 450 Cr that our faculty members have been handling, with the last 3 year's funds inflow being close to Rs. 230 Cr. The number of Scopus & Web of Science indexed

publications in the last 6 years is 5,900, 166 patents, which again reflects the thriving research activity.

With strong Japanese collaboration and support from Ministry of Education, the second phase of infrastructure development is in its full swing and is expected to be completed by 2022. This is expected to give a big push to the research activity of the institute. With a moto of Inventing and Innovating in Technology for Humanity (IITH), we have a strong start-up culture with a dedicated space for incubation and research park. By the end of the second phase, we will have about 1.5 lakh Sq. ft. of space each for both the above activities, which will boost the entrepreneurship activity significantly at IITH.

The fractal academics with an interdisciplinary approach, with departments such as AI, Climate Change, Engineering sciences, and interdisciplinary MTech and PhD provide a unique academic atmosphere at IITH. The BTech programs in AI, Biomedical Engineering, Bioinformatics (1st time in the IIT system), Computational Engineering, a minor in Entrepreneurship, Executive MTech in Data Science together with the Department of Design and Liberal Arts represent the unique and diversified academic fabric of IITH. The Institute has taken up several industry-oriented measures from this year. A semester-long internship in the 6th semester for BTech/BDes students, a mandatory 1-credit course on "Industry Lectures" are to name a few. It is ensured that at least 50% of MTech projects will be on Industry-defined problems. Several new industry-oriented MTech programs such as Additive Manufacturing (with DRDO support), e-Waste Resource Engineering & Management (jointly with C-MET, Hyderabad), Medical Device Innovation (jointly with AIG, Hyderabad), Energy Science & Technology, Integrated Sensor Systems, Network & Information Security, Polymers & Biosystems Engineering and Smart Mobility, will enhance our outreach to industry. We are also introducing a Dual degree MTech in Techno-Entrepreneurship for our BTech students from this year. We have also introduced several online MTech programs from this year such as EV Technology, Computational Mechanics, Integrated Computational Engineering, Industrial Metallurgy, Communication & Signal Processing, Power Electronics & Power Systems, Microelectronics & VLSI and MDes, so that industry personnel can upgrade themselves in their fields of interest.

We are looking forward to strong collaborations, both academic and industrial, to help us grow stronger. Industry-Research-Academia ties upon cutting-edge technologies are the key for the growth of the country. I am confident, IITH will play its part proactively in this direction.

We are looking forward to a strong and long-standing collaboration!

Stay Safe & Stay Strong…

Best Regards,

**B.S. Murty**
Director

WHAT WE OFFER

# ACADEMIC PROGRAMS

## Undergraduate

| | | |
|---|---|---|
| **B.Tech** | Duration **4 years** | Qualifying Test **IIT-JEE (Advanced)** |
| **B.Des** | Duration **4 years** | Qualifying Test **U-CEED** |

## Postgraduate

| | | |
|---|---|---|
| **M.Tech** | Duration **2/3 years** | Qualifying Test **GATE** |
| **M.Sc** | Duration **2 years** | Qualifying Test **JAM** |
| **M.Des** | Duration **2 years** | Qualifying Test **CEED** |
| **M.A (DS)** | Duration **2 years** | Qualifying Test **Written Test & Interview** |

## Doctorate

| | |
|---|---|
| **Ph.D** | Students with good academic background are admitted into the program through a rigorous interview.<br><br>Assistantship for regular PhD students is provided by MHRD. |

2022 GRADUATING

# BATCH PROFILE

| STRENGTH | B.TECH. |
|---|---|
| 35 | Civil Engineering |
| 26 | Chemical Engineering |
| 52 | Computer Science & Engineering |
| 52 | Electrical Engineering |
| 28 | Engineering Sciences |
| 10 | Mathematics & Computing |
| 15 | Materials Science & Metallurgical Engineering |
| 52 | Mechanical & Aerospace Engineering |
| 19 | Engineering Physics |

| STRENGTH | M.SC. |
|---|---|
| 47 | Chemistry |
| 18 | Mathematics & Computing |
| 24 | Physics |

| STRENGTH | M.DES. |
|---|---|
| 45 | Design |

| STRENGTH | M.TECH. |
|---|---|
| 24 | Artificial Intelligence |
| 11 | Additive Manufacturing |
| 09 | Biomedical Engineering |
| 10 | Biotechnology |
| 06 | Climate Change |
| 39 | Civil Engineering |
| 14 | Chemical Engineering |
| 44 | Computer Science & Engineering |
| 62 | Electrical Engineering |
| 08 | Energy Science and Technology |
| 05 | E-Waste Resource Engineering and Management |
| 09 | Integrated Sensor Systems |
| 15 | Materials Science & Metallurgical Engineering |
| 41 | Mechanical & Aerospace Engineering |
| 04 | Networks and Information Security |
| 04 | Polymers and Bio Systems Engineering |
| 17 | Smart Mobility |

| STRENGTH | M.A (DEVELOPMENT STUDIES) |
|---|---|
| 08 | Liberal Arts |

2020-2021

# PLACEMENT SUMMARY

Number of companies Registered
**195**

Number of Companies with offer
**101**

Total Number of Students
**601**

Number of students registered for Placements
**537**

Total offers Recieved
**323**

Highest Package
**Rs. 60 LPA**

Average package
**Rs. 15.41 LPA**

Number of International offers
**31**

The top paying companies are MTX, Microsoft, Rakuten, Accenture Japan, TSMC, NTT-AT, Yokogawa, Amazon, DG Takano, and Alphonso Inc.

**Mentioned below are the few Universities opted by students for higher education:**

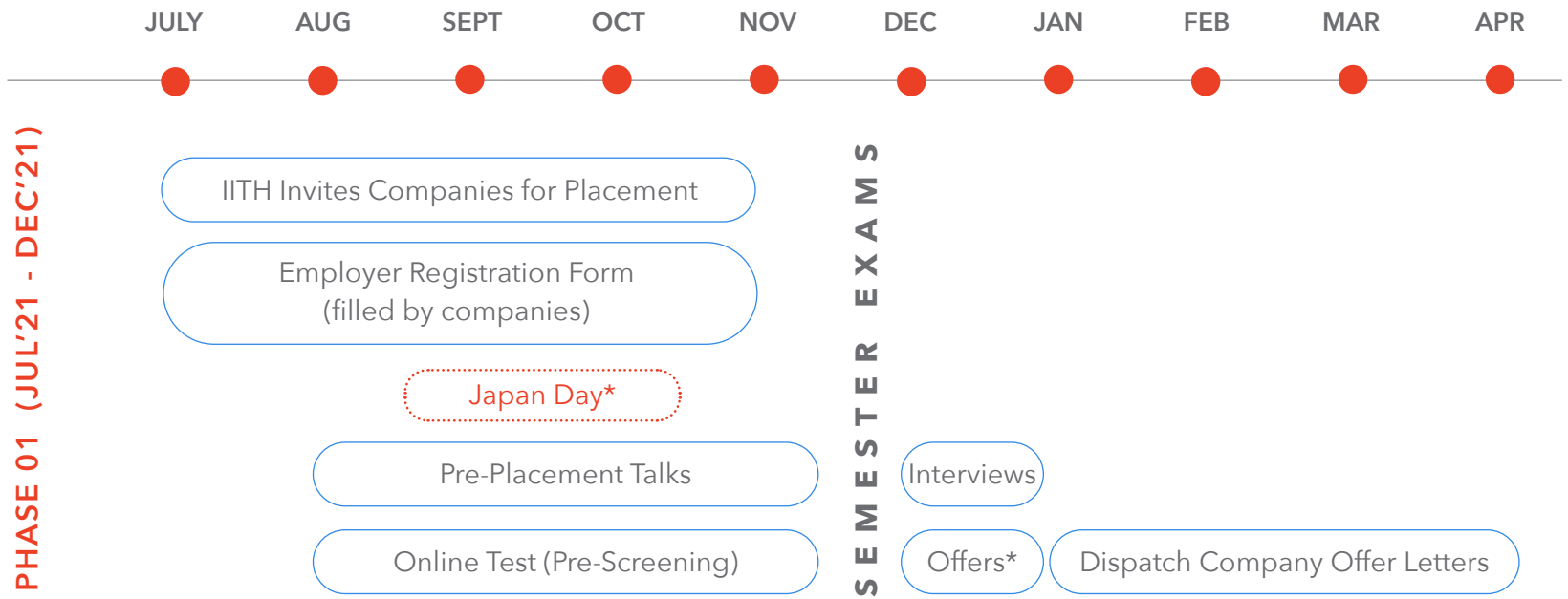
- California Institute of Technology
- Indian Statistical Institute
- Carnegie Mellon University
- IISc Bangalore
- Columbia University
- IIT Delhi
- Georgetown University
- IIT Madras
- Georgia Institute of Technology
- IIM Ahmedabad
- Harvard Business School
- IIT Bombay
- New York University
- Karlsruhe Institute of Technology
- Purdue University
- University of Minnesota Twin Cities
- University of Illinois
- University of Munster
- University of Pennsylvania
- University of Southern California
- University of Texas

IITH TIMELINE

# PLACEMENT PROCEDURE

## PHASE 01

- Interviews in the month of December (Every year)
- Highly Competitive
- Areas include IT, Circuit, PSU, Core, Auto, Banking and Finance, Healthcare, Pharma, R&D, Construction.

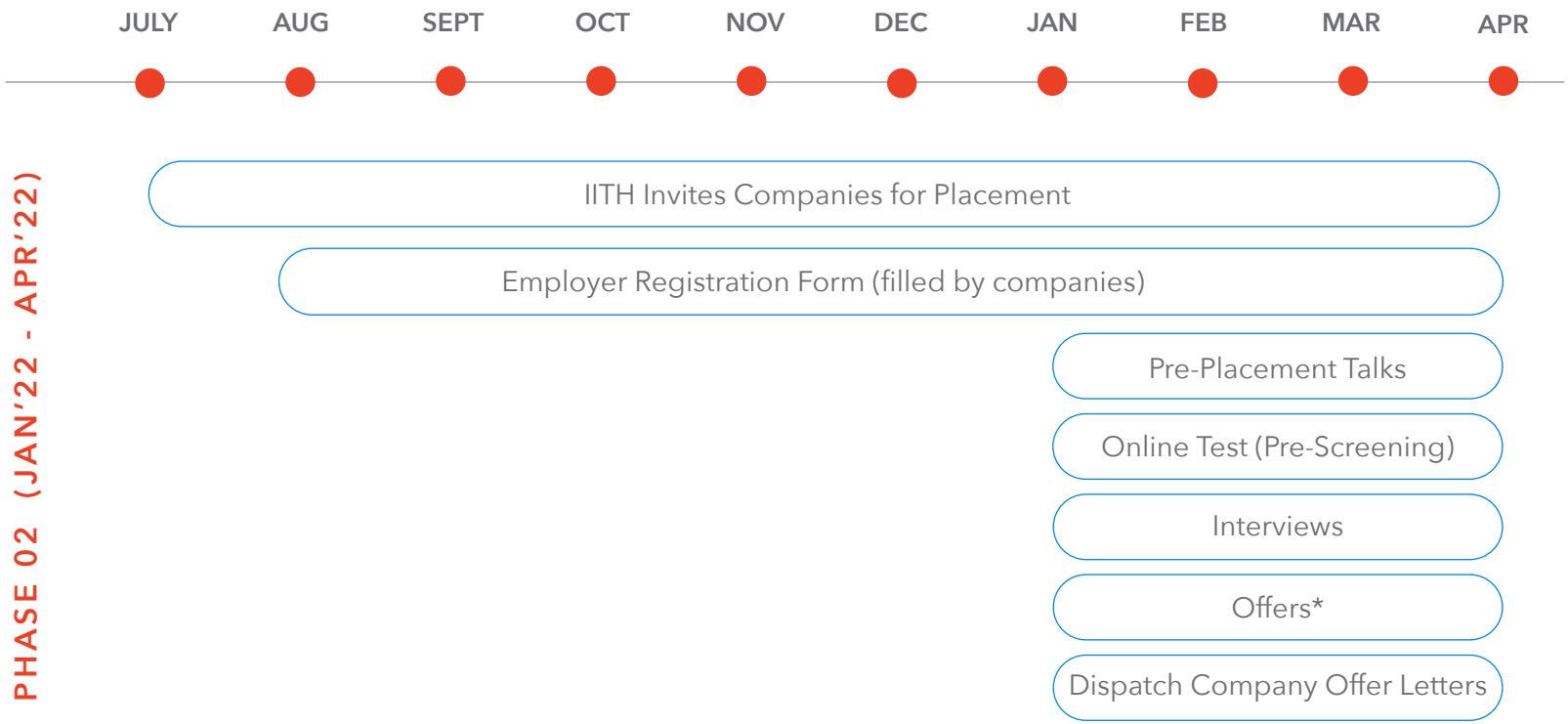


IITH TIMELINE

# PLACEMENT PROCEDURE

## PHASE 02

- Interviews in the months of January to April ( Every year)
- For students with specific focus areas.
- Hiring in diverse areas ( in addition to areas of Phase 1) Education, Manufacturing, Start-ups, Entrepreneurship)



OUR PROMINENT

# RECRUITERS

159 Solutions
Aakash Education
Aarvee Associates
Accenture
Accenture Japan
Accolite
Addverb
Aditya Birla
ADP Private Limited
Adobe Systems
Aganitha Cognitive Solutions
Agility
Aisin
Altair
Amazon
Amagi Media Labs Pvt. Ltd
Amrita University
Analog Devices
Applied Materials
AQR Capital
Arcesium India Private Ltd
Arista Networks
Arup
Ashoka Builders
Atkins
Axxela Limited
Bajaj Auto
Bank of America
Barclays
Bharat Dynamics
BeeHyv
Belcan
Mercedes-Benz
Bharat Petroleum
Bharti Airtel
Bizongo
BNY Mellon
Bombardier Inc.
Boston Scientific
BSCPL Infrastructure Ltd
Byju's
Capgemini
C-DAC
C-DOT
Celigo India Private Limited
CeWiT
Code Nation Innovation Labs
COGO FREIGHT PVT. LTD.
Collins
Coromandel
CTS
Cyient Limited
D. E. Shaw India Private Limited
Delhivery
Dell
Deloitte
Denso
DirectI
Electronic Arts
Eaton Corporation
eClerx
E - Ring Software Solutions India Pvt Ltd
ExaWizards Inc.
Ernst & Young
F5 Networks
Fast Retail
FIITJEE
Finisar Corporation
FinMee Technologies Pvt Ltd
Flipkart
Flytxt
Futures First Info Services Pvt Ltd
General Electric
Goldman Sachs
Gyan Data Pvt. Ltd.
Handzap Software
Halliburton Development Centre
Helium Consulting
HCL
Hexagon

Honeywell
Hindustan Petroleum
HSBC Bank
ImpactGuru
Indeed
Infinite Computer Solutions
Infosys
Innominds Software Pvt. Ltd.
Innovare Labs Pvt.Ltd
Intel
Indian Oil Corporation Ltd.
Indian Space Research Organisation
Jaguar Land Rover
Jaikranti Science College,Latur
JECRC University
KLA Corporation
L & W Constuctions
L&T Constructions
L&T Infotech(LTI)
L&T Limited
L&T Technology Services
Leo Force
LevaData Software Solutions Pvt Ltd
Legato Health Technologies
MAQ software
Maruti Suzuki
Marvell Semiconductor
Mathworks
MBB Labs
MedGenome Labs Ltd.
Mediatek
Mentor Graphics
Mercari
Merilytics
Microsoft IDC
Mobies
Murata Electronics Singapore
NEC Coporation
Netcracker Technology
Next Education India Pvt Ltd.
NFTDC
No Broker
NTT Advanced Technology
Nuevosol Energy
Oppo Mobiles
Optum - UnitedHealth Group
Oracle
Orbees
OYO Rooms
Panasonic India
PayPal
Paninian India Pvt Ltd
PDPU
Perceptive Analytics
Periyar Maniammai University
Phenome People
Philips
Public sapient
Qualcomm
RAAM
Rakuten
Rao Edu solutions
Redpine Signals
Reliance Jio Infocomm Ltd
Richtek
Robert Bosch
SAI Life Sciences Ltd.
Salesforce
Samsung Banglore
Samsung R&D Delhi
Schlumberger
Secureworks
Service Now
Setuserv
Shiv Nadar University
Shriram Educorp Ltd
Siemens Gamesa Renewable Energy
Sigmoid analytics
Smartron
SMS Data Tech
Softbank
Spandana Spoorty
Spiral Inc
Sprinklr
Stelios
Strandlife Sciences
Stryker Corporation
Suzuki Motor Corporation
Svaya Robotics Pvt Ltd
Swiggy
Synopsys
Tata Advanced Systems

Tata Motors

TCE

TCS R&D

Teach For India

Technoforte

Techolution

Telstra

Tesco PLC

Thermo Fisher Scientific

Think I

Thornton Tomasetti

Toshiba India

Tredence Analytics

Toyota Research Institute Advanced Development

TSMC

UHG

UTC F&S

Uurmi Systems

Value Labs

Vashishta Educational Institutions

Vassar Labs

VE Commercials (Volvo+Eicher)

Vedanta

Vidyamandir Classes

Vignan's Foundation for Science Technology & Research

Virtusa

Walmart Labs

WCB Robotics

Whirlpool of India

Works Applications

Worley

Xilinx

Xion Multiventures Pvt Ltd

XPO

Yahoo Japan

Yokogawa Electric Corporation

Zenoti

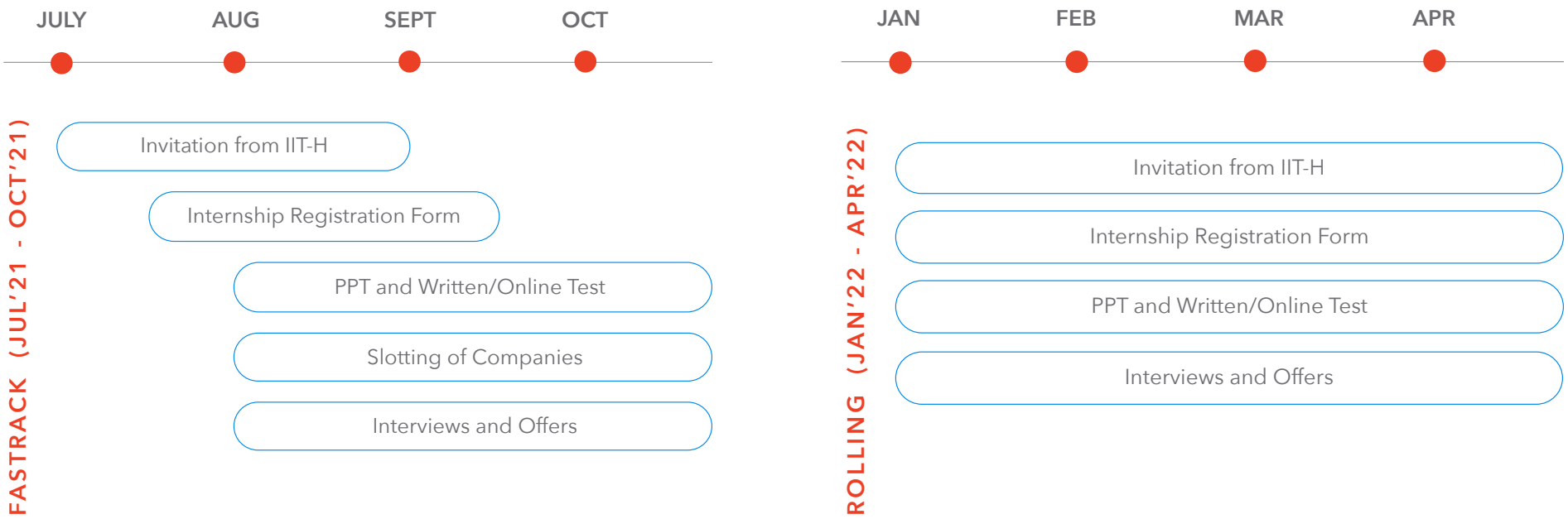
Zensar Technologies

ZS Associates

Zuti Engineering Solutions Pvt Ltd

IITH TIMELINE

# INTERNSHIP PROCEDURE



# INTERNSHIPS at IITH

Number of companies Registered
**126**

Number of companies with offers
**64**

Total Offers
**225**

International Offers
**27 (26 - Japan & 01 Dubai)**

Summer Internship offers
**213**

Semester Internship offers
**12**

Highest Monthly Stipend
**Rs. 2 Lakh**

Average Monthly Stipend
**Rs. 44 Thousand**

**Our Prominent Recruiters :**

ABB Global Industries & Services
Adobe
AGC Asia Pacific
Amazon
AMS Semiconductors
Apexplus
Appointy
Arcesium
Arista Networks
ASACO Pvt. Ltd.
Blitzjobs
BNY Mellon
DE Shaw
Deloitte
Denso
DG Takano
Eaton
Ecorenenergy
Flipkart
Frugal Testing
GE Digital
Goldman Sachs
GreatFour Systems
Grid Edge Works
Growth Arrow
Hexagon Capability Center India Pvt Ltd
Honeywell
Honeywell UOP
Houseitt
I'm Beside You
Indeed
Intel
KLA Tencor
KPIT

KRG Consultants

L&T Infotech

Legato Health Technologies

LG Soft India

Mathworks

Media.net

Medicento

MCEME

Micron Technologies

Microsoft

Mitsubishi

Mondelez International

My-healthconnect

NTT-AT

Omega Wealth Management

Oracle

Orbit Shifters

ORMAE

Our Food Pvt Ltd

OYO

Paninian India Pvt. Ltd

Peacock Solar

Philips

Pranava Technologies

Publicis Sapient

Qualcomm

Raam Group

Rakshak Foundation

Revmax Technologies

Salesforce

Samsung R&D Institute - Bangalore

Samsung R&D Institute - Delhi

Sansan

Sekisho Corporation

Servicenow

Siemens

SMS Data Tech

Spiral Inc.

Spiral Robotics

Sprinklr

Suzuki Motor Corporation

Svaya Robotics

Synchrony

Tata Consultancy Services

Tata Steel

TCS R&I

Tenhard

Tesco

Texas Instruments

TIHAN

TRDDC

UST Global

Xilinx

Yokogawa Electric Corporation

Yukai Engineering

2020 - 2021

# JAPAN DAY


## OBJECTIVES of Japan Day Event

To serve as a bridge in bringing Japanese companies and IITH students together for mutual long term relationships.

To enable companies to reach diverse pool of students at IITH and also understand the research projects at IITH

To enable students to broaden knowledge on areas of Technology in demand, career prospects and work culture in Japan.

To develop industry contacts and explore career opportunities.

## COMPANIES THAT PARTICIPATED IN JAPAN DAY 2020

- atDose Co.,Ltd.
- AWL,Inc.
- chaintope Inc.
- DENSO Corporation
- DG TAKANO Co., Ltd.
- Doctor-NET Inc.
- Fujitsu Ltd.
- I'mbesideyou.inc
- IPS, Inc.
- kay me Ltd.
- NTT Advanced Technology Corporation
- Quadlytics Inc.
- Rakuten, Inc.
- SAgri Co., Ltd
- Sansan, Inc.
- SEKISHO CORPORATION
- WOTA CORP.
- Yokogawa Electric Corporation
- Yukai Engineering Inc.

## OTHER JAPANESE COMPANIES THAT VISITED /PARTICIPATED IN IITH ON-CAMPUS PLACEMENTS /INTERNSHIP 2020-21

- Accenture Japan
- Denso Corporation
- DG Takano
- I'm Beside You
- Mitsubishi
- NTT Advanced Technology Corporation
- Rakuten Mobile
- Sekisho Corp.
- SMS Data Tech
- Yokogawa
- Yukai Engg.

Total Offers from Japanese Companies (2020-2021)
**52**

Placement Offers
**26**

Internship Offers
**26**

IITH ANNUAL

# PLACEMENT DAY

Indian Institute of Technology Hyderabad celebrates '**Placement Day'** to felicitate the young, dynamic, enthusiastic and aspiring students with the **"Excellence Award"** for their significant contribution to the placement and internship activities and procedures, performed under the Office of Career Services of IITH.

They are honorably designated as **'Student Placement Coordinator'** and **'Student Internship Coordinator'**, marking them as bearing greater responsibility and integrity and dedication.

We appreciate and thank the students for their efforts and valuable contribution in an exceptional way which fostered the success of the Institute in getting maximum companies.

IITH OFFERINGS

# DEPARTMENTS

01 Artificial Intelligence

02 Biomedical Engineering

03 Biotechnology

04 Chemical Engineering

05 Chemistry

06 Civil Engineering

07 Climate Change

08 Computer Science & Engineering

09 Design

10 Electrical Engineering

11 Engineering Science

12 Liberal Arts

13 Materials Science & Metallurgical Engineering

14 Mathematics

15 Mechanical & Aerospace Engineering

16 Physics

17 M.Tech Specialized Programs

# 1. Artificial Intelligence

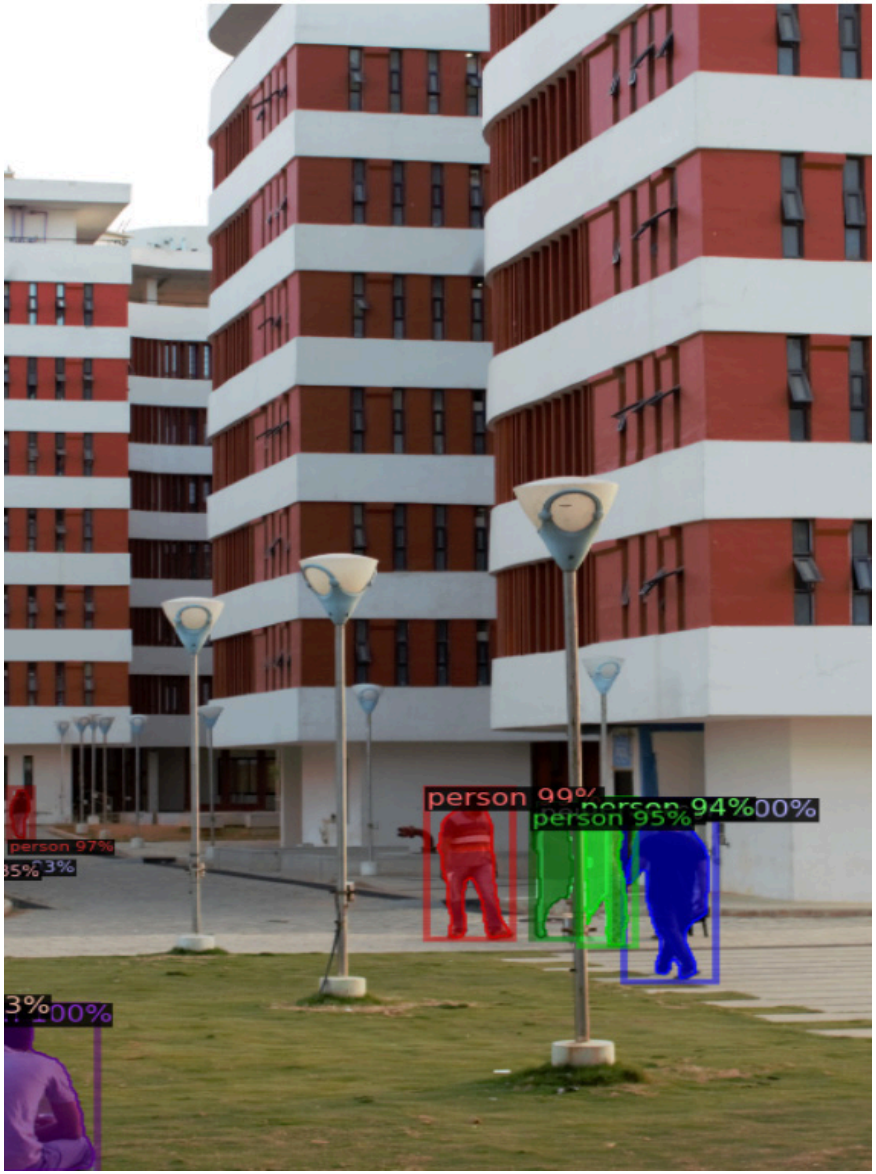
The Department of Artificial Intelligence (AI) at IIT-Hyderabad was established in 2019 to offer academic programs and mould students with a holistic understanding of the theory and practice of Artificial Intelligence, as well as to create a complete ecosystem for both academic practice and research in AI.

The mission of the department is to "Enable and facilitate students to become leaders in the AI industry and academia nationally and internationally; as well as to meet the pressing demands of the country in the various subareas and applications of AI". Presently the department offers B.Tech, M.Tech (2/3 yrs) and PhD programs. The department also offers "Professional program in AI and emerging technologies" which is a 5-week residential program at IITH.

**Research Areas:** AI for Agriculture, Intelligent Transportation and Smart Mobility, Generative Modelling, Speech Systems and Natural Language Processing, Robotics, Recommendation Systems and Data Mining, Bayesian learning, Explainable Machine Learning, Autonomous Vehicles, Computer Vision, Video Quality Assessment, Social Media and Text Analysis, ML in Astronomy, Inference Algorithms, Graphical Models, Big Data Analysis, Computer Architectures for AI, AI and IoT, AI and HPC.

**Collaborations:** NVAITC - NVIDIA AI Technology Center @IITH; AI Center supported by Honeywell and Japan International Cooperation Agency (JICA); MoUs with Government of Telangana, Oppo India and Jeju Technopark Korea; Active collaboration with NASSCOM on the Telangana AI Mission; Establishment of TiHAN with support of DST-GoI

*https://ai.iith.ac.in/*



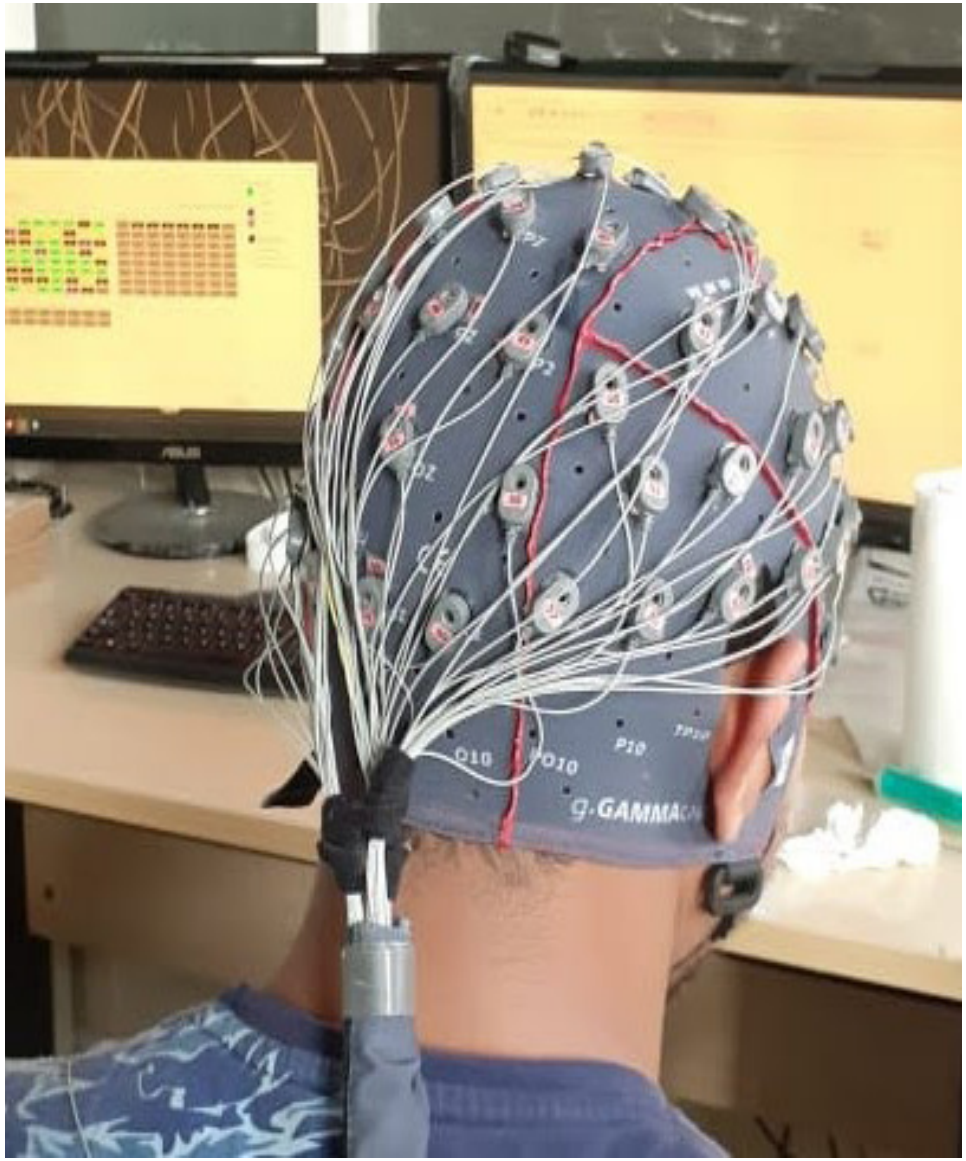
# 2. Biomedical Engineering

Biomedical Engineering at IIT Hyderabad is where the boundaries between disciplines fade for defining excellence in research and education. The primary mission of the department is to foster interdisciplinary work of highest quality by bringing together a broad spectrum of faculty expertise under a single umbrella to focus on research in Biomedical Engineering.

**Research Areas:** The students are exposed to advanced courses in Biomedical Engineering like biomedical devices, imaging, lab on a chip biosensors, biomaterials, brain-machine interfaces, stem cells, nano and regenerative medicine.

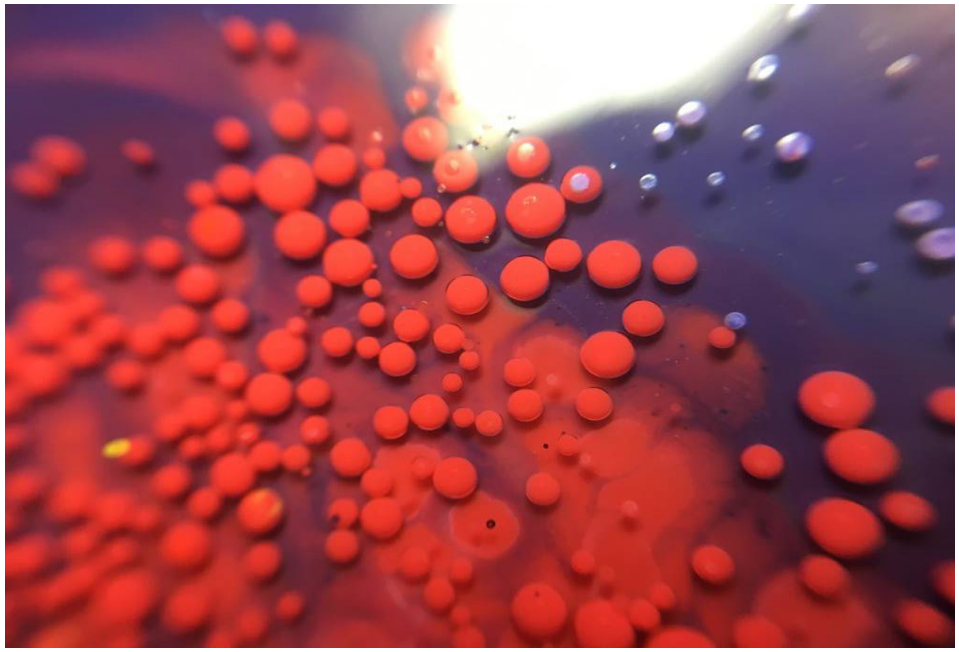
**Research Facilities/Labs:** Biofabrication and Tissue Engineering, Biomedical Imaging, Biomicrofluidics and Lab on Chip Design, Computational Biomechanics, Bio-nanotechnology and Nanomedicine, Computational Neurosciences, Computational Biology and Bio Fluid-mechanics, Nano Medicine and Regenerative Medicine, Neurotechnology and Neuroscience, Regenerative Medicine and Stem Cell Research, Diagnostic and Therapeutic Ultrasound.

https://bme.iith.ac.in/



# 3. Biotechnology

IITH is one of the 2nd generation IITs established by the Govt. of India in 2008. IITH offers 16 M.Tech programs, 16 Ph.D. programs, 11 B.Tech programs, 3 M.Sc programs, 1 M.Des program, and 1 B.Des program in all branches of engineering, science, liberal arts and design. The vibrant research culture at IITH is evident from the patents, publications and placements. The Department of Biotechnology was established in 2010 and has outstanding teaching & research programs. The department offers M.Tech in Medical Biotechnology and PhD in Biotechnology and has active research groups in the frontier areas encompassing Cancer biology, RNA Biology, Genomics and Transcriptomics, Infectious Diseases, Prion & amyloid Diseases, Advanced Bio-Imaging, Chromosome Biology and Genetic Disorders, Gene Regulation, Circadian Rhythms, molecular mechanisms of diseases/toxicity using zebrafish animal model, electrophysiology, Molecular and Cellular Neurobiology, Structural Biology and Enzyme Engineering. The department is rapidly expanding its capacity in other cutting-edge areas in biotechnology and industry collaborations.



**Research Facilities:**

Fluorescence Microscope
Real-Time PCR
Circular Dichroism
Isothermal Titration Calorimeter
Electrophysiology
FPLC
Multimode Readers
Bright Gel Imaging
FACS
Confocal Microscopy
SEM
TEM
AFM...and many more...

*https://biotech.iith.ac.in/*

**Research Areas of MTech Thesis**

Chromosome Biology
Cancer Biology
Circadian Rythm and Diseases
Prion & Amyloid Diseases
HIV-1 Biology
Protein engineering
Structural Biology and Drug Design
Protein Misfolding
Cell Signalling
Biomolecular NMR
RNA Biology
DNA Repair, epigenetics
Ion Channel Biology
Genomics
Transcriptomics and Proteomics
dvanced Bioimaging
Toxicology...and many more...

# 4. Chemical Engineering

The Department of Chemical Engineering at IIT Hyderabad (ChE@IITH) is one of the fastest growing Chemical Engineering Departments in the country and has an excellent reputation in teaching and research, built over the last 10 years. With 20 faculty members engaged in cutting edge research, we provide quality programs in chemical engineering education, research and expert consulting support to process industries.

With IITH standing tall in the NIRF ranking, ChE@IITH is committed to set new heights for excellence in engineering education. We are achieving this ambitious goal by (i) instilling our fractal teaching approach which provides our students the extreme flexibility of need based learning, (ii) amalgamating the theoretical concepts, computational methods and programming in chemical engineering, (iii) interdisciplinary research approach helping our students and faculties to become more socially responsible citizen, (iv) implanting the culture of productization and start-up in the young mind, and (v) making high quality education accessible to the citizens of the country at their ease.

**Education and vision**

With IITH standing tall in the NIRF ranking, ChE@IITH is committed to set new heights for excellence in engineering education. We will achieve this ambitious goal by (i) instilling our fractal teaching approach which provides our students the extreme flexibility of need based learning, (ii) amalgamating the theoretical concepts, computational methods and programming in chemical engineering, (iii) interdisciplinary research approach helping our students and faculties to become more socially responsible citizen, (iv) implanting the culture of productization and start-up in the young mind, and (v) making high quality education accessible to the citizens of the country at their ease. Moreover, students are receiving direct exposure in programming in MATLAB and python through projects and assignments.

*https://che.iith.ac.in/*

**Research Exposure**

Department is involved in some of these interdisciplinary areas such as Advanced Materials, AL & ML, Bio-engineering & Biotechnology, Systems Biology, Mineral Processing, Energy Conversion & Storage, Fluid Mechanics, Heterogeneous Catalysis, Process Systems Engineering, Polymer Science & Engineering, Techno-Economic Analysis, DFT & MD. With the state-of-the-art infrastructure and research facilities, the department is connected with universities across the globe through active collaborations and has received funding support from all leading government and private agencies (DST, DBT, DRDO, BRNS, UKIERI, MHRD, NMDC, Tata etc.).

# 5. Chemistry

Since its inception in 2008, the Department of Chemistry at IIT Hyderabad has been committed to empower the undergraduate and postgraduate students with a strong hold of the subject and to develop critical thinking-based approach and scientific temperament in the field of chemical science. We are a growing department with 16 dynamic and passionate faculties and around 80 young and enthusiastic doctoral students with diverse research interests. At master's level, we have introduced a rigorous one-year research project-based learning program as a part of the MSc curriculum to ensure real hands-on research experience to train our students for future research challenges. The strength of the MSc students is 46. We provide a student-friendly scientific environment with an excellent student to faculty ratio of 4:1, which gives ample opportunity to students to interact and satisfy their intellectual curiosity on one to one basis.

**Research Areas:** The department is actively pursuing a broader research in various areas namely Organic Synthesis and Drug Discovery; CO2 Activation and Pollution Abatement; Organometallic Chemistry; Molecular Sensors; Energy Conversion, Saving and Storage; Small Molecule Activation; High Performance Composites; Green Chemistry; Molecular Modeling; Spectroscopy and Dynamics of Transient Species; Strongly Correlated Materials for Thermoelectrics and Superconductors; Functional Organic Materials and Supramolecular Chemistry; Bioorganic Chemistry; Biophysical Chemistry; Computational Inorganic Chemistry.

**Research Facilities/Labs:** State of the art research facilities that include 600 & 400 MHz NMR, XPS, AFM, BET Analyzer, Raman Spectrometer, Glove Boxes, UVVis-NIR Spectrometer, CHNS-Analyzer, XRD, ICP, HRMS, CD, ESR, GC-MS, HPLC, TGA and many more sophisticated set-ups. The department is also equipped with necessary infrastructure for carrying out wet chemical syntheses and related experimentation.

*https://chemistry.iith.ac.in/*

# 6. Civil Engineering

The curriculam for these specializations ensure proficiency in breadth of topics as well as sufficient depth of coverage within each area. Students graduating from the programme are provided exposure to the latest analysis and design softwares such as ABAQUS, STAAD Pro, ANSYS, ZenCrack, FLAC 3D, PLAXIS 2D/3D and GeoStudio Professional, GMS, ERDAS, HGA, in a state-of-the-art computational facility.

**Research Areas**: Structural Strengthening, Earthquake Engineering, FRP composites, Improved Road and Rail Performance, Ground Improvement, SoilStructure Interaction, Recycled Material for Construction, Waste water treatment, Solid waste management, Remote Sensing with GIS, Contaminant transport, Groundwater flow, Surface water Hydrology and Development of Advanced Computational Techniques.

**Research Facilities / Labs:** Geotechnical Engineering, Structural Engineering, Water Resources Engineering, Traffic Engineering, Highway Materials, Air Quality Monitoring, Microbiology, Solid & Hazardous Waste Management, Water & Wastewater Engineering, Water Quality Analysis, Advanced Geotechnical Engineering, Geosynthetic Testing, Large Scale Testing, Advanced Soil Dynamics, Ground Characterisation, Advanced Cement Based Materials, Advanced Structural Material Testing, Scaled Structural Testing and Materials Characterisation.

*https://civil.iith.ac.in/*

# 7. Climate Change

The Department of Climate Change at IIT Hyderabad integrates academic and practical knowledge by bringing together a diverse array of stakeholders, including scientists, engineers, policy researchers, practitioners, and students in order to develop a holistic understanding of Climate Change.

We, at IITH, aspire to be a leading institute in developing real-world solutions to the many challenges brought forth by Climate Change. Our innovative interdisciplinary curriculum involves a mix of core and elective courses, an industry lecture and seminar series by leading experts, focus group discussions, field visits, and a research thesis to provide cutting-edge education in the area of Climate Change

**Research Areas:**

**Climate:**
Climate Adaptation, Climate Extremes, Climate Impact, Climate Resilience, Urban Studies, Sustainable Development

**Computation/ Modelling :**
Climate & WRF Models , Satellite and Radar Rainfall Estimation, Emissions Modelling, Scaling up and Efficiency of Simulations, Parallelization, 3D & 4D Variation Assimilation Methods, Applications of AI & ML

**Mitigation:**
Biofuels, Bio-electro chemistry, Carbon Emissions, CO2 Activation, Design for Sustainability, Life cycle Analysis, Resource Recovery from Waste, Waste Management, Renewable Energy

*https://cc.iith.ac.in/*

# 8. Computer Science & Engineering

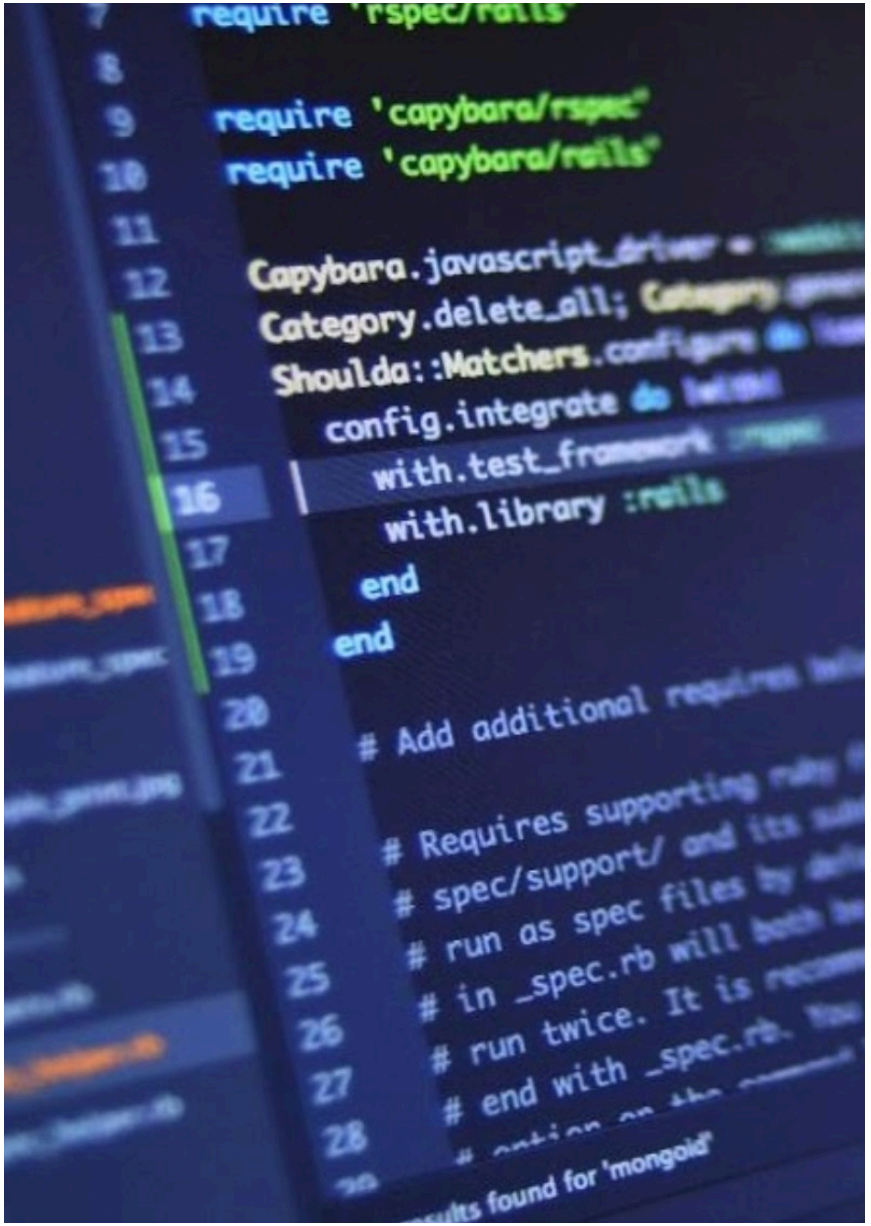
IIT Hyderabad's Computer Science and Engineering (CSE) department, established in 2008, is a one-of-a-kind centre of excellence (CoE), with exceptional research and innovation opportunities. It is one of the most dynamic, young, and vibrant departments in the institute, providing students with the environment to innovate, build and grow.
The faculty have active collaborations with various academic and industry partners such as Microsoft Research, IBM Research, Intel, AMD, Samsung, DRDO, and the University of Oxford, University of Tokyo, Swinburne University, IISc, other IITs. and many global Universities.
The Department has a strong collaboration with universities and companies in Japan. Many of the students have spent time in Japan as part of academic/ cultural exchange programs.

To help students stay updated with the ever-changing industry norms and standards, the "Industry Lecture series" is set up with the most popular companies' representatives and top executives- like Google, Verizon, Arista, Intel, VMWare, and Qualcomm, etc. to share insight with the students.

**The department also provides students with various labs such as :**

Visual Learning and Intelligence Lab (VIGIL), Networked Wireless Systems (NeWS) Lab, Cyber-Physical Systems Lab, Practical Networking and Blockchain (PRANET) Lab, Theoretical Computer Science Lab, Computer Architecture and Machine Learning (CANDLE) Lab, Compiler Lab, DISANET Lab, etc. which not just help in fulfilling the student's passion for research but are also at par with the global standards for research. The volume and quality of publications and patents speak for themselves. In the past couple of years alone, the department has produced more than 60+ publications and many unique patents.

*https://cse.iith.ac.in/*



# 9. Design

The Department of Design offers a vibrant environment for research and practice of several facets of Design. The department envisions a creative engagement in the space between technologies and people. The Department of Design currently offers Bachelors of Design (B.Des), Master of Design (M.Des), Doctor of Philosophy (Ph.D) in Design and Design Minor. The teaching methods adapt to customized student requirements. Students experience a strong foundation in courses such as Evolution of Design, Design Process, Design Thinking, Photography, Film Appreciation, Form Exploration, Material Exploration, Environmental Perception, Elements of Design and Principles of Design. This foundation enables them to branch out into electives such as User Experience Design, Graphic Design, Advanced Photography, Filmmaking, Animation, Illustration, Spatial Design, Product Design, System Design, Furniture Design, Information Visualization and Interaction Design. The Design students additionally explore Crafts and Performance Arts. The balance of foundation and specializations make the students flexible as per the dynamic industry requirements.

**Research Areas**:Department of Design delves into research in Traditional as well as Emerging Technologies. Research areas include Culture and Heritage, Traditional and Contemporary Photography, Art, Architecture, Design Education, Film Theories and Interactive Filmmaking, Design and Sustainability, Sketching Technologies, Haptic Communication, 3D Printing, Passenger Drone Design,

**Facilities/Labs:** The laboratories at Department of Design host the state of the art equipment such as Computerized Numerical Control (CNC) Machine, Digital Single-Lens Reflex (DSLR) Cameras, Projection Mapping Devices, Projectors for Film and Experimental Performance Art, Film and Sound Editing Systems, Drawing Display Monitors, Haptic Devices, 3D Printers, Laser Scanners, Cave Automatic Virtual Environment (CAVE) System for Mixed Reality Experiences, 360-Degree Virtual Reality Cameras, Drone Cameras, 360-Sound Capture Devices, Printing and Binding facilities.

*https://design.iith.ac.in/*

# 10. Electrical Engineering

The Department of Electrical Engineering (EE) at IIT Hyderabad offers a vibrant environment for undergraduate, post-graduate education and research in many areas of Electrical Engineering. The department comprises a diverse group of faculty members with varied research interests offering courses such as - traditional Electrical Engineering, interdisciplinary CS courses, etc.

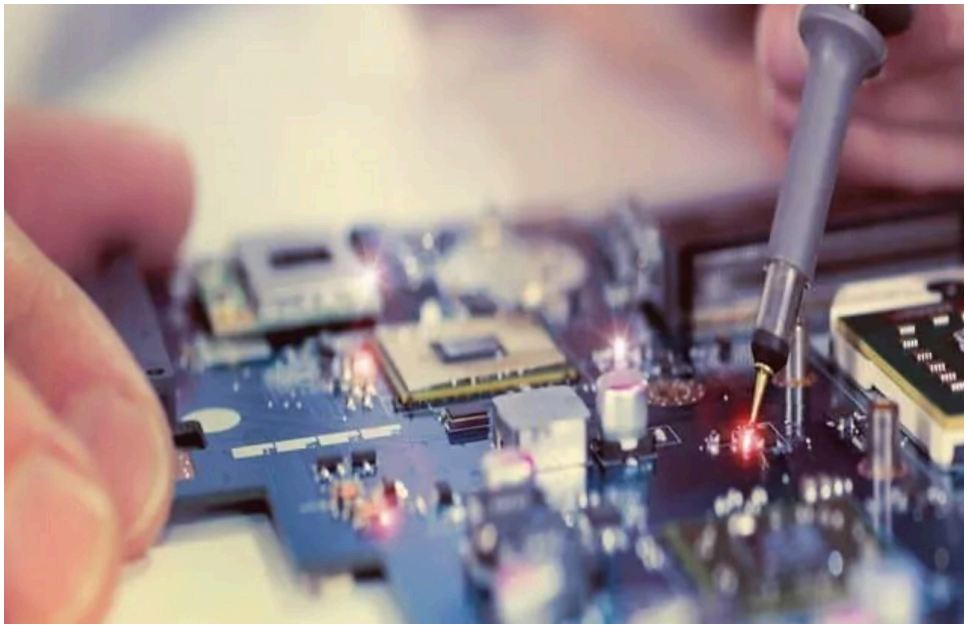
Research Outcomes include over 83 Journal papers, 74 Conference Proceedings, 5 Filed Patents, and over 11 Projects with a funding of 85 crores. Another major project includes a testbed on autonomous navigation (TiHAN) for unmanned aerial vehicles, which got funded 135 crores by GOI.

**Research Areas:** Research areas are a healthy mix of traditional Electrical Engineering and interdisciplinary research. Major areas of faculty expertise will include Microelectronics and VLSI, Communications and Signal Processing, Power Electronics and Power Systems, Systems and Control. Some of the emerging research fields include 5G and next-generation communication technologies, Autonomous Navigation and Data Acquisition Systems, Artificial Intelligence-based Computer-Aided Design techniques for VLSI, 3-D IC's, 3-D MEMS, Micro/Nano-electronics and fluidics, Cooperative Communication, Speech, and Multimedia Signal Processing, Source Coding, Space-Time Coding, Information Theory, Cognitive Radio/Radar, Cyber-Physical Systems, Image, and Video Quality Assessment, Green ICT(micro-grids, sensor networks), Power Systems and Electronics, Identification and Estimation of Fault and Diagnosis, Electric Vehicle, Integration of Renewable Energy Sources to Grid (Micro Grid), Smart Grid, Advanced Control Applications, Statistical Process monitoring and Control, Healthcare Electronics, Design for testability and fault-tolerant circuit design, Nano-magnetic Quantum Computations.

https://ee.iith.ac.in/

**Research Facilities / Labs:** Coding & Communication Theory Lab, Speech Information Processing (SIP) Lab, Immersive Multimedia and Telepresence Laboratory for Video and Image Analysis (LFOVIA), Renewable Energy and Power Systems Lab, Power Electronics and Power Systems (PEPS) Lab, Smart Power Applications and Renewables Control (SPARC) Lab, Electron device Research Lab, Dynamics and Control Lab, Littlings Lab, Nanophotonics Lab, Advanced Embedded Systems and Digital IC Design Lab, Flexible Electronics and Nanodevices Lab, VLSI Research lab, and Wireless Communications and Networking (WiCoN) Lab.

We aim to be recognized as ideators and leaders in higher education and research and to develop human power with creativity, technology, and passion for the betterment of India and humankind.



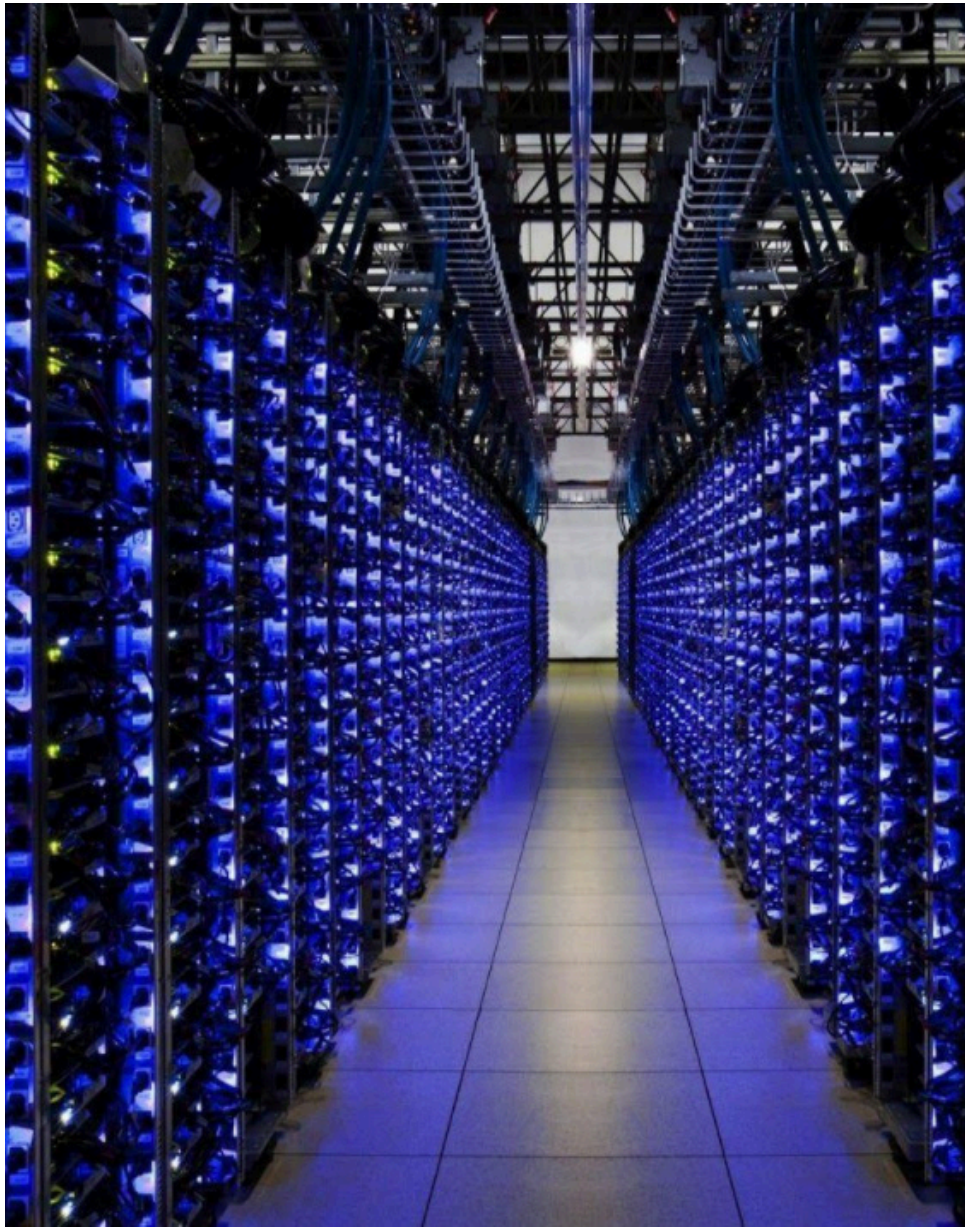
# 11. Engineering Science

Engineering Science is a unique interdisciplinary B. Tech. program started at IIT Hyderabad for the first time in 2012. It focuses on the T-Education model, where the horizontal line in T corresponds to breadth while the vertical line corresponds to depth. This program aims to let students experience the type of courses they will be doing in a particular branch before choosing. For the first two years of this program, students take courses from different departments such as Computer Science, Electrical, Maths and Computing, Mechanical, Chemical, Civil, Material Science, Physics and Chemistry. At the end of 2nd year, they will be selecting a department of their choice and continue to specialize in their respective branches from 3rd year onwards. A student specializing in a particular branch from Engineering Science will be doing nearly all the core courses done by any student of that specific branch. They are also allowed to remain as Engineering Science students and continue doing courses from different departments to gain interdisciplinary knowledge. This 'T' based model gives a holistic perspective in engineering education.

**Research Areas**: Emphasis on understanding and integrated application of engineering, Ability to apply acquired math, science and engineering skills to solve real-world engineering problems, Ability to identify, formulate and solve multi-disciplinary engineering problems, Ability to work well in interdisciplinary teams with focus on system integration

**Research Facilities / Labs:** The Engineering Science Department has a world-class faculty with education and training from the best Universities in India and abroad. As an interdisciplinary department, we have access to the labs of every department including CSE, EE, Math, Mechanical, Civil, Chemical, Physics, etc.

*https://es.iith.ac.in/*



# 12. Liberal Arts

Liberal Arts at IIT Hyderabad is a leading center for the study of a highly diverse range of subjects including Cultural Studies, Economics, English (Literature and Language), Psychology, Linguistics, Sociology and Social Anthropology.

**MA (DEVELOPMENT STUDIES)**

The concern with development encompasses all aspects of human life - physical, psychological, cultural, political, economic and ecological. How can we address each of these while simultaneously appraising their interdependence? The challenge is to train and conceive of professionals and roles that can critically inform ways in which these different areas of life affect one another. The MA - Development Studies program at the Department of Liberal Arts, IIT-H does just that. Through its interdisciplinary approach, it offers a plurality of ways in which the discourse of Development can be innovatively adapted to the ever-changing fabric of human
life. Faculty coordinating the different courses in this program come from disciplines of Anthropology, Development Studies, Economics, Psychology and the Humanities. With courses offered in the fields of Development Theory and Policy, Health, Gender, Technology Studies, Economics, Environment and Sustainability and Disease Management, and a dedicated Internship component, this two-year program offers students a formidable platform to engage with contemporary research in India and globally.

**Research Areas:** The broad areas of ongoing research in the department are Economic growth, Macroeconomics, Monetary economics, International finance, Gender studies, Cultural studies, Clinical Psychology, Positive Psychology, Literary Theory, Rhetoric and Composition, Modernist Fiction, Literature and the Visual Arts, Health Psychology, psycho-oncology, Cultural Psychology, Indigenous Healing, Medical Anthropology, Anthropology of the Media, Sculpture, New Media Art.

*https://lba.iith.ac.in/*


**Research Facilities / Labs:** Department of Liberal Arts has research facilities that cover both theoretical and experimental aspects of all core research areas. Few of them are given below: Language and Cognition Laboratory, Psychology Laboratory, Applied Econometrics Laboratory.

# 13. Materials Science & Metallurgical Engineering

The department offers course work covering broad fields of materials science and metallurgical engineering from fundamentals to advanced and emerging areas such as nanomaterials, biomaterials, energy materials, electron microscopy, thermomechanical processing, thin films and devices, to name a few, which impart strong foundation on several major aspects of materials science and Metallurgical engineering and enhance the state of the knowledge of the students.

**Research Facilities / Labs:** The department has several state-of-the-art laboratories such as X-materials Innovation Hub, Advanced Structural and Functional Materials research laboratories equipped with advanced and state-of-the-art equipment suitable for teaching, research and innovation.

**Research Areas:** Structural Materials, Functional Materials and devices, Healthcare and Biomaterials, Energy Materials, Nanoscience and Nano-Technology, Computational materials science.

The Department imparts in-depth knowledge in fundamental aspects of Materials Science and Metallurgy. Thus the student learns the principles of major characterization techniques such as X-Ray diffraction, optical and electron microscopy as well as spectroscopy. Moreover, students are given ample opportunity to gain hands-on expertise in all these techniques. Students also learn key materials processing techniques such as casting and thermomechanical processing of engineering alloys, fabrication of thin films and coatings, ceramic and polymer processing methods. In addition, they learn various computational modeling techniques. As a part of their undergraduate and graduate curriculum, students learn basic and advanced courses on thermodynamics, kinetics and phase transformations of materials. In these courses they are trained to apply fundamental principles of thermodynamics and kinetics to study phase equilibria and diffusion in key engineering alloys such as steels, superalloys, and light alloys using CALPHAD-based tools. They also learn various advanced courses such as design of biomaterials and bioimplants, biomimetics, metamaterials, design of semiconductors, ferroelectric and ferromagnetic devices and sensors, nanomaterials, functional and structural polymers and soft materials. Thus, the Department aims to develop students with strong fundamental understanding with a desire to innovate and explore new and exciting areas such as high entropy alloy design, plasmonics, materials informatics, magnetic nanowires .

# Materials Science & Metallurgical Engineering

**Industry relevant skills:** Hands on experience on advanced characterization, testing and processing techniques.
Characterisation: XRD, optical and electron microscopy, spectroscopy, thermal analysis, surface area.
Processing: rolling, forging, additive manufacturing,
Testing: tensile, hardness, impact, creep, tribology, nanoindenter,
Trained in Communication skills through formal courses, seminar, and technical writing professional ethics/plagiarism.

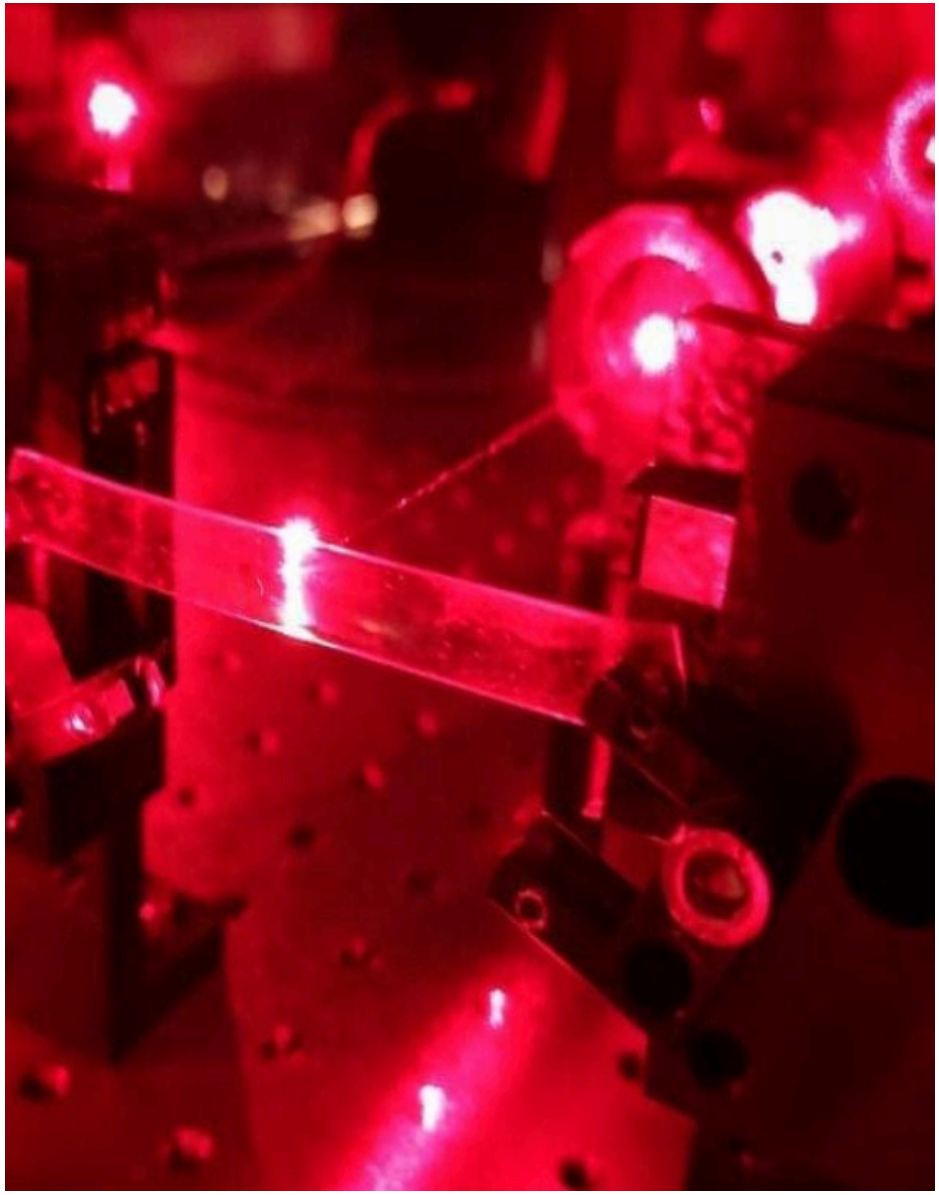
**Key distinguishing features:** Early introduction to computational methods and materials informatics,Fine balance between structural and functional aspects of Metallurgy and Materials science

Industry experiences in form of semester internships, industry sponsored/supported projects, summer placements and lectures from top industry personnels.

Technology focussed advanced courses allowing students to adapt and understand industry needs.

Global exposure to metallurgy and materials science academic and research - visiting foreign faculty and research collaborations
State-of-the-art curriculum distinct from any other contemporary department

*https://msme.iith.ac.in/*



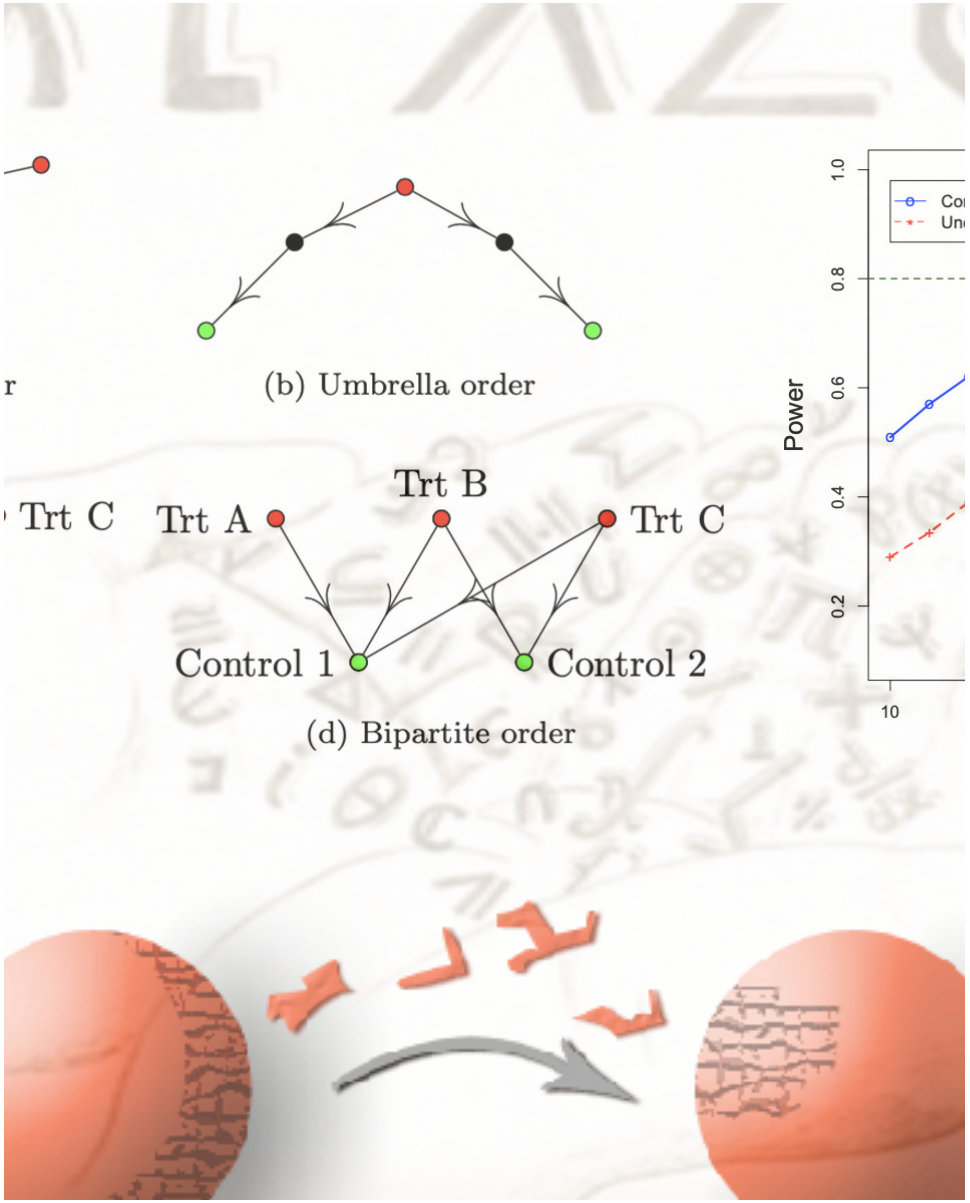
# 14. Mathematics

The department offers a complete range of mathematics programmes: BTech in Mathematics and Computing, MSc with specialisations in Mathematics, as well as, Mathematics and Computing, and PhD in Mathematics and Statistics. Firmly focussed on training students right from the start of their academic career, the Department of Mathematics is recognised for its commitment to developing a strong foundation in mathematics, and offering statistical and computational skills to prepare them for positions in industry, government, and academia.

**Research Areas**: Faculty in the department are engaged in research areas such as Algebra, Analysis, Applied Mathematics, Data Analysis, Fluid Dynamics, Fuzzy Logic, Geometry, Machine Learning, Number Theory, PDE, Probability and Statistics (Optimal Design Theory and Reliability Theory). The students are specifically trained in theoretical, applied and statistical aspects of mathematics, as well as, in emerging areas, such as, Computational Intelligence, Coding and Cryptography, and Statistical Data Analysis, which is evident from the research projects they do as part of their curriculum.

**Research Facilities/Labs**: The department has excellent and state-of-the-art computational facilities including high end GPU servers.

*https://math.iith.ac.in/*



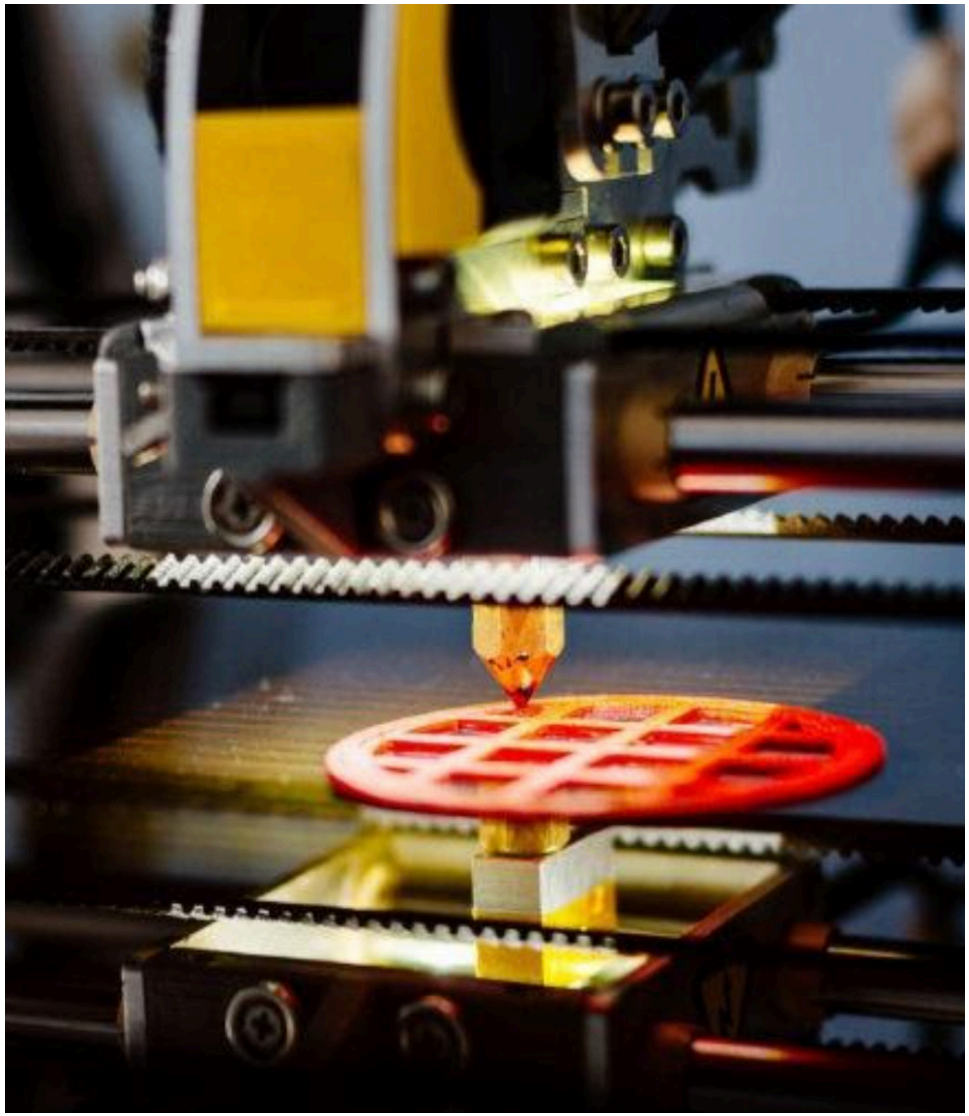
# 15. Mechanical & Aerospace Engineering

The department has a dynamic curriculum which integrates the teaching of engineering science fundamentals along with modern industrial practices. The department has a rich and diverse set of talented faculty.

**Research Areas:** The Department of Mechanical and Aerospace Engineering broadly works on Aerospace Structures, Integrated Design & Manufacturing, Mechanics & Design and Thermo-fluids Engineering.
The focus research areas are: Multibody Dynamics, Legged Robotics, Control Theory and Mechatronics ,MEMS, NEMS, Linear & Nonlinear Vibrations, Impact Mechanics, Experimental Solid Mechanics, Contact Mechanics, Applied Mechanics , Design of Composite Structures, Unmanned Aerial Vehicles, Robotics, Biomechanics, Acoustics, Dynamics Control, Vibrations in Structures and Turbo-Machines,
Thermal Management Approaches for Distortion Control in Metal Additive Manufacturing, Process Modeling and Optimization Fracture Mechanics, Laser Material Processing, Underwater laser material processing, Manufacturing processes for Mass Customization, Development of Integrated Product and Process Design Systems,
Supersonic & Hypersonic Flows, Combustion Kinetics, CFD modelling of Turbulent flows and Turbulent Combustion, Interfacial flows ,Phase Changing Materials, Stability Analysis of Flows, Multi-Materials Simulations, Experimental and Numerical Combustion Kinetics, Turbulent spray combustion,Turbulence modelling, LES, Combustion & Multiphase flows .

**Research Facilities / Labs:**
Robotics & Intelligent Systems Lab, Acoustics & Vibrations Lab, CAD/CAM, CAE, CFD, Dynamics Lab, Fluid Mechanics Lab , Heat Transfer Lab, Fluid Physics, Liquid Spray, Combustion diagnostics, Machining & Metrology, Manufacturing, MEMS, Optics, Solid Mechanics Lab.

*https://mae.iith.ac.in/*



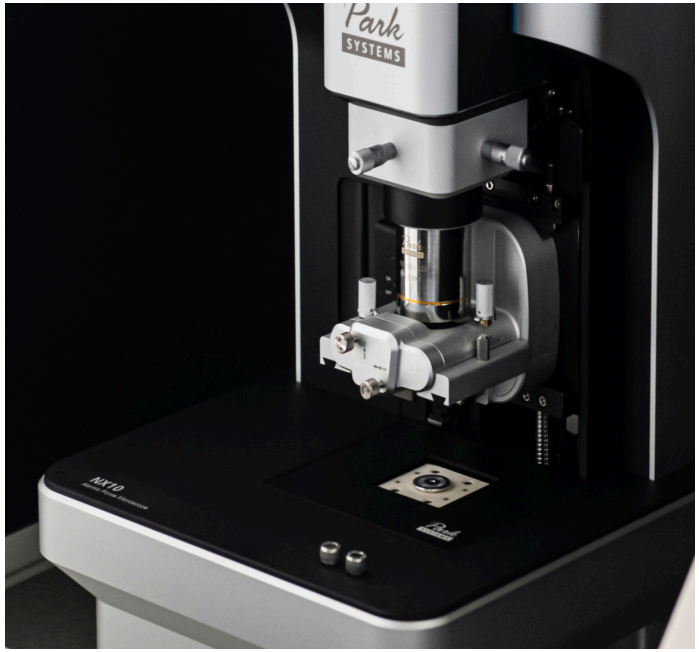
# 16. Physics

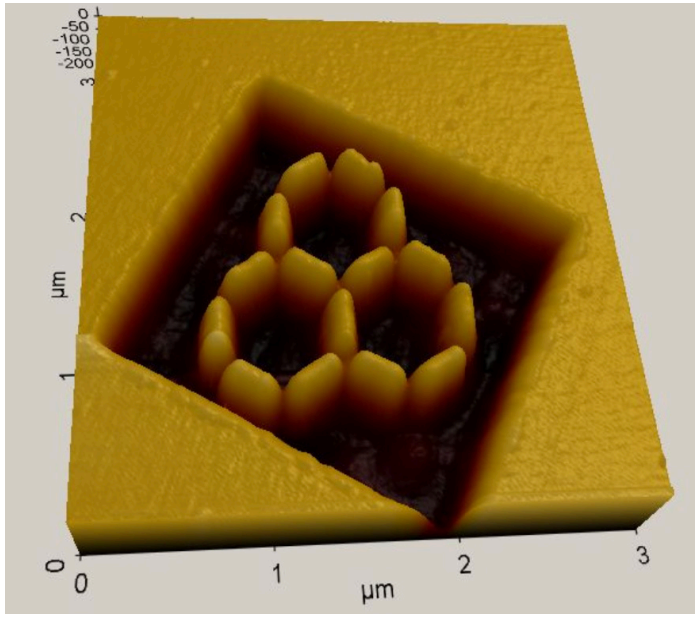
The Department of Physics is one of the most vibrant centers of learning in the campus. The theme of the department is to broaden the boundaries of research across its undergraduate, post-graduate and research programmes and become an outstanding center for Physics in the next decade. The technological and scientific aptitude that is nourished through contemporary learning methodologies, enable the students to bring significant contribution to industries, research and academia. The B.Tech program in 'Engineering Physics' is a unique combination of Physics and Engineering, the M.Sc. Physics Program prepares students well for a career in research or industry & The PhD program offers several exciting frontier research areas spreading across theory experiments and applications.

**Research Areas:** At present the department has 22 faculty members in the areas of MEMS & Micro/Nano Systems, Energy Conversion Devices, Statistical and Biological Physics, Astrophysics and Cosmology, Computational Condensed Matter Physics, Experimental Condensed Matter Physics, High Energy Physics, Optics, Spectroscopy and Laser-Plasma Physics.

**Research Facilities / Labs:** Advanced Detector Materials Design and Simulations, Energy Conversion Devices Lab, Intense Laser-Matter Interaction Lab, MEMS & Micro/Nano Systems Laboratory, Nanomagnetism and Microscopy, Advanced Functional Materials laboratory apart from the B. Tech. and M.Sc boasting of state-of-the-art teaching experimental demonstrations.

https://physics.iith.ac.in/



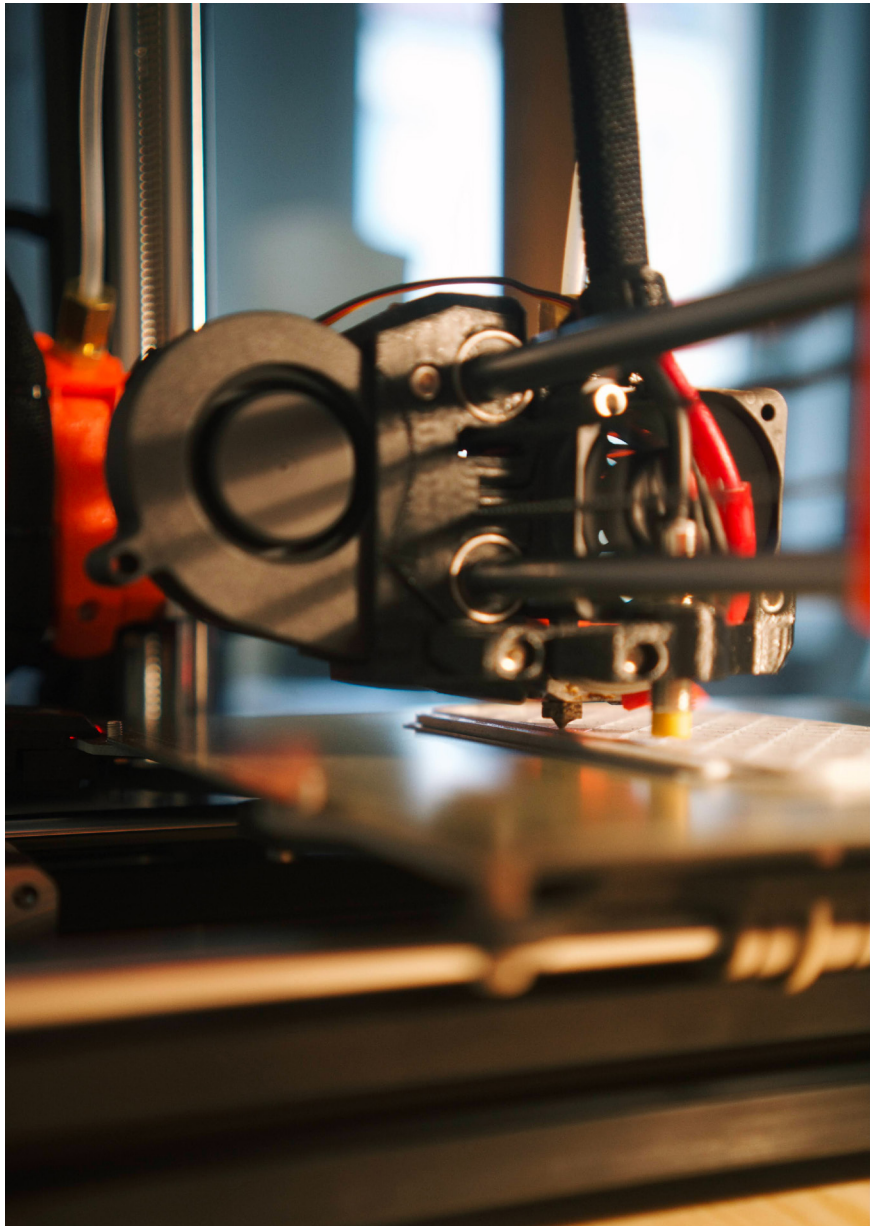




**High-resolution image of Co nanostructure**
Picture Credit: *Dr. Jyoti Mohanty, Department of Physics.*

# 17. Additive Manufacturing

The Department imparts in-depth knowledge in fundamental aspects of Materials Science and Metallurgy. Thus the student learns the principles of major characterization techniques such as X-Ray diffraction, optical and electron microscopy as well as spectroscopy. Moreover, students are given ample opportunity to gain hands-on expertise in all these techniques. Students also learn key materials processing techniques such as casting and thermomechanical processing of engineering alloys, fabrication of thin films and coatings, ceramic and polymer processing methods. In addition, they learn various computational modeling techniques. As a part of their undergraduate and graduate curriculum, students learn basic and advanced courses on thermodynamics, kinetics and phase transformations of materials. In these courses they are trained to apply fundamental principles of thermodynamics and kinetics to study phase equilibria and diffusion in key engineering alloys such as steels, superalloys, and light alloys using CALPHAD-based tools. They also learn various advanced courses such as design of biomaterials and bioimplants, biomimetics, metamaterials, design of semiconductors, ferroelectric and ferromagnetic devices and sensors, nanomaterials, functional and structural polymers and soft materials. Thus, the Department aims to develop students with strong fundamental understanding with a desire to innovate and explore new and exciting areas such as high entropy alloy design, plasmonics, materials informatics, magnetic nanowires .

The department offers course work covering broad fields of materials science and metallurgical engineering from fundamentals to advanced and emerging areas such as nanomaterials, biomaterials, energy materials, electron microscopy, thermomechanical processing, thin films and devices, to name a few, which impart strong foundation on several major aspects of materials science and Metallurgical engineering and enhance the state of the knowledge of the students.



**Research Facilities / Labs:** The department has several state-of-the-art laboratories such as X-materials Innovation Hub, Advanced Structural and Functional Materials research laboratories equipped with advanced and state-of-the-art equipment suitable for teaching, research and innovation.

**Research Areas:** Structural Materials, Functional Materials and devices, Healthcare and Biomaterials, Energy Materials, Nanoscience and Nano-Technology, Computational materials science.

**Industry relevant skills:** Hands on experience on advanced characterization, testing and processing techniques.
Characterisation: XRD, optical and electron microscopy, spectroscopy, thermal analysis, surface area
Processing:rolling, forging, additive manufacturing,

**Testing:** Tensile, hardness, impact, creep, tribology, nanoindenter,
Trained in Communication skills through formal courses, seminar, and technical writing Professional ethics/plagiarism

**Key distinguishing features:** Early introduction to computational methods and materials informatics,Fine balance between structural and functional aspects of Metallurgy and Materials science Industry experiences in form of semester internships, industry sponsored/ supported projects, summer placements and lectures from top industry personnels.Technology focussed advanced courses allowing students to adapt and understand industry needs Global exposure to metallurgy and materials science academic and research - visiting foreign faculty and research collaborations. State-of-the-art curriculum distinct from any other contemporary department.

# 18. Energy Science & Technology

M. Tech. in Energy Science and Technology (EST) is an interdisciplinary program being offered from the academic year 2020-2021 at IITH. The Department of Chemistry is initially coordinating this course. Faculty members from different departments (CHE, CHY, EE, MSE, PH) across the Institute with expertise in Energy, Materials and Technology serve as instructors for the diverse curriculum.
The goal of the program is to impart and foster knowledge in energy research and development and state-of the art approaches to shape the future of energy. Broad areas include, but are not limited to: Fossil Fuels, Power Engineering, General Energy, Renewable Energy, Energy Storage, Nuclear Energy and so forth.

**Research Facilities/Labs**

- Material Synthesis: Materials synthesis apparatus, Autoclave and fixed bed reactor.
- Energy Storage applications: Battery assembly and electrochemical characterization.
- Solar PV: Solar cell fabrication and characterization

**Characterization:** Scanning Electrochemical Microscopy (SECM), XRD & SAXS, SEM-EDAX, TEM, XPS, FTIR, UV-vis NIR, Atomic Force and Raman Microscopy, Chemisorption, GC, GC-MS, LCMS, Thermal Studies (TGA, DSC),

**Power Electronics and Converters Lab:** DC-DC converters, DC-AC converters, Three-phase voltage source converters, Bidirectional converters, Multipole multiphase induction machine.

# 19. E-Waste Resource & Engineering Management

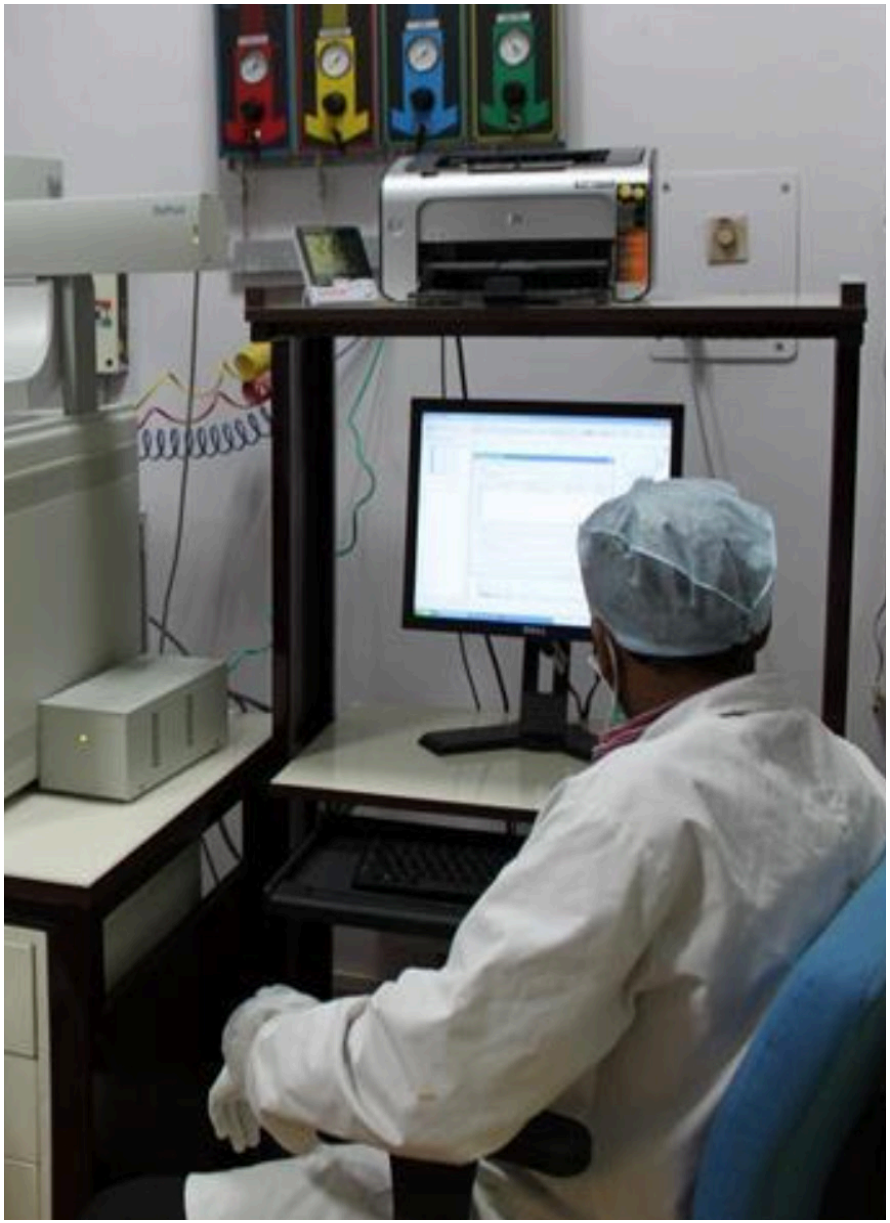
M.Tech. in E-Waste Resource Engineering & Management (EREM) is being offered, from the academic year 2020, jointly by IIT Hyderabad and C-MET. In the future, this initiative will help to catalyse efforts in the country and around the world to handle E-Waste and provide the necessary support for several government initiatives in this direction such as Skill India, Swachh Bharat, Waste-to-Wealth initiatives. This programme is supported by the Ministry of Electronics and Information of Technology, Govt. of India.

**Research Area:** As a part of the initiative, Professors and scientists from the IIT and the C-MET Hyderabad are working on a various project, including: Extraction of Rare Earth Elements from the spent Permanent Magnet; Innovative spent PCB recycling techniques for SMEs; Life Cycle Analysis of mobile phones in India; Use of ML& DL in E-Waste Management; Process recovery of metallic values from the spent Li-ion batteries.

The students are trained in metal extraction methods, such as hydrometallurgy and pyrometallurgy, as well as, RoHS enforcement, global E-Waste laws, machine learning, artificial intelligence, trace metal analysis, supply chain management optimization, and life cycle assessment.

**Research Facilities**: At CMET: It comprises a PCB recycling plant with a capacity of 100 kg/day. Besides, RoHS testing facilities with state-of-art of technology for evaluation of metal composition in shredded and segregated components of E-Waste by non-destructive techniques such as XRD, SEM XRF, FTIR, TGA/DTA, etc., and chemical evaluation by ICP-OES, AAS, UV-Vis, ICP-MS, GCMS, etc. is present.

At IIT Hyderabad: Similar material characterization facilities and many high-end pieces of equipment like XPS, TEM, DSC, GPC, HPLC are available at IIT-Hyderabad.



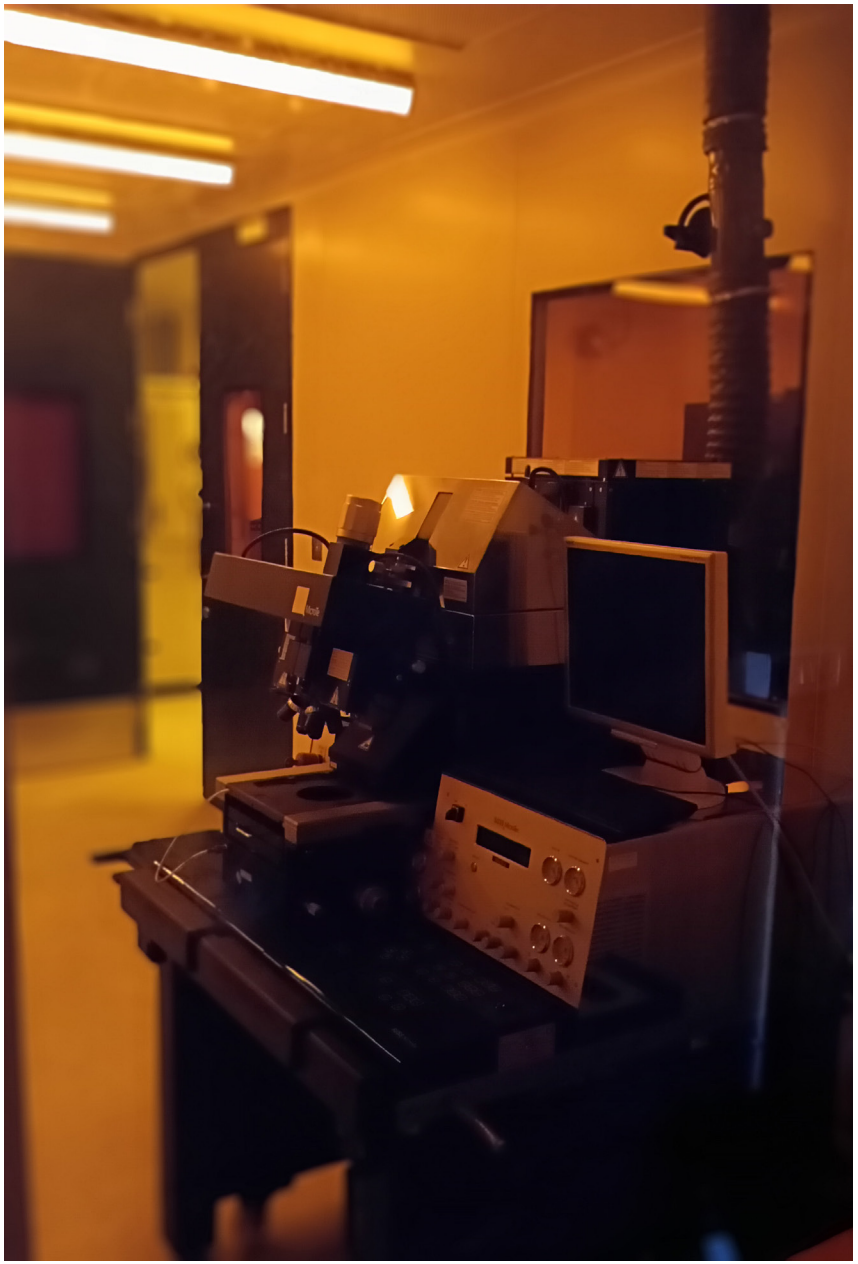
# 20. Integrated Sensor System

Integrated Sensor Systems is an interdisplinary branch of the Center of Interdisciplinary Program at IIT Hyderabad. It started offering 2 years MTech and 3 years MTech program since 2020 to provide all necessary basic and applied skills for design, fabrication and testing of integrated sensor system in all area of importance by using the concept of interdisciplinary science and technology. The program is designed to develop manpower and technopreneurs in the area of sensors technology.

Integrated Sensor Systems is having 28 faculty members from the area of Electrical Engineering, Mechanical Engineering, Chemical Engineering. Material Science and Engineering, Physics, and Chemistry. It offers courses such as Smart Materials and Transducers, Physics of Low Dimensions Devices, Computational Modelling Techniques, Micro and Nanofabrication Technologies, Circuit and Packaging, Embedded System and Compute Programming, Intelligent Signal Processing using AI/IoT as its core courses. Associated faculty members are having inter-disciplinary research interest and offer unique research problems to the students for thesis works which include the application of Sensors Network, Machine Learning, IoT based sensor system development, physical sensors, Multiple sensors single processing, Nano generators, Energy harvesters power management using IoT, etc.

**Research Facilities**: It uses various laboratories established in different department such as Advanced Embedded Systems and Digital IC Design Lab, Design of Analog RF Mixed Integrated Circuit Lab, Nano-X Cleanroom and Characterization Lab, Nanophotonics Lab, MEMS and Micro/Nanosystems Laboratory, CARBON Nano Lab, SenAct Lab, Flexible Electronics & Nano Devices Laboratory, BioFabTE Lab, Nanomagnetism and microscopy lab.

*https://sites.google.com/iith.ac.in/iss/home*



# 21. Medical Device Innovation

A unique MTech Degree Program to foster the development of world-class affordable medical devices to address the existing gap in the country.
This program, M Tech in Medical Device Innovation shall be offered in association with a clinical partner, Asian Institute of Gastroenterology (AIG) Hyderabad and an Incubator partner, Center for Healthcare Entrepreneurship, IIT Hyderabad.
It shall add impetus for scaling up of Med Tech innovations by translating Academic Research and Clinical Needs Finding into downstream commercial design and development of medical devices This program is for those for impact-driven students, committed to societal impact with an entrepreneurial and intrapreneurial mindset.

**CURRICULUM**

The uniqueness of this program is the core component of courses that focuses on developing core skillsets for a practical Biomedical Engineers.

- Design Thinking
- 3D Prototyping and Modelling
- Biodesign Process
- Biomedical Devices
- Medical Design Innovation Program requires a total of 50 credits including a Capstone Project for 24 credits.

The program requires 4 credits on clinical immersions working with clinicians in hospitals in understanding the unmet needs in hospital.
The enrolled participants will get an early exposure to key courses for translation of a medical device to industry.

- Intellectual Property Rights
- Regulatory track
- Safety and Standards for Medical Devices
- Business Plan Development and Entrepreneurship

Candidates from industry can choose their topic of capstone project in alignment with their industry.

# 22. Network & Information Security

NIS is a 2-Year MTech Programme initiated as a specialization under the department of Computer Science and Engineering, IIT Hyderabad. The program offers a rich curriculum in both the theoretical and practical aspects of networks and information security. The curriculum of the program is designed with the objective of laying a strong foundation through core courses, followed by advanced electives in various aspects of information security.

**NIS Course Curriculum**

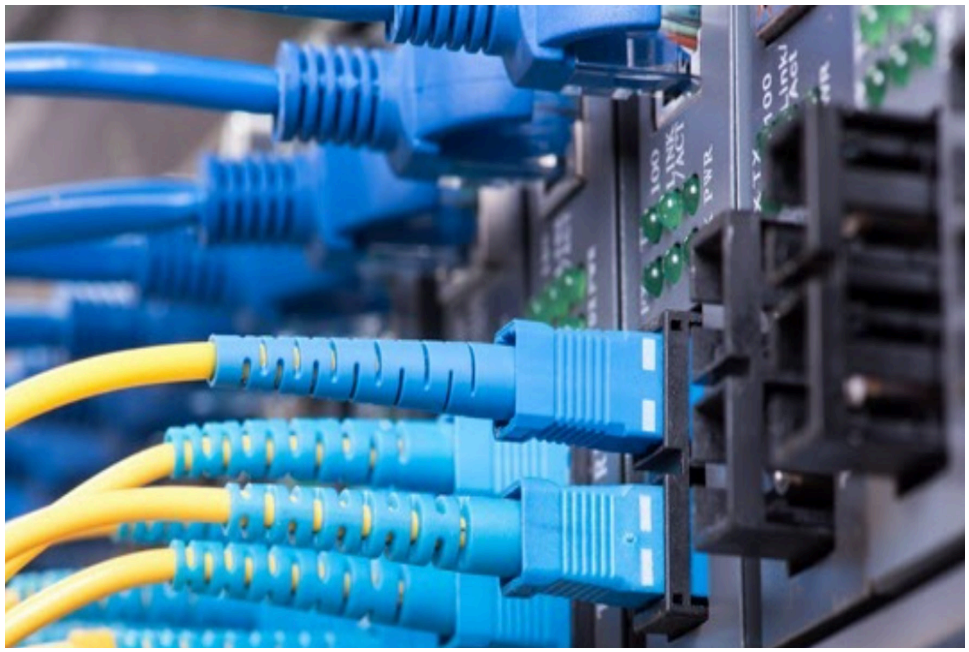
Core courses:
Advanced Data structures and Algorithms
Cryptology
Advanced Computer Networks ( Software Defined Networks)
Network Security

**Electives :**

Wireless networks and security (Wi-Fi, 4G/5G)
Foundations of Machine Learning
Natural Language processing (NLP)
Internet of Things (IoT)
Distributed Computing
Quantum Cryptography
Circuit Complexity

**Why NISCSE, IITH?**

Holistic Curriculum: The curriculum is designed to provide thorough training in both theoretical foundations and practical aspects of networks and information security. The program also includes training in other core areas of computer science, including subjects like Data Science and Machine Learning which are proving to be useful in security.
Hands-on training in cybersecurity: Extensive lab sessions with experiments like secure file transfer, downgrade attacks, MITM attacks using open SSL, firewalls: design, implementation, analysis and applications.



Distinguished faculty specializing in computer networks and security, with research papers published in prestigious scientific journals and conferences like IEEE Communications, Network Operations and Management Symposium, FCRC, DEBS - ACM,HiPC,SC.

**Relevant areas of research** at the department
Software defined networks,
Blockchain technologies,
ML applications in networks
Secure Quantum Communications
Cryptology
Network Security
Video content analysis
Code obfuscation (compilers security)

# 23. Polymers & Biosystems Engineering

The Polymer and Biosystems (PBS) engineering program is an interdisciplinary program at Indian Institute of Technology (IIT) Hyderabad. The program is aimed at training students in skillfully solving engineering problems in the emerging areas of polymer science, drug design, microfabrication and artificial intelligence. The major strength is the diverse background of the faculty members involved in this initiative, who have a sound knowledge in the aforementioned areas. One of the essential components of training the next generation is to provide an exposure to various fields where relevant industries are involved in developing technologies in healthcare. One of the steps towards this is also to establish a long-term partnership with industries and begin to work on problems of mutual interest to develop sustainable technologies for healthcare. In that direction, we have started an industry lecture series that focuses on holding seminars from various industry players in India. These seminar series include talk on various industry-relevant topics from Uniliver, D. Reddy's laboratories, Aurobindo Pharma, IBM, Ecolab, Dow Chemicals, Novartis, Lupin Pharmaceutical Limited, and JMP Statistical Software A strong collaboration with industries and Hyderabad is expected to be a unique opportunity in this program.

Some of the offered projects for the MTech thesis includes "Bacterial cellulose derived Carbon as Electrode and Interlayer for Metal Sulfur batteries", Machine Learning based data analysis and feature extraction from various time series signatures, Microfluidics aided patterned nanofibrous materials based on bacterial cellulose, Analysing Cancer Genomics and Transcriptomic Datasets for Biomarker and Drug Discovery and Smartphone imaging integrated 3D printed microflow device for protein detection.

Such an interdisciplinary program will enable the students in developing tools and technologies for design and assessment of material/ polymer composites, computational models for biological systems,

investigation on microfluidic technology for building diagnostics and implementation of AI/ML based tools for automation in analysis. Courses include various topics from polymer, advanced materials, AI/ ML, simulation tools and their applications in pharmaceuticals and healthcare domain.

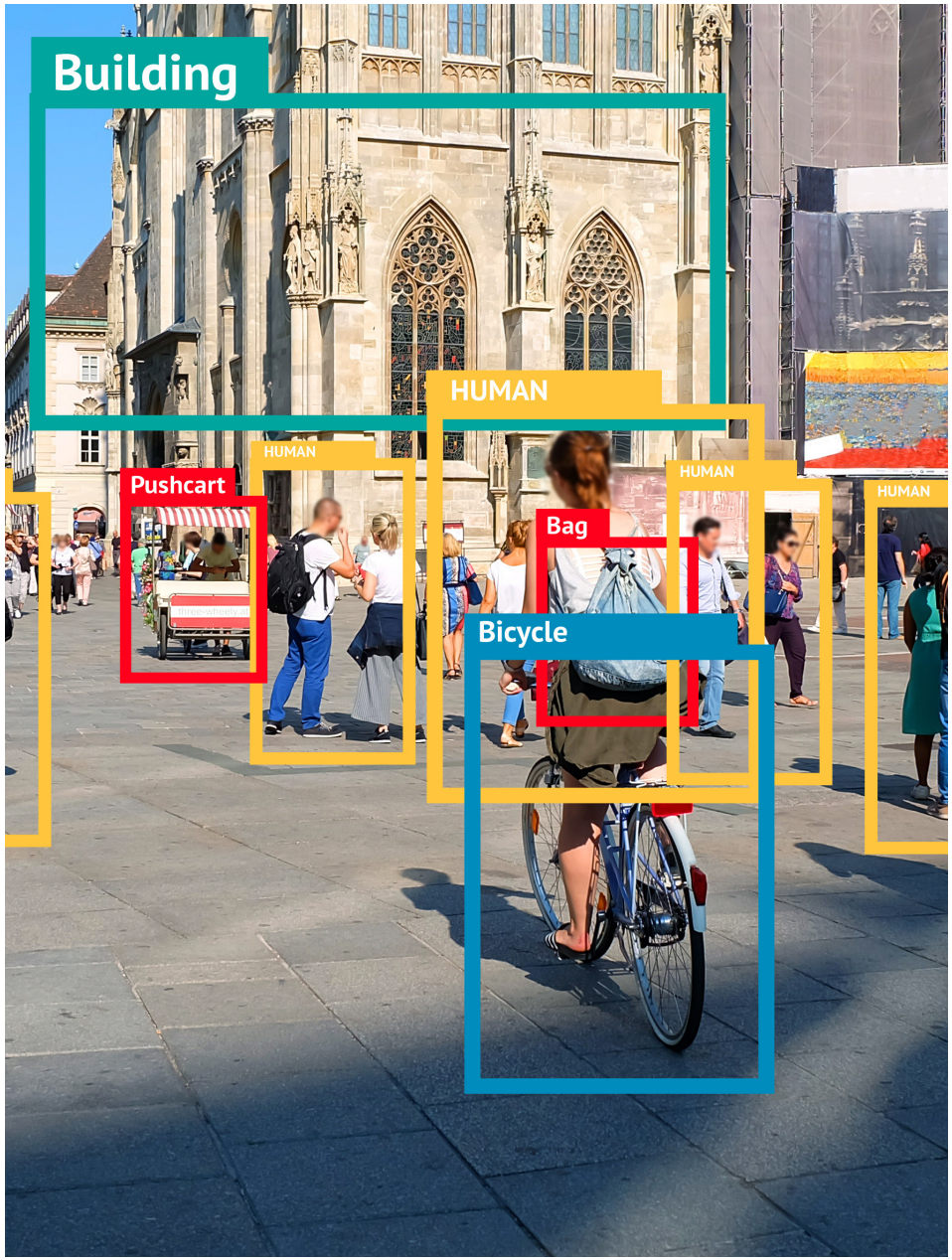
# 24. Smart Mobility

Smart Mobility is the only programme in India, initiated as part of TiHAN (Technology Innovation Hub on Autonomous Navigation) with a vision to train researchers to help generate Safe, Sustainable, and Next-Generation Mobility Solutions. Features an integrated curriculum to develop and enhance fundamental knowledge and innovation in the technology vertical of Autonomous Navigation and Data Acquisition Systems.

The primary mission of the program is to foster an interdisciplinary approach and generate skilled manpower with exposure to research on cutting edge technologies including AI/ML, Cloud Computing, Blockchain, Robotics, Intelligent Transportation System(ITS), Internet of Things(IoT), Sensor fusion, Electric Vehicles, ADAS (Advanced Driver Assistance System) etc.

**Research Areas:** Real-Time Object Detection, Video Segmentation, Developing Bayesian Deep Learning and Continual learning-based Algorithms for object detection, Evaluation of camera Image Quality, Autonomous Navigation of Drone Swarms, Sensor and subsystem integration for passenger drone, Formal methods for Autonomous Navigation, Evaluating the Security Performance using AI/ML, Steering Robot For AVs, Deep Learning Sensor Fusion, Design and Operation of Electric Charging Stations for AVs, Dynamics of Autonomous Vehicles, Modelling of AVs on TiHAN Testbed, Eco-friendly mobility as a service using Blockchain.

**Research Facilities / Labs:** NVIDIA AI Technology Center (NVAITC), Wireless Networks Wi-NET), Lab for Video and Image Analysis (LFOVIA), Wireless Communications and Networking (WiCon), Drone Lab, Visual Learning and Intelligence(VIGIL).



RESEARCH AND

# DEVELOPMENT

## SPONSORED PROJECTS

| | 2020-2021 | 2019-2020 | 2018-2019 |
|---|---|---|---|
| Total Amount | Rs. 75.41 crores | Rs. 64.49 crores | Rs. 58.34 crores |
| No. of Projects | 124 | 111 | 137 |
| No. of Funding Agencies | 43 | 37 | 28 |

## CONSULTANCY PROJECTS

| | 202-2021 | 2019-2020 | 2018-2019 |
|---|---|---|---|
| Total Amount | Rs. 750.21 crore | Rs. 4.24 crores | Rs. 3.18 crores |
| No. of Projects | 173 | 129 | 31 |
| No. of Funding Agencies | 88 | 62 | 77 |

## PATENTS AND PUBLICATIONS

The very foundation of IIT Hyderabad is based on research and innovation. The culture of research is inculcated in the undergraduate students in the first semester itself by introducing a one credit independent project, where the students execute a project of their choice in small groups irrespective of their branch. Heavy emphasis is given to the thesis component of the post-graduate programs. The vibrant research culture is evident from the number of patents and publications IITH has.

Till date there are about 166 patent applications filed by IIT Hyderabad. 13 of those patents applications are granted. These numbers speak volumes about the quality of academics and research at IITH.

## RESEARCH ENDEVOURS

Every research endeavour is a voyage to discover truth and IITH is committed to promote this voyage in India. It aims at learning through practice and research. The Institute is on its way in creating the infrastructure, ambiance and culture necessary for the pursuit of creative ideas.

## INNOVATIVE INITIATIVES

The conventional engineering skills are no more sufficient to address the problems of today's fast changing society. At IITH students are provided with a plethora of choices, from which they diligently choose with the help of a faculty advisor. Courses that last for a semester are almost a foregone story at IITH. All undergraduate programs have started offering courses

that are of smaller credits; called the fractal academics; very carefully designed to keep the enthusiasm of the students and to keep them in pace with the current scientific, technological and industrial scenarios. These courses are distributed the time from the first to the eighth semester.

Another academic initiative at IITH is the double major. In addition to the requirements from the parent branch, a student can get a major from another department by successfully completing 24 core credits. The options for a minor and honour's degree also exist on top of a double major. Moreover, the curriculum at IITH allows an enthusiastic student to credit any number of courses from the spectrum of lectures offered at IITH.

MOUs AND

# COLLABORATIONS

## THRUST AREAS OF COLLABORATIONS

IITH faculty members are currently involved in a large number of research projects which require interdisciplinary approach:

- Nano Science and Technology
- Next-gen Communication Systems
- Digital Manufacturing
- Energy and Environment
- Sustainable Development
- High performance and Multifunctional materials
- Smart mobility
- Health Care
- Gene editing
- Cyber Security
- Cyber Physical Systems
- Combustion and Propulsion
- Industry 4.0 and Digital Fabrication
- 5G and IoT

## OTHER AREAS OF COLLABORATIONS

Faculty members from different departments are involved in the collaborative research in the aforementioned areas and offer several courses that cover various aspects of these topics.

All these areas are very broad in its application and several faculty members from various departments are involved in executing a number of projects that fall under these thematic areas.

## MEMORANDUM OF UNDERSTANDING

Refer to the below listed link to find a listing of all the National and International MOUs:

National MOUs: *https://iith.ac.in/research/mous/#national*

International MOUs: *https://iith.ac.in/research/mous/#international*

AT IITH

# WHAT'S NEW?

## Dept. of Entrepreneurship & Management

Traditionally the effectiveness of higher educational institutions is measured by the level of employability of the students it graduates. Currently, we are moving away from this paradigm of producing employable students who are ready for the job market to creating entrepreneurs who not only can become self-employed but also create employment for others. As a part of an institute which promotes innovation and interdisciplinary, our department has tremendous potential to become a pioneer in the area of entrepreneurial education and research.

- Dr. M.P. Ganesh

## Vision

To become a department of international repute in the area of entrepreneurial education, training and research.

## Aim, Focus & Scope of the Department

To nurture entrepreneurial motivation and skills among young graduates and to produce high quality research in the areas of entrepreneurship and management.

# STUDENTS & FACULTY RAPPORT

Well qualified, and with the right mix of experience and youth, our faculty members are zestful, energetic and creative, and share a common goal to put IITH on the international map as a hub for technological innovation. Students to faculty ratio of 14:1 ensures close interaction between the students and faculty. Most of the faculty are equipped with research and/or industrial experience from reputed foreign or national research laboratories and are involved in cutting edge research with major publications in reputed international journals. Our faculty members advise both industry and government organizations through consultancy projects. They are also involved in Out-Reach Courses which include short courses for the industry professionals. Furthermore, workshops are held under Technical Education Quality Improvement Programme (TEQIP).

Our students and research scholars are not only academically brilliant, but also national & international scholarship awardees. They are nationally recognized chess players, Olympiad winners, NTSE (National Talent Search Examination) and KVPY (Kishore Vaigyanik Protsahan Yojana) Scholars, etc. who have a proven record of excellence & precociousness even before their entry into the Institute. A large number of our students have been awarded with various scholarships like TODAI (scholarship from the University of Tokyo) in association with Mori Seki Company Limited, IMCM (Institute Merit–Cum-Means).

Peek into the

# STUDENT LIFE

A healthy campus life plays a pivotal role in the all-round development of the students. Along with the intense academic schedule and brain-storming class hours, the students of IIT Hyderabad indulge in extensive sporting action.

## ELAN FESTIVAL

The Technical-cum-Cultural Festival of IIT Hyderabad is the best exhibition of the management and organizational skills of the students. The internationally recognized event is very popular among the students all over the state. The students' active participation in cultural, technical and literary competitions has made it a grand success.

## N-VISION FESTIVAL

N-vision is the techno-management fest organised by the students of IIT Hyderabad with a motto of providing a platform to the technical enthusiasts of our country to explore, innovate and showcase their technical and engineering prowess.

N-vision started in 2011 and over the years it has gradually evolved from an inter-college festival to one of the most recognised techno-management fests of the country.

## STUDENT GYMKHANA

Student Executive body called the 'Gym-khana' is a student governed body headed by a President, who along with the council, ensures smooth functioning of all the student affairs.

## E-CELL

E-Cell is a group of entrepreneurs and seeks to solve real life problems and come up with really innovative and cool designs as a solution for the same.

Unwind with

# CLUB ACTIVITIES

Clubs are the integral part of any college. The enthusiastic students of IIT Hyderabad have also formed many significant clubs like Sci-tech. Clubswhich include Kludge, Infero, Electronica, Cepheid, Endeavour, Torque, Robotics along with the colorful Cultural Clubs enlisting Gesture, Movie Club, Photography Club, Rang de manch,Vibes. Regular cultural rendezvous have transformed the student community into a happy family where all major festivals are celebrated with pomp and gaiety. The Night Life revolves around the various workshops and competitions conducted by numerous student-managed clubs. To sum it up, life at Indian Institute of Technology Hyderabad is the IIT experience lived king size.

## 01. NATIONAL SERVICE SCHEME (NSS)

National Service Scheme (NSS) at IITH is aimed at providing each student with a significant context in which he/she can reach a deeper understanding of social reality in India today. As a part of this, the students in their leisure time visit nearby schools and hospitals to assist the government authorities.

## 02. EK BHARAT SHRESHTHA BHARAT (EBSB)

EBSB is a programme for promoting national integration through systematic exchange between paired institutes in the cultural, literary and linguistic fields. We intend to learn the linguistic and cultural aspects of the home state of our paired institute, covering history, culture, language, cuisine, festivals, clothing etc. The EBSB club has been formed at IITH to carry forward activities under the programme with our paired institute, IIT Kanpur.  We aim to celebrate a plethora of Indian festivals and customs (paying special attention to those of Uttar Pradesh) in ways which are both enjoyable and informative which would thereby educate our fellow students while having fun.

## 03. SPORTS CLUB

IIT-Hyderabad provides full fledged facilities for all outdoor sports. A well equipped Gymnasium and regular practice has shown great results at Inter-IIT sports meets.

## 04. TEDx IITH

TEDxIITH is a very active student body, driving fun and insightful talks by great personalities.

## 05.CONSULTING and FINANCE CLUB

The Consulting and Finance Club is responsible for creating Finance proficient avid problem solvers who can become great leaders in the Consulting and Finance industries.

Loosen up at

# SHIRU CAFE

Shiru Cafe at the Indian Institute of Technology Hyderabad's campus is the first store outside Japan. The Cafe is manned by Japanese student interns and offers free beverages to IITH fraternity.

The mission of Shiru Cafe is to create a place where students can learn about the professional world and envision their future careers. Students enjoy free select coffee, tea and juice while learning about careers, companies and job opportunities.


How to reach

# DIRECTIONS to IITH

## FROM THE AIRPORT:

• IIT Hyderabad can be reached by any authorized taxi in about 1 hour from the Rajiv Gandhi International Airport

Select Cab Services Contact Number:
Meru Cabs: 040 4422 4422
Dot Cabs: 040 2424 2424
Taxi for Sure: 040 4040 9090
Ola Cabs: 040 3355 3355
Yellow Cabs: 040 4646 4646

## CITY BUS:

• Take city bus to Patancheru (No. 219 or 226). The journey takes about 1.5 hours. Patancheru is about 18 km from IIT Hyderabad.

• At Patancheru Bus Station, board the Sangareddy Bus and get a ticket for IITH.
(Patancheru - Isnapur - Rudraram - Kowlampet - IITH Bus Stop - Kandi - Sangareddy)

• IIT Hyderabad bus stop will come before Kandi village bus stop.

Bus Numbers: Secunderabad to Patancheru 219-216, Koti to Patancheru 218, 222, 217, Jubilee Bus Station to Patancheru 226, Chandanagar to Patancheru 219, 218, 222

## BY TRAIN:

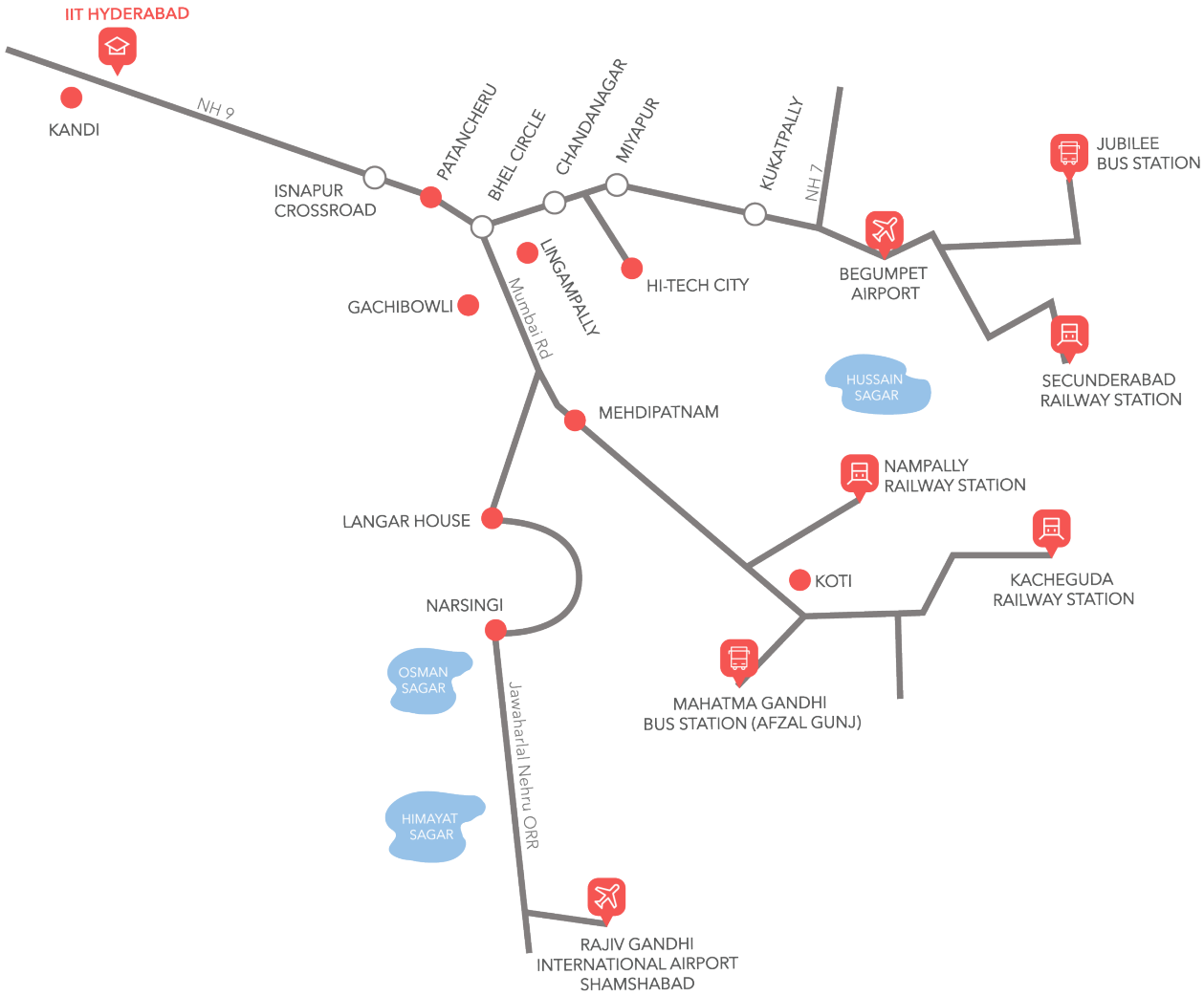
• Take MMTS Local Train to Lingampalli station. Lingampalli is about 25 km from IIT Hyderabad.

• Take city bus from Lingampalli station (Platform 6 side) to Patancheru (No. 216)

• At Patancheru Bus Station, board the Sangareddy Bus and get the ticket for IITH. (Patancheru - Isnapur - Rudraram - Kowlampet - IITH Bus Stop - Kandi - Sangareddy)

• IIT Hyderabad bus stop will come before Kandi village bus stop.

Note: Autos are also available from Patancheru to IITH Campus




**Contact us:**
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**Indian Institute of Technology Hyderabad**
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# INDIAN INSTITUTE OF TECHNOLOGY HYDERABAD

## PLACEMENT BROCHURE
## 2021-2022

Designed by Vinisha Mohanchandran, Raghul Sreedhar, Siddhika Desai, Utkarsh Srivastava,
Akanksha Pansare, Ishani Churi, Department of Design, IITH