भारतीय सांकेतिक विज्ञान संस्थ हैदराबाद
भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

Computational Engineering Department Brochure 2025-26

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About IITH

- Established in 2008, IITH is one of India's newest IITs, rapidly gaining prominence in science and technology, consistently ranking among the top 10 engineering institutions in India by NIRF for its academic excellence.
- IITH provides a diverse range of programs in classical engineering, applied sciences and design.
- A rigorous and flexible curriculum which helps students with deep knowledge and industry-ready skills, while also offering options for minors, double majors across disciplines, and faculty-mentored research.

- The university also encourages entrepreneurship, from campus-wide courses which students can take to dedicated innovation centers and incubators supporting student start-ups from ideation to launch.
- IITH has a vibrant research ecosystem with a strong emphasis on innovation, resulting in increasing number of patents and peer-reviewed publications each year.

COE at IITH

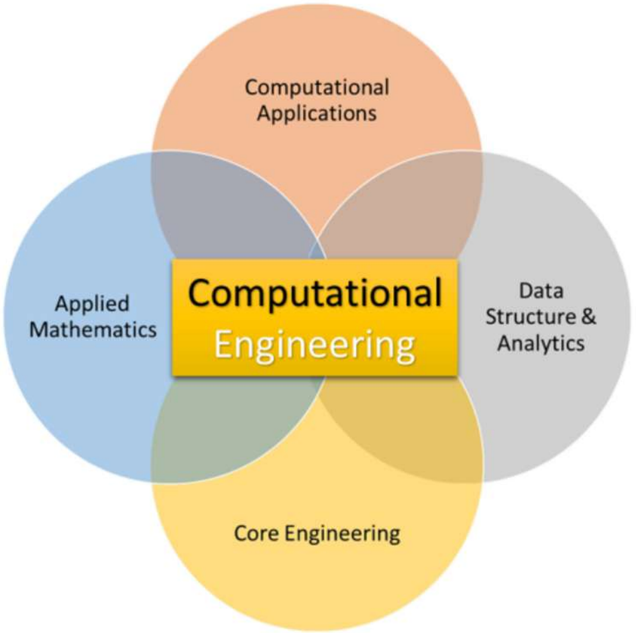
Emerging Program:
The Computational Engineering program trains students in modern computational methods applied in solving various engineering and scientific problems..

Comprehensive Curriculum:
Students learn Math, Fundamentals of Engineering, Scientific Computing and AI-ML. They are exposed to a broad range of modeling and simulation techniques across various engineering disciplines. Curriculum includes hands-on projects, enabling students to gain real-world experience in problem-solving.

Interdisciplinary Approach:
By combining courses from multiple domains, the program prepares students for real-world challenges and diverse careers in the industry.

Faculty members actively collaborate with academic and industry partners, imparting industry-relevant knowledge and ensuring that students are well-prepared for professional challenges.

The campus fosters a vibrant culture, encouraging students to enhance their technical skills through practical application and innovation.



Why Recruit Us?

- IITH is one of the top engineering schools in India, consistently ranking among the top 10

#8
NIRF- National Engineering

#3
NIRF- Innovation

#12
QS - India Overall

- A strong curriculum which ensures that students have a strong foundation in core concepts like Operating Systems, Data Structures and Applications, Machine Learning while also providing a wide range of electives so students can shape their expertise.
- With a balanced mix of theory, labs and projects, students are equipped with both practical and theoretical knowledge.

- IITH consistently attracts India's top students and rankers every year

JEE Advanced Cutoffs

Year	Opening Rank	Closing Rank
2021	1089	1356
2022	1212	1550
2023	1304	1884
2024	1046	1771

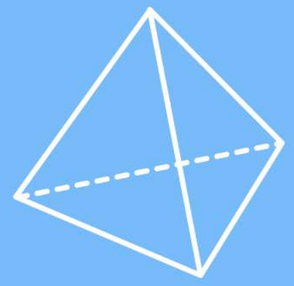
COE Curriculum

Software and AI-ML

- Data structures and applications
- Foundations of Machine learning
- Operating Systems
- Parallel and Concurrent Programming
- Distributed Computing

- Computer Aided Numerical Methods
- Parallel Scientific Computing
- Computational Methods in Material Science
- Optimization Techniques

Scientific Computing

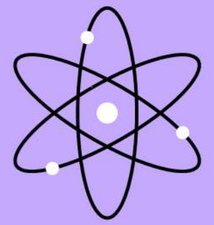


Math and Engineering

- Calculus
- Linear Algebra
- Probability and Statistics
- Differential Equations
- Thermodynamics
- Biological Databases

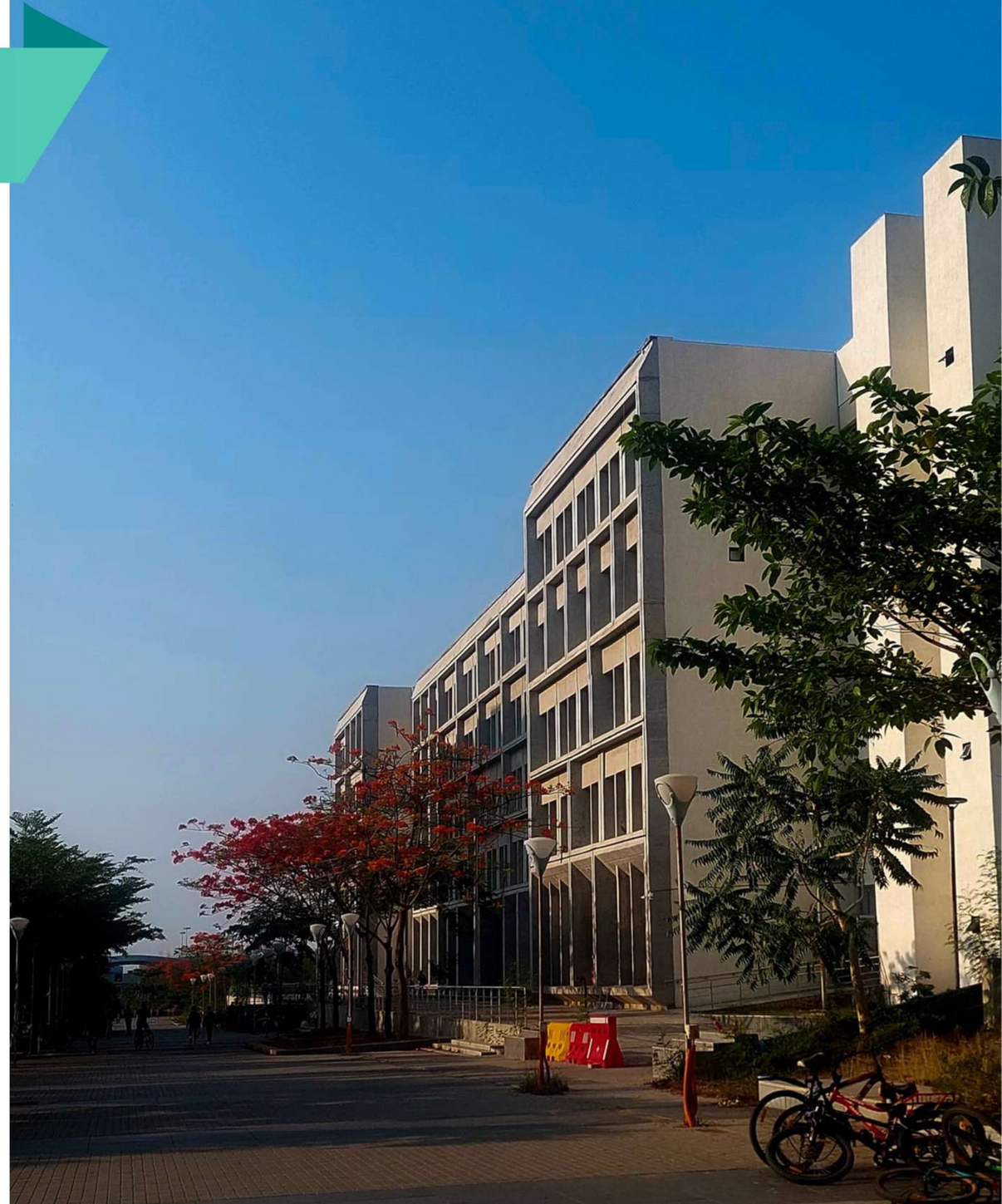
- Finite Element Methods
- Computational Fluid Dynamics
- Atomistic Modeling
- Intro to Hardware Description Languages
- Mesoscale Modelling

Modeling and Simulations



Core Skills

- Solid grasp of data structures and algorithms, to think critically and solve problems efficiently under real-world constraints.
- Understanding of how operating systems handle processes, memory, files, and concurrency help in making systems and backend development.
- Foundation in machine learning, enabling us to implement predictive models and extract insights from real-world data to tackle complex, data-driven challenges.
- Hands-on electronic structure & atomistic modeling covering Linux command-line workflows for high-performance computing, DFT calculations and Molecular Dynamics Simulations.
- Strong understanding of Computer-aided numerical methods including numerical integration and differentiation, direct & iterative solvers for linear systems, eigenvalue problems and different PDE Schemes implemented hands-on using MATLAB/Python /C/C++ .

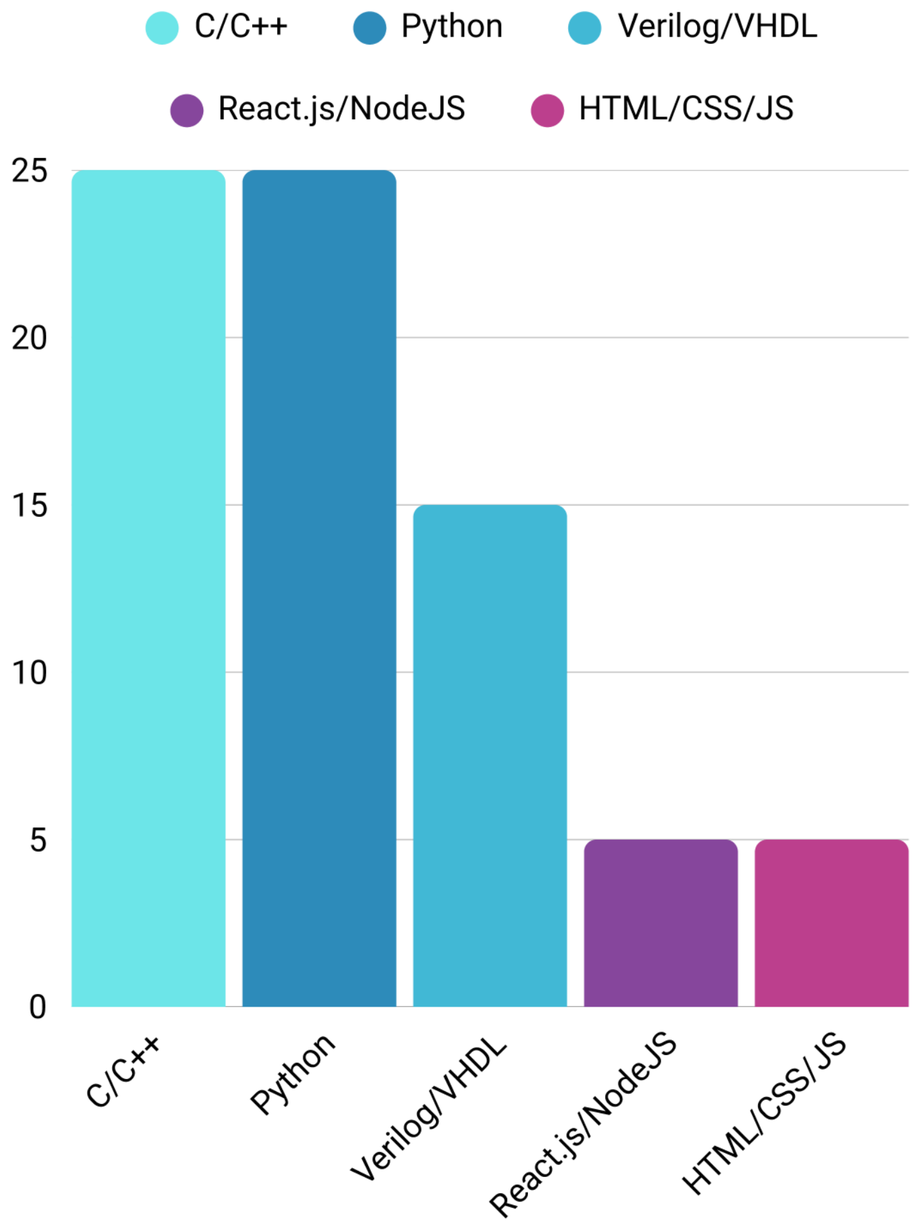


Beyond the Curriculum

- With curiosity and passion for continuous learning, students at IITH actively pursue knowledge beyond the classrooms. By the Institute's vibrant tech culture and ecosystem, students find abundant opportunities to explore, innovate, and grow independently
- C/C++ Programming – Strengthened through multiple hands-on coursework, this foundation empowers students to design low-level, high-performance solutions with precision and efficiency
- App and Web Development – Covers HTML, CSS, JavaScript, Flutter, Node.js, Next.js, MongoDB, and Firebase to build functional websites, applications, and backends.
- ML and AI – Through practical exposure to frameworks like PyTorch, TensorFlow, and Scikit-learn, students build a strong foundation in AI, enabling them to develop impactful solutions for real world problems
- Game Development - Covers C# to build functional games and backend.

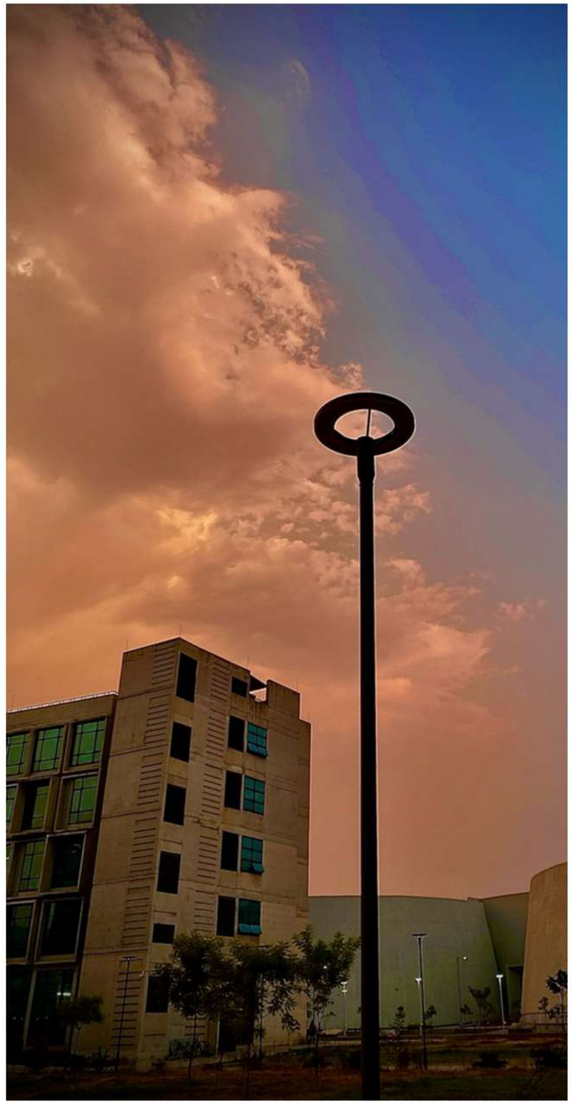
Clubs that support this learning:

- Lambda – Software and Web-Development Club
- Epoch – Focuses on Deep Learning, NLP, Vision, and Data mining.
- Kludge – Deals with cybersecurity, CTFs, and network systems.
- Infero –Algorithms and Competitive programming.
- Glitch - Game Development Club
- Blockspace - Cryptology and Block Chain development Club



Projects

- Synchronized process execution by multithreading using **Pthreads**
- Complaints website using **NextJS, Firebase, Google Appscripts**
- RISC-V Cache Simulator with integrated Assembler supporting **memory inspection and D-cache policies**
- Health Care decentralized application using **Blockchain deployed on Solana testnet**
- Network Security website using **KNN imputation and grid-search optimization of ensemble classifiers**



- Heat conduction simulation using **Python**
- Kernel mapping and Memory Management using **GemOS**
- Emotion Detection with both audio and visual aspects using **Deep Learning**
- Image Captioning Model using **NLP and Computer Vision**
- Video Summarizer using **Gemini API, ffmepg, cv2 with Cuda**
- Research Paper Recommendation System and Subject Area Prediction using **Deep Learning**

Past Recruiters

THOMSON REUTERS®

ORACLE®

BOSCH

Accelquant

Google

amazon

SILICON LABS

KLA-Tencor

D E Shaw & Co

Sagri

AMERICAN EXPRESS

Adobe

ATLASSIAN

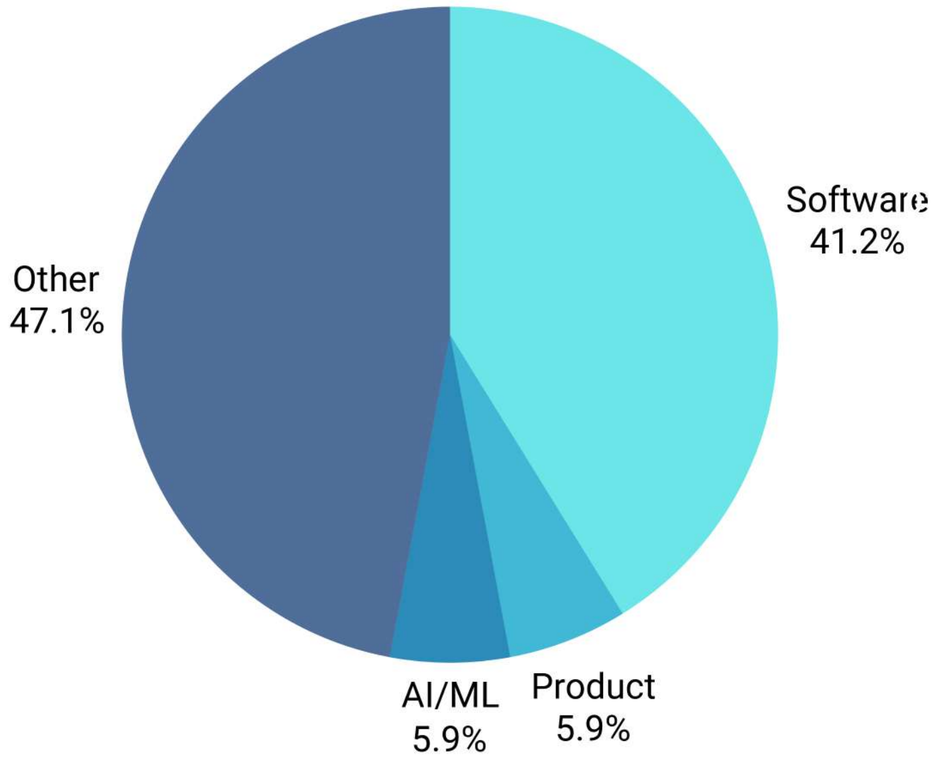
SIEMENS

Carrier®

Previous Statistics

93%
Students secured internship

100+
Companies offered internship



"Past Internship Companies and Domains"

Company	Domain(s)
Google (SWE Intern)	TPU Monitoring, Systems Engineering
Google (STEP SWE Intern)	Software Development, Data Visualization, Frontend-Backend Integration
Google Summer of Code (GSoC)	Open Source Software Development
Google – Software Engineering Intern	Software Engineering
Amazon	Software Engineering, Internal Systems Migration
Oracle	Applications Development (Project Intern)
Adobe – AI Research	AI Research, Reward Models, Vision-Language Models
Adobe – Product Management	Product Management, AI-powered Analytics
Atlassian	Software Engineering, Frontend Developmen
American Express	Data Science, Research on Audio LLMs

Company	Domain(s)
Thomson Reuters	Applied AI Research
D. E. Shaw India Private Limited	Technology Developer Intern
Siemens	Machine Learning, RAG Application
Bosch Global Software Technologies (BGSW)	Software Development, AI, RAG, Unit Testing Automation
KLA Tencor	Algorithm Engineering
Carrier Technologies India Ltd	General Internship (likely Engineering/Product)
Silicon Labs	Embedded Systems, Software Design, Peripheral Modeling
Crystalball	Computational Engineering, Full Stack Development, Cloud, AI, Geospatial Analytics
Accelequant	Quantum Engineering
Sagri Co. Ltd	Machine Learning
Nikko Co. Ltd, Japan	Machine Learning, Material Detection

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Thank You

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