IIT Hyderabad

Biomedical Engineering

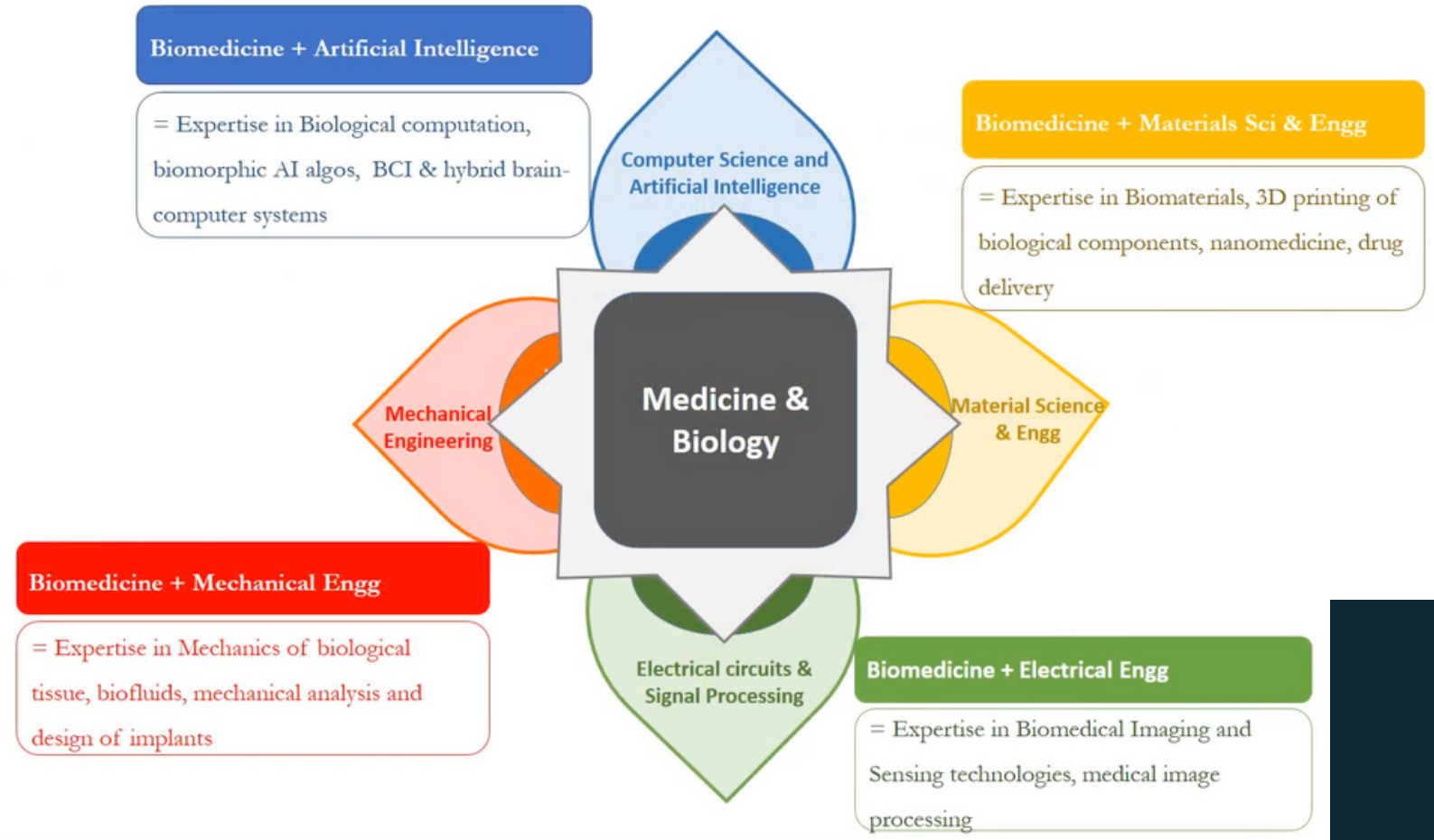
Internship Brochure

2022 - 2023

Vision

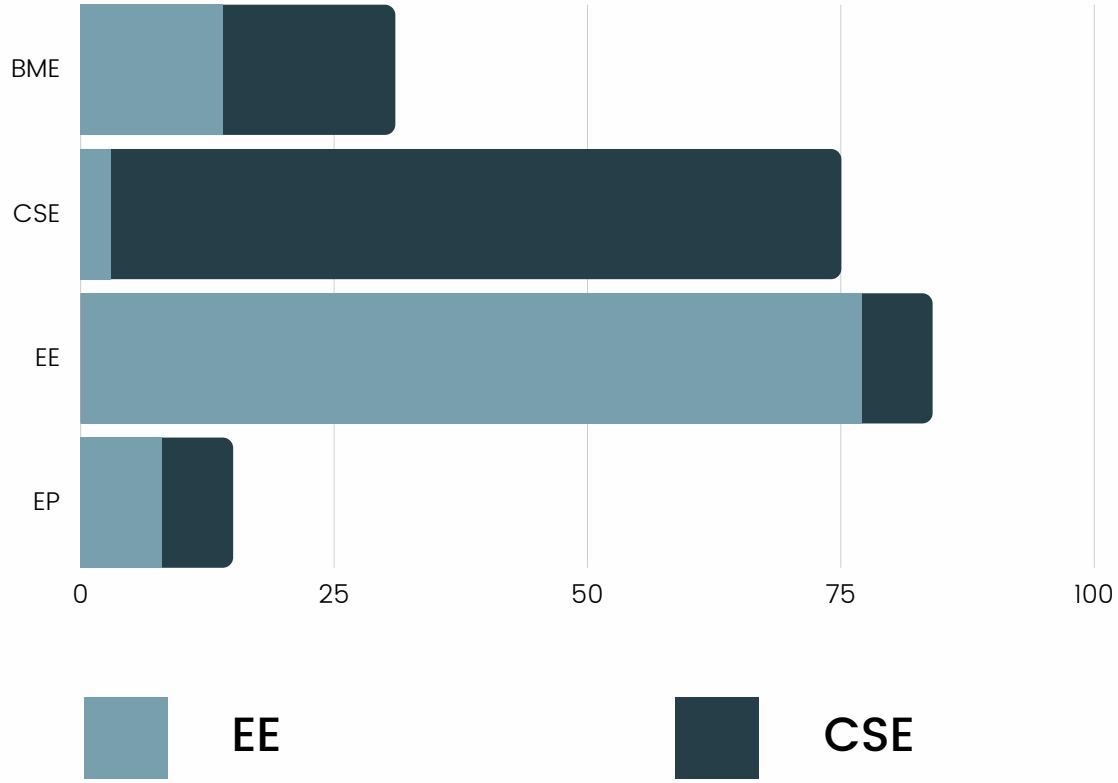
BME @ IITH is a unique Bachelor of Technology program in Biomedical Engineering, the first-ever in the country. The program aims to introduce young & enthusiastic minds to the exciting field of healthcare and become torchbearers & enablers of accessible, quality healthcare for all. The program offers several elective baskets to specialize in cutting-edge areas such as healthcare data analytics, 3D bioprinting, medical optics & Imaging, nanomedicine, neurotechnology, biomechanics, neuromorphic engineering, medical data modeling & simulation.

Inter-disciplinary

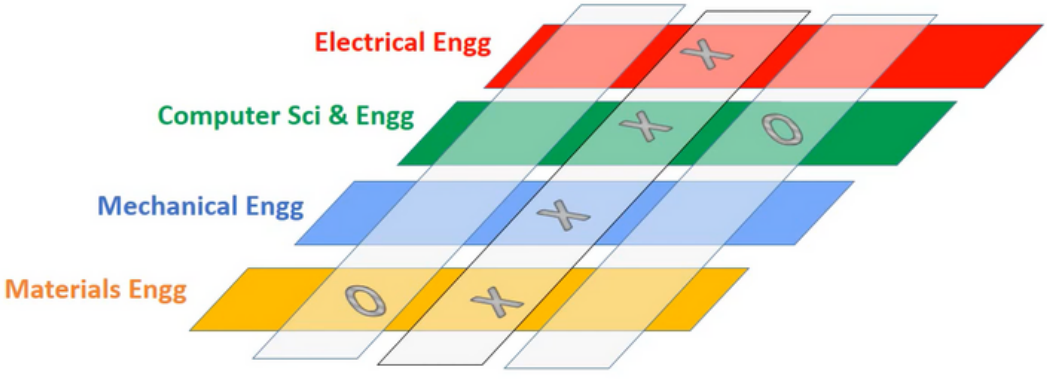


BME AS COMPARED TO SIBLING BRANCHES

CSE + EE department credits across branches



14 Credits by the Computer Science and Engineering and 17 Credits by the Electrical Engineering departments are offered as part of the Biomedical core curriculum, which is more than the number of credits required for a minor in each of the departments respectively



BME

CURRICULUM

Core Courses

- Mathematical models & systems biology
- Basic Bioinformatics
- Biomedical imaging
- Biomedical devices
- Foundations of Natural intelligence
- Neurotechnology & BCI theory
- Neurotechnology & BCI lab

EE Courses

- Basic Electrical Engineering
- Analog and integrated circuits
- Introduction to embedded systems
- Control systems
- Linear Systems and Signal Processing
- Sensors & transducers in healthcare

CS/AI Courses

- Introduction to Programming
- Data structures and applications
- Algorithms and data structures lab
- Foundations of Machine learning
- Artificial intelligence

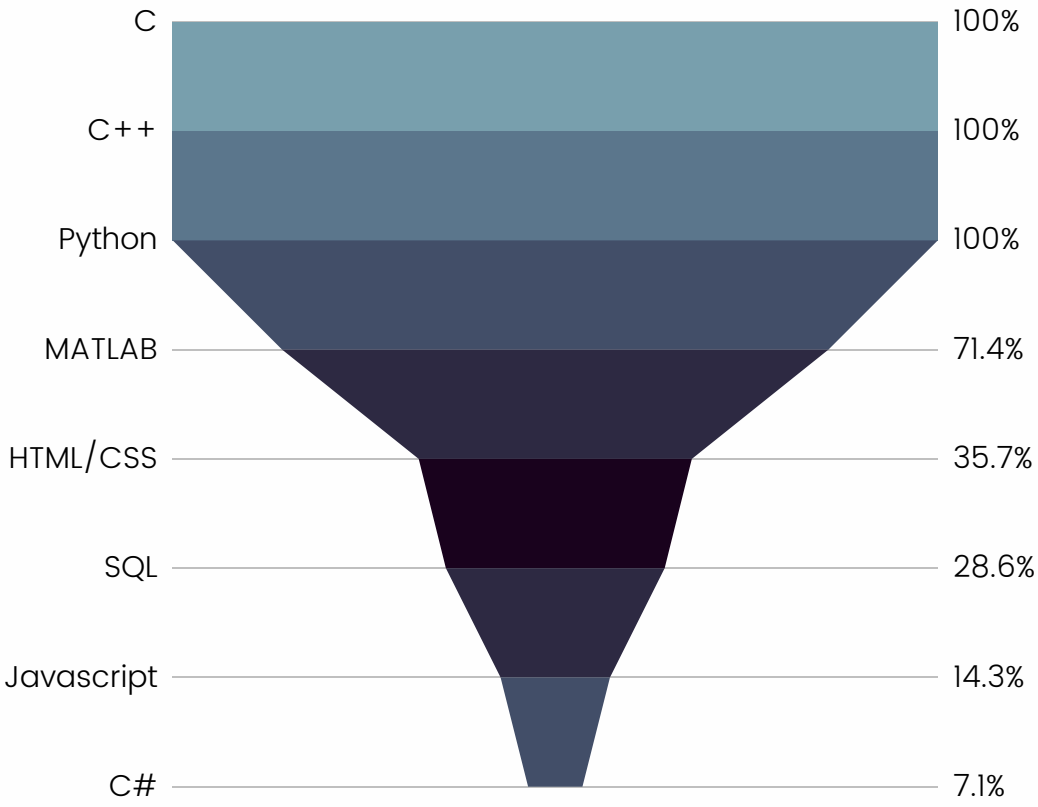
- The Biomedical Engineering curriculum is designed to fulfil the educational requirements and caters to the industry's needs.
- Every core course involves real-world applications for professional work in various fields ranging from coding in IT companies to working in R&D.

COURSES AS ELECTIVES

Math Courses	EE Courses	CS/AI Courses
• Calculus-I • Calculus-II • Differential Equations • Linear Algebra • Probability • Transform Techniques • Statistics	• Signal Processing • Medical Image processing • Biophotonics	• Probability and Random Processes • Reinforcement learning • Robotics • Computaional Neuroscience

- As part of our curriculum, we are given the freedom to take on electives and additional courses from any department. A majority of the electives commonly taken are listed in the adjoining table.
- Courses involving core Computer Science topics and sub-fields of Artificial Intelligence and Data Science, together with Mathematical Courses and courses based on real-world Electrical Engineering, compose the principal group of the electives.
- This results in diverse knowledge about additional realms of engineering, which supplement our core skills.

WE POSSESS EXTENSIVE KNOWLEDGE OF NUMEROUS PROGRAMMING LANGUAGES



The graph displays the familiarity of working with various programming languages. 100% of the branch has knowledge of C, C++, and python. Over 50% are familiar with languages such as Matlab. And many people are familiar with SQL, JavaScript, C#, and other development languages.

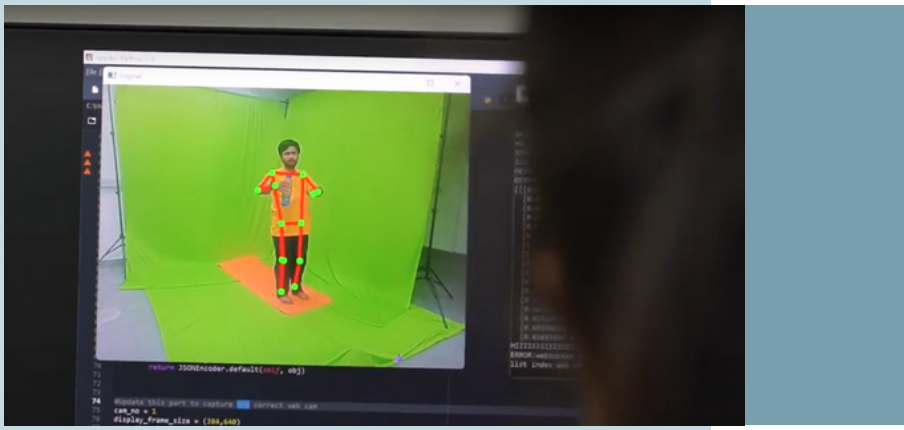
Fluency in such skills allows us to be at par with students from computer science engineering in terms of formulating quick solutions to problems. Software development also allows us to present the solutions developed on theoretical topics, maximizing our capabilities for all-around development.

Online Courses

- ☑ Machine Learning by Andrew NG
- ☑ Web Development by Angela Yu
- ☑ Python for all

In wake of the pandemic and the need for technological upskilling, it brought, our students took online courses to fulfill these global requirements.

The adjoining text summarizes the data of the various courses taken by the student population.



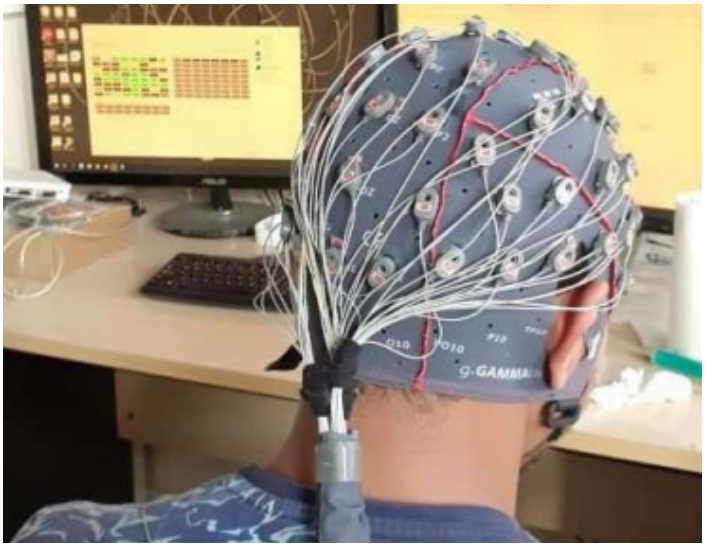
- ☑ Deep Learning and Neural networks specialization by Andrew NG
- ☑ Machine Learning A-Z : Hands- On Python and R in Data Science
- ☑ SQL for data analytics and business intelligence
- ☑ Science of Stem cells
- ☑ Fundamentals of Accelerated Computing with CUDA C/C++

Projects

- **ECG machine:** built only in 48 hours
- **Card authenticity software**
- **Security system using LASER and LDR**
- **Water Automation System:** Ultrasound-based water level sensing and motor control
- **Developing Artificial Intelligence enabled Mental Condition Diagnosis Solution.**
- **Yoga performance detection:** using a pressure mat sensor to get pressure points from the yoga mat while a person is performing yoga
- **Machine learning in YOGA:** Data analysis and feedback from sensor input data were obtained using many sensor fixtures on the yoga performer using machine learning modules
- Built an FSR sensor-based prototype to determine the expansion and contraction of the chest and thorax of a person when the person does various Yoga asanas. Transferred the data to a mobile app in real-time using the ESP32 module and Websockets.
- Developed Websites for Student bodies and college programs

Why Hire Us

- Biomedical engineering is the branch that fills the gap between information technology and health.



- BME BEING INTERDISCIPLINARY HAVE BEEN SKILLED TO WORK FOR SOFTWARE, HARDWARE AND EVEN CORE MEDICAL TECHNOLOGY INDUSTRIES.

- Batch of freshers & work experienced enthusiasts having exposure to industry relevant skill set including Programming, Machine Learning, Deep Learning and many more.

- Through an emphasis on engineering skills and basic medical sciences, our students are well equipped with the skills needed to tackle any issues in multidisciplinary areas and researches.

- INTERNED IN STARTUPS AND WORKED UNDER FACULTIES WHO HAVE EXPERIENCE IN SOFTWARE AND HARDWARE INDUSTRIES.

OUR PAST RECRUITERS & ALUMNI NETWORK

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