INFORMATION BROCHURE

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Overview of Department of Computer Science & Engineering

Indian Institute of Information Technology Bhagalpur started functioning from August, 2017 with two departments, namely, Computer Science Engineering and Electronics and Communication Engineer- ing. The Department of Computer Science and Engineering (CSE) at the Indian Institute of Information Technology Bhagalpur, Bihar was established in the year 2017. The department is currently offering the degree of Bachelor of Technology (B.Tech.) in Computer Science and Engineering. The programme aims to provide core concepts and skills in the area of Computer Science and Engineering supported by practicums. The course structure of the department offers core computer science subjects in the early semesters which allow the students to master the subjects and carry out projects and research in their interested areas starting from the third year. The programme also includes different subjects in mathematics, basic science, engineering and humanities which enable students to explore the wider applications of information technology.

Our faculty members aim at delivering top class education blending their rich research experience with classroom teaching. The main goal of the faculty members is to impart theoretical and practical knowledge to students and help them to fit into industry, research and pursue higher studies. The Department has state-of-the-art infrastructure and computing equipment supported by high speed Ethernet and wireless networks. The future direction of the department includes the proposal to start M.Tech. and Ph.D. programmes in Computer Science and Engineering with various specializations.

Vision

To transform the department into a centre of excellence for Computer Science and Engineering through formulating technical programs with modern state of the art that allow our students to utilize their technical potential, managerial capability, creativity in the field of education and research.

Mission of the Department

- Produce and nurture quality engineers in the department of Computer Science & Engineering.
- Impart state of art knowledge in the field of Computer Science & Engineering.
- Conduct cutting-edge research in the areas like AI and Machine Learning, Wireless Communications and Mobile Computing and other allied areas of Computer Science & Engineering.
- Collaboration with Research & Development establishment and industry.
- Provide consultancy services in the field of Information and Communication Technology.
- Giving students intensive hands-on experience in designing, developing, and implementing software and hardware technologies.

HoD Message

Message from Head of Department

HOD, Department of Computer Science & Engineering, IIIT Bhagalpur

Indian Institute of Information Technology Bhagalpur (IIIT Bhagalpur), is located near the southern banks of river Ganges and the city of Bhagalpur has historical importance. The Department of Computer Science and Engineering at IIIT Bhagalpur was formed in 2017. The department focused on information technology and is currently offering the degree of Bachelor of Technology (B.Tech.) in Computer Science and Engineering. The department has strong undergraduate programme, designed to create innovators and researchers. The department will start M.Tech in Artificial Intelligence and Data Science and Ph.D. programs from July 2021.

Our students are very passionate and enthusiastic in learning. Students are given a strong foundation in CSE that includes both theoretical and experimental frameworks. The Department aims to produce quality professionals in the field of Computer Science and Engineering and strive for excellence in research and development. Our faculties have excellent academic knowledge and assist students to be dynamic in choosing and pursuing their interest. Students are encouraged to take ICT projects such as Smart City, IoT, Robotics, Graphics, Future Networks, Artificial Intelligence, Machine Learning, Green Technology and Grid Computing.

The department provides excellent infrastructure and high-speed Ethernet and wireless facilities for faculties and students to excel in teaching and to be dynamic to accept any research challenges. In current year, a number of students of the department have been placed in good companies such as Amazon, National Instruments, MAC Software, Cimpress, Nykaa, Naggaro, Deloitte, Tata Consultant Services, Infosys etc. with very good packages.

Dr. Pradeep Kumar Biswal
Head, Dept. of CSE
Email: hod.cse@iiitbh.ac.in
Mobile No.: 7632995200

People

Faculty Members

Dr. Pradeep Kumar Biswal
Assistant Professor Head
of Department,

Dr. Rupam Bhattacharyya
Assistant Professor

Dr. Thejaswini M
Assistant Professor

Dr. Babul Prasad Tewari
Assistant Professor

Dr. Dilip Kumar Choubey
Assistant Professor

Computer Science & Engineering

Programming

- Computer Programming.
- Object Oriented Programming

Data Structures and Algorithms

- Data Structures and Algorithms.
- Design and Analysis and Algorithm

Artificial Intelligence & Machine Learning

- Artificial Intelligence.
- Machine Learning.
- Information Retrieval.
- Computational Geometry.

Other Courses

- Engineering Mathematics I, II and III.
- Electrical Sciences.
- Engineering Physics.
- Professional Communications.
- Engineering Graphics.
- Digital Design.
- Semiconductor Devices and Circuits.
- Engineering Materials.
- National Service Schemes.
- Management Concepts and Technology.
- Society Internship Programs.
- Microprocessor and Interfacing.
- Probability and Statistics.
- Digital Signal Processing.
- IoT and Embedded Systems.
- Academia Internship.

Computer Systems

- Operating Systems.
- Computer Organization and Architecture.
- Database Management Systems.
- Computer Graphics.
- Formal Language and Automata Theory.
- Software Engineering.
- Compiler Design.
- Discrete Mathematics.
- Discrete Mathematics.
- VLSI Design Verifications and Testing.
- Advanced Computer Architecture.
- Distributed Operating Systems.
- Formal Methods and Verification.
- Introduction to Data Mining.

Computer Networks & Network Security

- Data Communication.
- Computer Networks.
- Wireless Sensor Networks.
- Network Security.
- Foundations of Cloud Computing.
- Introduction to Cryptography.
- Data Compression and Protection.

Facilities and Resources

The Computer Science and Engineering has state of the art infrastructure computing facility supported by high speed Ethernet and Wireless connectivity. The students have access to central computing facility, where they perform their computation task and upload their assignments.

The Department has various Labs which are as follows:

Programming Lab.

Gaining extensive programming skills is a basic necessity of an engineering student. This lab is dedicated to enhance the programming skills of the students by giving practical assignments and also requisite knowledge about various programming through various software, hardware, projector and other necessary interactive tools so that students can make their own applications and projects. This lab is accessible to all department students for practicing programming languages. Major focused areas are as follows:

- Programming with C
- Object Oriented Programming using C++
- Implementation of data structures using C.

Computer Systems Lab.

This lab consists of interconnected network of systems, wireless devices, servers workstations, equipped with necessary software, hardware and simulators and are accessible to students for practicing communications and networks practical, projects related to wireless communications and mobile computing. This lab is also for Internet of Things and cloud computing research.

Software system areas such as operating system lab using Linux, database management systems using ORACLE, Computer graphics using programming language, are the main part of this laboratory. The lab also includes Windows Servers with all other necessary software and hardware installed. This lab consists of high end processing systems with good computing facilities all the necessary software's such as MATLAB, hardware tools and simulator. Students also use this lab for practicing GPU computing and computer graphics. The major focused areas are:

- Computer Networks Lab.
- Operating System Lab using Linux.
- Computer Graphics Lab.
- Cloud Computing Lab.
- Internet of Things Lab.
- Software Engineering Lab.

Artificial Intelligence & Machine Learning Lab.

This lab plays a vital role in uplifting the technical skills of the students of IIIT Bhagalpur for taking up challenges in the IT industry. Students utilize this lab to carry out experiments in various undergraduate courses like Artificial Intelligence and Machine Learning. Apart from this, various research based projects have been conducted through the software and hardware facilities present in this lab. This lab also focuses on image filtering, enhancement and segmentation of images, visual information processing, augmented reality technology, 3D image technologies. This lab consists of high end processing systems with good computing facilities all the necessary software's such as MATLAB, hardware tools and simulator. Major areas include:

- Artificial Intelligence by Prolog
- Machine Learning, Information Retrieval, Computational Geometry by using Python, R, R Studio, MATLAB, SPSS, WEKA.

Major Research Areas

IIIT Bhagalpur B.Tech programs are designed to create innovators and researchers. Our department has distinguished research faculties from IITs/NITs. Department supports and provides all the necessary facilities to faculties to excellence in both teaching and research. Out faculties have high-quality papers published in international conferences and journals. Students are also encouraged to carry on their research under faculty guidance, innovative hubs, through seminars from distinguished industrialists and researchers.

The major focused research areas of the department are:

- Artificial Intelligence, Machine Learning, Deep learning and Cognitive computing.
- Wireless Communications and Mobile Computing, IoT, Cloud Computing and Cyber security.
- Soft Computing, Pattern recognition, Bio-informatics, Data Mining.
- Digital VLSI testing.

The department is in the process of introducing M.Tech. and Ph.D. programmes in Computer Science and Engineering with various specializations as noted above.

Co-curricular Activities

Technical Clubs

Coding Club

Coding Club of IIIT Bhagalpur provides platform to enthusiastic students to learn and gain extensive programing skills. Sessions are taken frequently either by mentor students, professors, program developers, from industrialists, webinar, tutorials, workshops or through innovative hubs. The club provides opportunities to students to participate in various coding competitions, internships, paper presentations, quizzes, workshops, gives industrial exposure, placements opportunities and also encourages studentsto take build ICT applications and mentors students tofind solutions to real world problems through coding.

Robotics & IoT Club

Robotics and IoT Club of IIIT Bhagalpur provides a platform for students to design and create next generation embedded applications. The club brings together students of various interdisciplinary subject background such as mechatronics, electronics and computer science. The club provides student exposureto innovative ideas, to solve real world problem using pervasive technologies. The club encourages the students to build ubiquitous automotive projectsprovided with required hardware's such as Rasberry Pi,Arduino and software's. This club also provides opportunities to students to participate in various Robotics and IoT competition, workshops, paper presentations and industrial exposure.

Hackathon

This Department encourages student to participate in various activities such as competitive coding, hackathon, etc. to improve their coding skill.

Developer Student Club

Google developer student clubs (DSC) platform to university students to come together to learn, share and develop various innovative technical projects. IIIT Bhagalpur students use Google DSC to enhance their programming skills and helps them to solve and build various ICT, local business and community related projects.

Artificial Intelligence & Machine Learning Club

Aritificial Intelligence and Machine Learning Club plays a pivotal role in engaging the students of IIIT Bhagalpur in knowing various application areas of AI and ML. The club sessions of this club are very helpful for the newcomers to learn various python packages commonly used in the Industry. Apart from this, various workshops have been organized through the industry professional working in this area. This motivates the students to apply the theoretical concept present in AI and ML for the societal good as well as the industry-relevant areas. Webinars are held to educate the students about openly available GPU computing facility and industry standards for starting and executing various research-based projects in AI and ML.

Extra-curricular Activities

Sports Club

The institute is furnished with cricket and football grounds, Gym, and CAC (Common Activity Centre) which includes badminton courts, Volleyball courts and other indoor games. Sports in our department are well encouraged and the students in the college actively participate in sports with passion and

Fitness Club

A fitness club has been constituted as a part of Prime Minister of India endorsed Fit India Movement at IIIT Bhagalpur. Department encourages the students to actively participate in various sports such as cricket, football, athletics, martial arts and yoga.

Cultural Club

The institute supports and provides a dedicated space and instruments for practicing cultural activities. Department encourages the students to actively participate in various cultural activities such as dance, and Demography of the department.

NSS and Environment Cleanliness Activities

Department encourages the students to actively participate in various social services and environment cleanliness activities such as NSS and Swachhata Pakhwada.

Research Publications

Publication Since 2017

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- **Babul P. Tewari** and Sasthi C. Ghosh "Joint Frequency Assignment and Association Control to Maximize the Aggregate Throughput in IEEE 802.11 WLAN"**, Springer**, *Wireless Personal Communications*, **Vol. 94**, No. 3, pp. 1193-1221,[DOI: 10.1007/s11277-016-3677-y], **2017.**
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- Shankar K Ghosh and **Babul P. Tewari**, Performance Analysis of Distributed Mobility Protocol for multi-hop IoT Networks, Industrial Internet of Things: Technologies and Research Directions", CRC Press, A Taylor & Francis Group, ISBN: 978-1-003-14500-4. **[Accepted, WoS, Scopus Indexed].**

- Babul P. Tewari and Sasthi C Ghosh. Inter-AP Communication Protocol based Frequency Assignment in IEEE 802.11 WLAN. IEEE International Conference on COMmunication Systems & NETworkS (COMSNETS). **2021**, pp. 193-196.
- **Babul P. Tewari** and Biplab K. Mondal, "Efficient 802.11 Handoff through Load Aware Channel Probing in IEEE 802.11 WLAN", ***12th IEEE*** *International Conference on Advanced Networking and Telecommunication Systems* (**IEEE ANTS**), DOI: 10.1109/ANTS.2018.8710151, 16th – 19th Dec. pp. 1-6, **2018**.
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- Vaibhav Shukla, Prabhat Kumar Patel, **Dilip Kumar Choubey,** Santosh Kumar, "Cascadability analysis of WDM recirculating loop buffer-based switch in optical data networks", Journal of Optical Communications, De Gruyter, ISSN: 0173-4911, ISSN: 2191-6322 (Online). **DOI: https://doi.org/10.1515/joc-2020-0100. [In Press, Scopus Indexed]**
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Funded Research Project

Title: "IoT Based Precision Farming for Unstable Indian Environment"

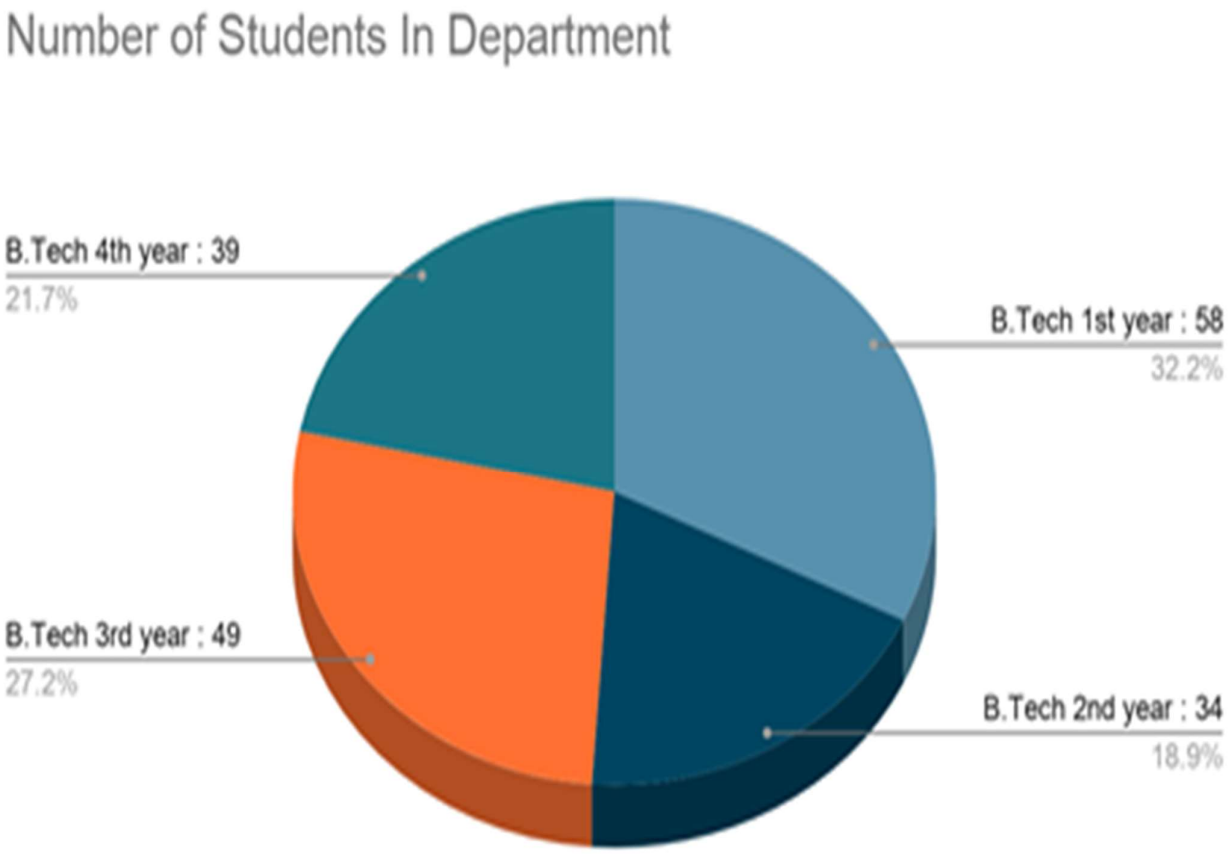
Funded By: "TEQIP Collaborative Research Scheme"

Role: Co-Principal Investigator

Duration: 18th June 2019-30th Sept 2020

Budget: RS 767000/- (Rupees Seven Lakh Sixty Seven Thousand Only)

Demography


Number of Students In Department
B.Tech 4th year : 39
21.7%
B.Tech 1st year : 58
32.2%
B.Tech 3rd year : 49
27.2%
B.Tech 2nd year : 34
18.9%

CONTACT DETAILS

CONTACT US

Head of the Department
Computer Science & Engineering
E-mail: hod.cse@iiitbh.ac.in
Phone No: +91-7632995200