



Indian Institute of Information Technology Bhagalpur

(An Institute of National Importance Under Act of Parliament)

ANNUAL REPORT 2019- 2020



Indian Institute of Information Technology Bhagalpur

BCE Campus, Bhagalpur- 813210, India



Proposed Building

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1. Introduction

Indian Institute of Information Technology Bhagalpur (IIIT Bhagalpur) is one of the IITs set up by the Ministry of Human Resource Development, Government of India. Indian Institute of Information Technology is a joint venture of the Government of Bhagalpur. 50% of the Government of India, 35% of the Government of Bihar and 15% of the Beltron Company. The institute started its first academic session from 1 August 2017. The institute has got the status of "Institute of National Importance" under the Act of Parliament.

Bhagalpur is a city of historical importance on the southern bank of the Ganges River in the state of Bihar, India. It is the third largest city of Bihar and also the headquarters of Bhagalpur district and Bhagalpur division. Known as the Silk City, it is a major educational, commercial and political center, and is listed for development under the Smart City Program. The ancient Vikramashila University established in the 9th century is just 38 km from the campus. The institute will be established in 50 acres with state-of-the-art art and the campus will be equipped with facilities like multimedia board room, smart class room, lecture hall and Wi-Fi etc.

Bhagalpur College of Engineering (BCE) had provided the following buildings to IIIT Bhagalpur. They were renovated/repared by PWD Bihar. However, certain major and minor repairs and provisioning of logistics were done by IIIT Bhagalpur.

1. Academic Building (Six Classrooms for regular class, Two classroom for Computer LAB, Three Laboratory Rooms, One Library Room, Admin and Faculty Rooms)
2. Guest House (Twelve seater)
3. Director's Quarter(One 3BHK Duplex)
4. Five rented Boy's Hostel (capacity of 290 students)
5. Girls Hostel (capacity of twenty students)

2. Vision and Mission of the Institute

(a) Vision

To create technocrats by providing high quality education, research by inculcating technical skills so that they can play a pivotal role in transforming the world and serving the community.

(b) Mission

(i) Enhance the Student Learning Environment

The Institute will improve learning for its diverse group of students by emphasizing upon effective traditional teaching methods, innovative pedagogy and active learning through research experiences, internships, service learning, and learning communities. We will accomplish this by promoting teamwork, academic rigor, learning assessment, information literacy, ethics and problem solving skills.

(ii) Resource Development

The IIIT Institute will seek to generate sufficient resources to support our strategic planning priorities. Resources will be increased from a combination of centre and state funds, student tuition, private support, grants and contracts, continuing education initiatives, and funds for services provided to the industry and region. The successful acquisition of resources combined with an innovative approach to reduce costs will ensure the required fund to support key priorities.

(iii) Commitment to Student Transformation

The Institute will aggressively focus on the excellent performance of students and their transformation by focusing on data driven and research-based projects and strategies.

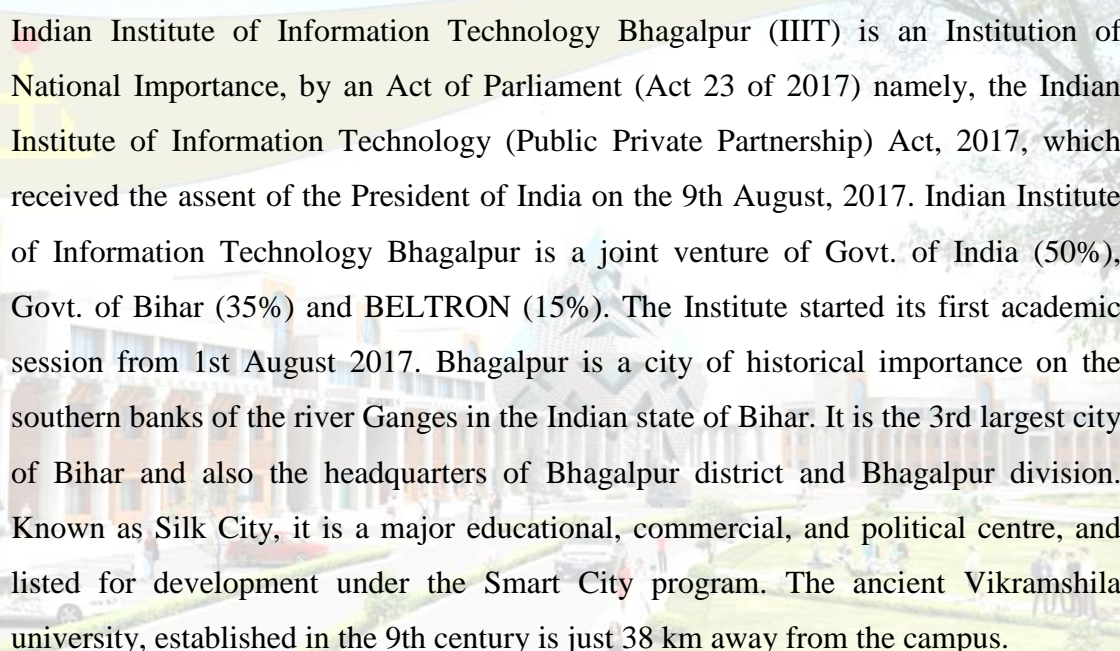
(iv) Developing our Campus Community

The ability of the Institute to achieve its aspiration is dependent upon its ability to recruit and retain a pool of highly qualified and diverse set of faculty, staff and administrators. An emphasis will be placed on defining, supporting and assessing the entire institute as an inclusive and transformative learning community characterized by a strong commitment to innovation.

(v) Engagement with the Region and Outreach activities

- IIIT will duly recognize and ensure to commit to engage with region & community.
- To improve education, healthcare, agriculture, promote awareness & skill development.
- To develop industry clusters to improve the regional economy growth & development.
- To empower social networks to improve neighbourhood and communities.

3. Establishment of the Institute



Indian Institute of Information Technology Bhagalpur (IIIT) is an Institution of National Importance, by an Act of Parliament (Act 23 of 2017) namely, the Indian Institute of Information Technology (Public Private Partnership) Act, 2017, which received the assent of the President of India on the 9th August, 2017. Indian Institute of Information Technology Bhagalpur is a joint venture of Govt. of India (50%), Govt. of Bihar (35%) and BELTRON (15%). The Institute started its first academic session from 1st August 2017. Bhagalpur is a city of historical importance on the southern banks of the river Ganges in the Indian state of Bihar. It is the 3rd largest city of Bihar and also the headquarters of Bhagalpur district and Bhagalpur division. Known as Silk City, it is a major educational, commercial, and political centre, and listed for development under the Smart City program. The ancient Vikramshila university, established in the 9th century is just 38 km away from the campus.

4. Mentor Institute

IIIT is being mentored by IIT Guwahati on the basis of a communication from MHRD, Govt. of India, since 20th April, 2017.

5. Permanent Campus

The permanent campus of IIIT Bhagalpur will be established approximately in 50 acres of land identified in Bhagalpur College of Engineering Bhagalpur. The consultant has been appointed to finalize the layout and architecture. The master plan is in the process for the new campus.

6. Transit Campus

Bhagalpur College of Engineering (BCE) had provided the following buildings to IIIT Bhagalpur. They were renovated/repared by PWD Bihar. However, certain major and minor repairs and provisioning of logistics were done by IIIT Bhagalpur.

i. Academic Building (Six Classrooms for regular class, Two classroom for Computer LAB, Three Laboratory Rooms, One Library Room, Admin and Faculty Rooms).

ii. Boys Hostel (Thirty-four 3 seater rooms, Rooftop Mess and Dining Facility, sports facility etc. built by IIIT Bhagalpur)

iii. Girls Hostel (Ten 2 seated rooms, 1 Dining room).

iv. Guest House (Two 3BHK duplex Quarter).

v. Director's Quarter (One 3BHK Duplex).

vi. Four rented Boy's Hostel (capacity of 193 students).

For the establishment of campus of IIIT Bhagalpur, 50 acres of land has been provided by Govt. of Bihar by bifurcating the campus of Bhagalpur College of Engineering Bhagalpur. Measurement and demarcation of 50 acres land allocated to IIIT Bhagalpur has been completed.

7. Joining of Director

Prof. Arvind Choubey has taken over as the first Director, Indian Institute of Information Technology Bhagalpur on April 26, 2019. He obtained his Bachelor's in Electrical Engineering from Bihar University, India (1984), Master's in Electrical Engineering from Banaras Hindu University, India (1987) and Ph.D. in Electronics and Communication Engineering from Ranchi University, India (2009).

Prof. Choubey has also been the Director in Charge of IIIT Ranchi before joining this institute. He has more than 33 years of teaching and research experiences. His research interest includes Soft Computing, Antenna Design, Signal Processing. Before joining this institute, he has been the senior Professor in HAG scale in the Department of Electronics and Communication Engineering of National Institute of Technology Jamshedpur. In addition to his vast teaching and research experiences he has served

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the responsibility of HOD, ECE and Dean Admin. and Faculty welfare. He has guided 06 Ph.D. students at NITJsr and 23 Masters Students and trained several postdoctoral and several thousand industry professionals and teachers through continuing education workshops. Prof. Choubey is a member of BOG of IIT Allahabad and AICTE council. Sir has already written 3 books and there are many research publications including reputed international journals and conferences in his credit.



Figure 1: The Mentor director Prof. Goutam Biswas handing over the charge of IIIT Bhagalpur to the Permanent Director Prof. Arvind Choubey, IIIT Bhagalpur

8. Joining of Registrar

The director in-charge of the Goa-based India Meteorological Department (IMD), Dr. K. V. Padgalwar was promoted to the post of permanent registrar at Indian Institute of Information Technology Bhagalpur on 3rd March 2020.



Figure 2: Welcome of registrar Dr. K. V. Padgalwar, IIIT Bhagalpur

9. Governing Body

The Governing Body of the Institute is the Principal authority responsible for academic, financial and administrative matters of the institute. Besides, it also has the ultimate responsibility for all the long term policy formulation, planning and development for overall growth and governance of the institute. The Board has the power to constitute other subordinate and subsidiary groups/committees, as felt necessary by it, to ensure free and fair discharge of its functions, as entrusted to it by Govt. of India, in the overall interest of the nation.

The information of the current Governing Body of Indian Institute of Information Technology Bhagalpur is given below:

Serial Number	Name	Designation
1.	Shri Amit Khare Secretary, MHRD, New Delhi	Chairman
2.	Smt, Darshana M Dabral Member JS & PA Finance & Accounts MHRD, New Delhi	Member
3.	Representative, BELTRON, Shastri Nagar, Patna, Bihar	Member

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4.	Shri. Pradip Kumar Jam Director, NIT, Patna	Member
5.	Shri. S. M. Karim Pro Vice Chancellor Aryabhata Knowledge University, Patna, Bihar	Member
6.	Shri Lokesh Kumar Singh Principal Secretary, DST, Bihar	Member
7.	Prof. Arvind Choubey Director, IIIT Bhagalpur	Member
8.	Dr. K. V. Padgalwar Registrar, IIIT Bhagalpur	Member Secretary

10. Senate

Subject to provision of the Act, the Statutes and Ordinances, the Senate is the Principle Academic Body of the Institute. The Senate is responsible for maintenance of Standards of teaching, evaluation, research and consultancy in the Institute. It has the responsibility to lay down policy guidelines and the directions to further the academic growth and development of the Institute. Director, IIIT Bhagalpur is the Ex-Officio Chairman of the Senate, while Registrar is the Member Secretary.

The information of the senate of Indian Institute of Information Technology Bhagalpur is given below:

Serial Number	Name	Designation
1.	Prof. Arvind Choubey Director, IIIT Bhagalpur	Chairman
2.	Prof. S K Patra Director, IIIT Vadodara External Member	Member
3.	Prof. K K Shukla Director, NIT Jamshedpur External Member	Member

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4.	Prof. Sukumar Mishra Dept. of Electrical Engineering, IIT Delhi External Member	Member
5.	Dr. K. V. Padgalwar Registrar, IIIT Bhagalpur	Member Secretary

11. Finance Committee

The information regarding current finance committee of IIIT Bhagalpur has been given below:

Serial Number	Name	Designation
1.	Shri Amit Khare Secretary, Ministry of Human Resource Development, New Delhi Email: secy.dhe@nic.in	Chairman
2.	Smt. Darshana M Darbal Joint Secretary/ Finance & Account, MHRD, New Delhi Email: jsfa.edu@gov.in	Member (Ex-officio)
3.	Principal Bhagalpur College of Engineering Email: principal@bcebhagalpur.ac.in	Member (Ex-officio)
4.	Mr. H.S. Dwivedi General Manager (Project) BSEDC Ltd., Patna Email: h.s.dwivedigm@gmail.com	Member
5.	Prof. Arvind Choubey Director, IIIT Bhagalpur Email: director@iiitbh.ac.in	Member (Ex-officio)
6.	Dr. K. V. Padgalwar Registrar, IIIT Bhagalpur Email: registrar@iiitbh.ac.in	Member (Ex-officio)

12. Building and Work Committee

The information regarding current “building and work committee” of IIIT Bhagalpur has been given below:

Serial Number	Name	Designation
1.	Prof. Arvind Choubey Director, IIIT Bhagalpur	Chairman
2.	Dr. Vaibhav Singhal Faculty, Department of Civil Engineering, IIT Patna Nominee by Government of India	Member
3.	Head, Department of Civil Engineering Bhagalpur College of Engineering Nominee by State Government	Member
4.	Shri. H.S.Dwivedi / Ms. Sanjivni Nominee by Industry Partner	Member
5.	Dr. Fulena Rajak Prof. Department of Architecture & Dean (P&D) NIT Patna Experts from outside the Institute appointed by the Board	Member
6.	Mr. Kishori Prasad Retd. Chief Engineer CPWD Experts from outside the Institute appointed by the Board	Member
7.	Dr. K. V. Padgalwar Registrar, IIIT Bhagalpur	Member Secretary

13. PEOPLE

(i) Administration

Name	Designation
Prof. Arvind Choubey (From 26 April 2019)	Director
Dr. K. V. Padgalwar (From 3rd march 2020)	Registrar

(ii) Faculties

Sl.No	Department/Specialization	Name	Designation
1	Basic Science and Humanities (Maths)	Dr. Hiranmoy Pal	Asst. Prof
		Dr. Himadri Nayak	Asst. Prof
		Dr. Santu Das	Asst. Prof
		Dr. Sudin Ganguly	Visiting Faculty
2	Mechatronics	Dr. P.K. Mandal	Asst. Prof
		Dr. Gaurav Kumar	Visiting Faculty
		Mr. Sunil Kumar Singh	Visiting Faculty
3	CSE	Dr. Rupam Bhattacharya	Visiting Faculty
		Dr. Pradeep Kumar Biswal	Asst. Prof
		Dr. Mohit Kumar	Asst.Prof
		Dr. Thejaswini M	Asst.Prof
4	ECE	Dr. Dheeraj Sinha	Asst Prof
		Dr. Anupam Kuamr	Asst.Prof
		Dr. Sanjay Kumar	Asst.Prof

		Dr. Sandeep Raj	Asst.Prof
		Dr. Prakash Ranjan	Asst.Prof
		Dr. Suraj	Asst.Prof

(iii) Outsourced staffs:

The temporary outsourced staff works in various cadres in the institute. A total of 27 personnel work for the smooth functioning of the office related activities of the institute. A total of 31 personnel were engaged for the security purpose of the institute. For cleaning the hostels and office premises, a total of 12 personnel were present.

14. Academic Infrastructure

(i) Computer Science and Engineering

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 allows 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.

The Department has state-of-the-art infrastructure and computing equipment supported by high speed Ethernet and wireless networks. Students execute their laboratory assignments (programs) during the lab session and use the central server facility to upload their assignments through the internet.


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Figure 3 and 4: Lab Session carried out in the Computer Programming Lab

The department is offering various lab courses. These include C programming lab, Data Structures lab, Database Management System lab, Object Oriented Programming lab, Artificial Intelligence lab, Compiler Design lab, Computer graphics lab, Computer Network lab, etc. The department is currently running with a single Programming laboratory and various labs are conducted by installing appropriate software and tools.

Faculty Profile

Photo	Name of the Faculty	Designation	Area of Research
	Dr. Pradeep Kumar Biswal	Assistant Professor	Digital VLSI Testing, On-line Testing, Computer Architecture, Asynchronous Circuit Design

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	Dr. Rupam Bhattacharyya	Visiting Faculty	Knowledge Representation, Reinforcement Learning, Cognitive Vision
	Dr. Thejaswini M	Assistant Professor	Networks and Communications, Mobile Computing, Cloud Computing, Internet of Things, Mobile Applications, Smart Cities, Future Networks
	Dr. Mohit Kumar	Assistant Professor	Automatic Speaker and Speech Recognition, Speech Processing, Machine Learning
	Dr. Biswajit Bhowmik	Assistant Professor	Network-on-Chip (2D, 3D, Wireless, and Photonic), VLSI Testing, Formal Verification, Cyber-Physical Systems, Distributed Systems, and Computational Geometry

(ii) **Electronics and Communication Engineering**

The Department of Electronics and Communication Engineering (ECE) has been evolving since the inception of IIIT Bhagalpur in the year 2017. This department is developed in response to the needs of industry, this course will give you advanced level knowledge and skills in the design of complex electronic and communication systems. The major objective of the department is to impart high-quality education and to encourage the students in pursuing research.

The Department undertakes a continuous process of setting up experimental and computational facilities for taking up research & development activities in various fields as also to produce state-of-the-art research output. High-End computational

servers and software are available with the Department to accelerate the research. Following Instructional laboratories are fully operational:

Electrical Science

Semiconductor Device & Circuits

Analog Electronics

Digital Design

Analog Communication

Digital Communication

Signals and Systems

Microprocessor & Interfacing

Digital Signal Processing

VLSI

Antenna & Microwave

Minor & Major Project Lab

1. Analog & Digital Electronics Laboratory

The Analog & Digital Electronics Laboratory is accessible to undergraduate students of all the departments. The lab is well equipped with Digital Storage Oscilloscopes, function generators, digital multi-meters, Analog & Digital ICs, general purpose ICs, etc.

Lab Equipments: -

- Two channel 100 MHz Digital Storage Oscilloscope (Model: SMO1002; Make: Scientific)
- 25 MHz single Channel Function Generator (Model: SMG5225; Make: Scientific)
- Triple output Regulated DC Power Supply (Model: PSD3304 Make: Scientific)
- 4½ Hand Held Digital Multi-meter (Model: SM7024, Make: Scientific)

- Universal IC Tester (Model: DICT-03, Make: Kitek)
- LCR Meter (Model: LCR-914, Make: GW-Instek)
- Analog Kit (Model: ASLK PRO, Make: Texas Instruments)

2. Communication Laboratory

This laboratory focuses on training the students in both analog and digital transmission/reception of signals. The students are trained for constructing the circuits for analog and digital modulations. The concepts of all type of modulation & demodulation can be studied. The recent communication techniques is demonstrated with available equipment

Lab's Equipment: -

- Analog Communication System Trainer (Model: CM2, CM3, CM4, CM6, CM7, Make: Benchmark Electronic System Pvt Ltd)
- Digital Communication Training System (Model: Wicomm T, Benchmark Electronic System Pvt Ltd)
- 4 ½ hand held DMM (Model: DM-87, HTC MAKE)
- 200MHz 4-channel Oscilloscope (Model: SDS 2204X, Make: Siglent)
- Quad Output DC Regulated Power Supply (Model: GPE4323, Make: GW INSTEK)
- Triple DC Regulated Power Supply (Model: PSD3304, Scientific Mes- Technik)
- 30MHz True dual channel DDS Arbitrary Function Generator with optional separate 25MHz Pulse (Model: MFG-2230M, Make: GW INSTEK)
- LCR Meter (Model: 914, Make: GW INSTEK)
- Software Defined Radio (Model: B210 Make: National Instruments/Ettus Research/Benchmark Electronics)
- Universal IC tester (Model: DICT-03, make: Kitek Technologies Pvt. Ltd.).

3. DSP & VLSI Laboratory

Electronic world is going towards miniaturization, more features and Functionality, High speed, Low power consumption and Portable Size are the priority demand from the consumer side and are challenges for Electronic gadgets manufacturer. The technology because of which these demands and challenges have been fulfilled so far and are in a continuous process is known as VLSI. VLSI means Very Large Scale integration where researchers are working to incorporate large scale integration of electronic devices on a single silica chip “Integrated Circuit or IC to fulfil the market demand.

Digital signal processing laboratory helps the students to learn, analyze and design the techniques that give core knowledge for DSP engineers to develop the laboratory aims at supporting the teaching and research activities in the area of DSP. The lab is well equipped with 31 number of high performance computers. Software packages such as MATLAB with Simulink and Code composer studio are installed in the systems. Programming of the DSP chip is done using the Code Composer Studio in an integrated development environment.

Lab Equipments: -

- All in One DSP Lab
- Make: EduTech Learning Solutions PVT.
- All in One DSP Educational Practice Board
- USB JTAG Emulator for All in One DSP Kit
- RFID Interface Module
- Finger print module
- GSM Modem
- CCD Camera
- Texas Instrument DSP Development Kit (Model: TMS320C6) with Emulator

- Protection PCB for DSP board
- DSP Based Motor Control System
- Function Generator
- MAGIC Software for VLSI Design
- HP Desktop (Intel core i5 7th Gen.)

4. Antenna & Microwave and Design Laboratory

The focus of the Antenna & Microwave Engg. Laboratory is the development and use for scientific studies of the microwave frequencies. The major areas of research involve simulation, analysis, design and development of microwave circuits, components and sub-systems including micro machined devices for RF, microwave, milli-meter wave applications. Micro machined antennas, phase shifters and filters are some such components.

Design Lab is being used for the Major and Mini Project of the Final year undergraduate students of ECE Branch. It contains the hot air SMD Rework Stations, Printed Circuit Board 3D Printer. SMD can perform conventional through-hole soldering and newer SMT soldering. The stations allow for quick and simple IC attachment and detachment through the use of solder paste and the hot air tool. The 3D printer greatly expands the possibilities for enclosing final project circuits in compact, customized boxes and housings.




Lab Equipments: -

- 500 MHz 4-channel Digital Storage Oscilloscope
- Programmable DC Power Supply
- MICROWAVE TRAINING KIT (Klystron Based)
- MICROWAVE TRAINING KIT (Gunn Based)
- PCB Prototyping Machine
- SMD Rework Station Temperature Controlled Soldering Station

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- 3D PRINTER
- Microwave Training Lab
- 3D 0.3GHz-3.8GHz Antenna Training Lab
- 4 GHz MIC Training Lab

Faculty Profile

Photo	Name of the Faculty	Designation	Area of Research
	Prof. Arvind Choubey	Director and Professor	Soft Computing, Antenna Design, Signal Processing
	Dr. Dheeraj Kr. Sinha	Assistant Professor	Microelectronics & VLSI, Circuit/Device Interaction, ESD Protection Circuits, Layout Optimization.
	Dr. Anupam Kuamr	Assistant Professor	Fuzzy Logic and Neural Networks, Robotics Control and Automation, Intelligent Control Theory and Applications, Fractional Order System, Optimization Techniques.

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	Dr. Sanjay Kumar	Assistant Professor	Modeling and Simulation of Advance CMOS devices for Analog/RF Application
	Dr. Sandeep Raj	Assistant Professor	Digital Signal Processing, Embedded Systems, Biomedical Engineering, Machine learning
	Dr. Praksah Ranjan	Assistant Professor	Microwave Metamaterial Absorbers, ZOR Antenna, Soft Computing Optimization Techniques
	Dr. Suraj	Assistant Professor	Control Systems, Biomedical Signal Processing & Control

(iii) Mechatronics Engineering

Indian Institute of Information Technology Bhagalpur started functioning from August, 2017 with two departments, namely, Computer Science Engineering and Electronics and Communication Engineering. However, a synergetic integration of electronics with mechanical engineering along with intelligent computer control is required for improving the functionality, productivity and efficiency in design and manufacturing of products. This calls for the introduction of the Mechatronics Engineering branch at IIIT Bhagalpur.

The program combines mechanical design, manufacturing, automation and electrical/electronics control within a foundational context of design and manufacturing. Degree holders under the discipline will have the opportunity to work in various sectors, viz., aviation, electronics, automobile, manufacturing, oil and gas, mining, transport, defence, robotics and aerospace industries from pursuing higher degrees.

The following are the objectives of the proposed degree:

1. The program will produce graduates that are prepared for successful careers in the area associated with the analysis, applied design, development, implementation, and oversight of electro-mechanical, mechatronics, robotics and automation systems.
2. The program will prepare graduates that advance in their careers and continue their professional development.
3. The program will prepare graduates that understand the overall human context in which engineering technology activities take place.

To promote interdisciplinary research, the curriculum of the department has been designed by a panel of experts considering the need of the academia and the industry. The department is offering four years undergraduate B.Tech course with a sanctioned strength of 30 students.

To fulfil the requirement of the Department, the curriculum of Department of Mechatronics Engineering has been designed keeping in mind that a student should be capable to design and automate a system. For designing and automation of a system mainly four different types of domain knowledge is needed i.e. Mechanical design, Electrical design, Signal processing and Control, and Programming. In this regard, the curriculum is segregated in mainly four sections,

1. Subjects, which give an understanding of mechanical design,
2. Subjects, which give an understanding of electrical design,
3. Subjects related to signal processing and control
4. Subject, which deals with a complete mechatronic system.
5. Subjects dealing with computational capabilities




Based on the area, the following laboratories have prepared to develop the skill of the students.

1. Manufacturing Lab

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2. Electric Machine Lab
3. Robotics Lab
4. Strength of Materials Lab
5. Mechanical Workshop

Faculty Profile

Photo	Name of the Faculty	Designation	Area of Research
	Dr. Gaurav Kumar	Visiting Faculty	Electromechanical interactions in electrical machines, Electric Vehicle, Vibrations
	Dr. Purnendu Kumar Mandal	Assistant Professor	Micro-alloying of aluminum alloys, mechanical properties evaluation, microstructural characterization, failure mechanism and generation of processing maps of metallic alloys
	Mr. Sunil Kumar	Visiting Faculty	Kinematics, Static Balancing, Design of Linkage, Solid Modelling, Design & Simulation of Linkage

(iv) Basic Science and Humanities

Knowledge in basic science forms the fundamentals of almost every engineering and technical courses. Value-based education, communication and management skills are essential to provide a finishing touch to a budding engineer. IIIT Bhagalpur is currently running UG (B.Tech.) programs in Computer Science and Engineering, Electronics and Communication, and Mechatronics Engineering. All of these curricula need some common courses in Mathematics, Physics, Humanities and Management as

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essential components. The Department of Basic Science and Humanities was formed in 2019 to cater to these needs under a single umbrella of departmental structure. Well-experienced and highly qualified faculty members of the department aspire to make consistent and fruitful efforts to improve the students' learning, research and development processes. In addition to the common courses for various streams in UG engineering, the department will also like to float elective courses in Mathematics and Physics in order to support the whole UG curriculum. In future, the department aspires to start PhD programs in selective specializations.

	Dr. Himadri Nayak	Assistant Professor	Word Combinatorics: String reconstruction, Word complexities; Discrepancy Theory
	Dr. Hiranmoy Pal	Assistant Professor	Algebraic Graph Theory - Quantum State Transfer in Graphs: Perfect State Transfer, Approximate Quantum State Transfer
	Dr. Santu Das	Assistant Professor	Wave-structure interaction, Hydroelasticity, Poroelasticity, Viscoelasticity, Flexural gravity waves, wave blocking,
	Sudin Ganguly	Visiting Faculty	Quantum transport in nanoscale system, Graphene and other topological materials, 2D materials,

(v) Student Intake

The admission of the students at IIIT Bhagalpur has been done through the counselling of JEE MAINS 2017, 2018 organised by JOSAA/CSAB.

The planned intake of the students in the year 2017, 2018 and 2019 was 120, 150 and 150 respectively. However, 67, 100 and 69 students took admission in the year 2017, 2018 and 2019 respectively students were admitted after the final round of counselling held by CSAB/JOSAA. The total number of continuing students are 236 out of 16 is girls students. The students come from various parts of India. The distribution of the students branch-wise has been given below:

Batch	Branch	No of students	Gender	Count of Gender
2017-21	CSE	39	Male	38
			Female	01
	ECE	28	Male	24
			Female	04
2018-22	CSE	49	Male	46
			Female	03
	ECE	39	Male	36
			Female	03
	MEA	12	Male	12
			Female	----
2019-23	CSE	35	Male	31

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	ECE	24	Female	04
			Male	24
	MEA	10	Female	----
			Male	09
		Female	01	

15. Publication Details

Sl	Name of the faculty	Publication Type	Details
01	Prof. Arvind Choubey	Patent	<ol style="list-style-type: none"> 1. Sandeep Raj, and Arvind Choubey “Bacterial and Viral Infection Localization and Classification Using X-rays and CT Images”, Indian Patent, Appl. No.: TEMP/E-1/26230/2020-KOL. 2. Arvind Choubey, Prakash Ranjan, Chetan Barde, Santosh Kumar Mahto and Rashmi Sinha. “Zeroth Order Resonator (ZOR) Antenna using slotted Metamaterial structure” Ref. No. 202031026590, App. Number TEMP/E-1/29503/2020-KOL. 2020.
		Journal	<ol style="list-style-type: none"> 1. Chetan Barde, Arvind Choubey, Rashmi Sinha, Santosh Kumar and Prakash Ranjan. "A compact wideband metamaterial absorber for Ku band applications." Journal of Materials Science: Materials in Electronics 31.19 (2020): 16898-16906. 2. Chetan Barde, Arvind Choubey, and Rashmi Sinha. "A set square design metamaterial

			<p>absorber for X-band applications." Journal of Electromagnetic Waves and Applications 34.10 (2020): 1430-1443.</p> <p>3. Prakash Ranjan, Arvind Choubey, Rashmi Sinha, Santosh Kumar and Chetan Barde. "A novel ultrathin wideband metamaterial absorber for X-band applications." Journal of Electromagnetic Waves and Applications 33.17 (2019): 2341-2353.</p> <p>4. Chetan Barde, Arvind Choubey, and Rashmi Sinha. "Wide band metamaterial absorber for Ku and K band applications." Journal of Applied Physics 126.17 (2019): 175104.</p> <p>5. Anand Kumar, Santosh Kumar, Rashmi Sinha and Arvind Choubey. "Dual circular slot ring triple-band MIMO antenna for 5G applications." Frequenz 1. ahead-of-print (2020).</p>
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16. Facilities

a. Computer and Communication Centre

The Computer and Communication Centre is responsible for keeping the Electronics and Communication as well as Computation related facilities available to each member of IIIT Bhagalpur. The services provided by the Computer and Communication Centre includes:

A. Installation and Maintenance of Servers for:

- Internet Access
- E-mailing Facilities
- Computation Facilities
- Management and upkeep of the Official IIIT Bhagalpur and Intranet Web Page.

B. The Centre is having 04 DELL PowerEdge R730 Servers of Max Turbo Speed @2.20 GHz with 12 cores and 64 GB RAM running Cent-OS Operating System.

C. The campus LAN connection of Academic and Administrative building has been extended to both boy's and girl's hostel. On campus, students can access high-speed LAN and Wi-Fi. IIIT Bhagalpur is part of National Knowledge Network (NKN), which ensures 100 Mbps connection.

b. Library

- The Institute library started functioning on 1st August 2017 with approximately 500 text and reference books. During a short span of time, the library has acquired a good number of books as more than 5200 printed volumes of books from reputed publishers. The Library caters to the information needs of faculty members, students

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as well as the staff of the Institute, by offering a wide range of Electronics, Information Technology, Computer science, Mechatronics, Basic science and Humanities and competitive examination (like GATE, JRE, etc) books. The library also catered to Hindi Sahitya books as per the guidelines of MHRD.

- The Library is well equipped with modern facilities and resources. The Library is kept open from 9 AM to 6 PM in the evening on all the week days and till 10 pm in the night during exam times except Institute holidays.



Figure 5: Server room at IIIT Bhagalpur



Figure 6: Library at IIIT Bhagalpur

a. Conference Room

The Conference Room has a capacity of 15 and is well equipped with one PTZ Camera with 43"LED TV with Video Conferencing facility through Panasonic Codec. It also has a Projector with a well-equipped sound system.



Figure 7: Conference room

b. Virtual Class Room

IIIT Bhagalpur has a dedicated Virtual class room for 1:5 Video Conferencing and is well equipped with PTZ Camera, Projector, 43" LED TV, Amplifier, Wireless MIC, Presenter and Sound System.



Figure 8: Virtual Class Room

c. Hostels

IIIT Bhagalpur currently has five boys' hostel and one girls' hostel in the campus. Boys' hostel no 1 is at about 100 Meters and the girls' hostel is situated near the guest house, about 0.5 KM from the academic complex. Students have access to LAN and Wi-Fi connectivity throughout the Hostels. In addition to the adequate health care facilities are provided and medical bills are reimbursed. The hostel is equipped with a TV room and study room facilities. The boys' hostel has a volleyball court, and badminton court. A football-cum-cricket ground is also available nearby boys' hostel premises. There are one students' mess in boys' hostel and one mess in the girls' hostel, along with food joints and canteen. 24 hours security and water supply is available in the hostels.



Figure 9: Girl's hostel and boy's hostel

d. Mess

IIIT Bhagalpur provides separate mess facilities for both boys and girls with adequate arrangements. Hygienic, nutritious and a well laid-out cafeteria exists in the campus for ready service to the students and faculty.



Figure 10: Hostel Mess for students at IIIT Bhagalpur

e. SBI ATM Facility

ATM facility is also available in the institute's academic building.



Figure 11: ATM inside the Academic Building

f. Gym, Music & Sports

IIIT Bhagalpur has the basic Gym, Music, and Sports facility. Students participate in various cultural events such as: Ek Bharat Shrestha Bharat (EBSB), Independence Day, Republic Day etc. All the facilities are available in the common activity centre (CAC). The cricket ground and football ground is developed at the permanent campus of IIIT Bhagalpur and volleyball, badminton and Indoor games are played at CAC premises.

g. Medical

A medical doctor visits our Institute thrice a week to take care of the health of our students. Moreover, medical expenses up to Rs. 2,500.00 is reimbursed to each student.

h. Scholarship Assistantship

The students of IIIT Bhagalpur can apply and avail different Central/State Govt. scholarship schemes. In addition to these govt. schemes, a student can also apply for different PSU (Public Sector Unit) scholarships. Different scholarships provided by govt./PSU organizations to selected/all students are based on student's merit, income, category, physically disabled, state of residence, etc. The number of scholarships and selection is to be decided by the Government / PSU organization. Various categories

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of such scholarships are given below. IIIT Bhagalpur offers assistance to the students in applying for such scholarships.

National Scholarship Portal

- Central Sector Scholarship of Top-Class Education for SC students (Ministry of Social Justice and Empowerment, New Delhi)
- National Fellowship and Scholarship for Higher Education of ST students (Ministry of Tribal Affairs)
- National Scholarship for Persons with Disabilities

- Merit-cum-Means Scholarship for Students Belonging to Minority Communities. (Ministry of Minority Affairs, New Delhi)

- Central Sector scholarship for College and University Students (MHRD, Govt. of India)

- State Post-Matric Scheme of Assam, Arunachal Pradesh, Bihar, Uttarakhand, Tripura, Manipur Meghalaya, Goa, etc.,

Central Sector/PSUs Scholarships

- Oil & Natural Gas Corporation Scholarship for SC/ST students.

- SAIL Scholarship for SC/ST Students.

- NTPC Scholarship.

- Coal India Limited Scholarship.

State Government Fee Reimbursement Schemes

Many State Governments have fee reimbursement schemes for SC, ST, OBC, EBC etc., IIIT, Bhagalpur students, being funded by MHRD, are eligible for such schemes from their respective state government. Some of the information on financial support can be found below:

- Government of Uttar Pradesh.
- Government of Madhya Pradesh.
- Government of Telangana.
- Government of Jharkhand.

Education Loan Assistantship

IIIT Bhagalpur offers assistance to the students in availing of various educational loans to undergo various degree programmes. Few of them are mentioned below:

- Vidya Laxmi portal for education loan: <https://www.vidyalakshmi.co.in/Students/>
- Bihar Student Credit Card Loan Scheme: <https://www.7nishchay-yuvaupmission.bihar.gov.in/>

17. Electricity Supply

The electricity supply to IIIT Bhagalpur was taken from the substation of BCE Bhagalpur but due to an increase in load and for better quality, two independent HT connections ($I \times 200\text{KVA}$) for academic block and boys hostel, ($I \times 63\text{KVA}$) for guest house, girls hostel and residential accommodation are processed and came into operation from September 2018.

To deal with the frequent power cut, the institute has made an alternative arrangement of following generator set on rental basis:

- 5 KVA Generator set, one in 1st year boys Hostel and one in Girls hostel.
- 25 KVA Generator Set of 2nd and 3rd Year students.
- 62 KVA Generator Set on rent basis for academic building.

18. Invited Talks

- (i) Mr. P. K. Jha, Ex-General Manager, Maruti Suzuki India Ltd. delivered a motivational lecture for the students of IIIT Bhagalpur on January 09, 2021.
- (ii) Mr. Pradeep Kaushik delivered a motivational lecture on 5th November 2019.



Figure 12: Welcome of Mr. P. K. Jha, Ex-General Manager, Maruti Suzuki India Ltd

19. Academic Event

(i) Smart India Hackathon 2020 (SIH)

As per the directive of Govt. of India, Smart India Hackathon 2020 (SIH) was conducted to solve some pressing problems faced in our daily lives. In this regard, an internal Hackathon was organized at IIIT Bhagalpur. The main objective of this internal Hackathon was to nominate 5 teams in the software section and 2 teams in the hardware section from IIIT Bhagalpur. This internal Hackathon was held on 7th February 2020 where 23 teams participated.

(ii) Faculty Development Programme (FDP) on IOT and Embedded System Design

One week FDP on IOT and Embedded System Design was organized by IIIT Bhagalpur in association with “Electronics and ICT Academy”, IIT Guwahati. This

FDP was very instrumental in imparting quality technical skills to the faculties ranging from all over India. It was started on 27 May 2019 and ended on 31st May 2019. This FDP was also supported by Digital Shark Technology.



Figure 13: Inaugural session of internal Hackathon

(iii) Intellectual Property Right (IPR) Awareness Programme

Associated Chambers of Commerce and Industry of India (ASSOCHAM) and Patent Office, Govt. of India have been organizing IPR awareness programmes across different parts of India. IIIT Bhagalpur was always interested to contribute to this great initiative. By following the guidelines of ASSOCHAM and Patent Office, Govt. of India; IIIT Bhagalpur organized a one-day IPR awareness programme on 27 January, 2020. This programme was a great success where various faculties and students got to know about the intellectual property and its importance in the nation building process.



Figure 14: IPR Awareness Program at IIIT Bhagalpur

20. NSS/Extracurricular activities

Students are participating in music, drama and other cultural activities. Facilities are provided by the Institute with the active participation of the students and staff. The following major events were organised:

- Orientation and Inaugural ceremony of the institute.
- Celebration of "Independence Day".
- Observance of "Rashtriya Ekta Diwas"(National Unit Day).
- Observance of "Constitution Day".
- Observance of "Republic Day".
- Observance of "Martyrs Day".

21. Swachhta Pakhwada Awareness Programme

The earth we live in is almost always under the threat of destruction by factors attributed to our own negligence. Now, it is the time to change our society as well as our country and make it beautiful by taking some serious steps. Forests play a vital role in preventing global warming and building sustainable societies. So the need to protect and develop them can never be stressed enough. Forests have a variety of functions, including land conservation, securing of water sources, control of climate change, and creation of a natural environment essential to human existence. The law gives new value to these 'multifunctional' forests with a view to achieving harmony between them and society. The relationship between forest conservation and global warming deserves special attention, given forests' great role as an absorber of carbon dioxide.

Recycling is important in today's world if we want to leave this planet for our future generations. It is good for the environment, since we are making new products from the old products which are of no use to us. Recycling begins at home. If you are not throwing away any of your old product and instead utilizing it for something new then you are actually recycling. When you think of recycling you should really think about the whole idea of reduce, reuse and recycle. We've been careless up to this point with

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the way we've treated the Earth and it's time to change; not just the way we do things but the way we think.

Energy conservation plays a significant role in lessening climate change. It helps the replacement of non-renewable resources with renewable energy. Energy conservation is often the most inexpensive solution to energy shortages, and it is a more environmentally kind alternative to increased energy production.

Since we have a limited quantity of non-renewable energy resources available on earth, it is very important to preserve energy from our current supply or to utilize renewable resources so that it is also available to our future generations.

Everything on Earth requires water to sustain itself. But abusing water means that we are lessening its ability to provide us with this basic necessity. Water is a limited resource and while Earth is a self-contained ecosystem, meaning Earth always has, and will always have, the same amount of water, the population growth puts a strain on water supplies and clean water is reduced by the pollution and contamination we create.

Many people around us are not even aware of need for conservation of our natural resources due to lack of proper education in the country and to spread this awareness government of India took an initiative program namely 'Swachhta Pakhwada' which was celebrated in the month of January this year in which various events were organised from 16th January to 31st January 2020 in order to promote social values and general awareness amongst the people. Swachhta Pakhwada was started in April 2016 with the objective of bringing a fortnight of intense focus on the issues and practices of '*Swachhta*' by engaging Government of India. Under 'Swachhta Pakhwada' various events relating to cleanliness, forest conservation, energy conservation, waste recycling and water conservation are held in order to show their utmost importance.

The Ek Bharat Shrestha Bharat (EBSB) team members of IIIT Bhagalpur have taken initiation of this swachhta awareness programme. They organized a lot of activities regarding swachhta awareness among the people as well as students. A lot of students participated in this awareness programme. The activity are listed below

1. Swachhta pledge taking ceremony

2. Motivational speech by director
3. Plantation of saplings.
4. Motivational speech by the member of ISKON.
5. Competitions regarding swachhta - speech, poster making, slogan writing, etc.
6. Organisation of cleanliness drive in campus with active participation of students, faculty and non-faculty.
7. Competitions regarding water conservation - speech, poster making, slogan writing, etc.
8. Talk show on swachhta - create awareness among students on all aspects of Swachhta - personal, physical, mental, environmental, societal etc.
9. Competitions regarding forest conservation-speech, poster making, slogan etc.
10. Cleanliness drive in hostels with active participation of students and hostel staff. Special stress on maintenance of kitchen, food waste management and clean lines
11. Competition 'Best out of waste' - creates useful items out of waste materials in the surroundings.
12. Organisation of special drive on water conservation. Check wastage of water and take appropriate measures to rectify.
13. Village activities by institutions in association with NGOs: Say no to single use plastic. Awareness camps regarding cleanliness thorough road show, nukkad natak, songs, poems, display of banners etc.
14. Prize distribution ceremony for winners in the competitions organised, with display of top 10 entries of poster, slogan, 'Best out of waste', presentation of innovative technologies for waste recycling, energy conservation etc.

Swachhta Pledge Taking Ceremony

Mahatma Gandhi dreamt of an independent and clean India. He had a revolutionary vision about making India clean. Cleanliness is not just the responsibility of the government but all citizens, including those who work for the government. Also swachhta is not only about ensuring sanitation but also a vision about how people of the country can contribute towards this goal. In this effort, Swachhata Pakhwada was started in April 2016 under Swachh Bharat Mission with the objective of bringing a fortnight of intense focus on the issues and practices of Swachhata by engaging GOI Ministries/Departments in their jurisdictions.

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An oath taking ceremony was organised by IIIT Bhagalpur followed by a motivational speech by our honorable director Prof. Arvind Choubey on 16.01.2020 as per the schedule provided by MHRD under Swachhta Pakhwadam, a awareness mission to the people regarding Swachhta and followed by a motivational speech by honorable director Prof. Arvind Choubey, IIIT Bhagalpur.



Figure 15: Swachhta Pledge was taken by all faculty, students and staff of IIIT Bhagalpur

Plantation of saplings

Plantations of trees are important as they improve the life and fulfill essential needs of mankind. During photosynthesis, the trees breakdown food materials and consume carbon dioxide. Resultantly with the help of sunlight, the trees produce carbohydrates. Moreover, trees support life by providing habitat to different species such as squirrels, bees and birds. Trees cleanse the climate by absorbing carbon dioxide from the environment and releasing oxygen. The trees cool the environment through their leaves by absorbing the sun heat. Thus, there occurs cooling in the atmosphere. The trees provide shades to houses and streets.

Trees clean the air by absorbing harmful chemicals such as nitrogen oxide and removing dust particles from the air by absorbing them in their leaves. Another importance of planting trees is that they save the water from impurity. Trees stop water pollution by breaking the direct fall of rainfall to the ground. Through trees, we make

Poster Making Competition

There was competition on poster making in which participants have to use their imagination and visualization on swachhta and presentation of the art with which people can get conscious about Swachhta.



Figure 17: Participants of poster making competition

Slogan Writing

There was a competition on Slogan in which participants had to use their imagination and ideas on swachhta and presentation of the effective slogan which can tell the importance of Swachhta.



Figure 18: Participants during Slogan Writing competition- Swachhhta

Cleanliness Drive in Campus

For a clean and healthy environment Cleanliness is one of the most important practices, which we need to adhere to. It is quite essential for all of us to know and learn about cleanliness, hygiene, sanitation and various diseases, which are caused due to poor hygiene conditions. It could be regarding either personal hygiene or public hygiene. It is our social responsibility to keep our neighbourhood clean and safe.

EBSB Team of IIIT Bhagalpur organised cleanliness drive in the campus. Students had started this drive from their Common activity centre. They had separated biodegradable and non-biodegradable wastes and prepared a pit where all the biodegradable waste was collected to prepare manure from it. They segregated all the non-degradable waste and dumped that into dustbins.

Many students, faculties and staff participated in the drive. Then students proceeded to Hostels, academic building, continued drive, and awareness program there. Then, students did poster holding in order to spread the message of cleanliness among students.

After doing this job for two hours, they assembled in the place, which was initially cleaned by them; they took an oath to keep their rooms and the locality clean, and thanked Mother Nature for providing huge amount of resources.



Figure 19: The students, faculties and staffs involved in Cleanliness drive in campus of IIIT Bhagalpur

Swachchhta Campaign in Village by EBSB Team, IIIT Bhagalpur

Swachchhta is a way of living that ensures longevity, health and satisfaction. It ensures that we are living a healthy life. It is a very important part of our life. In order to make people aware about it, the MHRD has taken major steps to organise cleanliness activities so that it makes the younger generation aware and make swachchhta a habit. With the same intention, the initiative of Swachchhta Pakhwada has been taken by MHRD. Following the same path, IIIT Bhagalpur organised Swachchhta Pakhwada from 16th of January, 2020 to 31st of January,2020 which consisted of cultural and many social activities. One of the activities organised under Swachchhta Pakhwada was a Village visit and awareness program.

The faculty members and the students of IIIT Bhagalpur actively participated in this activity. A team was made which consisted of both the faculty members and students.

This team consisting of faculty members, staffs and students visited a village to spread awareness regarding cleanliness and to understand the problem of villagers regarding cleanliness and to plan accordingly for the best results. Team after the interim discussion chalk out the plan to visit the village in Sabour, Bhagalpur. The team decided to spread the awareness among the villagers with the help of small talks, slogans, posters, banners, Nukkad natak and cleaning the premises of a primary government school present there.

Under the banner “Ek Bharat Shreshtha Bharat”, the team visited the village with the intention to spread awareness among the villagers regarding cleanliness. The team tried to convey the message of cleanliness and its importance with the help of slogans, banners and Nukkad natak in the village and reached the pre-selected school. Firstly, the team members introduced themselves and gave a small talk regarding cleanliness, and its importance to make our life disease free.

The Swachchhta Pakhwada team of IIIT Bhagalpur, made the gathering aware of cleanliness by performing a Nukkad natak. Afterwards, the team also demonstrated how to clean hands and educated the villagers and young kids about sanitation.

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Figure 20: Nukkad Natak performance by EBSB team, IIIT Bhagalpur

A small quiz was organised for the students of the school, where questions based on cleanliness and hygiene were asked by the team members. It raised the interest among the students to understand the importance of swachchhta. The team also explained the use of dustbin and educated the gathering about the importance of cleanliness.



Figure 21: Awerness regarding Swachhta and use of dustbins explained by EBSB team, IIIT Bhagalpur

The Swachchhta Pakhwada team of IIIT Bhagalpur also provided four dustbins and hand wash to the school. Among the four dustbins being provided, two were for degradable wastes (green) and two were for non degradable wastes (blue). The students were instructed and demonstrated regarding the use of dustbins for various categories of

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garbage. The teachers and staffs of the school were facilitated by memento for their kind participation and efforts to make the event memorable and successful.

After that the team members, along with the staffs of the school organised a cleanliness program under which every member along with the school staffs cleaned the premises of the school. All the degradable and non-degradable wastes were being put in the respective dustbins (the green dustbins for degradable wastes and blue for non-degradable wastes).



Figure 22: Swachchhta drive at school by students of IIIT Bhagalpur

After that the students along with the faculty members of IIIT Bhagalpur organised a programme under which the village children were encouraged to wash their hands with hand wash. In order to show the encouragement to village children, small biscuit packets were being distributed amongst them. The village children also showed positive response and washed their hands using hand wash.



Figure 23: Children using the hand wash provided by EBSB team, IIIT Bhagalpur and cleaning their hands



Figure 24: The girl using dustbin for dumping waste after eating.

The event was finally concluded with a very positive response from the village children as well as the primary school students as they started inculcating the habit of using hand wash and dustbins.



Figure 25: Group Photograph of EBSB Team, IIIT Bhagalpur along with the school children

Swachhta Pakhwada is an idea put forward by MHRD, Government of India in order to ensure the mental and physical well being of all. In order to carry out the same, IIIT Bhagalpur Swachhta Pakhwada team tried to put some effort to raise the vibrations of this movement. The whole event was being organized with a positive mindset and the students and faculty members actively played their roles for making this event a great success.

22. “UDYATVA -2020” (The Annual Sports Fest)

Udayatva-2020, whose name is derived from a SANSKRIT word ‘UDYAT’ meaning Hard Work, Discipline, Trained or Exercised. Main Objective of Udayatva was to organize sports competitions in selected recognized events, to encourage sportsmanship, to promote and create better harmony, understanding and friendly interaction among the students of the IIITs as well as to establish a close association among them. Also it will raise the standard of sports of the student of IIIT-Bhagalpur and to work for the development of character and values through sports. To equip students with skills not only in sports, games and exercises but also to handle real life situations, creates awareness of physical fitness and sports and games in day to day life.

The first intra IIIT-Bhagalpur sports event was organized by the Sports Board Student’s Gymkhana Council Coordinated by Dr. Himadri Nayak and managed by General Secretary Uday Pratap Singh. It included both Team and Individual events conducted from 8th to 10th February, 2020. The events are as follows

Team events

1. Cricket
2. Football
3. Volleyball
4. Kabaddi
5. Tug of War

Athletics events (both track and field events)

1. 100m

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2. 200m
3. 400m
4. 800m
5. 1500m
6. 4X100m (Relay)
7. Javelin Throw
8. Discuss Throw
9. Shot Put

10. Long jump

11. High Jump

Indoor Games

1. Chess
2. Carrom
3. Badminton



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Figure 26: Inauguration Programme of Annual Sports Fest, 2020



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Figure 27: Photographs of various outdoor and indoor games happened during UDYATVA -2020



Figure 28: Award distribution ceremony of UDYATVA -2020

23. Institute's Achievement during Covid-19

Coronavirus disease 2019 (COVID 19) is an infectious viral respiratory disease caused by coronavirus SARS-CoV2 that can progress to severe acute respiratory syndrome with pneumonic and acute respiratory distress syndrome. Histologically, COVID 19 shows diffuse alveolar damage corresponding to the phase of the disease (acute to fibrotic). It is divided into 3 main injuries patterns-epithelial, vascular & fibrotic. The definitive diagnosis is done on the basis of detection of viral RNA by RT-PCR. Average time from exposure to onset of symptom is 05 days (Ann Intern Med 2020:172:577) and it can be extended up to 12 days in almost 98% of people (JAMA 2020 July 10, E-pub ahead print).

Radiologically the disease presents with GGO, crazy paving pattern and consolidation in bilateral lobes in most of the cases (Radiology 2020; 295:775). 40% of chest radiograph findings are normal early in the disease. It takes 02 weeks to appear the above radiologic findings in X ray chest. With HRCT lung the disease can be identified earlier as well as more accurately.

In this COVID-19 pandemic, IIIT Bhagalpur has taken an initiative and developed an artificial intelligence (AI)-based COVID-19 detection software under Make-In-India Program. This work is undertaken under the guidance of Prof. Arvind Choubey, Director, IIIT Bhagalpur. The software is trained on the open source database consisting of X-ray images of COVID-19 and NON-COVID-19 (Pneumonia, Normal and etc.) subjects.

Features of the software:

- The software can be deployed in remote locations for screening where the RT-PCR are not available or timely results of RT-PCR is not available (as per recommendation 2 of WHO).
- The patients with mild, moderate or severe (following the WHO guidelines) symptoms for COVID-19 conditions can be evaluated and if found COVID-19 positive by the software in the primary stage, then the samples of only those patients (detected by the software is recommended for final confirmation by RT-PCR test kits).
- The execution time of the software is very less and hence; it can be used to screen a large number of people within a short time.
- The asymptomatic patients (i.e. patients may appear as physically normal or have no symptoms of COVID-19) or patients with Normal Chest X-rays are not suggested for diagnosis using chest imaging according to recommendations of WHO.
- The software may be deployed in remote locations for screening where the RT-PCR are not available or timely results of RT-PCR is not available (as per recommendation 2 of WHO).

- The patients with mild, moderate or severe (following the WHO guidelines) symptoms for COVID-19 conditions can be evaluated and if found COVID-19 positive by the software in the primary stage, then the samples of only those patients (found positive by software) may be recommended for final confirmation by RT-PCR test kits.
- The execution time of the software is very less (of a few seconds) and hence; it can be used to screen a large number of people within a short time.

Field Trials

- The field trials of the developed software have been conducted at All India Institute of Medical Sciences (AIIMS) Patna and Atal Bihari Vajpayee & Ram Manohar Lohia (RML) Hospital, New Delhi.
- The field trial conducted at these Centrally Governed hospitals at their site have reported an average sensitivity of more than 95% and specificity of more than 92% is reported by this AI-based software.
- The software will help to screen the COVID-19 infected patients at an initial stage where no RT-PCR is available or there is a delay in getting the RT-PCR report as per the WHO recommendations 2.2. Further, the software will assess chest infection along with the symptoms of the patients and decide whether symptomatic patients need home quarantine or to be referred to secondary or tertiary care.

Advantages

- Using the software, the screening of the COVID-19 infected patients can be made faster to them at an initial stage and can be implemented on large scale so that proper care can be provided by the governments to reduce the rate of communication.
- The software will reduce the burden of RT-PCRs and further will also reduce the cost for initial screening of patients.
- The software involves low-cost, since the X-ray facility is available at block level, it will be easy to deploy in remote locations.

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- The RT-PCR generates the binary report i.e. COVID-19 or NON-COVID-19 and fails to provide the level of infection in the chest. However, the software classifies into three categories including Pneumonia and access the level of chest infection to decide patients need home quarantine or to be referred to secondary or tertiary care.

Conclusion

1. Given the pandemic situation, the software is highly sensitive in predicting COVID-19 and NON-COVID-19 (including Pneumonia and Normal) disease.
2. As per *WHO guidelines (recommendation R2.2)*, it can be utilized as alternating screening modality of the COVID-19 disease at the time of its pandemic triage of cases and this may benefit in initiating or triaging requisite management of the cases.

24. Momerendum of Understanding (MoU)

(i) MoU with Central Public Works Department (CPWD)



Figure 29: Honourable dignitaries in the MoU ceremony with CPWD

The MoU between IIIT Bhagalpur and CPWD was held on 14 November, 2019. This ceremony was organized at Hotel Rajhans where dignitaries from both of these premiere institutes were present.

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Figure 30: MOU was signed between Prof. Arvind Choubey, director IIIT Bhagalpur and Mr. Arvind Dixit, director & CEO AdvanceTech India Pvt. Ltd.

(ii) MoU with AdvanceTech India Pvt Ltd.

AdvanceTech India Pvt Ltd. has been identified as a reputed and innovative manufacturer of Electronics Hardware & Software. An MoU between IIIT Bhagalpur and AdvanceTech India Pvt Ltd. was signed on 3rd of September 2019. This MOU will be pivotal in strengthening the industry-academia relationship. Students of IIIT Bhagalpur will also get benefitted by this MoU. Students can have fruitful Industry interactions as well as industry internships from this initiative.

25. Analysis of Plan and Non Plan Grants

Sl No.	Particulars	Amount (In Lakhs)	
(A)	Plan Grant (Year 2019-2020)		
	Central Govt.	100.00 lakh	2080.00
	State Govt. of Bihar	NIL	
	Industry Partners	1980.00 lakh	
(B)	Non Plan Grant (Year 2019-2020)		
	Central Govt.	0 lakh	00
	State Govt. of Bihar	0 lakh	
	Total (A+B)		2080.00

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Source of Fund (Year 2019-2020)

SI No.	Particulars	Amount (In Lakhs)
(A)	Central Govt.	100.00
(B)	State Govt. of Bihar	NIL
(C)	Contribution from Industry Partners	1980.00
(D)	Interest Income (2019-2020)	--
(E)	Tuition Fee (2019-2020)	497.16
(F)	Other Income	--

Expenditure position for last three years

SI No.	Year	Recurring Expenditure	Non Recurring Expenditure	Total (in Lakh)
1.	2017-2018	249.49	253.72	503.21
2.	2018-2019	467.83	381.73	849.56
3.	2019-2020*	547.64	151.35	698.99

*Unaudited account for the financial year 2019 – 2020

26. Acknowledgement

IIIT Bhagalpur acknowledges the help and services rendered by MHRD and IIT Guwahati as the Mentor Institute for its support and Guidance for proper functioning of IIIT Bhagalpur.

