

Facilities and technical support form a prime resource of any technical institute towards providing good infrastructure and a conducive environment for a student to transform into a successful individual. In this context, the Department of Information Science & Engineering has state-of-the-art laboratories. The subsequent sections provide an insight into the laboratory-related details and the description of the equipment utilized. The major programme specific laboratories are:

- **Computer Center – 1**

1. Data Structures Laboratory
2. Algorithms Laboratory
3. Operating Systems Lab
4. Unix System Programming & Design Lab
5. Microcontroller and Microprocessor Lab
6. Networks Laboratory

- **Computer Center – 2**

- Computer Networks Lab
- Database Systems Lab
- Microprocessors and Microcontrollers Lab
- Artificial Intelligence / Machine Learning Lab
- Software Engineering
- Big Data

- **Programming Laboratory**

The Programming Lab in our department serves as a vital space for students to sharpen their coding skills and gain hands-on experience in various programming paradigms. Under the guidance of experienced faculty members, students undertake a series of practical exercises aligned with the curriculum's programming languages and scripting languages components. By utilizing modern evaluating tools such as CodeZinger and HackerRank, the lab fosters an environment of competitiveness and helps students gauge their programming proficiency.

1. Object-Oriented Programming using C++
2. Web Programming Lab
3. Object-Oriented Programming using Java
4. C# with DotNet

- **Research Centre/ Project Lab**

- **Intelligent Systems Laboratory:** This laboratory is used by the students to use the facility to develop small applications during their Mini projects and their Main projects.
- **Project Laboratory:** The facilities in this laboratory are utilized by the students to do their mini-project and the major project. Students are facilitated with ample network points and internet connectivity to use their laptops for executing their projects whenever they are on-premises.

- **Digital Electronics Laboratory**

- Third-semester students understand and realize the hardware experiments as per the Analog and Digital Design curriculum.

Table: 6.1 Adequate and well-equipped laboratories and technical supporting staff

Sl. No.	Name of the Laboratory	No. Of Students as per setup (Batch Size)	Name of the Important Equipment	No.	Weekly utilization status for which the lab is utilized	Technical Manpower support		
						Name of the technical Staff	Designation	Qualification
1	Computer Centre-1	30	LENOVO Think center Desktop: Intel i3-2130 Processor, H61 Chipset, 4GB RAM, 500 GB HDD, USB Keyboard and Mouse 18.5 '' TFT Monitor.	10 no's.	30 Hrs.	Mr. B. N. Manjunath	Programmer /Foremen	PGDBC, M.Sc., M.Phil.,
			DELL Desktop : DELL Desktop 5060, intelcore i5, 8GB DDR4, 3.5'' m2 SSD driver 1 TB SATA HDD, DVD+/- RW, USB Keyboard and Mouse 20'' backlit LED Monitor	04 no's.				
			ACER Desktop : Acer Veriton Desktop Intel core i5-CPU@3.10Ghz , 8GB RAM, 500GB HDD, 19'' Monitor	10 no's.				
			DELL Vostro 3020T Desktop : Vostro 3020T 13 th Gen Intel core i5-13400 processor 8GB DDR4 RAM, 512GB SSD, UHD graphic Memory, 20'' monitor	08 no's.				
2	Computer Centre-2	30	ZENITH NET SERVER: XEON Processor with INTEL EM 64T (Standard)@3.6Ghz, 800Mhz, 2x512MB DDR 2 SD RAM, 200GB HDD, 17'' TFT LCD Monitor.	01	30 Hrs.	Mr. G. B. Pandukumar	Asst. Instructor	M. A., DOEACC 'O' level Course
			LENEVO Desktop: Intel i5, 19.5" HD display monitor, 8 GB Ram, 500 GB HDD, USB Keyboard and Mouse	04				
			LENOVO Think Centre Desktop: Intel Core i5 3GHz, 18.5" HD Display, 8GB SDRAM, 1TB HDD, Intel HD Graphics.	05				
			HP Desktop: Intel i5 3.0 GHz-8500 8th gen processor, 8GB DDR4 RAM, 1 TB HDD, 19.5" LED Monitor, USB Keyboard & Mouse.	15				
			DELL Desktop: DELL Desktop 5060, intel core i5, 8GB DDR4, 1 TB SATA HDD, 20'' backlit LED Monitor	06				

3	Programming Laboratory	66	DELL Vostro 3020T Desktop : Vostro 3020T 13 th Gen Intel core i5-13400 processor 8GB DDR4 RAM, 512GB SSD, UHD graphic Memory, 20'' monitor	66	30 hrs	Mr. B. N. Manjunath	Programmer /Foremen	PGDBC, M.Sc., M.Phil.,
4	Research Project Lab./ Digital Electronics Laboratory	20	Protokit IOT Node Rasbery PI 3 Central Processing Unit (CPU) HDMI port. ... Graphic Processing Unit (GPU) ... Memory (RAM) ... Ethernet port. ... SD card slot. ... General Purpose Input and Output (GPIO) pins. ... LEDs.	5	Research Work & Project Work / IOT 20	Mr. G. B. Pandukumar	Asst. Instructor	M. A., DOEACC 'O' level Course
			Digital Trainer Kit 16 pin ZIF socket, logical input switches, logical output switches, seven segment display	15				
			LENOVO Think Centre Desktop: Intel Core i5 3GHz, 18.5" HD Display, 8GB SDRAM, 1TB HDD, Intel HD Graphics.	03				
			HP Desktop: Intel i5 3.0 GHz-8500 8th gen processor, 8GB DDR4 RAM, 1 TB HDD, 19.5" LED Monitor, USB Keyboard & Mouse.	05				
			DELL Vostro 3020T Desktop : Vostro 3020T 13 th Gen Intel core i5-13400 processor 8GB DDR4 RAM, 512GB SSD, UHD graphic Memory, 20'' monitor	07				

6.2 Laboratories maintenance and overall ambiance (10)

Laboratories maintenance

The Department of Information Science and Engineering has an adequate number of laboratories used for all the years as per the timetable to meet the curriculum requirements. The courses which demand practical learning will be supported by laboratories every week. The laboratories are well maintained by maintaining and upgrading the required software in the machines available in the laboratories. Sometimes the laboratory staff himself will perform the essential servicing work. Each laboratory batch is associated with laboratory staff and faculty, who will help the students execute their laboratory exercises.

Students are refreshed with the basic concepts before starting the current subjects' experiments. An appropriate list of experiments is also provided to the students. The faculty of the department conducts bridge courses for some subjects like data structures to revise the previous semester's laboratory contents.

Students extensively use the laboratories for their project works during their sixth and eighth semesters. Since the curriculum focuses on laboratory-based learning, the students learn the subjects better with hands-on laboratory sessions to understand the theoretical concepts. The students are allowed to download and install open-source software and tools in the presence of the laboratory staff, which facilitates the development of their projects.

All our laboratories are equipped with Wi-Fi, Fire Extinguishers, a First Aid box and overhead projectors. Individual desktop is provided for each student during laboratory classes.

The hardware and software are upgraded based on the requirement of the curriculum and the need of the students. The laboratory facilities are also used to run vocational courses during Semester End vacation to enhance the skills of the students of our institute and other institutes. Table 6.2 gives the list of laboratories with their dimensions and the facilities available for exclusive use or on a sharing basis.

Overall Ambiance

- All laboratories are equipped with state-of-the-art equipment to meet the requirements of the curriculum.
- All laboratories are well furnished with computer tables chairs.
- All laboratories have good ventilation with lighting and Air Conditioners.
- Overall ambience of the laboratories is good.
- A separate cabin is available for UPS and batteries.
- Individual machines are available for student usage.
- The laboratory is also facilitated with a printers are used during the practical examinations.

- Rules and regulations are displayed in the laboratories.
- Drinking water facility is available.
- Laboratories are equipped with data projector facility.
- Charts showing details of Computer Configurations, Software and Hardware equipments in the laboratories are displayed.
- Proper safety measures are taken and safety instruction charts are displayed at appropriate places.
- First aid kits and fire extinguishers are provided in each laboratory.
- All the computer systems are having internet connection with 750 MBPS Internet speed.
- Steel racks are available in the laboratory for students to place their belongings.

Table 6.2 Laboratories with their dimensions and other facilities available in the department

Laboratory Description in the curriculum	Exclusive use / shared	Space /No. of Students	Other facilities available
Computer Centre-1	Exclusive	9.1x8.05m / 30 Students	<ul style="list-style-type: none"> • Projector • Wireless access points
Computer Centre-2	Exclusive	9.1x8.05m / 30 Students	<ul style="list-style-type: none"> • Projector • Wireless access points
Programming Laboratory	Exclusive	18.2x16.1m / 66 Students	<ul style="list-style-type: none"> • Projector • Wireless access points
Research Project Lab./ Digital Electronics Laboratory	Exclusive	8x6m / 15 Students	<ul style="list-style-type: none"> • Projector • Wireless access points




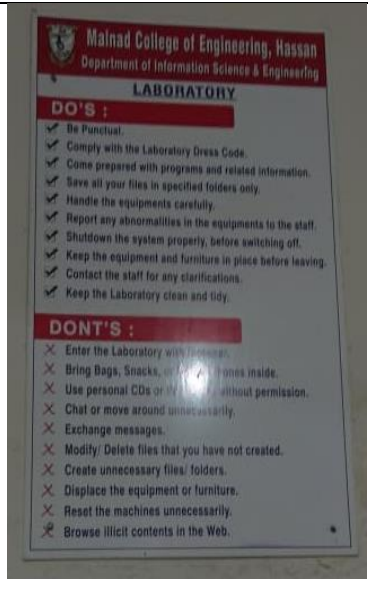

Maintenance of Laboratory Equipment

- Regular preventive maintenance of equipment is carried out at the end of every week/month, depending on the equipment.
- The laboratory assistant carries out minor repairs.
- Hardware maintenance of computers and major equipment are taken care of by Network control center and services to resolve the software and networking issues.

6.3 Safety measures in laboratories

The Information Science Department is committed to providing a safe laboratory environment for all students. Safe working culture is practiced for the safety of every individual. Surveillance cameras are kept inside the laboratories to ascertain the security of the student’s belongings and other aspects of the laboratory. The other safety measures followed in the department laboratories are shown in Table 6.3.

6.3 Safety Measures in Laboratories (10)

Sl.No.	Name of the Laboratory	Safety Measures
1	Computer Centre-1	
2	Computer Centre-2	
3	Programming Lab	
4	Research Project Lab./ Digital Electronics Laboratory	
		<p>CC Camera, Fire Extinguisher, Bag Stand, Slipper Stands, Do's & Dont's Board and First Aid Box, are kept in the laboratory</p>
		
		
		

6.4 Project Laboratory (Mention facilities & Utilization) (20)

The department has been provided with an adequate facility for project-related learning. The figure below provides insight into the multiple tasks accomplished in the respective laboratory facilities available in the department.

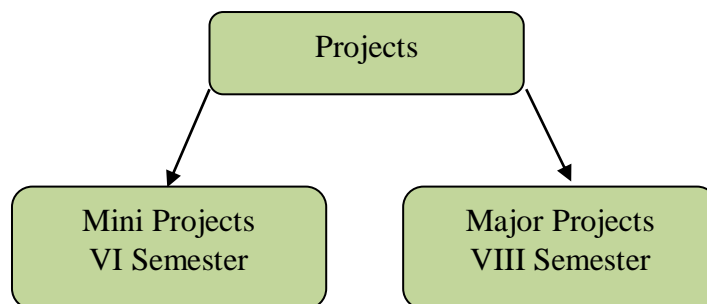


Figure 6.4: Utilization of Laboratory for Projects



The department laboratories are equipped with high-end machines to help students carry out their projects effectively. The departments in association with industries have executed several projects. Students have been successfully involved in research-oriented, industry-based projects.


As part of the mini-project, students design and implement database-related, IoT-based projects and web application-related projects during their 5th and 6th semesters. Some of the students have extended their database projects to incorporate the automation requirement of some simple tasks at the institution level.



The continuous involvement of students in various projects has exposed them to learning and building end-to-end solutions. The outcome of these projects has given enough exposure to the various technologies. Some have ventured to open up their startups, and some have been placed in reputed industries. Many students could convert their projects into paper publications in conferences/journals. The latest facilities in the laboratories will help students to learn the tools and technologies which further help them to participate and win in the national level hackathon. The table below gives some of the students' learning outcomes through their curriculum-based laboratory and the projects.

Facilities made available in Project Lab	
Systems and Software	Available i5 Systems for Project Work. High speed Internet facilities provided for all systems K7 antivirus installed in all systems Laboratory are kept open from morning 9.00 am to 530 pm for students
Operating System	Ubuntu and Windows 10, Windows 2003 NT
Application Software	Turbo C++, Python, Visual Studio, Java, Oracle, NS2, .net, MySQL, MASM.
Tools	Protokit IOT Node, Rasbery PI 3

List of Programme specific laboratories

#	Name of the Laboratory	Conduction of laboratory for the following courses	Utilization
1	Computer Centre - 1		No. of Machine available: 32
			
	Conduction of laboratory for the following courses		Utilization
	<ol style="list-style-type: none"> 1. Operating Systems Lab 2. Unix System Programming & Design Lab 3. Microcontroller and Microprocessor Lab 4. Networks Laboratory 		<ul style="list-style-type: none"> • Conduction of various laboratory courses • online placement examination
2	Computer Centre - 2		No. of Machine available: 34
			
	Conduction of laboratory for the following courses		Utilization
	<ol style="list-style-type: none"> 1. Web Programming Lab 2. Artificial Intelligence / Machine Learning Lab 3. Software Engineering 4. Big Data 		<ul style="list-style-type: none"> • Conduction of various laboratory courses • online placement examination

3	Programming Laboratory	No. of Machine available: 66
		
	Conduction of laboratory for the following courses	Utilization
	<ol style="list-style-type: none"> 1. Data Structures Laboratory 2. Algorithms Laboratory 3. Object-Oriented Programming Lab 4. Computer Networks Lab 5. Database Systems Lab 6. Microprocessors and Microcontrollers Lab 	<ul style="list-style-type: none"> • Conduction of various laboratory courses & online placement examination

4	Research Project Lab./ Digital Electronics Laboratory	No. of Machine available: 8		
				
				
	Conduction of laboratory for the following courses	Utilization		
	<ol style="list-style-type: none"> 1. Mini Project Work 2. Project Work 3. Digital Electronics Laboratory 	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">7th and 8th Sem students use this lab to execute their projects</td> <td style="width: 50%;">For to conduct of 3rd Sem Digital Electronics Lab</td> </tr> </table>	7 th and 8 th Sem students use this lab to execute their projects	For to conduct of 3 rd Sem Digital Electronics Lab
7 th and 8 th Sem students use this lab to execute their projects	For to conduct of 3 rd Sem Digital Electronics Lab			

Computing facilities in the laboratory:

Sl. No.	Facilities	Description
1.	Internet facility	We dedicated ILL (Internet lease Line) of 1 G bits/sec Internet bandwidth from Airtel
2.	Wi-Fi facility	
3.	Network, hardware, software maintenance	Services for maintaining the hardware, software, and network-related issues by NCC.
4.	Routers, Wi-Fi access points	RUCKUS wireless Access Point access rate connected to campus network by NCC
5.	Switches	D-Link 10G fiber/copper backbone switch connected 100G core switch having 1G link.
6.	Smart Rooms	LH-1 is a smart class room facility with SAMSUNG touch screen Wi-Fi TV and Projector

Laboratory Details 2018-2021

Table 6.7 details some of the outcomes of the student projects done in the department Laboratory. Few of the student's mini-projects and major projects are awarded /converted into a working model. Most of the students' work are published either in conferences or journals.

Table 6.7 Outcome of the project-based learning component Parameters	Outcome
Prototype developed/ Software working mode	1
Publications	34