



Swami Keshvanand Institute of Technology, Management & Gramothan

(Accredited by NAAC with 'A++' Grade)

Approved by AICTE, Ministry of Education, Government of India

Recognized by UGC under Section 2(f) of the UGC Act, 1956

Affiliated to Rajasthan Technical University, Kota

Department of Computer Science Engineering

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Swami Keshvanand Institute of Technology, Management and Gramothan, Jaipur

Department of Computer Science & Engineering

RESEARCH FACILITIES (2022-23)

The SKIT is highly committed to provide facilities and environment conducive to high quality education, training and research & development. Moving forward in this way Department of Computer Science & Engineering is equipped with various researcher facilities and has established RTU recognised research centre in the field of Internet of Things. A tremendous amount of research has been accomplished since last decade due to the availability of high-tech equipment and development activities funded by AICTE, DST and other funding agencies. Following are the research areas in which students and faculty members are doing their research work.

- Web Applications & Network Security
- Data Mining, Data Warehousing & Knowledge Discovery
- Artificial Intelligence, Fuzzy Logic & Genetic Algorithms
- Software Engineering & Software Product Development
- Image Processing & Pattern Recognition
- Mobile and Pervasive Computing
- High Performance Computing
- Big Data Analytics
- Internet of Things
- Nano Technology

RESEARCH FACILITES IN THE DEPARTMENT

1. High Performance Computing Data Center
2. Microsoft Azure Cloud Platform
3. IBM Cloud Platform
4. Research Centre Lab
5. Centre of Excellence for Internet of Things (CoE-IoT)

Research Facilites in the Department:

1. High Performance Computing Data Center

High Performance Computing Data Center to support an intranet & internet services. Internet facility is provided in the laboratories through a leased line based on Radio Frequency (RF)/ Fiber Optic Cable (FOC).





LAB SPECIFICATIONS

Central Computing Facility (NET LAB)

S.No.	Component	Configurations	Qty.
1.	COMPUTER SYSTEM	Make Lenovo <ul style="list-style-type: none">• Intel® Core(TM) i5-10400 CPU @• 2.90GHz 2.90 GHz• 8 GB DDR-4 RAM• 256 GB SSD• 46.99CM Lenovo Color Monitor[TFT]• Lenovo Keyboard• Optical Lenovo Mouse	43
2.	OPERATING SYSTEM	• Windows-11	
3.	SOFTWARE INSTALLED	Microsoft Office 10, Adobe Reader, Mozilla Firefox, Google Chrome, WinRAR, Quick Heal Antivirus	
4.	SWITCH	D-Link – 48 ports D-Link – 24 ports D-Link – 16 ports	03
5.	PRINTER	Canon LBP2900B HP M1005 MFP	02
6.	LAN	INTERNET SERVER - 192.168.1.1 FTP SERVER - 192.168.3.1 ANTIVIRUS SERVER - 192.168.3.3	
7.	UPS	15 kVA/ 240V Numeric	01

Empowered
By:

IBM
Software Center
of Excellence

Infosys
Advance Partner
Institute

Oracle
Academy Partner

Microsoft
Cloud
Technology

FOSS IIT
Bombay
Knowledge Partner

IOT-COE
Center of
Excellence by
RTU Kota


2. Microsoft Azure Cloud Platform

Microsoft Ed-vantage Platinum Campus

Microsoft Cloud Competence Centre Lab

Microsoft Edu-Cloud Enable Lab



 LAB SPECIFICATIONS CL - 12			
S.No.	Component	Configurations	Qty.
1.	COMPUTER	Make Lenovo <ul style="list-style-type: none">Intel[R] Pentium[R]CPUG630 @ 2.70GHz2.70GHz6 GB RAM500 GB HDD17" Lenovo Color MonitorLenovo KeyboardOptical Lenovo Mouse	33
2.	OPERATING SYSTEM (Dual Booting)	<ul style="list-style-type: none">Microsoft Operating SystemLinux	
3.	SOFTWARE INSTALLED	Microsoft Ed-Vantage Software, RSA, C++, Jsdk, Google Chrome, Mozilla Firefox, Adobe Reader, MS Office, WinRar, Mat Lab, My Sql, Quick heal Antivirus	
4.	SWITCH	Cisco – 48 ports	01
5.	PRINTER	Canon Laser LBP2900	01
5.	PROJECTOR	Epson	01
6.	LAN	INTERNET SERVER - 192.168.1.1 FTP SERVER - 192.168.3.1 DG LIB. SERVER - 192.168.1.10 ANTIVIRUS SERVER - 192.168.3.3	
7.	UPS	Emerson 6 kVA/ 240V	01

Empowered By:

IBM
Software Center of Excellence

Infosys
Advance Partner Institute

Oracle
Academy Partner

Microsoft
Cloud Technology

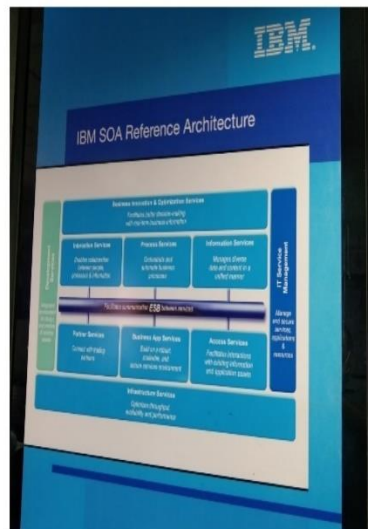
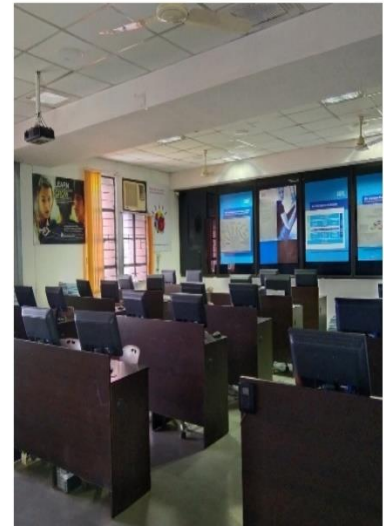
FOSS IIT
Bombay Knowledge Partner

IOT-COE
Center of Excellence by RTU Kota

3. IBM Cloud Platform

Empowered with IBM Software Center of Excellence

IBM Academic Initiative – Skills Build





LAB SPECIFICATIONS

CL-4 (IBM LAB)

S.No.	Component	Configurations	Qty.
1.	COMPUTER SYSTEM	Make IBM Lenovo Intel[R] Core[TM]2 Duo CPU E7500 @ 2.93 GHz 3 GB DDR-2 RAM 320 GB HDD 18.5" Lenovo Color Monitor[TFT] Lenovo Keyboard Optical Lenovo Mouse	30
2.	OPERATING SYSTEM	Windows-7	
3.	SOFTWARE INSTALLED	IBM-RAD, RSA, DB2, WAS, Eclipse ADT, JDK 1.6, Microsoft ED-VANTAGE Software, Adobe Reader, Mozilla Firefox, WinRar, Quick Heal Antivirus	
4.	SWITCH	Cisco – 48 ports	01
5.	PRINTER	Laser Canon LBP2900B	01
6.	LAN	INTERNET SERVER - 192.168.1.1 FTP SERVER - 192.168.3.1 ANTIVIRUS SERVER - 192.168.3.3 OLTP SERVER - 192.168.12.3	
7.	UPS	06 kVA/ 240V EMERSON	01
8.	PROJECTOR	OPTOMA	01
9.	SOUND SYSTEM	AMPLIFIER COLLAR MIKE WITH RECEIVER CORDLESS MIKE WITH RECEIVER SOUND SPEAKER	01 01 01 06

Empowered
By:

IBM
Software Center
of Excellence

Infosys
Advance Partner
Institute

Oracle
Academy Partner

Microsoft
Cloud
Technology

FOSS IIT
Bombay
Knowledge Partner

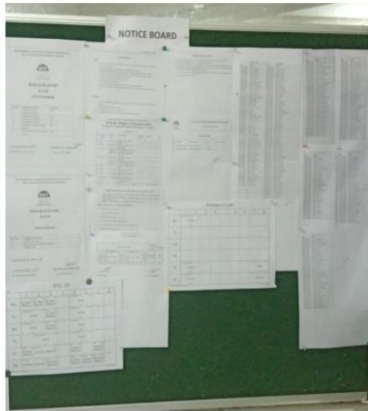
IOT-COE
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4. Research Centre Lab

Data Analytics Lab - Apache Spark and Hadoop

Machine Learning – Spark ML

Industry Academia Interface (IAI) Lab



1. COMPUTER	DELL Desktops (i7-12700 CPU @2.1 GHz) 8 GB RAM 512 GB SSD	08
2. OPERATING SYSTEM	Microsoft Operating System (WINDOWS 10), Linux(Ubuntu)	
3. SOFTWARE INSTALLED	HFSS, Google Chrome, MySQL, Pdf Reader and WinRAR	
4. LAN SWITCH	D-Link - 24 Port	01
	D-Link - 16 Port	01
5. LOCAL SERVER ADDRESS	FTP SERVER - 192.168.3.1 ANTIVIRUS SERVER - 192.168.3.3	
7. UPS	EMERSON 6 KVA (with Battery-16)	01



LAB SPECIFICATIONS			
Research Lab			
S. No	Component	Configuration	Quantity
1.	COMPUTER	DELL Desktops (i7-12700 CPU @2.1 GHz) 8 GB RAM 512 GB SSD	08
		DELL Desktops- (i3-6100 CPU @3.7 GHz) 4GB RAM 240 GB HDD	03
		18.5" DELL Color LED Monitor DELL Keyboard DELL Mouse	
2.	OPERATING SYSTEM	Microsoft Operating System (WINDOWS 10), Linux(Ubuntu)	
3.	SOFTWARE INSTALLED	HFSS, Google Chrome, MySQL, Pdf Reader and WinRAR	
4.	LAN SWITCH	D-Link - 24 Port	01
		D-Link - 16 Port	01
5.	LOCAL SERVER ADDRESS	FTP SERVER - 192.168.3.1 ANTIVIRUS SERVER - 192.168.3.3	
7.	UPS	EMERSON 6 KVA (with Battery-16)	01

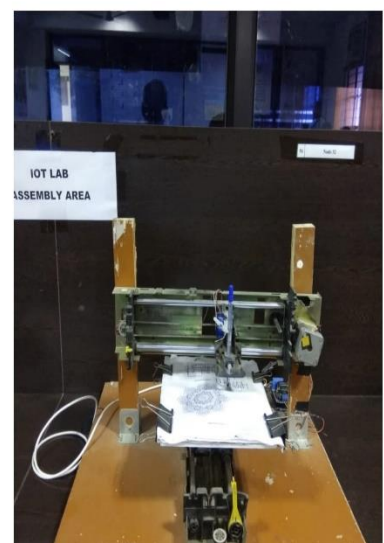
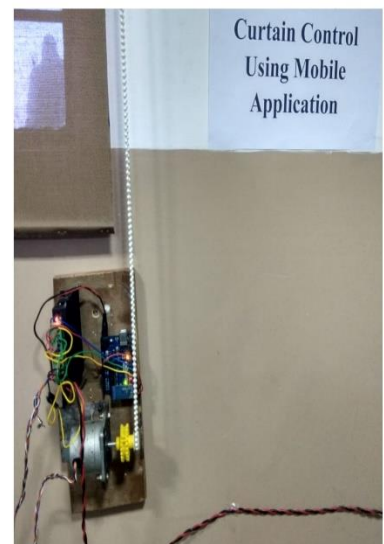
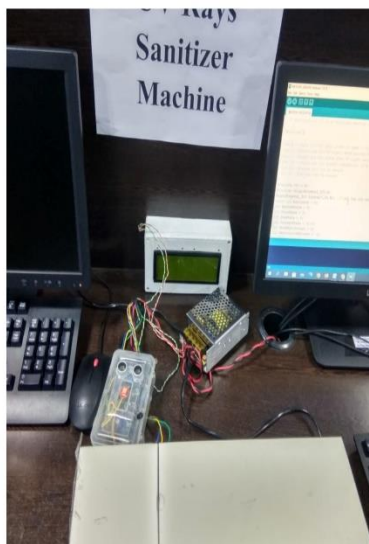


5. Centre of Excellence for Internet of Things (CoE-IoT)

RTU recognized Centre of Excellence for Internet of Things (CoE-IoT)



S.No.	Component	Configurations	Qty
01	COMPUTER SYSTEM	Make Lenovo - Intel (R) Core (TM) i5-10400 CPU @ 2.90GHz 2.90 GHz 8.00 GB RAM 754 GB SSD 19" Lenovo Color Monitor (FHD) Lenovo Keyboard Optical Lenovo Mouse	30
02	OPERATING SYSTEM	Microsoft Windows Linux (Ubuntu 20.04.3)	
03	SOFTWARE INSTALLED	Microsoft Cloud Technology, Adobe Reader, Arduino, Google Chrome, Mozilla Firefox, Wi-Fi, Wi-Fi, Turbo C, Quick heal, Python, DEV C++, JAVA, Anacanda 3	
04	SWITCH	Erica - 48 ports	01
05	PROJECTOR	Optoma	01
06	LAN	INTERNET SERVER - 192.168.1.1 FTP SERVER - 192.168.1.3 DG LIB. SERVER - 192.168.1.10 ANTIVIRUS SERVER - 192.168.1.3	
07	UPS	Numeric KIDVA 240V	01





 SWAMI KESHVANAND INSTITUTE OF TECHNOLOGY, MANAGEMENT & GRAMOTHAN, JAIPUR LAB SPECIFICATIONS CL-02			
S.No.	Component	Configurations	Qty.
01	COMPUTER SYSTEM	Make Lenovo: - Intel (R) Core (TM) i5-10400 CPU @ 2.90GHz 2.90 GHz 8.00 GB DDR-4 RAM 256 GB SSD 19" Lenovo Color Monitor (TFT) Lenovo Keyboard Optical Lenovo Mouse	30
02	OPERATING SYSTEM	Microsoft Windows Linux (Ubuntu 20.04.3)	
03	SOFTWARE INSTALLED	Microsoft Cloud Technology, Adobe Reader, Arduino, Google Chrome, Mozilla Firefox, WinRAR, Turbo C, Quick heal, Python, DEV C++, JAVA, Anaconda 3	
04	SWITCH	Cisco - 48 ports	01
05	PROJECTOR	Optoma	01
06	LAN	INTERNET SERVER - 192.168.1.1 FTP SERVER - 192.168.3.1 DG LIB. SERVER - 192.168.1.10 ANTIVIRUS SERVER - 192.168.3.3	
07	UPS	Numeric 10kVA/ 240V	01
<div> <div>Empowered By:</div> <div>  Infosys Advance Partner Institute </div> <div>  IBM Software Centre of Excellence </div> <div>  Oracle Academy Partner </div> <div>  Microsoft Edu-Cloud Program </div> <div>  FOSS IIT Bombay Knowledge Partner </div> <div>  IoT CoE Centre of Excellence by RTU Kota </div> </div>			

Objectives:

The main objective of the centre is to create innovative applications and domain capability by harnessing the innovative nature of start-up community and leveraging the experience of corporate players. The other objectives are as follows:

1. To create innovative applications and domain capability across vertical for country's needs such as Smart City, Smart Health, Smart Manufacturing, Smart Agriculture, and others.
2. To build industry capable talent, start-up community, and entrepreneurial ecosystem for IoT.
3. To provide an ecosystem for innovation to thrive and embrace entrepreneurship.
4. To energise research mind-set and reduce cost in Research and Development by providing neutral and interoperable, multi technology stack laboratory facilities.
5. To reduce import dependency on IoT components and promote indigenization.
6. To promote indianisation by providing development facilities to researchers as well as to those who need to develop prototypes using reverse engineering, and required library of equivalent components.

Benefits of Center of Excellence on IoT

Stakeholder	Benefits
Start-up/Small Medium Enterprises	<ul style="list-style-type: none">✓ Use of Open Technology Stack,✓ Access to Industry experts /Consultants✓ Showcasing the prototype/project to companies. Access to students to work on projects.
Investors	<ul style="list-style-type: none">✓ Future products for cross functional business process enhancement in various industry verticals.
Engineering Service providers, Global MNCs	<ul style="list-style-type: none">✓ "Risk free" demand technology lab on demand proficiency centre for skill up-gradation.✓ Access to industry ready talent, technical experts, and consultants
Academia / Researchers	<ul style="list-style-type: none">✓ Availability of technology lab for faculty/researchers.✓ Industry standard proficiency courses for upgrading skills✓ Platform for offering special course/consulting projects✓ Innovative ideas from stack holders, start-up starters, self, etc.✓ Access to current research papers related to their work.✓ Team of experts helping them to find research solutions.
Industry	<ul style="list-style-type: none">✓ Trained Industry ready students✓ Innovative Ideas

	✓ Prototypes for new products.
Students/job seekers	✓ Internships on IoT projects ✓ Access to Industry experts/ courses / showcase of talent

Research Facility available in Internet of Things Lab

S. No.	Name of software/Hardware	Details	Quantity	Features	Area in which students are expected to enhance learning
1	Raspberry Pi	Raspberry Pi 4 model with 4 GB RAM	12	The Raspberry Pi 4 includes 1.5GHz quad-core Broadcom processor, two micro-HDMI ports, 2 USB 3.0 ports, and support for 4K video output at 60 fps	IOT, Embedded Systems
2	Arduino Uno R3 - compatible	Arduino Uno is a microcontroller board	13	The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.	IOT, Embedded Systems
3	Xilinx Vivado Design suite	25 users licensed, Xilinx vivado 2017.4 version	25 user	Synthesis and analysis of HDL designs	IOT, VLSI, Embedded system, FPGA based design
4	Nexys 4 DDR	7 kits available, based on Artix-7	7	Synthesis and hardware interfacing of HDL design	IOT, VLSI, Embedded system, FPGA based design

		FPGA from Xilinx			
5	ZYBO board	2 kits available, Zynq series FPGA	2		
6	NODEMCU ESP8266-12 CH340 BASED		20	NodeMCU has ESP-12 based serial WiFi integrated on board to provide GPIO, PWM, ADC, I2C and 1-WIRE resources at your finger tips , built-in USB-TTL serial with super reliable industrial strength CH340 for superior stability on all supported platforms.	IOT, Embedded Systems
7	Proteus	VSM software	2	Simulation software for microcontroller and analog and digital circuit, PCB design package	Analog and digital circuits, embedded system design and PCB design
8	Lab View	NI/Academic FDS teaching	2		
10	NI MYRIO Mechatronics kit	3 axis digital compass, 3 axis digital accelerometer, 3 axis digital gyro	1		
11	NI MYRIO embedded kit	BT interface, temp sensor, LCD display, Serial EEPROM	1	Real time simulation and sensor interfacing for embedded system design	IOT, Embedded system design

12	NI MYRIO starter kit	Bread board, adapter, power cable	1		
13	MY RIO 1900	WIFI and MSP connector	1		
14	NI USB-6008 LabView interfacing module	NI/ 12 bit,10 ks/s	1	Multifunction Input output and NI DAQ mx software with NI USB	
15	Spectrum Analyzer	HM 5012-2 150 kHz to 1 GHz Caddo 8010 150 kHz to 1050 MHz	1+1	Circuit testing, measurement and troubleshooting	Electronic Devices and circuits
16	DSO	Model No. 401-DSO-Scienteck 50 MHz, 500 ms/s, Channel-2	2	Circuit testing, measurement and troubleshooting	Electronic Devices and circuits
		Model No. HM1507-3, 150 MHz, 200 ms/s, Channel-2 (Analog and digital)	1		
		Keysight DSO 1012 A/ 100 MHz/ two channel	1		
17	Proto Cure PCB Curing Machine (Oven)	Maximum allowable PCB size: 250 X 300 mm (10" X 12"), finned	1	Table top unit for curing of liquid photoresist	PCB fabrication

		heaters with thermostat controls			
18	Photoresist dip coating machine	Maximum allowable PCB size: 250 X 300 mm (10" X 12"), Rectangular tank 2 L capacity	1	Coating of laminates with photoresist	PCB fabrication
19	PCB art work film maker	Working area: 250 X 300 mm (10" X 12") with diffused light	1	Negative making contact printer as well as an Illuminated art work table	PCB fabrication
20	PCB etching machine	Usable etching area: 250 X 300 mm (10" X 12"), Tank capacity 20 L	1	For fast etching of single sided and double sided PCB	PCB fabrication
21	Tina Pro Simulation Software	1 User License	1	Simulation software for microcontroller and analog and digital circuit, PCB design package	Analog and digital circuits, embedded system design and PCB design
22	OrcadPspice Simulation and PCB Design Software	1 User License	1	Simulation and PCB design software	Analog and digital circuits, embedded system design and PCB design
23	Xilinx ISE tool	Open source	1	Xilinx software for synthesis and analysis of HDL designs	VLSI, Embedded system, FPGA based design

24	Digital microscope	USB digital microscope magnifier	1	Circuit testing, measurement, and troubleshooting	Electronic devices and circuits
25	CRO	Caddo 803/Scientech ST251/ 30 MHz/ Two Channel	4		
26	Milli ohm meter	scientiFic SM 5081	3		
27	Frequency counter	scientiFic SM 5051/ 1 GHz	5	Circuit testing, measurement and troubleshooting	Electronic devices and circuits
28	Distortion meter	scientiFic SM 5027	1		
29	Digital LCR meter	Caddo 9302	4		
30	Pulse generator	scientiFic SM 5035/ 20 MHz	1		
31	Digital Multimeter	scientiFic SM 7022/metravi 19 F/Agilent U-1252 A	14		
32	Function generator	scientiFic SM 5070/caddo 4061/ 3 MHz	3		
33	Universal IC tester	VPL -VICT	1	Circuit testing, measurement, and troubleshooting	Digital IC testing
34	Project interfacing board	TI	5	Designing and developing electronics and embedded systems	Electronic circuits and embedded system design
35	Microcontroller	Dynalog/NVIS NV 5001, NV 5002,	6		

	development board				
36	Programmable multiplier	scientiFic SM 5015	4		
37	Power scope	scientiFic SM 901/ 30 MHz	1		
38	Power Supply	Scientech ST-4070, ST-4077	3		
39	Project Board	Scientech ST-2610	5		
40	ADC interfacing kit	TI/ AD58364M-EVM	1		
41	DAC interfacing kit	TI	1		
42	GSM modem interface kit	TI	1	Designing and developing electronics and embedded systems	Electronic circuits and embedded system design
43	Finger print sensor	TI	1		
44	GLCD interfacing kit	TI	1		
45	Video interfacing kit	TI/ 6713 DSK	1		
46	CCD camera & TV Tuner	TI	1		
47	RF development kit	TI	1		
48	USB EPROM Eraser	VPL EE-1	6		
49	USB based EPROM programmer	VPL UPROG-VX	6		

50	R-pi Camera module		2		
51	AVR programmer	Micronics	1	USB programmer for AVR development board	Embedded system
52	Spartan 2 FPGA kit	ST102, ST103, ST104, ST105	4	Design and implement digital circuits of all kinds	VLSI, Embedded system, FPGA based design
53	Spartan 3 FPGA Protoboard	Spartan 3 IM Board MXS3FK-IM	1	Development platform for realizing various digital designs	VLSI, Embedded system, FPGA based design
54	Spartan 3 DSP Protoboard	MXS3FK-004-DSP	1	Used to physically verify DSP algorithms	VLSI, Embedded system, FPGA based design
55	Spartan 6 DSP Protoboard		1	Used to physically verify DSP algorithms	VLSI, Embedded system, FPGA based design
56	CPLD Trainer kit	XC9572	1	Provides advanced in system programming and test capabilities	VLSI, Embedded system, FPGA based design
57	FPGA trainer kit XCS05	XCS05	1	Have generous routing resources to accommodate most complex interconnect patterns	VLSI, Embedded system, FPGA based design

Equipment's and Sensors available in the IoT Lab

S. No	Items	Quantity
1	Raspberry Pi Casing	12
2	ERD Mobile Charger TC55	12
3	Bread Board	12
4	HDMI To VGA Converter	10
5	1*40 Female To Female	13
6	1*40 Male 2 Female	13
7	1*40 Male 2 Male	100
8	LED 5 MM	100
9	Potention Meter	20
10	Resistance 1K	100
11	Resistance 10K	100
12	Sound Sensor Module	10
13	IR Sensor Module	10
14	PIR HC-SR 501	10
15	MQ-6 gas sensor Module	5
16	Display 20*4 (Green)	3
17	Display 16*2 (Green)	10
18	1CHANNEL RELAY BOARD without OPTO 5V	10
19	Bluetooth HC-05	4
20	Sensor DHT-11	8
21	HC-SR -04 Ultrasonic	3
22	Soil Moisture Sensor	3
23	LDR MODULE	3
24	Switch	10
25	Peltier	3
26	Heat Sink	2
27	Relay 2 channel	3
28	Relay 4 channel	2
29	Water Level Sensor	2
30	Dust Sensor	1
31	Flame	2

32	GSM 900	2
33	GPS	3
34	Camera Pi	1
35	Camera UNO	2
36	Water Temp	1
37	Solenoid valve	2
38	DC motor (water pump) 5-12 V	5
39	Wi Fi	4
40	Vibration Sensor	2
41	Pulse Sensor	2
42	Small passive buzzer module	1
43	2-color LED module	1
44	Hit sensor module	1
45	Vibration switch module	1
46	Photo resistor module	1
47	Key switch module	1
48	Tilt switch module	1
49	3-color full-color LED SMD modules	1
50	Infrared emission sensor module	1
51	3-color LED module	1
52	Mercury open optical module	1
53	Yin Yi 2-color LED module 3MM	1
54	Active buzzer module	1
55	Temperature sensor module	1
56	Node 32	1
57	Lilipad	1
58	Water Meter	1

Glimpse of IoT Lab



IoT Software Components (Open Source & Other Platforms)

S. No.	Name of Component	Description
1.	IBM Watson IoT Platform	SKIT is IBM CoE under which the faculty members and students can access IBM software tools like WID, RAD, DB2, WAS etc. and has access to IBM Cloud. Certifications like Robotics and TJBOT are also provided under this initiative.
2.	Microsoft Azure IoT Central	Under Microsoft Ed-vantage Initiative, SKIT is recognized Microsoft Cloud Competency Center under which the faculty members and students can access various features and services of Azure Cloud. Certifications like IOT-BOT, Microsoft Innovative Educator are also provided to students and faculty members under this initiative.
3.	Shakti Processors (IIT Madras)	Open-source processor development initiative by the RISE group at IIT-Madras.
4.	Shakti Software (IIT Madras)	Software Development Kits and IDE's readily available to build applications on SHAKTI
5.	RISC-V ISA	Free and open-source ISA
6.	Arduino	Integrated development environment (IDE)
7.	Devicehub.net	Universal interface for IoT and M2M
8.	IoT Toolkit	Intelligent object API gateway service
9.	OpenWSN	Repository for IoT hardware and software projects
10.	Particle	Suite of hardware and software for building IoT devices, applications, and services
11.	SiteWhere	Deployment tool
12.	ThingSpeak	IoT application and API
13.	Webinos	web-based application platform for the IoT
14.	Zetta	API based IoT platform based on Node.js
15.	Node-RED	visual tool for lining the Internet of Things
16.	Flutter	Programmable processor core
17.	M2MLabs Mainspring	Application framework for developing M2M applications
18.	ThingsBoard	Data collection, Processing, Visualization, and Device Management toolkit
19.	Kinoma	Marvell Semiconductor hardware prototyping platform
20.	Kaa IoT Platform	Multi-purpose middleware platform
21.	DSA	Open-Source Platform & “Toolkit” for Internet of Things Devices, Services and Applications.
22.	Thingier	Scalable cloud base for connecting devices. It supports Raspberry Pi, Intel Edison, ESP8266.
23.	OpenRemote	Open-Source IoT platform
24.	gem5	Simulator for computer-system architecture