SHIV NADAR UNIVERSITY
CHENNAI

School of Engineering

Department of Computer Science and Engineering

B. TECH

COMPUTER SCIENCE AND ENGINEERING (IoT)

CURRICULUM

SEMESTER – I

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	EN1001	Communicative English	HS	3	2	1	0	3
2.	MA1001	Linear Algebra	BS	3	3	0	0	3
3.	CS1001	Programming in C	ES	3	3	0	0	3
4.	BS1001	Environmental Science and Engineering	BS	2	2	0	0	2
5.	CS1005	Digital Design and Microprocessor	ES	3	3	0	0	3
6.	CS1007	Basics of Electrical and Electronics Engineering	ES	3	3	0	0	3
7.	EA1001T	Extra Academic Activities	AEA*	2	0	0	0	1
PRACTICALS								
8.	CS1801	Programming in C Lab	ES	4	0	0	4	2
9.	CS1803	Digital Design and Microprocessor Lab	ES	4	0	0	4	2
			TOTAL	**27**	**16**	**1**	**8**	**22**

SEMESTER – II

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	EN1002	English for Engineers	HS	3	2	1	0	3
2.	MA1002	Probability and Statistics	BS	3	3	0	0	3
3.	PH1001T	Engineering Physics	BS	3	3	0	0	3
4.	CS1004	Computer Organization and Architecture	ES	3	3	0	0	3
5.	CS1702	Introduction to Internet of Things + Lab	ES	5	3	0	2	4
6.	CS1002	Programming in Python	ES	2	2	0	0	2
7.	EA1001T	Extra Academic Activities	AEA*	2	0	0	0	1
PRACTICALS								
8.	PH1801T	Engineering Physics Lab	HS	4	0	0	4	2
9.	CS1802	Programming in Python Lab	ES	4	0	0	4	2
			TOTAL	**29**	**16**	**1**	**10**	**23**

***Ability Enhancement Activity – 40 hours per semester**

SEMESTER – III

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	MA2001	Discrete Mathematics and Graph Theory	BS	4	3	1	0	4
2.	CS1006T	Data Structures	PC	3	3	0	0	3
3.	CS2003	Object Oriented Programming	PC	3	3	0	0	3
4.	CS2001T	Database Management Systems	PC	3	3	0	0	3
5.	CS2005	Software Engineering and Design	PC	3	3	0	0	3
PRACTICALS								
6.	CS1804T	Data Structures Lab	PC	4	0	0	4	2
7.	CS2801T	Database Management Systems Lab	PC	4	0	0	4	2
			TOTAL	**24**	**15**	**1**	**8**	**20**

SEMESTER – IV

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	CS2008	Operating Systems	PC	3	3	0	0	3
2.	CS2004	Design and Analysis of Algorithms	PC	3	3	0	0	3
3.	CS2002	Computer Networks	PC	3	3	0	0	3
4.	CS2006	Introduction to Sensor Technology	ES	3	3	0	0	3
5.	CS2000	Agile Scrum Process	PC	1	1	0	0	1
6.		Open Elective I	OE	3	3	0	0	3
PRACTICALS								
7.	CS2804	Operating Systems Lab	PC	4	0	0	4	2
8.	CS2802	Computer Networks Lab	PC	4	0	0	4	2
9.	CS2800	Design Thinking	PC	2	0	0	2	1
			TOTAL	**26**	**16**	**0**	**10**	**21**

SEMESTER – V

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	CS2007	Artificial Intelligence	PC	3	3	0	0	3
2.	CS3005	Web Technologies	PC	3	3	0	0	3
3.	CS3003	Software and Programming in IoT	PC	3	3	0	0	3
4.	CS3001	Distributed Computing	PC	2	2	0	0	2
5.	BM3000T	Business Basics for Entrepreneurs (Audit Course)	HS	2	2	0	0	0
6.		Professional Elective I	PE	3	3	0	0	3
7.		Open Elective II	OE	3	3	0	0	3
PRACTICALS								
8.	CS3807	Web Technologies Lab	PC	4	0	0	4	2
9.	CS3805	Artificial Intelligence Lab	PC	4	0	0	4	2
10.	CS3803	Software and Programming in IoT Lab	PC	2	0	0	2	1
			TOTAL	**29**	**19**	**0**	**10**	**22**

SEMESTER – VI

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	CS3006	Machine Learning Algorithms	PC	3	3	0	0	3
2.	CS3004	IoT Architecture and Protocols	PC	3	3	0	0	3
3.	CS3002	Cryptography Concepts	PC	2	2	0	0	2
4.		Professional Elective II	PE	3	3	0	0	3
5.		Professional Elective III	PE	3	3	0	0	3
6.		Open Elective III	OE	3	3	0	0	3
PRACTICALS								
7.	CS3852	Industrial Training	EEC	1	0	0	1	1
8.	CS3900	Mini Project	EEC	2	0	0	2	1
9.	CS3802	Machine Learning Algorithms Lab	PC	4	0	0	4	2
			TOTAL	**24**	**17**	**0**	**7**	**21**

SEMESTER – VII

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	CS4005	Trusted Computing and Security Models	PC	3	3	0	0	3
2.	CS4001	Cloud and Fog Computing for IoT	PC	3	3	0	0	3
3.	CS4003	DevOps	PC	3	3	0	0	3
4.	BM4001	Management Principles for Engineers	HS	2	2	0	0	2
5.	HS4001	Intellectual Property Rights	HS	1	1	0	0	1
6.		Professional Elective IV	PE	3	3	0	0	3
PRACTICALS								
7.	CS4852	Industrial Training / MOOC / Seminar	ES	2	0	0	2	1
8.	CS4801	DevOps Lab	PC	4	0	0	4	2
9.	CS4999	Project (Phase-I) / Internship (4-6 weeks)	EEC	6	0	0	6	3
			TOTAL	**27**	**15**	**0**	**12**	**21**

SEMESTER – VIII

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.		Professional Elective V	PE	3	3	0	0	3
2.		Professional Elective VI	PE	3	3	0	0	3
PRACTICALS								
3.	CS4998	Project (Phase-II)	EEC	12	0	0	12	6
			TOTAL	**18**	**6**	**0**	**12**	**12**

TOTAL NO. OF CREDITS: 162

PROFESSIONAL ELECTIVES (PE)

SEMESTER V

PROFESSIONAL ELECTIVE I

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	CS3699T	Introduction to Cyber Security	PE	3	3	0	0	3
2.	CS3697	Sensors, Actuators and Signal Processing	PE	3	3	0	0	3
3.	CS3695	Dynamic Paradigm in IoT	PE	3	3	0	0	3
4.	CS3693	IoT Device Programming	PE	3	3	0	0	3
5.	CS3691T	Data Preprocessing	PE	3	3	0	0	3
6.	CS3689	Quantum Computing	PE	3	3	0	0	3

SEMESTER VI

PROFESSIONAL ELECTIVE II

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	CS3698	Ethical Hacking	PE	3	3	0	0	3
2.	CS3696	IoT: Communication Technologies	PE	3	3	0	0	3
3.	CS3694	Industry IoT 4.0	PE	3	3	0	0	3
4.	CS3692	Web of Things	PE	3	3	0	0	3
5.	CS3690	Data Science for Internet of Things	PE	3	3	0	0	3
6.	CS3688	Descriptive Analytics for IoT	PE	3	3	0	0	3

SEMESTER VI

PROFESSIONAL ELECTIVE III

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	CS3686	Digital Forensics	PE	3	3	0	0	3
2.	CS3684	Introduction to Robotics	PE	3	3	0	0	3
3.	CS3682	Game Programming	PE	3	3	0	0	3
4.	CS3680	Software Testing Tools	PE	3	3	0	0	3
5.	CS3678	Big Data and Hadoop	PE	3	3	0	0	3
6.	CS3676	Business Analytics	PE	3	3	0	0	3

SEMESTER VII

PROFESSIONAL ELECTIVE IV

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	CS4699	IoT Security	PE	3	3	0	0	3
2.	CS4697	Operating System for IoT	PE	3	3	0	0	3
3.	CS4695	Open Source Intelligence (OSINT)	PE	3	3	0	0	3
4.	CS4693	Software Project Management	PE	3	3	0	0	3
5.	CS4691	Deep Learning	PE	3	3	0	0	3
6.	CS4689	Augmented Reality and Virtual Reality	PE	3	3	0	0	3

SEMESTER VIII

PROFESSIONAL ELECTIVE – V

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	CS4698	Vulnerability Assessment and Penetration Testing	PE	3	3	0	0	3
2.	CS4696	Software Defined Networking	PE	3	3	0	0	3
3.	CS4694	Wireless Sensor Networks (WSN) & IoT Standards	PE	3	3	0	0	3
4.	CS4692	Drone Technology	PE	3	3	0	0	3
5.	CS4690	Data Management in IoT	PE	3	3	0	0	3
6.	CS4688	Data Visualization	PE	3	3	0	0	3

SEMESTER VIII

PROFESSIONAL ELECTIVE – VI

Sl. No	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	CS4686	Blockchain and Cryptocurrencies	PE	3	3	0	0	3
2.	CS4684	IoT Device and Infrastructure Management	PE	3	3	0	0	3
3.	CS4682	Electric Vehicle Design	PE	3	3	0	0	3
4.	CS4680	Semantics for IoT	PE	3	3	0	0	3
5.	CS4678	Computer Vision	PE	3	3	0	0	3
6.	CS4676	Real-time Analytics	PE	3	3	0	0	3

PROGRAM STRUCTURE – B.Tech CSE (IoT)

Sl. No	Topics	B.Tech CSE (IoT)	AICTE Breakup for CSE
1.	HS: Humanities and Social Sciences including Management courses	10	12
2.	BS: Basic Science courses	16	24
3.	ES: Engineering Science Courses	29	29
4.	PC: Professional Core Courses	67	49
5.	PE: Professional Elective courses relevant to chosen specialization/branch	18	18
6.	OE: Open electives	15	12
7.	EEC: Project Work, Seminar and Internship In Industry, etc and Ability Enhancement Activity (AEA)	7	15
	Total	**162**	**159**

SEMESTER-WISE CREDITS BREAKUP

Category\Sem	HS	BS	ES	PC	PE	OE	EEC/AEA	Total
1	2	6	13				1	22
2	5	6	11				1	23
3		4	3	13				20
4				18		3		21
5				16	3	3		22
6				10	6	3	2	21
7	3		1	11	3		3	21
8					6	6		12
Total	10	16	28	68	18	15	7	162

OPEN ELECTIVES (OE)

Each department of the University (under school of Engineering), will offer two open-elective courses (typically, 3 credits each) to the students of other departments. The list of offered courses will be provided by the departments, based on current requirements.

MICRO-SPECIALIZATION

The University proposes to offer Micro-Specializations to UG students.
Its salient features are as follows:

1. Each Micro-Specialization has a defined structure in terms of three sequential components:
    - **Component-I** – One Foundation course that constitutes a mandatory requirement and also a pre-requisite for subsequent components
    - **Component-II** - Two courses from a specified stream
    - **Component-III** - Project/Design/Term Paper

2. A Student would be required to complete all the three components (10-12 credits) from the specified stream in order to earn a Micro-Specialization.

Eligibility for Micro-Specialisation registration

In order to register for a Micro-Specialization, the student must have completed all curricular requirements up to the previous semester and have a CGPA $\geq$ 8.0. Thereafter the student must maintain a CGPA $\geq$ 8.0 without any backlog in the subsequent semesters to keep the Micro-Specialization registration active.

Provisional list of Micro Specialization courses

1. Artificial Intelligence and Data Science
(Shall be offered to all the programs except B. Tech (AI & DS))

- Foundations of Data Science + lab (4 credits)
- Statistical Inference (3 credits)
- Deep Learning (3 credits)

2. Internet of Things
(Shall be offered to all the programs except B. Tech-CSE (IoT))

- Introduction to Internet of Things + Lab (4 credits)
- Software and Programming in IoT (3 credits)
- IoT architecture and Protocols (3 credits)

3. MedTech

(Shall be offered to all the programs)

- Sensors for healthcare (4 credits)
- Medical Instrumentation (3 credits + lab 1 credit)
- Wearable devices and Mobile health / IoMT / Big data analytics in Healthcare / Neuro-rehabilitation and Brain Computer Interface (3 credits)

4. Applied Robotics

(Shall be offered to all the programs)

- Robotics for Engineers (3 credits)
- Robot System Design (4 credits)
- Intelligent Robotics (3 credits)