

Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

(Accredited 'A++' Grade by NAAC with a score of 3.6)

Hingna Road, Wanadongri, Nagpur - 441 110



## Bachelor of Technology

### SoE & Syllabus 2023

#### 1<sup>st</sup> to 6<sup>th</sup> Semester

(Department of Electronics Engineering)

**B. Tech in CSE (IoT)**



Nagar Yuwak Shikshan Sanstha's  
**Yeshwantrao Chavan College of Engineering**  
 (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)  
**B.TECH SCHEME OF EXAMINATION 2023**  
 (Scheme of Examination w.e.f. 2023-24 onward)  
**(Department of Electronics Engineering)**  
**B. Tech in CSE (IOT)**

SoE No.  
23IoT-101

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/ P	Contact Hours					Credits	% Weightage			ESE Duration Hours
							L	T	P	Hrs	MSEs*		TA**	ESE		
FIRST SEMESTER (GROUP-B)																
1	1	BS	GE	23GE1102	Differential Equations, Matrices and Statistics	T	3	0	0	3	3	30	20	50	3	
2	1	BS	GE	23GE1110	Applied Physics	T	3	0	0	3	3	30	20	50	3	
3	1	BS	GE	23GE1111	Lab: Applied Physics	P	0	0	2	2	1		60	40		
4	1	BES	EE	23EE1101	Basic Electronics	T	3	0	0	3	3	30	20	50	3	
5	1	BES	EE	23EE1102	Lab : Basic Electronics	P	0	0	2	2	1		60	40		
6	1	BES	EL	23EL1102	Basic Electrical Engineering	T	3	0	0	3	3	30	20	50	3	
7	1	PC	EE	23EE1103	Digital Logic Design	T	3	0	0	3	3	30	20	50	3	
8	1	PC	EE	23EE1104	Lab : Digital Logic Design	P	0	0	2	2	1		60	40		
9	1	VSEC	GE	23GE1117	Get Set Go	...	...	...	...	...	2		60	40		
10	1	CC2	GE		Liberal Learning Course (LLC2)	...	...	...	...	...	2		60	40		
TOTAL FIRST SEM							15	0	6	21	22					

**MANDATORY LEARNING COURSES**

1	1	HS		GE2131	Universal Human Values (UHV)	A	2	0	0	2	0					
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SECOND SEMESTER (GROUP-B)																
1	2	BS	GE	23GE1201	Calculus and Vector	T	3	0	0	3	3	30	20	50	3	
2	2	BS	GE	23GE1206	Engineering Chemistry	T	3	0	0	3	3	30	20	50	3	
3	2	BS	GE	23GE1207	Lab: Engineering Chemistry	P	0	0	2	2	1		60	40		
4	2	HS/AEC1	GE	23GE1212	Professional Communication	T	2	0	0	2	2	30	20	50	2	
5	2	HS/IKS	GE	23GE1215	Indian Knowledge System	T	2	0	0	2	2	30	20	50	2	
6	2	BES	EE	23EE1205	Electronics Device and Circuit	T	3	0	0	3	3	30	20	50	3	
7	2	BES	EE	23EE1206	Lab: Electronics Device and Circuit	P	0	0	2	2	1		60	40		
8	2	BES	IT	23IT1203	Programming for Problem Solving	T	2	0	0	2	2	30	20	50	2	
9	2	BES	IT	23IT1204	Lab: Programming for Problem Solving	P	0	0	2	2	1		60	40		
10	2	VSEC	GE	23GE1218	Functional English	...	...	...	...	...	2		60	40		
11	2	CC1	GE		Liberal Learning Course (LLC1)	...	...	...	...	...	2		60	40		
TOTAL SECOND SEM							15	0	6	21	22					

**Liberal Learning Course**

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	2	CC2	GE	23LLC1201	Music (Vocal)
2	2	CC2	GE	23LLC1202	Music (Instrumental)
3	2	CC2	GE	23LLC1203	Indian Classical Dance
4	2	CC2	GE	23LLC1204	Other forms of Dances
5	2	CC2	GE	23LLC1205	Painting
6	2	CC2	GE	23LLC1206	Theatre and acting
7	2	CC2	GE	23LLC1207	Photography
8	2	CC2	GE	23LLC1208	Yoga
9	2	CC2	GE	23LLC1209	Chess
10	2	CC2	GE	23LLC1210	Athletics
11	2	CC2	GE	23LLC1211	Basket Ball
12	2	CC2	GE	23LLC1212	Judo
13	2	CC2	GE	23LLC1213	Elements of Japanese Language
14	2	CC2	GE	23LLC1214	Elements of German Language
15	2	CC2	GE	23LLC1215	Elements of French Language
16	2	CC2	GE	23LLC1216	Elements of Spanish Language
17	2	CC2	GE	23LLC1217	Basics of Vedic Maths
18	2	CC2	GE	23LLC1218	Skillling in Microsoft Visio and Inkscape



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SoE No.  
23IoT-101

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/ P	Contact Hours				Credits	% Weightage			ESE Duration Hours
							L	T	P	Hrs		MSEs*	TA**	ESE	

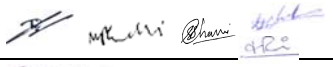

**Liberal Learning Course**

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	1	CC1	GE	23LLC1101	Music (Vocal)
2	1	CC1	GE	23LLC1102	Music (Instrumental)
3	1	CC1	GE	23LLC1103	Indian Classical Dance
4	1	CC1	GE	23LLC1104	Other forms of Dances
5	1	CC1	GE	23LLC1105	Painting
6	1	CC1	GE	23LLC1106	Theatre and acting
7	1	CC1	GE	23LLC1107	Photography
8	1	CC1	GE	23LLC1108	Yoga
9	1	CC1	GE	23LLC1109	Chess
10	1	CC1	GE	23LLC1110	Athletics
11	1	CC1	GE	23LLC1111	Basket Ball
12	1	CC1	GE	23LLC1112	Judo
13	1	CC1	GE	23LLC1113	Elements of Japanese Language
14	1	CC1	GE	23LLC1114	Elements of German Language
15	1	CC1	GE	23LLC1115	Elements of French Language
16	1	CC1	GE	23LLC1116	Elements of Spanish Language
17	1	CC1	GE	23LLC1117	Basics of Vedic Maths
18	1	CC1	GE	23LLC1118	Skilling in Microsoft Visio and Inkscape

**MSEs\* = Two MSEs of 15 Marks each will be conducted and marks of these 2 MSEs will be considered for Continuous Assessment**

**TA \*\* = for Theory : TA1-5 marks on Proctored Online Exam, TA2-12 marks on activities decided by course teacher, TA3 - 3 marks on class attendance**

**TA\*\* = for Practical : MSPA will be 15 marks each**

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Chairperson	Dean (Acad. Matters)	Date of Release	Version	



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SoE No.  
23IoT-101

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							L	T	P	Hrs		MSEs*	TA**	ESE	
THIRD SEMESTER															
1	3	HSSM-I	GE	23GE1301	Fundamentals of Economics & Management	T	2	0	0	2	2	30	20	50	3
2	3	PC	EE	23IOT1301	Microcontroller & Interfacing	T	3	0	0	3	3	30	20	50	3
3	3	PC	EE	23IOT1302	Lab : Microcontroller & Interfacing	P	0	0	2	2	1		60	40	
4	3	PC	EE	23IOT1303	Computer Architecture Organization	T	3	0	0	3	3	30	20	50	3
5	3	PC	CT	23IOT1304	Data Structures	T	3	0	0	3	3	30	20	50	3
6	3	PC	CT	23IOT1305	Lab.: Data Structures	P	0	0	2	2	1		60	40	
7	3	PC	CT	23IOT1306	Lab: Computer Workshop	P	0	0	2	2	1		60	40	
8	3	VEC-2	CT	23IOT1307	Basics of Python Programming	T	2	0	0	2	2	30	20	50	3
9	3	CEP	CT	23IOT1308	Community Engagement Project	P	0	0	2	4	2		60	40	
10	3	OE-1	OE		Open Elective-I	T	2	0	0	2	2	30	20	50	3
11	3	MDM	CT		MD Minor Course-I	T	2	0	0	2	2	30	20	50	3
TOTAL							17	0	8	27	22				

**List of Mandatory Learning Course (MLC)**

1	3	HS	T&P	MLC2123	YCAPP3 : YCCE Communication Aptitude Preparation	A	3	0	0	3	0				
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**Open Elective - I**

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	3	OE1	GE	23OE1301	OE-I : Combinatorics
2	3	OE1	GE	23OE1302	OE-I : Fuzzy Set Theory, Arithmetic And Logic
3	3	OE1	GE	23OE1303	OE-I : Green Chemistry & Sustainability
4	3	OE1	GE	23OE1304	OE-I : Hydrogen Fuel
5	3	OE1	GE	23OE1305	OE-I : Electronic Materials And Applications
6	3	OE1	GE	23OE1306	OE-I : Laser Technology And Applications
7	3	OE1	MGT	23OE1307	OE-I : Finance And Cost Management
8	3	OE1	MGT	23OE1308	OE-I : Operation Research Techniques
9	3	OE1	MGT	23OE1309	OE-I : Project Evaluation & Management
10	3	OE1	MGT	23OE1310	OE-I : Total Quality Management
11	3	OE1	MGT	23OE1311	OE-I : Value Engineering
12	3	OE1	MGT	23OE1312	OE-I : Maintenance Management
13	3	OE1	MGT	23OE1313	OE-I : Industrial Safety
14	3	OE1	MGT	23OE1314	OE-I : Industry 4.0
15	3	OE1	MGT	23OE1315	OE-I : Operation Management
16	3	OE1	MGT	23OE1316	OE-I : Material Management
17	3	OE1	MGT	23OE1317	OE-I : Hospitality Management
18	3	OE1	MGT	23OE1318	OE-I : Human Resource Management & Organizational Behaviour
19	3	OE1	MGT	23OE1319	OE-I : Agri-Business Management
20	3	OE1	MGT	23OE1320	OE-I : Rural Marketing
21	3	OE1	MGT	23OE1321	OE-I : Marketing Management
22	3	OE1	MGT	23OE1322	OE-I : Health Care Management
23	3	OE1	MGT	23OE1323	OE-I : Designated approved online NPTEL/KKSU Course
24	3	OE1	MGT	23OE1324	OE-I : Indian Archeology
25	3	OE1	MGT	23OE1325	OE-I : Social & Positive Psychology
26	3	OE1	MGT	23OE1326	OE-I : Seismology & Earthquake

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							L	T	P	Hrs		MSEs*	TA**	ESE	
FOURTH SEMESTER															
1	4	BS	GE	23GE1404	Probability Theory and Sampling Theory	T	3	0	0	3	3	30	20	50	3
2	4	HS	GE	23GE1401	Entrepreneurship Development	T	2	0	0	2	2	30	20	50	3
3	4	AEC-2	GE	23GE1405 23GE1406	Marathi Language / Hindi Language	T	2	0	0	2	2	30	20	50	3
4	4	VEC-1	CV	23CV1411	Environmental Sustainability, Pollution and Management	T	2	0	0	2	2	30	20	50	3
5	4	PC	CT	23IOT1401	Introduction to Internet of Things	T	3	0	0	3	3	30	20	50	3
		PC	CT	23IOT1402	Lab : Introduction to Internet of Things	P	0	0	2	2	1		60	40	
6	4	PC	CT	23IOT1403	Object Oriented Programming	T	3	0	0	3	3	30	20	50	3
7	4	PC	CT	23IOT1404	Lab : Object Oriented Programming	P	0	0	2	2	1		60	40	
8	4	VSEC-3	CT	23IOT1405	Lab : Vocational & Skill Enhancement Data Analysis using R	P	0	0	2	4	2		60	40	
9	4	OE-2	OE		Open Elective-II	T	2	0	0	2	2	30	20	50	3
10	4	MDM	CT		MD Minor Course-II	T	2	0	0	2	2	30	20	50	3
TOTAL							19	0	6	27	23				

**List of Mandatory Learning Course (MLC)**

1	4	HS	T&P	MLC2124	<b>YCAP4</b> : YCCE Communication Aptitude Preparation	<b>A</b>	3	0	0	3	0				
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**Open Elective - II**

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	4	OE2	GE	23OE2401	OE-II : Combinatorics
2	4	OE2	GE	23OE2402	OE-II : Fuzzy Set Theory, Arithmetic And Logic
3	4	OE2	GE	23OE2403	OE-II : Green Chem. & Sustainability
4	4	OE2	GE	23OE2404	OE-II : Hydrogen Fuel
5	4	OE2	GE	23OE2405	OE-II : Electronic Materials And Applications
6	4	OE2	GE	23OE2406	OE-II : Laser Technology And Applications
7	4	OE2	MGT	23OE2407	OE-II : Finance And Cost Management
8	4	OE2	MGT	23OE2408	OE-II : Operation Research Techniques
9	4	OE2	MGT	23OE2409	OE-II : Project Evaluation & Management
10	4	OE2	MGT	23OE2410	OE-II : Total Quality Management
11	4	OE2	MGT	23OE2411	OE-II : Value Engineering
12	4	OE2	MGT	23OE2412	OE-II : Maintenance Management
13	4	OE2	MGT	23OE2413	OE-II : Industrial Safety
14	4	OE2	MGT	23OE2414	OE-II : Industry 4.0
15	4	OE2	MGT	23OE2415	OE-II : Operation Management
16	4	OE2	MGT	23OE2416	OE-II : Material Management
17	4	OE2	MGT	23OE2417	OE-II : Hospitality Management
18	4	OE2	MGT	23OE2418	OE-II : Human Resource Management & Organizational Behaviour
19	4	OE2	MGT	23OE2419	OE-II : Agri-Business Management
20	4	OE2	MGT	23OE2420	OE-II : Rural Marketing
21	4	OE2	MGT	23OE2421	OE-II : Marketing Management
22	4	OE2	MGT	23OE2422	OE-II : Health Care Management
23	4	OE2	MGT	23OE2423	OE-II : Designated approved online NPTEL/KKSU Course
24	4	OE2	MGT	23OE2424	OE-II : Indian Archeology
25	4	OE2	MGT	23OE2425	OE-II : Social & Positive Psychology
26	4	OE2	MGT	23OE2426	OE-II : Seismology & Earthquake

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SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/P	Contact Hours				Credit s	% Weightage			ESE Duration Hours
							L	T	P	Hrs		MSEs*	TA**	ESE	
FIFTH SEMESTER															
1	5	PC	CSE(IOT)	23IOT1501	Database Management System	T	3	0	0	3	3	30	20	50	3
2	5	PC	CSE(IOT)	23IOT1502	Lab : Database Management System	P	0	0	2	2	1		60	40	
3	5	PC	CSE(IOT)	23IOT1503	Operating Systems	T	3	0	0	3	3	30	20	50	3
4	5	PC	CSE(IOT)	23IOT1504	Lab : Operating Systems	P	0	0	2	2	1		60	40	
5	5	PC	CSE(IOT)	23IOT1505	Design Analysis and Algorithms	T	3	0	0	3	3	30	20	50	3
6	5	PC	CSE(IOT)	23IOT1506	Lab : Design Analysis and Algorithms	P	0	0	2	2	1		60	40	
7	5	PC	CSE(IOT)	23IOT1507	Therotical Foundations Computer Science	T	2	0	0	2	2	30	20	50	3
8	5	PE	CSE(IOT)		Professional Elective-I	T	3	0	0	2	2	30	20	50	3
9	5	PE	CSE(IOT)		Lab : Professional Elective-I	P	0	0	2	2	1		60	40	
10	5	OE-3	OE		Open Elective-III	T	3	0	0	3	3	30	20	50	3
11	5	MDM	CSE(IOT)		MD Minor Course-III	T	3	0	0	3	3	30	20	50	3
12	5	STR	CSE(IOT)	23IOT1508	Internship, Seminar and Report	P	0	0	2	2	1		60	40	
TOTAL							20	0	10	29	24				

**List of Mandatory Learning Course (MLC)**

1	5	HS	T&P	MLC2125	YCAP5 :YCCE Communication Aptitude Preparation	A	3	0	0	3	0				
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**Professional Electives - I**

1	5	PE-I	CSE(IOT)	23IoT1521	PE-I : Computer Vision
	5	PE-I	CSE(IOT)	23IoT1522	PE-I : Lab : Computer Vision
2	5	PE-I	CSE(IOT)	23IoT1523	PE-I : Geo-Intelligence for Smart IoT Devices
	5	PE-I	CSE(IOT)	23IoT1524	PE-I : Lab : Geo-Intelligence for Smart IoT Devices
3	5	PE-I	CSE(IOT)	23IoT1525	PE-I : Mathematical Foundations for Data Analysis
	5	PE-I	CSE(IOT)	23IoT1526	PE-I : Lab : Mathematical Foundations for Data Analysis

**Open Elective - III**

SN	Sem	Type	BoS/Deptt	Sub. Code	Subject	FACULTY
1	5	OE3	CSE	23OE3501	OE-III : Social Reformers in Modern Maharashtra	ARTS
2	5	OE3	CSE	23OE3502	OE-III : Independent India 1948-2010	ARTS
3	5	OE3	CT	23OE3503	OE-III : Introduction To Cognitive Psychology	ARTS
4	5	OE3	CT	23OE3504	OE-III : Introduction To Engineering Psychology	ARTS
5	5	OE3	CT	23OE3505	OE-III : Introduction To Behavioural Psychology	ARTS
6	5	OE3	CT	23OE3506	OE-III : Introduction To Emotional Psychology	ARTS
7	5	OE3	EL	23OE3507	OE-III : Elements of Public Administration	ARTS
8	5	OE3	ETC	23OE3508	OE-III : Ancient Indian History	ARTS
9	5	OE3	IT	23OE3509	OE-III : Consciousness Studies	ARTS
10	5	OE3	IT	23OE3510	OE-III : Psychology for Professionals	ARTS
11	5	OE3	IT	23OE3511	OE-III : Introduction to Sociology and Human Behavior	ARTS
12	5	OE3	GE	23OE3512	OE-III : Economics of Money and Banking	ARTS
13	5	OE3	GE	23OE3513	OE-III : Economics of Capital Market	ARTS
14	5	OE3	GE	23OE3514	OE-III : Digital Humanities	ARTS
15	5	OE3	GE	23OE3515	OE-III : Introduction to Political Science	ARTS
16	5	OE3	CT	23OE3516	OE-III : Bhagwat Geeta - An Engineer's Interpretation	ARTS - IKS
17	5	OE3	CT	23OE3517	OE-III : Artha shastra by Kautiliya	ARTS - IKS
18	5	OE3	CSD	23OE3518	OE-III : Glimpses of Ancient science and Technology	ARTS - IKS
19	5	OE3	CV	23OE3519	OE-III : Indian taxation system	COMMERCE
20	5	OE3	CV	23OE3520	OE-III : Elements of share trading	COMMERCE
21	5	OE3	EE	23OE3521	OE-III : Introduction to Fintech	COMMERCE
22	5	OE3	EE	23OE3522	OE-III : Financial Analytics	COMMERCE
23	5	OE3	ETC	23OE3523	OE-III : Fundamentals of Investments	COMMERCE
24	5	OE3	EE	23OE3524	OE-III : Lifestyle Diseases	HEALTHCARE & MEDICINE
25	5	OE3	EE	23OE3525	OE-III : Holistic Nutrition	HOME SCIENCE
26	5	OE3	EL	23OE3526	OE-III : Community Organization & Development	HOME SCIENCE
27	5	OE3	CSE	23OE3527	OE-III : Human Rights & International Laws	LAW
28	5	OE3	CSE	23OE3528	OE-III : Cyber Crime Administration	LAW
29	5	OE3	MATHS	23OE3529	OE-III : Finite Differences & Numerical Methods	SCIENCE
30	5	OE3	MATHS	23OE3530	OE-III : Business Statistics	SCIENCE
31	5	OE3	PHY	23OE3531	OE-III : Crystalline Solids: Properties and Applications.	SCIENCE
32	5	OE3	PHY	23OE3532	OE-III : Nanotechnology: Fundamental to Applications	SCIENCE
33	5	OE3	CHE	23OE3533	OE-III : Chemistry in daily life	SCIENCE
34	5	OE3	CHE	23OE3534	OE-III : Battery Systems and Management	SCIENCE
35	5	OE3	NPTEL	23OE3535	OE-III : Designated approved online NPTEL Course	NPTEL

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							L	T	P	Hrs		MSEs*	TA**	ESE	
SIXTH SEMESTER															
1	6	PC	CSE(IOT)	23IOT1601	Computer Networks	T	2	0	0	3	3	30	20	50	3
2	6	PC	CSE(IOT)	23IOT1602	Lab : Computer Networks	P	0	0	2	2	1		60	40	
3	6	PC	CSE(IOT)	23IOT1603	Artificial Intelligence and Machine Learning	T	3	0	0	3	3	30	20	50	3
4	6	PC	CSE(IOT)	23IOT1604	Lab : Artificial Intelligence and Machine Learning	P	0	0	2	2	1		60	40	
5	6	PC	CSE(IOT)	23IOT1605	Lab : Competitive Coding	P	0	0	2	2	1		60	40	
6	6	PC	CSE(IOT)	23IOT1606	Design Thinking and Research Methodology	T	2	0	0	2	2	30	20	50	3
7	6	PE	CSE(IOT)		Professional Elective-II	T	3	0	0	3	3	30	20	50	3
8	6	PE	CSE(IOT)		Lab : Professional Elective-II	P	0	0	2	2	1		60	40	
9	6	PE	CSE(IOT)		Professional Elective-III	T	3	0	0	3	3	30	20	50	3
10	6	MDM	CSE(IOT)		MD Minor Course-IV	T	3	0	0	3	3	30	20	50	3
11	6	VSEC-4	CSE(IOT)	23IOT1607	Lab : Java FSD	P	0	0	2	2	1		60	40	
12	6	STR	CSE(IOT)	23IOT1608	Project Phase-I	P	0	0	4	4	2		60	40	
TOTAL							16	0	14	31	24				
List of Mandatory Learning Course (MLC)															
1	6	HS		MLC126	YCAP6 :	A	3	0	0	3	0				

**Professional Electives -II**

1	6	PE-II	CSE(IOT)	23IOT1621	PE-II : Bussiness Intelligence
2	6	PE-II	CSE(IOT)	23IOT1622	PE-II : Lab : Bussiness Intelligence
3	6	PE-II	CSE(IOT)	23IOT1623	PE-II : Mobile and Web Application for IoT
4	6	PE-II	CSE(IOT)	23IOT1624	PE-II : Lab : Mobile and Web Application for IoT
5	6	PE-II	CSE(IOT)	23IOT1625	PE-II : UI/UX Design
6	6	PE-II	CSE(IOT)	23IOT1626	PE-II : Lab : UI/UX Design

**Professional Electives -III**

1	6	PE-III	CSE(IOT)	23IOT1641	PE-III : Industrial IoT
2	6	PE-III	CSE(IOT)	23IOT1642	PE-III : IoT Sensors and devices
3	6	PE-III	CSE(IOT)	23IOT1643	PE-III : Optimization Techniques

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Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

(Accredited 'A++' Grade by NAAC with a score of 3.6)

Hingna Road, Wanadongri, Nagpur - 441 110



## Bachelor of Technology

### SoE & Syllabus 2023

#### 1<sup>st</sup> Semester

(Department of Electronics Engineering)

**B. Tech in CSE (IoT)**





Nagar Yuwak Shikshan Sanstha's  
**Yeshwantrao Chavan College of Engineering**  
 (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)  
**B.TECH SCHEME OF EXAMINATION 2023**  
 (Scheme of Examination w.e.f. 2023-24 onward)  
 (Department of Electronics Engineering)  
**B. Tech in CSE (IOT)**

SoE No.  
23IoT-101

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/ P	Contact Hours					Credits	% Weightage			ESE Duration Hours
							L	T	P	Hrs	MSEs*		TA**	ESE		
FIRST SEMESTER (GROUP-B)																
1	1	BS	GE	23GE1102	Differential Equations, Matrices and Statistics	T	3	0	0	3	3	30	20	50	3	
2	1	BS	GE	23GE1110	Applied Physics	T	3	0	0	3	3	30	20	50	3	
3	1	BS	GE	23GE1111	Lab: Applied Physics	P	0	0	2	2	1		60	40		
4	1	BES	EE	23EE1101	Basic Electronics	T	3	0	0	3	3	30	20	50	3	
5	1	BES	EE	23EE1102	Lab : Basic Electronics	P	0	0	2	2	1		60	40		
6	1	BES	EL	23EL1102	Basic Electrical Engineering	T	3	0	0	3	3	30	20	50	3	
7	1	PC	EE	23EE1103	Digital Logic Design	T	3	0	0	3	3	30	20	50	3	
8	1	PC	EE	23EE1104	Lab : Digital Logic Design	P	0	0	2	2	1		60	40		
9	1	VSEC	GE	23GE1117	Get Set Go	...	...	...	...	...	2		60	40		
10	1	CC2	GE		Liberal Learning Course (LLC2)	...	...	...	...	...	2		60	40		
TOTAL FIRST SEM							15	0	6	21	22					

**MANDATORY LEARNING COURSES**

1	1	HS		GE2131	Universal Human Values (UHV)	A	2	0	0	2	0					
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SECOND SEMESTER (GROUP-B)																
1	2	BS	GE	23GE1201	Calculus and Vector	T	3	0	0	3	3	30	20	50	3	
2	2	BS	GE	23GE1206	Engineering Chemistry	T	3	0	0	3	3	30	20	50	3	
3	2	BS	GE	23GE1207	Lab: Engineering Chemistry	P	0	0	2	2	1		60	40		
4	2	HS/AEC1	GE	23GE1212	Professional Communication	T	2	0	0	2	2	30	20	50	2	
5	2	HS/IKS	GE	23GE1215	Indian Knowledge System	T	2	0	0	2	2	30	20	50	2	
6	2	BES	EE	23EE1205	Electronics Device and Circuit	T	3	0	0	3	3	30	20	50	3	
7	2	BES	EE	23EE1206	Lab: Electronics Device and Circuit	P	0	0	2	2	1		60	40		
8	2	BES	IT	23IT1203	Programming for Problem Solving	T	2	0	0	2	2	30	20	50	2	
9	2	BES	IT	23IT1204	Lab: Programming for Problem Solving	P	0	0	2	2	1		60	40		
10	2	VSEC	GE	23GE1218	Functional English	...	...	...	...	...	2		60	40		
11	2	CC1	GE		Liberal Learning Course (LLC1)	...	...	...	...	...	2		60	40		
TOTAL SECOND SEM							15	0	6	21	22					

**Liberal Learning Course**

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	2	CC2	GE	23LLC1201	Music (Vocal)
2	2	CC2	GE	23LLC1202	Music (Instrumental)
3	2	CC2	GE	23LLC1203	Indian Classical Dance
4	2	CC2	GE	23LLC1204	Other forms of Dances
5	2	CC2	GE	23LLC1205	Painting
6	2	CC2	GE	23LLC1206	Theatre and acting
7	2	CC2	GE	23LLC1207	Photography
8	2	CC2	GE	23LLC1208	Yoga
9	2	CC2	GE	23LLC1209	Chess
10	2	CC2	GE	23LLC1210	Athletics
11	2	CC2	GE	23LLC1211	Basket Ball
12	2	CC2	GE	23LLC1212	Judo
13	2	CC2	GE	23LLC1213	Elements of Japanese Language
14	2	CC2	GE	23LLC1214	Elements of German Language
15	2	CC2	GE	23LLC1215	Elements of French Language
16	2	CC2	GE	23LLC1216	Elements of Spanish Language
17	2	CC2	GE	23LLC1217	Basics of Vedic Maths
18	2	CC2	GE	23LLC1218	Skillling in Microsoft Visio and Inkscape



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**B. Tech in CSE (IOT)**

SoE No.  
23IoT-101

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/ P	Contact Hours				Credits	% Weightage			ESE Duration Hours
							L	T	P	Hrs		MSEs*	TA**	ESE	

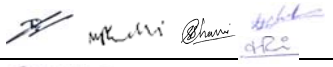



**Liberal Learning Course**

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	1	CC1	GE	23LLC1101	Music (Vocal)
2	1	CC1	GE	23LLC1102	Music (Instrumental)
3	1	CC1	GE	23LLC1103	Indian Classical Dance
4	1	CC1	GE	23LLC1104	Other forms of Dances
5	1	CC1	GE	23LLC1105	Painting
6	1	CC1	GE	23LLC1106	Theatre and acting
7	1	CC1	GE	23LLC1107	Photography
8	1	CC1	GE	23LLC1108	Yoga
9	1	CC1	GE	23LLC1109	Chess
10	1	CC1	GE	23LLC1110	Athletics
11	1	CC1	GE	23LLC1111	Basket Ball
12	1	CC1	GE	23LLC1112	Judo
13	1	CC1	GE	23LLC1113	Elements of Japanese Language
14	1	CC1	GE	23LLC1114	Elements of German Language
15	1	CC1	GE	23LLC1115	Elements of French Language
16	1	CC1	GE	23LLC1116	Elements of Spanish Language
17	1	CC1	GE	23LLC1117	Basics of Vedic Maths
18	1	CC1	GE	23LLC1118	Skilling in Microsoft Visio and Inkscape

**MSEs\* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment**

**TA \*\* = for Theory : TA1-5 marks on Proctored Online Exam, TA2-12 marks on activities decided by course teacher, TA3 - 3 marks on class attendance**

**TA\*\* = for Practical : MSPA will be 15 marks each**

 Chairperson	 Dean (Acad. Matters)	July, 2023	1.00	Applicable for AY 2023-24 Onwards
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(Department of Mathematics & Humanities)

**SoE No.**  
**23FY-101**

## B.Tech First Year

### I SEMESTER

### 23GE1102 : Differential Equations, Matrices and Statistics

Course Outcomes	
<b>The students will be able to</b> <ol style="list-style-type: none"> <li>1. Use appropriate Methods to solve first order and higher order differential equations and apply it to find solution of engineering problems.</li> <li>2. Use Matrix method to solve linear system of equations, evaluate eigen values - eigen vectors and its applications.</li> <li>3. Make use of probability distributions to solve real life problems.</li> <li>4. Inspect scientific data, use proper curve fitting and find correlation, regression of variables.</li> </ol>	
<b>Unit I: Differential Equations I</b>	<b>(7 Hrs.)</b>
Linear differential equations of first order and first degree, Differential equation reducible to linear form, Exact differential equations (excluding the case of integrating factor) and their applications to various fields. <b>(Contemporary Issues related to Topic)</b>	
<b>Unit II: Differential Equations II</b>	<b>(8 Hrs.)</b>
Higher order linear differential equations with constant coefficients, Complementary functions and Particular Integral for different cases, Method of variation of parameters, Examples on application to various fields. <b>(Contemporary Issues related to Topic)</b>	
<b>Unit III: Differential Equations III</b>	<b>(7 Hrs.)</b>
Cauchy's homogeneous linear differential equations, Legendre's linear differential equation, Applications of differential equations to various fields (only up to second order). <b>(Contemporary Issues related to Topic)</b>	
<b>Unit IV: Partial Differential Equations</b>	<b>(8 Hrs.)</b>
Partial Differential Equations of first order, first degree i.e. Lagrange's form, linear homogeneous equations of higher order with constant coefficient. Application of variable separable method to solve first and second order partial differential equations. <b>(Contemporary Issues related to Topic)</b>	
<b>Unit IV: Matrices</b>	<b>(8 Hrs.)</b>
Rank of a matrix, Consistency of system of equations using rank, Characteristics equations, Eigen values and Eigen vectors, Cayley Hamilton Theorem (without proof) statement and verification, Sylvester's theorem-statement and its application. <b>(Contemporary Issues related to Topic)</b>	
<b>Unit VI: Statistics</b>	<b>(7 Hrs.)</b>
Fitting of straight line, $y = a + bx$ , a parabola $y = a + bx + cx^2$ , exponential curves and power curves by method of least squares; Lines of regression and correlation; Rank correlation. <b>(Contemporary Issues related to Topic)</b>	
<b>Total Lecture</b>	<b>45 Hours</b>

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**SoE No.**  
**23FY-101**

## B.Tech First Year

### Textbooks:

1.	Erwin Kreyzig, Advance Engineering Mathematics, 6 <sup>th</sup> Edition, John Wiley and Sons, INC.
2.	H.K. Dass, Engineering Mathematics, 11 <sup>th</sup> revised edition, S. Chand, Delhi.
3.	H.K. Dass, Advanced Engineering Mathematics, 8 <sup>th</sup> revised edition, S. Chand, Delhi.
4.	Dr. B.S. Grewal, Higher Engineering Mathematics, 42 <sup>th</sup> edition, Khanna Publishers.
5.	P.N.Wartikar and J.N.Wartikar, Applied Mathematics, 4 <sup>th</sup> Edition, Vidyarthi GrihaPrakashan.

### Reference Books:


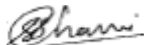
1.	G B Thomas and R L Finney, Calculus and Analytical Geometry, 9th edition, Addison-Wesley, 1999.
2.	N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, 10 <sup>th</sup> edition, Laxmi Prakashan.

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1	<a href="http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Applied%20Sciences%20&amp;%20Humanities/Mathematics%20and%20Humanities/">http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Applied%20Sciences%20&amp;%20Humanities/Mathematics%20and%20Humanities/</a>
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### MOOCs Links and additional reading, learning, video material

1.	<a href="https://nptel.ac.in/courses/111103070">https://nptel.ac.in/courses/111103070</a>
2.	<a href="https://onlinecourses.nptel.ac.in/noc19_ma28/preview">https://onlinecourses.nptel.ac.in/noc19_ma28/preview</a>
3.	<a href="https://nptel.ac.in/courses/111/106/111106100/">https://nptel.ac.in/courses/111/106/111106100/</a>

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# Yeshwantrao Chavan College of Engineering

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**B. Tech SoE and Syllabus 2023**  
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(Department of Physics)

**B.Tech First Year**

**SoE No.**  
**23FY-101**

## I SEMESTER

### 23GE1110 : Applied Physics

#### Course Outcomes :

**Upon successful completion of the course the students will be able to**

1. Correlate fundamentals of quantum mechanics to solve problems dealing with quantum particles.
2. Justify the characteristics of semiconductor materials in terms of crystal structures, charge carriers and energy bands.
3. Analyze the motion of charged particles in electric and magnetic field and its applications to electron optic devices.
4. Examine the intensity variation of light due to Laser and its application.
5. Illustrate working principles of optical fibers for their use in the field of industry.

#### Unit I: Quantum Physics

(8 Hrs.)

Wave particle duality, Davisson and Germer experiment, Wave packet, Heisenberg's uncertainty principle, thought experiment, Significance, Applications. **(Contemporary Issues related to Topic)**

#### Unit II: Introduction to Quantum Computing

(7 Hrs.)

Introduction of complex numbers, operators, Eigen values, Eigen functions. Wave function and its probability interpretation, Schrodinger Equation, Particle in infinite and finite potential well, quantum tunneling, Introduction to Bits and Qubits. **(Contemporary Issues related to Topic)**

#### Unit III: Band Theory of Solids

(8 Hrs.)

Formation of energy bands in solids; Classification of solids, Energy band diagram of Si and Ge, Intrinsic and extrinsic semiconductors, Conductivity, Law of mass action, Hall effect, Direct and Indirect band gap semiconductors. **(Contemporary Issues related to Topic)**

#### Unit IV: Electron Ballistics and Devices


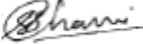
9 Hrs.)

Motion of a charged particle in uniform electric and magnetic field, Cross field configuration; Electron refraction, Electron lens. Cathode ray oscilloscope and its application. **(Contemporary Issues related to Topic)**

#### Unit V: Lasers

(7 Hrs.)

Coherence and its types, Interaction of radiation with matter, Population Inversion, Pumping: methods and schemes, Optical resonant cavity, Ruby laser, He-Ne laser, diode laser, Properties and engineering applications of laser. **(Contemporary Issues related to Topic)**

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(Department of Physics)

**SoE No.**  
**23FY-101**

## B.Tech First Year



<b>Unit VI: Optical Fibres</b>	<b>(6 Hrs.)</b>
Principle, structure and classification, Acceptance angle, Numerical aperture, Losses in optical fibers, Applications as sensors. <b>(Contemporary Issues related to Topic)</b>	
<b>Total Lecture</b>	<b>45 Hours</b>

<b>Textbooks</b>	
<b>1</b>	M. N. Avadhanulu, P. G. Kshirsagar, A Textbook of Engg. Physics, S. Chand and Company.
<b>2</b>	Hitendra K Malik, A K Singh, Engineering Physics, 2nd Edition, Tata McGraw Hill Education Private Limited,

<b>Reference Books</b>	
<b>1</b>	David Halliday, Robert Resnick and Jerle Walker, John-Wiley India, Fundamentals of Physics, 10 <sup>th</sup> John Wiley & Sons Inc.
<b>2</b>	Brijlal and Subramanyam, Text Book of Optics, Revised edition, S. Chand and Company.
<b>3</b>	M.N. Avadhanulu, 2 <sup>nd</sup> Edition, Laser, S.Chand and Company.
<b>4</b>	A. Beiser, Concept of Modern Physics, 6 <sup>th</sup> Edition, Laser, Tata McGraw-Hill.
<b>5</b>	Thyagarajan K. and Ghatak A.K, LASERS: Theory and Applications, 2 <sup>nd</sup> Edition, Macmillan Publication
<b>6</b>	S. O. Pillai, Solid State Physics, 9 <sup>th</sup> Edition, New Edge International Publishers.
<b>7</b>	Palanisamy, Solid State Physics, 8 <sup>th</sup> Edition, New Edge International Publishers.
<b>8</b>	C. Kittel, Solid State Physics, 8 <sup>th</sup> Edition, Willey Publication.

<b>YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]</b>	
<b>1</b>	chrome-http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Physics/Eisberg%20&%20Resnick%20-%20Quantum%20Physics.pdf
<b>2</b>	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Physics/2016 Book ThePhysicsOfSemiconductors.pdf

<b>MOOCs Links and additional reading, learning, video material</b>	
<b>1</b>	<a href="https://nptel.ac.in/courses/115106066">https://nptel.ac.in/courses/115106066</a> - Quantum Physics
<b>2</b>	<a href="https://archive.nptel.ac.in/courses/115/105/115105121/">https://archive.nptel.ac.in/courses/115/105/115105121/</a> -CRO
<b>3</b>	<a href="http://www.digimat.in/nptel/courses/video/115102124/L36.html">www.digimat.in/nptel/courses/video/115102124/L36.html</a> - Laser

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(Department of Physics)

**B.Tech First Year**

**SoE No.**  
**23FY-101**

## I SEMESTER

### 23GE1111 : Lab. Applied Physics


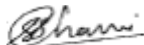
#### Course Outcomes:

**Upon successful completion of the course the students will be able to**

1. Correlate fundamentals of quantum mechanics to solve problems dealing with quantum particles.
2. Justify the characteristics of semiconductor materials in terms of crystal structures, charge carriers and energy bands.
3. Analyze the motion of charged particles in electric and magnetic field and its applications to electron optic devices.
4. Examine the intensity variation of light due to Laser and its application.
5. Illustrate working principle of optical fibers for their use in the field of industry.

#### List of Experiments :

Sr. No.	Experiments based on
1	Determination of Planck's Constant
2	Study of Tunnel Diode.
3	Determination of Hall coefficient and density of charge carriers using Hall effect.
4	Dependence of Hall coefficient on temperature.
5	The study of V-I characteristics of a semiconductor diode (Germanium and silicon) in forward and reverse bias mode.
6	Determination of Band gap in a semiconductor by four probe method.
7	Determination of Band gap in a semiconductor using reverse biased p-n junction diode.
8	Determination of wavelength of laser using diffraction grating.
9	Determination of divergence of laser beam.
10	Determination of Acceptance angle and numerical aperture of a given optical fiber.
11	To measure the phase shift introduced by a phase shift network using Dual beam CRO.
12	Determination of amplitude and frequency of sinusoidal signal using CRO.

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**B. Tech SoE and Syllabus 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Electronics Engineering)

## B.Tech in Electronics Engineering

**SoE No.  
23EE-101**

### I SEMESTER

### 23EE1101 : Basic Electronics

#### Course Outcomes:

**Upon successful completion of the course the students will be able to**

1. Understand, define and explain the fundamental concepts of Analog Electronic Circuits
2. Apply the concepts of Electronic Circuits to obtain the desired parameter
3. Analyze Electronic Circuits to arrive at suitable Conclusions.
4. Design simple circuits using fundamentals of Electronic circuit for given application

<b>Unit:1</b>	<b>Diode and its Applications</b>	<b>7 Hours</b>
Characteristics of materials based on Energy band theory, Intrinsic and extrinsic semiconductors, P-N junction diodes, Biasing & Characteristics of diodes. Diode Circuits - Half wave rectifier, full wave rectifier, bridge rectifier		
<b>Unit:2</b>	<b>Bipolar Junction Transistor</b>	<b>7 Hours</b>
Introduction to BJT- NPN and PNP, biasing, Modes of operation, Configuration and its Characteristics		
<b>Unit:3</b>	<b>BJT Applications</b>	<b>7 Hours</b>
Amplifiers: Various classes of operation (Class A, B, AB, C etc.), Oscillators: Review of the basic concept, Barkhausen criterion, RC & LC oscillators		
<b>Unit:4</b>	<b>OPAMP &amp; its Applications</b>	<b>6 Hours</b>
Introduction to Op-Amp, Inverting and Non-Inverting Amplifier, Linear Applications of OP-AMP, Comparator.		
<b>Unit:5</b>	<b>Measurement Systems</b>	<b>7 Hours</b>
Introduction to Measurement System, Generalized block diagram of Measurement System, Static & dynamic characteristics of measurement system, Types of errors & their sources, Statistical analysis		
<b>Unit :6</b>	<b>DAC &amp; ADC</b>	<b>7 Hours</b>
Digital-to-Analog converters: Weighted resistor, R-2R ladder, etc. Analog-to-Digital converters: Single slope, dual slope, etc		
<b>Total Lecture Hours</b>		<b>41 Hours</b>

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## B. Tech SoE and Syllabus 2023

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Electronics Engineering)

## B.Tech in Electronics Engineering

SoE No.  
23EE-101

### Text books

- |   |   |
|---|---|
| 1 | Electronics Devices and circuits, Millman Jacob, McGraw Hill Education, Fourth Edition (2015) |
| 2 | A.S. Sedra and K.C. Smith, Microelectronic Circuits, sixth edition, Oxford University Press   |

### Reference Books

- |   |  |
|---|--|
| 1 | OP-AMP and Linear Integrated Circuit, by Ramakant A. Gayakwad, Prentice Hall India Learning Private Limited, Published in 2002 |
| 2 | J.V. Wait, L.P. Huelsman and GA Korn, Introduction to Operational Amplifier theory and applications, McGraw Hill, 1992.        |
| 3 | Electrical & Electronic measurement & Instrument, A. K. Sawhney, Dhanpat Rai & Co., 18th edition 2008                          |

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

- |   |   |
|---|---|
| 1 | <a href="http://link.springer.com/openurl?genre=book&amp;isbn=978-1-4613-6193-0">http://link.springer.com/openurl?genre=book&amp;isbn=978-1-4613-6193-0</a> |
| 2 | <a href="https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042">https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042</a>                 |

### MOOCs Links and additional reading, learning, video material

- |   |   |
|---|---|
| 1 | <a href="https://onlinecourses.nptel.ac.in/noc22_ee113/preview">https://onlinecourses.nptel.ac.in/noc22_ee113/preview</a> |
| 2 | <a href="https://nptel.ac.in/courses/108106084">https://nptel.ac.in/courses/108106084</a>                                 |

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Chairperson	Dean (Acad. Matters)	Dean OBE	Date of Release	Version	



# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

## B. Tech SoE and Syllabus 2023

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Electronics Engineering)

## B.Tech in Electronics Engineering

SoE No.  
23EE-101

### I SEMESTER

### 23EE1102 : Lab. Basic Electronics

#### Course Outcomes:

Upon successful completion of the course the students will be able to

1. Understand, define and explain the fundamental concepts of Analog Electronic Circuits
2. Apply the concepts of Electronic Circuits to obtain the desired parameter
3. Analyze Electronic Circuits to arrive at suitable Conclusions.
4. Design simple circuits using fundamentals of Electronic circuit for given application

Sr. No.	Experiments based on
1	To verify characteristics of PN Junction under Forward and Reverse bias
2	To study Half Wave Rectifier and Full wave rectifier
3	To verify Input and Output characteristics of Transistor in Common Emitter configuration
4	To verify Input and Output characteristics of Transistor in Common Base configuration
5	To verify Inverting and Non-inverting Operational amplifiers
6	To study Summing Operational amplifier
7	To study Generalized block diagram of Measurement System
8	To study Static & dynamic characteristics of measurement system
9	To study Analog to Digital converter
10	To study Digital to Analog converter

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Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

## B. Tech SoE and Syllabus 2023

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Electrical Engineering)

## B.Tech in Electrical Engineering

SoE No.  
23EL-101

### I SEMESTER

### 23EL1102 : Basic Electrical Engineering

#### Course Outcomes:

Upon successful completion of the course the students will be able to

1. Reproduce fundamentals of dc circuits.
2. Explain, construction, working and applications of various electrical machines.
3. Analyze performance of various electrical machines

Unit:1	D.C. Circuits	7 Hours
D.C. Circuits: Basics of electrical circuits. Equivalent resistance, Kirchhoff's Laws. Current and Voltage division rule. Mesh and Nodal analysis of dc circuits. Superposition Theorem. (Contemporary Issues related to Topic)		
Unit:2	AC Circuits	7 Hours
A.C. Fundamentals: Values of alternating quantity. Concept of power factor, reactive power and apparent power with power triangle, R, L, C Series circuit and Parallel circuit, Resonance condition. (Contemporary Issues related to Topic)		
Unit:3	Three Phase AC Circuits	7 Hours
Advantages of three – phase system over single – phase system. Generation of three phase a.c. supply. Phase sequence. Interconnection of three phases. Star or Wye (Y) connection. Phase and line voltages/currents in star connection and their relationships. Delta or Mesh connection. Phase and line voltages/currents in delta connection and their relationships. Concept of balanced load. Active, reactive, and apparent power in balanced three phase circuits. (Contemporary Issues related to Topic)		
Unit:4	Single Phase Transformer	6 Hours
Working principle. EMF equation. Voltage ratio and turns ratio. Step up and step down transformers. Construction of single phase transformer. Ideal transformer. Transformer on no load and equivalent circuit. Practical transformer and its equivalent circuit. Referred values. Voltage Regulation. Losses in transformer. Open circuit and Short circuit tests on transformer. Efficiency and condition for maximum efficiency. (Contemporary Issues related to Topic)		
Unit:5	DC Motor	7 Hours
Principle, Torque Equation, Characteristics and applications of various types of D.C. Motors, Starting of D.C. Motors, Speed control of Series and Shunt motors, Power flow in DC machines, Losses and Efficiency in D.C. machines. (Contemporary Issues related to Topic)		

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Nagar Yuwak Shikshan Sanstha's

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## B. Tech SoE and Syllabus 2023

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Electrical Engineering)

## B.Tech in Electrical Engineering

SoE No.  
23EL-101

<b>Unit :6</b>	<b>Three Phase Induction Motor</b>	<b>7 Hours</b>
Construction, Production of rotating magnetic field. Principle of operation. Speed and slip. Frequency of rotor voltage and current. Applications of three phase induction motor. <b>(Contemporary Issues related to Topic)</b>		
<b>Total Lecture Hours</b>		<b>39 Hours</b>

### Textbooks

<b>1</b>	T. K. Nagsarkar and M. S. Sukhija, Basic Electrical Engineering, 1st Edition, Oxford Higher Education, 2005
<b>2</b>	V. N. Mittle and A. K. Mittal, Basic Electrical Engineering, 2nd Edition, 2006, The McGraw Hill Companies, New Delhi
<b>3</b>	B.L. Theraja, Electrical Technology, S.Chand, 2005
<b>4</b>	T. Kenjo and S. Nugatory, Permanent Magnet and Brushless DC motors, England, Clarendon Oxford Press, 1989

### Reference Books

<b>1</b>	I J Nagrath and D. P. Kothari, Basic Electrical Engineering, 2nd Edition, 2002, McGraw Hill, New Delhi
<b>2</b>	Vincent Del Toro, Electrical Engineering Fundamentals, 2nd Edition, 2002, Prentice Hall India, New Delhi

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

<b>1</b>	<a href="http://link.springer.com/openurl?genre=book&amp;isbn=978-3-642-25904-3">http://link.springer.com/openurl?genre=book&amp;isbn=978-3-642-25904-3</a>
<b>2</b>	<a href="http://link.springer.com/openurl?genre=book&amp;isbn=978-1-4614-0399-9">http://link.springer.com/openurl?genre=book&amp;isbn=978-1-4614-0399-9</a>

### MOOCs Links and additional reading, learning, video material

<b>1</b>	<a href="https://nptel.ac.in/courses/108105155">https://nptel.ac.in/courses/108105155</a>
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# Yeshwantrao Chavan College of Engineering

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**B. Tech SoE and Syllabus 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Electronics Engineering)

**B.Tech in Electronics Engineering**

**SoE No.  
23EE-101**

## I SEMESTER

### 23EE1103 : Digital Logic Design

#### Course Outcomes:

**Upon successful completion of the course the students will be able to**

1. Apply the laws of Boolean algebra to simplify logical equations and combination logic circuits.
2. Understand and demonstrate the various codes and illustrate their addition subtraction.
3. Solve logical functions using K- map to implement combinational logic circuits.
4. Design and analyze Synchronous and Asynchronous sequential Circuits.

<b>Unit:1</b>	<b>Number system and codes</b>	<b>7 Hours</b>
Binary, Octal, hexadecimal and decimal Number systems and their inter conversion, BCD numbers (8421-2421), Gray code, ASCII codes. Binary addition and subtraction, signed and unsigned binary numbers, 1's and 2's complement representation.		
<b>Unit:2</b>	<b>Boolean Algebra</b>	<b>7 Hours</b>
Basic logic circuits: Logic gates (AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR and their truth tables), Universal Gates, Laws of Boolean algebra, De-Morgan's theorem.		
<b>Unit:3</b>	<b>Minimization Techniques</b>	<b>7 Hours</b>
Minterm, Maxterm, POS, SOP, K-Map, Simplification by Boolean theorems, don't care condition.		
<b>Unit:4</b>	<b>Combinational Logic</b>	<b>7 Hours</b>
Half adder, Full adder, Subtractor circuit. Multiplexer demultiplexer, decoder, BCD to seven segment Decoder, encoders, code converters.		
<b>Unit:5</b>	<b>Sequential Circuits</b>	<b>7 Hours</b>
Flipflop, set-reset latches, R-S flip-flop, D-flipflop, J-K Flip-flop, Master slave Flipflop, T flip-flop, excitation table of flip-flops. Flip-Flop to flip-flop conversion		
<b>Unit :6</b>	<b>Registers &amp; Counters</b>	<b>7 Hours</b>
Serial in/Serial out shift register, Serial in/parallel out shift register, parallel in/parallel out shift register, parallel in/Serial out shift register, Bi-directional register, Synchronous/Asynchronous counter: Ring Counter, Ripple Counter Johnson's Counter operation, Up/down synchronous counter, application of counter.		
<b>Total Lecture Hours</b>		<b>42 Hours</b>

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## B. Tech SoE and Syllabus 2023

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(Department of Electronics Engineering)

## B.Tech in Electronics Engineering

SoE No.  
23EE-101

### Textbooks

- |   |   |
|---|---|
| 1 | Modern Digital Electronics , RP Jain, Tata McGraw Hill, 3rd Edition   |
| 2 | M. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003. |
| 3 | Donald P. Leach and Albert Paul Malvino, Digital Principles and Applications, 6th Edition, TMH, 2003.   |
| 4 | Anandkumar- fundamental of digital circuit. 3rd edition. PHI  |

### Reference Books

- |   |  |
|---|--|
| 1 | Fundamentals of Logic Design, C.H. Roth, Public Work & Services, 3rd edition 2007. |
| 2 | Engg Approach to Digital Design, Fletcher, Prentice Hall of India 1993.            |
| 3 | Digital Circuits & Microprocessors, Hebert Taub, Mc Graw Hill, 1988.               |

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

- |   |   |
|---|---|
| 1 | <a href="http://103.152.199.179/YCCE/yccelibrary.html">http://103.152.199.179/YCCE/yccelibrary.html</a> |
|---|---|

### MOOCs Links and additional reading, learning, video material

- |   |   |
|---|---|
| 1 | <a href="https://www.digimat.in/nptel/courses/video/108105132/L01.html">https://www.digimat.in/nptel/courses/video/108105132/L01.html</a> |
| 2 | <a href="https://www.digimat.in/nptel/courses/video/108105113/L01.html">https://www.digimat.in/nptel/courses/video/108105113/L01.html</a> |
| 3 | <a href="https://www.coursera.org/learn/digital-systems">https://www.coursera.org/learn/digital-systems</a>                               |

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**B. Tech SoE and Syllabus 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Electronics Engineering)

**B.Tech in Electronics Engineering**

**SoE No.  
23EE-101**

## I SEMESTER

### 23EE1104 : Lab. Digital Logic Design

#### Course Outcomes:

**Upon successful completion of the course the students will be able to**

1. Apply the laws of Boolean algebra to simplify logical equations and combination logic circuits.
2. Understand and demonstrate the various codes and illustrate their addition subtraction.
3. Design and exhibit the methods to solve logical functions using K- map to implement combinational logic circuits.
4. Design and analyze Synchronous and Asynchronous sequential Circuits.

Sr. No.	Experiments based on
1	Basic logic circuits: Logic gates verification using kit.
2	Introduction to Bread Board and Verify Truth Tables of basic Logic gates using BreadBoard.
3	Construction of half/full adder using XOR and NAND gates and verification of its operation.
4	Verify Binary to Gray and Gray to Binary conversion using NAND gates only.
5	Implementation of 4x1 multiplexer and 1x4 demultiplexer using logic gates.
6	Verify the truth table of D-flip-flops and JK- flip-flops.
7	Design and verify the 4-Bit Synchronous Counter.
8	Introduction to SPICE Digital model and commands. Verify Truth Tables of basic Logic gates & Universal Gates using <b>using SPICE</b> .
9	Design & verify Truth Table of Half adder & Full adder circuits <b>Logic simulator</b> .
10	Design & verify Truth Table of 4:1 Multiplexer & 1:4 Demultiplexer circuits <b>using SPICE</b> .

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**B. Tech SoE and Syllabus 2023**  
(Scheme of Examination w.e.f. 2023-24 onward)  
(Department of Civil Engineering)

**SoE No.**  
**23FY-101**

## B.Tech in FYC

### I SEMESTER

### 23GE1117-Get Set Go

#### Course Outcomes:

Upon successful completion of the course the students will be able to

1. Students will understand the importance of building trust in communication and learn how to use the 3Vs of communication (Visual, Vocal, Verbal) to energize their interactions.
2. The course will focus on leadership principles and styles, emphasizing how effective communication can motivate others and gain willing cooperation. Students will participate in activities like skits and team presentations to demonstrate their leadership skills.
3. The course will equip students with team management and organization skills, enabling them to lead and participate in team-building activities effectively.

<b>Unit:1</b>	<b>Build a foundation for success</b>	<b>6 Hours</b>
<p>Explain the Importance of Process of improvement, stating your Name with Impact, Recall and Use Names, Name Remembering Formula o LIRA o PACE – Individual Activity o BRAMMS o Chaining Method, Introduce “My Vision”</p> <p>Communication Fundamentals for Building Trust- Be a good listener, use conversation links, show genuine interest Hi-Five of Success ♣ Build on Memory Skills and Enhance Relationships ♣ PEG words ♣ Explain Permanent PEG Memory System, energize our Communications – Explain 3Vs of communication – Visual-Vocal-Verbal</p> <p>Activity – Practice Conversations, Pause-Part-Punch, Group Activity</p>		
<b>Unit:2</b>	<b>Increase Self Confidence</b>	<b>6 Hours</b>
<p>Use our experiences to communicate more confidently • Communicate with clarity and conciseness • Discover how past experiences influence behaviour ,Motivate Others and Enhance Relationships- • Learning Objectives • Explain Gain Willing Cooperation Principles • Group Presentation • Explain Demonstration of Leadership Principles • Explain “Evidence” critical in establishing credibility</p> <p>Individual Activity – Sharing of defining moment, Skit to demonstrate Leadership Principles, Stranded on Island .</p>		
<b>Unit:3</b>	<b>Fundamentals of Communication</b>	<b>6 Hours</b>
<p>Fundamentals of Communication (Earn the right – Excite -Eagerness) ♣ Elevator Pitch ♣ Develop more Flexibility, ♣ Recap and Summarize</p> <p>Activities - – Individual Presentation, Flexibility Drills, Individual Presentations – My Vision Assignment</p>		
<b>Unit:4</b>	<b>Team Management and Organization skills</b>	<b>5 Hours</b>
<p>Team Management and Organization skills, Leadership Styles, Effective Communication</p> <p>Activity- Team Presentation, Team building activities.</p>		
<b>EVALUATION</b>	<b>1 Hour</b>	<b>EVALUATION</b>
<b>WRITTEN TEST</b>		
<b>Total Lecture Hours</b>		<b>24 Hours</b>

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Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

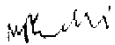

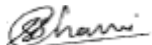
**B. Tech SoE and Syllabus 2023**  
(Scheme of Examination w.e.f. 2023-24 onward)  
(Department of Civil Engineering)

**SoE No.**  
**23FY-101**

## B.Tech in FYC

### Reference Books

- |   |   |
|---|---|
| 1 | Soft Skills - Enhancing Employability: Connecting Campus with Corporate. - M S Rao    |
| 2 | Soft Skills Training: A Workbook to Develop Skills for Employment - Frederick H Wentz |
| 3 | Soft Skills: Know Yourself and Know the World - Alex                                  |

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Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

(Accredited 'A++' Grade by NAAC with a score of 3.6)

Hingna Road, Wanadongri, Nagpur - 441 110



## **Bachelor of Technology SoE & Syllabus 2023 2<sup>nd</sup> Semester**

(Department of Electronics Engineering)

**B. Tech in CSE (IoT)**



Nagar Yuwak Shikshan Sanstha's  
**Yeshwantrao Chavan College of Engineering**  
 (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)  
**B.TECH SCHEME OF EXAMINATION 2023**  
 (Scheme of Examination w.e.f. 2023-24 onward)  
**(Department of Electronics Engineering)**  
**B. Tech in CSE (IOT)**

SoE No.  
23IoT-101

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/ P	Contact Hours					Credits	% Weightage			ESE Duration Hours
							L	T	P	Hrs	MSEs*		TA**	ESE		
FIRST SEMESTER (GROUP-B)																
1	1	BS	GE	23GE1102	Differential Equations, Matrices and Statistics	T	3	0	0	3	3	30	20	50	3	
2	1	BS	GE	23GE1110	Applied Physics	T	3	0	0	3	3	30	20	50	3	
3	1	BS	GE	23GE1111	Lab: Applied Physics	P	0	0	2	2	1		60	40		
4	1	BES	EE	23EE1101	Basic Electronics	T	3	0	0	3	3	30	20	50	3	
5	1	BES	EE	23EE1102	Lab : Basic Electronics	P	0	0	2	2	1		60	40		
6	1	BES	EL	23EL1102	Basic Electrical Engineering	T	3	0	0	3	3	30	20	50	3	
7	1	PC	EE	23EE1103	Digital Logic Design	T	3	0	0	3	3	30	20	50	3	
8	1	PC	EE	23EE1104	Lab : Digital Logic Design	P	0	0	2	2	1		60	40		
9	1	VSEC	GE	23GE1117	Get Set Go	...	...	...	...	...	2		60	40		
10	1	CC2	GE		Liberal Learning Course (LLC2)	...	...	...	...	...	2		60	40		
TOTAL FIRST SEM							15	0	6	21	22					

**MANDATORY LEARNING COURSES**

1	1	HS		GE2131	Universal Human Values (UHV)	A	2	0	0	2	0					
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SECOND SEMESTER (GROUP-B)																
1	2	BS	GE	23GE1201	Calculus and Vector	T	3	0	0	3	3	30	20	50	3	
2	2	BS	GE	23GE1206	Engineering Chemistry	T	3	0	0	3	3	30	20	50	3	
3	2	BS	GE	23GE1207	Lab: Engineering Chemistry	P	0	0	2	2	1		60	40		
4	2	HS/AEC1	GE	23GE1212	Professional Communication	T	2	0	0	2	2	30	20	50	2	
5	2	HS/IKS	GE	23GE1215	Indian Knowledge System	T	2	0	0	2	2	30	20	50	2	
6	2	BES	EE	23EE1205	Electronics Device and Circuit	T	3	0	0	3	3	30	20	50	3	
7	2	BES	EE	23EE1206	Lab: Electronics Device and Circuit	P	0	0	2	2	1		60	40		
8	2	BES	IT	23IT1203	Programming for Problem Solving	T	2	0	0	2	2	30	20	50	2	
9	2	BES	IT	23IT1204	Lab: Programming for Problem Solving	P	0	0	2	2	1		60	40		
10	2	VSEC	GE	23GE1218	Functional English	...	...	...	...	...	2		60	40		
11	2	CC1	GE		Liberal Learning Course (LLC1)	...	...	...	...	...	2		60	40		
TOTAL SECOND SEM							15	0	6	21	22					

**Liberal Learning Course**

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	2	CC2	GE	23LLC1201	Music (Vocal)
2	2	CC2	GE	23LLC1202	Music (Instrumental)
3	2	CC2	GE	23LLC1203	Indian Classical Dance
4	2	CC2	GE	23LLC1204	Other forms of Dances
5	2	CC2	GE	23LLC1205	Painting
6	2	CC2	GE	23LLC1206	Theatre and acting
7	2	CC2	GE	23LLC1207	Photography
8	2	CC2	GE	23LLC1208	Yoga
9	2	CC2	GE	23LLC1209	Chess
10	2	CC2	GE	23LLC1210	Athletics
11	2	CC2	GE	23LLC1211	Basket Ball
12	2	CC2	GE	23LLC1212	Judo
13	2	CC2	GE	23LLC1213	Elements of Japanese Language
14	2	CC2	GE	23LLC1214	Elements of German Language
15	2	CC2	GE	23LLC1215	Elements of French Language
16	2	CC2	GE	23LLC1216	Elements of Spanish Language
17	2	CC2	GE	23LLC1217	Basics of Vedic Maths
18	2	CC2	GE	23LLC1218	Skill in Microsoft Visio and Inkscape



Nagar Yuwak Shikshan Sanstha's  
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**B.TECH SCHEME OF EXAMINATION 2023**  
 (Scheme of Examination w.e.f. 2023-24 onward)  
 (Department of Electronics Engineering)  
**B. Tech in CSE (IOT)**

SoE No.  
23IoT-101

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/ P	Contact Hours				Credits	% Weightage			ESE Duration Hours
							L	T	P	Hrs		MSEs*	TA**	ESE	

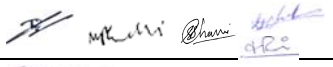

**Liberal Learning Course**

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	1	CC1	GE	23LLC1101	Music (Vocal)
2	1	CC1	GE	23LLC1102	Music (Instrumental)
3	1	CC1	GE	23LLC1103	Indian Classical Dance
4	1	CC1	GE	23LLC1104	Other forms of Dances
5	1	CC1	GE	23LLC1105	Painting
6	1	CC1	GE	23LLC1106	Theatre and acting
7	1	CC1	GE	23LLC1107	Photography
8	1	CC1	GE	23LLC1108	Yoga
9	1	CC1	GE	23LLC1109	Chess
10	1	CC1	GE	23LLC1110	Athletics
11	1	CC1	GE	23LLC1111	Basket Ball
12	1	CC1	GE	23LLC1112	Judo
13	1	CC1	GE	23LLC1113	Elements of Japanese Language
14	1	CC1	GE	23LLC1114	Elements of German Language
15	1	CC1	GE	23LLC1115	Elements of French Language
16	1	CC1	GE	23LLC1116	Elements of Spanish Language
17	1	CC1	GE	23LLC1117	Basics of Vedic Maths
18	1	CC1	GE	23LLC1118	Skilling in Microsoft Visio and Inkscape

**MSEs\* = Two MSEs of 15 Marks each will be conducted and marks of these 2 MSEs will be considered for Continuous Assessment**

**TA \*\* = for Theory : TA1-5 marks on Proctored Online Exam, TA2-12 marks on activities decided by course teacher, TA3 - 3 marks on class attendance**

**TA\*\* = for Practical : MSPA will be 15 marks each**

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(Department of Mathematics & Humanities)

**SoE No.**  
**23FY-101**

## B.Tech First Year

### II SEMESTER

### 23GE1201: Calculus and Vector

#### Course Outcomes :

##### The students will be able to

1. Apply the knowledge of differentiation to solve the Engineering problems.
2. Determine the derivatives of functions of several variables and develop the relations among the derivatives of variables.
3. Apply the knowledge of Beta and Gamma functions to find area, volume and mass.
4. Discuss Calculus of Scalar and vector point function and use appropriate theorems to evaluate integrals of functions of single and multiple variables.

<b>Unit I: Differential Calculus</b>	<b>(7 Hrs.)</b>
Successive differentiation, $n^{\text{th}}$ derivative of rational function, Trigonometrical transformations, $n^{\text{th}}$ derivative of the product of two functions (Leibnitz's theorem), Taylor's theorem, Use of Maclaurin's theorem for one variable, standard expansions, Examples on Taylor's Theorem. <b>(Contemporary Issues related to Topic)</b>	
<b>Unit II: Partial Differentiation</b>	<b>(8 Hrs.)</b>
Functions of several variables, First and higher order derivatives, Homogeneous functions, Euler's theorem on homogeneous function, Chain rule and total differential coefficient of composite functions. Jacobians. <b>(Contemporary Issues related to Topic)</b>	
<b>Unit III: Integral Calculus</b>	<b>(7 Hrs.)</b>
Improper integrals: Gamma and Beta functions, applications of integral calculus in computing area, length, volumes, and surface of solids of revolutions. <b>(Contemporary Issues related to Topic)</b>	
<b>Unit IV: Multiple integrals</b>	<b>(8 Hrs.)</b>
Double integral, change of order of integral, change of variables, triple integrals and its applications. <b>(Contemporary Issues related to Topic)</b>	
<b>Unit V: Vector Calculus</b>	<b>(7 Hrs.)</b>
Vector fields, Vector differentiation, Gradient, Divergence and Curl, Directional derivatives with physical interpretation, Solenoidal and irrotational motions. <b>(Contemporary Issues related to Topic)</b>	
<b>Unit VI: Vector Integration &amp; Applications</b>	<b>(8 Hrs.)</b>
Vector integration: Line, surface and volume integrals, Statement of Stoke's theorem, Gauss divergence theorem and Green's theorem (without proof), Simple applications of these theorems. <b>(Contemporary Issues related to Topic)</b>	
<b>Total Lecture</b>	<b>45 Hours</b>

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**SoE No.**  
**23FY-101**

## B.Tech First Year

### Textbooks:

1.	Erwin Kreyzig, Advance Engineering Mathematics, 10 <sup>th</sup> Edition, John Wiley and Sons, INC.
2.	H.K. Dass, Engineering Mathematics, 11 <sup>th</sup> revised edition, S. Chand, Delhi.
3.	H.K. Dass, Advanced Engineering Mathematics, 8 <sup>th</sup> revised edition, S. Chand, Delhi.
4.	Dr. B.S. Grewal, Higher Engineering Mathematics, 42 <sup>th</sup> edition, Khanna Publishers.
5.	P.N.Wartikar and J.N.Wartikar, Applied Mathematics, 4 <sup>th</sup> Edition, Vidyarthi GrihaPrakashan.

### Reference Books:


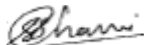
1.	G B Thomas and R L Finney, Calculus and Analytical Geometry, 9th edition, Addison-Wesley, 1999.
2.	Michael Spivak and Tom Apostol, Calculus, Vol I & Vol II 2 <sup>nd</sup> edition, Wiley.
3.	N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, 10 <sup>th</sup> edition, Laxmi Prakashan.

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1	<a href="http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Applied%20Sciences%20&amp;%20Humanities/Mathematics%20and%20Humanities/">http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Applied%20Sciences%20&amp;%20Humanities/Mathematics%20and%20Humanities/</a>
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### MOOCs Links and additional reading, learning, video material

1.	<a href="https://nptel.ac.in/courses/111/106/111106146/">https://nptel.ac.in/courses/111/106/111106146/</a>
2.	<a href="https://nitkkr.ac.in/docs/5-Multiple%20Integrals%20and%20their%20Applications.pdf">https://nitkkr.ac.in/docs/5-Multiple%20Integrals%20and%20their%20Applications.pdf</a>

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(Department of Applied Chemistry)  
**B.Tech First Year**

SoE No.  
23FY-101

## I/II SEMESTER

### 23GE1106/23GE1206: Engineering Chemistry

#### Course Outcomes :

Upon successful completion of the course the students will be able to:

1. **Build** the knowledge of qualitative and quantitative aspects of water for industrial and domestic applications. (L3)
2. **Apply** fundamental principles of electrochemistry to understand corrosion, energy storage devices and their industrial applications. (L3)
3. **Develop** insight into spectroscopic techniques for material characterization. (L3)
4. **Utilize** knowledge of advanced engineering materials for technological applications. (L3).

#### Unit I: Water Chemistry

(8 Hrs.)

Introduction, Potable water quality parameters. Hardness, Types of hardness. Sterilization. Desalination of water by R.O. Softening of water by Zeolite process and Ion Exchange Process (principle, advantages, and limitations). Numerical based on Hardness and Zeolite process. Boiler trouble (Scale and sludge). Contemporary issues related to the topic.

#### Unit II: Electrochemistry

(8 Hrs.)

Introduction, Redox reactions, EMF of a cell, standard electrode potential, Nernst equation, numerical and applications to chemical cells. Conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Electrolysis, laws of electrolysis and numerical.

Industrial applications: Electroplating, Electrolytic refining.

**Corrosion:** Definition, Causes, theories of corrosion- dry, wet and differential aeration.

Contemporary issues related to the topic.

#### Unit III: Energy storage devices

(7 Hrs.)

**Battery:** Introduction, Characteristics, and General applications

Lithium-ion battery, Glass battery,  $H_2$ - $O_2$  Fuel cell. Differences between Battery and Fuel cell. Recycling and safe disposal of batteries.

**Supercapacitors:** Definition, Types, Characteristics, and Application.

**$H_2$  as a green fuel:** Introduction, Production, Storage, and Utilization. Contemporary issues related to the topic.

#### Unit IV: Spectroscopic Techniques and Applications

(7 Hrs.)

Introduction, fundamentals, types, principles, and selection rules of spectroscopy.

Basic principle and applications of UV- Visible, IR, NMR Spectroscopy and numerical.

Contemporary issues related to the topic.

#### Unit V: Drugs & Polymer chemistry

(8 Hrs.)

**Drugs:** Introduction, types of drugs, synthesis of commonly used drug molecules such as aspirin and paracetamol.



**Polymer:** Introduction, Classification of polymers, Use and disposal of polymers.

Properties of polymers - Solubility, Molecular Weight, Crystallinity and Glass transition temperature.

Synthesis of conducting polymers: Polyaniline, Polypyrrole. Contemporary issues related to the topic.

#### Unit VI: Advanced Materials

(7 Hrs.)

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## B.Tech in CT/IT/CSE/AIDS/AIML/CSD/CSE-IoT

**Nanomaterials:** Definition, Carbon Nanotubes and types. Applications of Nanomaterials in Electronics, Environment and Medicine.

**Chemical sensors:** Types and application.

**Liquid Crystal Polymers:** Introduction, General properties and applications.

**Polymers in electronic industries:** Introduction, Piezo, Pyroelectric, Ferroelectric polymers.

**Smart materials:** Introduction, Properties and applications of Chromoactive, Photoactive and Magneto rheological materials. Contemporary issues related to the topic

Total Lecture 45 Hours

### Text books

- 1 S S. Dara, A Textbook of Engineering Chemistry, S. Chand & Co New Delhi. Eleventh Edition.
- 2 P.C. Jain and Monica Jain, Engineering Chemistry, Dhanpat Rai & sons New Delhi, Sixteenth Edition.
- 3 P. W. Atkins, Physical Chemistry, Oxford Publications, Eighth edition.
- 4 Y.R. Sharma, Elementary organic spectroscopy, S. Chand and company private limited.

### Reference Books



1. B.K.Sharma Krishna, Engineering Chemistry, Prakashan media private LTD. 1st Edition, 2014.
2. CNR Rao, Chemistry of Advanced Materials, Willey Publications, 1993.
3. Fred. Billmeyer Jr., A textbook of polymer science, Wiley India, 2nd Edition.
4. Robert B Leighou, Chemistry of Engineering Materials, Hill Book Company, Inc New York
5. C.N. Banwell, Fundamentals of Molecular Spectroscopy, Mc Graw hill education, 4th Edition
6. William C. O'Mara, Robert B. Herring, Handbook of Semiconductor Silicon Technology, Noyes Publications Park Ridge, NJ, USA. 1st Edition.

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

- 1 <http://103.152.199.179/YCCE/Supported%20file/Supported%20file/SERIES%20WISE%20BOOKS/CHEMISTRY/>

### MOOCs Links and additional reading, learning, video material

- 1 <https://www.youtube.com/watch?v=XTt3gXB0a84>
- 2 <https://www.youtube.com/watch?v=iihYXx79QiE>
- 3 <https://www.youtube.com/watch?v=JfJ7MIP9Dco>
- 4 <https://www.youtube.com/watch?v=L2VSOccUrSk>
- 5 <https://www.youtube.com/watch?v=p5pk4Um6lsk>
- 6 <https://www.youtube.com/watch?v=zVDMgoffmC0>

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**B.Tech First Year**

**SoE No.**  
**23FY-101**

## I/II SEMESTER

### 23GE1107/23GE1207: Engineering Chemistry Lab

#### Course Objectives (PR)

- 1) Develop analytical ability.
- 2) Integrate chemistry fundamentals with practical applications.

#### Course Outcomes



##### Upon successful completion of the course the students will be able to

1. **Apply** the knowledge of quantitative and qualitative chemical analysis to perform record and analyze the results. (L3)
2. **Experiment** with instrumental and analytical techniques in Chemistry to solve engineering problems related to sustainability. (L3)
3. **Write** effective reports and communicate through oral presentations. (L3)
4. **Review** and apply laboratory safety protocols and procedures to acquire the ability for independent and lifelong learning. (L3)

**Total 9 experiments are to be performed**

**(4 each from Lab I and Lab II and one demonstration experiment)**

SN	Experiments based on
	<b>List of Experiments-Lab- I</b>
1	Estimation of Nickel.
2	Estimation of $\text{Fe}^{2+}$ ions by redox titration
3	Determination of copper by iodometric titration
4	Determination of Cation exchange capacity of an ion exchange resin
5	To determine the strength of a given potassium dichromate solution with N/20 sodium thiosulphate solution
6	Determination of COD of water sample.
	<b>List of Experiments-Lab- II</b>
1	Determination of viscosity of lubricating oil by Redwood Viscometer I or II
2	Determination of molecular weight of a polymer.
3	Proximate analysis of coal
4	Determination of electrochemical equivalence of copper using Faradays Law
5	Determination of strength of the given acid conductometrically.
6	To verify Beer-Lambert law for $\text{KMnO}_4$ calorimetrically and determine the concentration of the given solution of $\text{KMnO}_4$ .
	<b>List of Demonstration Experiments</b>
1	Synthesis of urea formaldehyde.

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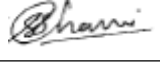
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(Department of Applied Chemistry)

## B.Tech in CT/IT/CSE/AIDS/AIML/CSD/IOT

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Advanced Topics (CBS)	
1.	To Determine optimum alum dosage for water or wastewater treatment by turbidity measurement using nephelometer and residual chlorine testing using chloroscope.
2.	Comparative study of effects of different drying techniques on the quality of fruits and vegetables.

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(Department of Mathematics & Humanities)

**SoE No.**  
**23FY-101**

## B.Tech First Year

### II SEMESTER

### 23GE1212 : Professional Communication

#### Course Outcomes :

**Upon successful completion of the course the students will be able to:**

1. Apply different modes for effective communication
2. Produce competently the Phonology of English language
3. Apply nuances of LSRW skills
4. Practice Communication through different channels

#### Unit I: Basics of Communication

(7 Hrs.)

Process of Communication, Levels of Communication, Flow of Communication, Networks of Communication, Classification of Barriers (Intrapersonal, Interpersonal, Organizational).

#### Unit II: English Phonetics

(8 Hrs.)

Speech Mechanism, Organs of speech, Consonant and Vowels sounds symbols, word stress rules

#### Unit III: Presentation & Interview Skills

(7 Hrs.)

Presentation-Nuances of presentation- Kinesics, Proxemics, Chronemics, Vocalics, Modes of Presentation,

Interview-Purpose, expectations of employer and preparation for Interview, Types, Types of Questions & Answering Techniques, Telephonic Interviews – preparation and guidelines

#### Unit IV: Technical Reports, Memo & E-Mail Etiquettes

(8 Hrs.)

Report -Types, Characteristics, prewriting aspects of report and preparing writing of reports


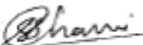
Memo- Objectives, Types, Structure and Layout

Email-Etiquette, acronyms.

**Total Lecture 30 Hours**

#### Textbooks:

1. Meenakshi Raman & Sangeeta Sharma, Technical Communication, Raman & Sharma, Oxford University Press Orford University Press
2. T. Balasubramaniam, Textbook of English Phonetics for Indian Students, Macmillan India Ltd
- 3.

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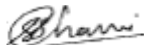
## B.Tech First Year

### Reference Books:

1.	Dale Carnegie ,How to Develop Self – Confidence & Influence People by Public Speaking
2.	Asha Kaul, Communication Skills
3.	Allen Peas ,Body Language
4.	Gerson's Gerson, Technical Communication

### MOOCs Links and additional reading, learning, video material

1.	<a href="https://dl.uswr.ac.ir/bitstream/Hannan/141245/1/9781138219120.pdf">https://dl.uswr.ac.ir/bitstream/Hannan/141245/1/9781138219120.pdf</a>
2.	<a href="https://www.pdfdrive.com/word-power-made-easy-the-complete-handbook-for-building-a-superiorvocabulary-e157841139.html">https://www.pdfdrive.com/word-power-made-easy-the-complete-handbook-for-building-a-superiorvocabulary-e157841139.html</a>
3.	<a href="https://www.pdfdrive.com/improve-your-communication-skills-present-with-confidence-write-with-stylelearn-skills-of-persuasion-e156963640.html">https://www.pdfdrive.com/improve-your-communication-skills-present-with-confidence-write-with-stylelearn-skills-of-persuasion-e156963640.html</a>
4.	<a href="https://www.pdfdrive.com/21-days-of-effective-communication-everyday-habits-and-exercises-to-improveyour-communication-skills-and-social-intelligence-e158273760.html">https://www.pdfdrive.com/21-days-of-effective-communication-everyday-habits-and-exercises-to-improveyour-communication-skills-and-social-intelligence-e158273760.html</a>

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## B.Tech First Year

### II SEMESTER

### 23GE1215 : Indian Knowledge System

#### Course Outcomes:



Upon successful completion of the course the students will be able to

1. Apply primary requirements pertaining towards awareness of Indian Knowledge System.
2. Analyze various Indian society, culture and literature to enhance their traditions.
3. Evaluate structure of Indian art.
4. Understand Indian heritage and architectural skills.

<b>Unit:1</b>	<b>Introduction to Indian Civilization</b>	<b>7 Hours</b>
Development of Human Civilization with specific reference: Stone age: Tool Technology and Cultural Development, Indus Valley civilization, Vedic Civilization. (Contemporary Issues related to Topic)		
<b>Unit:2</b>	<b>Indian Society, Culture and Literature</b>	<b>7 Hours</b>
Society and its types, Culture and its Characteristics, Foundational Literature. (Contemporary Issues related to Topic)		
<b>Unit:3</b>	<b>Tradition of Indian Art and Painting</b>	<b>8 Hours</b>
Indian Traditional Painting, Art style folk, mural with Gandhara and Mathura school of art. (Contemporary Issues related to Topic)		
<b>Unit:4</b>	<b>Indic Traditions of Architecture, Design and Planning</b>	<b>8 Hours</b>
Monumental studies of architectural skill: Rock Cut Caves, Stupa and Temple Architecture, The Ancient cities of Indus Saraswati region. Town Planning and drainage system. (Contemporary Issues related to Topic)		
<b>Total Lecture Hours</b>		<b>30 Hours</b>

#### Textbooks

1	Reader's Digest: Vanished Civilizations, THE READER'S DIGEST ASSOCIATION LIMITED, LONDON, NEWYORK.
2	Qaiser Zoha Alam ; Language and Literature Divers Indian Experience
3	Bal Ram Singh (Author), Nath Girish (Author) ; Science and Technology in Ancient Indian Texts
4	NCERT Books

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## B.Tech First Year

### Reference Books


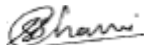
1	B S Harishankar; Art and Archaeology of India: Stone Age to the Present, 2003.
2	Gupte R S and Mahajan B D; Ajanta, Ellora and Aurangabad, 1962.
3	Dharampal, Some Aspects of Earlier Indian Society and Polity and Their Relevance Today, New Quest Publications, Pune, 1987.
4	Michel Lorblanchet, "Rock Art In The Old World" IGNCA series, in India
5	Percy Brown, "Indian Architecture" D. B. Taraporevala sons & co. Pvt. Ltd. Bombay(1959).

### PPT's/Research papers

1	<a href="https://www.researchgate.net/publication/360889208_STONE_AGE_TOOL_TECHNOLOGY_and_CULTURAL_DEVELOPMENT">https://www.researchgate.net/publication/360889208_STONE_AGE_TOOL_TECHNOLOGY_and_CULTURAL_DEVELOPMENT</a>
2	<a href="https://scholar.google.com/citations?view_op=view_citation&amp;hl=en&amp;user=iT1KSV8AAAAJ&amp;sortBy=pubdate&amp;citation_for_view=iT1KSV8AAAAJ:UcHWp8X0CEIC">https://scholar.google.com/citations?view_op=view_citation&amp;hl=en&amp;user=iT1KSV8AAAAJ&amp;sortBy=pubdate&amp;citation_for_view=iT1KSV8AAAAJ:UcHWp8X0CEIC</a>

### MOOCs Links and additional reading, learning, video material

1	<a href="https://prepp.in/news/e-492-indian-architecture-art-and-culture-notes">https://prepp.in/news/e-492-indian-architecture-art-and-culture-notes</a>
2	<a href="https://www.artzolo.com/blog/most-famous-indian-painting-styles">https://www.artzolo.com/blog/most-famous-indian-painting-styles</a>
3	<a href="https://www.researchgate.net/publication/360889332_Stone_Age_Tool_Technology_Cultural_Development">https://www.researchgate.net/publication/360889332_Stone_Age_Tool_Technology_Cultural_Development</a>
4	<a href="https://testbook.com/ias-preparation/ancient-history-16-mahajanapadas">https://testbook.com/ias-preparation/ancient-history-16-mahajanapadas</a>

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(Department of Electronics Engineering)

## B.Tech in Electronics Engineering

**SoE No.**  
**23EE-101**

### II SEMESTER

### 23EE1205 : Electronics Device and Circuit

#### Course Outcomes:

#### Upon successful completion of the course the students will be able to

1. Understand the principles of semiconductor Physics and apply it to electronic devices
2. Appreciate different devices for different applications.
3. Understand and utilize the mathematical models of semiconductor devices for circuits.
4. Understand the basic processes required for fabrication of electronic devices.

<b>Unit:1</b>	<b>Introduction to Semiconductor Physics:</b>	<b>7 Hours</b>
Review of Quantum Mechanics, Electrons in periodic Lattices, E-k diagrams. Energy bands in intrinsic and extrinsic silicon; Carrier transport: diffusion current, drift current, mobility and resistivity.		
<b>Unit:2</b>	<b>Semiconductor Physics for devices:</b>	<b>7 Hours</b>
Generation and recombination of carriers; Poisson and continuity equation, P-N junction characteristics, I-V characteristics, and small signal switching models; Avalanche breakdown, Zener diode, Schottky diode.		
<b>Unit:3</b>	<b>Diode Circuits and applications</b>	<b>7 Hours</b>
Rectifiers, Clippers, Clampers, zener Voltage regulators, LED, photodiode and solar cell.		
<b>Unit:4</b>	<b>Transistors</b>	<b>7 Hours</b>
Bipolar Junction Transistor, I-V characteristics, Ebers Moll Model, MOS capacitor, MOSFET, I-V characteristics, and small signal models of MOS transistor.		
<b>Unit:5</b>	<b>Transistors Biasing</b>	<b>7 Hours</b>
Biasing schemes for BJT and FET amplifiers, bias stability, various configurations (such as CE/CS, CB/CG, CC/CD) and their features.		
<b>Unit :6</b>	<b>Integrated circuit fabrication process:</b>	<b>6 Hours</b>
Oxidation, diffusion, ion implantation, photolithography, etching, chemical vapor deposition, sputtering, twin-tub CMOS process.		
<b>Total Lecture Hours</b>		<b>41 Hours</b>

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Chairperson	Dean (Acad. Matters)	Dean OBE	Date of Release	Version	



Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

## B. Tech SoE and Syllabus 2023

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Electronics Engineering)

## B.Tech in Electronics Engineering

SoE No.  
23EE-101

### Textbooks

- |   |   |
|---|---|
| 1 | G. Streetman, and S. K. Banerjee, Solid State Electronic Devices, 7th edition, Pearson, 2014.                     |
| 2 | Donald Neamen, Dhrubus Biswas "Semiconductor Physics and Devices" McGraw-Hill Education                           |
| 3 | Jacob Millman, Christos Halkias & Chetan D Parikh, "Integrated Electronics", 2nd Edition, McGraw Hill India, 2017 |

### Reference Books

- |   |   |
|---|---|
| 1 | S. M. Sze and K. N. Kwok, Physics of Semiconductor Devices, 3rd edition, John Wiley & Sons, 2006. |
| 2 | Y. Tsividis and M. Colin, Operation and Modeling of the MOS Transistor. Oxford Univ. Press, 2011. |
| 3 | A.S. Sedra and K.C. Smith, Microelectronic Circuits, Saunders College Publishing, Edition IV      |

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

- |   |   |
|---|---|
| 1 | <a href="http://103.152.199.179/YCCE/yccelibrary.html">http://103.152.199.179/YCCE/yccelibrary.html</a> |
|---|---|

### MOOCs Links and additional reading, learning, video material

- |   |   |
|---|---|
| 1 | <a href="https://nptel.ac.in/courses/117103063">https://nptel.ac.in/courses/117103063</a>                                 |
| 2 | <a href="https://nptel.ac.in/courses/108108112">https://nptel.ac.in/courses/108108112</a>                                 |
| 3 | <a href="https://onlinecourses.nptel.ac.in/noc23_ee120/preview">https://onlinecourses.nptel.ac.in/noc23_ee120/preview</a> |
| 4 | <a href="https://nptel.ac.in/courses/108107142">https://nptel.ac.in/courses/108107142</a>                                 |

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# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

## B. Tech SoE and Syllabus 2023

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Electronics Engineering)

## B.Tech in Electronics Engineering

SoE No.  
23EE-101

### II SEMESTER

### 23EE1206 : Lab. Electronics Device and Circuit

#### Course Outcomes:

Upon successful completion of the course the students will be able to

1. Understand the principles of semiconductor Physics and apply it to electronic devices
2. Appreciate different devices for different applications.
3. Understand and utilize the mathematical models of semiconductor devices for circuits.
4. Understand the basic processes required for fabrication of electronic devices.

Sr. No.	Experiments based on
1	To plot the V- I characteristics of PN junction diode (Si and Ge) using breadboard and on experimental kit.
2	To plot the V- I characteristics of Zener diode.
3	To study half wave and full wave rectifier with and without capacitive filter.
4	To perform the clipper and clamper circuit using breadboard.
5	To plot I/P & O/P Characteristics of Common Base Transistor Configuration. Find I/P & O/P Resistance and Current Gain.
6	To plot I/P & O/P Characteristics of Common Emitter Transistor Configuration. Find I/P & O/P Resistance and Current Gain.
7	To perform the Drain and Transfer characteristics of Field Effect Transistor (FET).
8	To perform the Fixed Bias circuit of transistor.
9	To perform the Self Bias circuit of transistor

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# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech SoE and Syllabus 2023**  
(Scheme of Examination w.e.f. 2023-24 onward)  
(Department of Information Technology)

**SoE No.  
23IT-101**

## B.Tech in Information Technology

### II SEMESTER

### 23IT1203 : Programming for Problem Solving

#### Course Outcomes :

- 1) Understand the basics of computer system operations and algorithms, flowcharts.
- 2) Apply the basics of C programming for problem solving.
- 3) Apply and analyze the different dimensional arrays for problem solving.
- 4) Understand the basics of string, structure, and union and apply them to problem solving.

#### Unit I: Computer System Basics:

**(3 Hrs.)**

Basics of programming and problem solving. Introduction to algorithms and flowcharts, Types of programming errors, basic input/output statements and functions (scanf, printf, getch, putch, gets, puts ), Introduction to library functions,

#### Unit II: Basic of C Programming

**(6 Hrs.)**

**Basic building blocks of C:** Character set, variables, identifiers & keywords, Data types, Operators: arithmetic, logical and relational operators, , bitwise operators, precedence of operators, Expressions, sizeof() operator, constants, typedef statement, writing straight line programs. Decision control statements: if, if - else and nested if-else statements, else-if ladder statement, switch-case control statement.

#### Unit III: Loop Structures:

**(5 Hrs.)**

While, do while and for loops, break and continue statement, “goto” statement, real life programming examples based on these loop structures, real life programming examples.

#### Unit IV: Modular Programming:

**(6 Hrs.)**

Concept of functions, user defined functions, function prototypes, formal parameters, actual parameters, return types, call by value , call by reference, C programs using functions, Recursive functions, comparing recursion against iteration, C programs using recursive functions, real life programming examples

#### Unit V: Arrays:

**(6 Hrs.)**

One dimensional array, array manipulation, insertion, deletion of an element, searching techniques- Linear and binary search, sorting technique – Bubble sort. Two-dimensional arrays: matrix representation, programs for basic matrix operations such as addition, multiplication and transpose, Array as function arguments. real life programming examples

#### Unit VI: String, Structure and Union:

**(4 Hrs.)**

Strings: string representation and string handling functions, Introduction to pointer, structure and union. real life programming examples

**Total Lecture 30 Hours**

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Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

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## B. Tech SoE and Syllabus 2023

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Information Technology)

## B.Tech in Information Technology

SoE No.  
23IT-101

### Text books

1	The C Programming Language, J.B.W.Kernighan & D.M.Ritchie, Prentice Hall
2	Mastering C, K.R.Venugopal & S.R. Prasad, TMH, 2007.
3	Programming in ANSI C, E. Balaguruswamy, Mc Graw Hill Education

### Reference Books

1	Problem Solving And Program Design In C, Jeri. R. Hanly, Elliot B. Koffman, Pearson Education.
2	Programming with C, Byron Gottfried, Schaum;s Outline Series
3	How to solve it by computers, R. G. Dromey, Prentice Hall India

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1	<a href="http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books">http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books</a>
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### MOOCs Links and additional reading, learning, video material

1	<a href="https://nptel.ac.in/courses/106104128">https://nptel.ac.in/courses/106104128</a>
2	<a href="https://nptel.ac.in/courses/106104128">https://nptel.ac.in/courses/106104128</a>
3	<a href="https://www.youtube.com/watch?v=rQoqCP7LX60&amp;list=PLxgZQoSe9cg1drBnejUaDD9GEJBGQ5hMt">https://www.youtube.com/watch?v=rQoqCP7LX60&amp;list=PLxgZQoSe9cg1drBnejUaDD9GEJBGQ5hMt</a>

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Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech SoE and Syllabus 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Information Technology)

## B.Tech in Information Technology

**SoE No.  
23IT-101**

### II SEMESTER

### 23IT1204 : Lab. Programming for Problem Solving

#### Course Outcomes: Students will be able to

- 1) Understand the basics of computer system operations and algorithms, flowcharts.
- 2) Apply the basics of C programming for problem solving.
- 3) Apply and analyze the different dimensional arrays for problem solving.
- 4) Understand the basics of string, structure, and union and apply them to problem solving.

<b>Unit I: Computer System Basics:</b>	<b>(3 Hrs.)</b>
Basics of programming and problem solving. Introduction to algorithms and flowcharts, Types of programming errors, basic input/output statements and functions (scanf, printf, getch, putch, gets, puts ), Introduction to library functions,	
<b>Unit II: Basic of C Programming</b>	<b>(6 Hrs.)</b>
<b>Basic building blocks of C:</b> Character set, variables, identifiers & keywords, Data types, Operators: arithmetic, logical and relational operators, , bitwise operators, precedence of operators, Expressions, sizeof() operator, constants, typedef statement, writing straight line programs. Decision control statements: if, if - else and nested if-else statements, else-if ladder statement, switch-case control statement.	
<b>Unit III: Loop Structures:</b>	<b>(5 Hrs.)</b>
While, do while and for loops, break and continue statement, "goto" statement, real life programming examples based on these loop structures, real life programming examples.	
<b>Unit IV: Modular Programming:</b>	<b>(6 Hrs.)</b>
Concept of functions, user defined functions, function prototypes, formal parameters, actual parameters, return types, call by value , call by reference, C programs using functions, Recursive functions, comparing recursion against iteration, C programs using recursive functions, real life programming examples	
<b>Unit V: Arrays:</b>	<b>(6 Hrs.)</b>
One dimensional array, array manipulation, insertion, deletion of an element, searching techniques- Linear and binary search, sorting technique – Bubble sort. Two-dimensional arrays: matrix representation, programs for basic matrix operations such as addition, multiplication and transpose, Array as function arguments. real life programming examples	
<b>Unit VI: String, Structure and Union:</b>	<b>(4 Hrs.)</b>
Strings: string representation and string handling functions, Introduction to pointer, structure and union. real life programming examples	
<b>Total Lecture</b>	<b>30 Hours</b>

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# Yeshwantrao Chavan College of Engineering

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## B. Tech SoE and Syllabus 2023

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Information Technology)

## B.Tech in Information Technology

SoE No.  
23IT-101

### Text books

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3	Programming in ANSI C, E. Balaguruswamy, Mc Graw Hill Education

### Reference Books

1	Problem Solving And Program Design In C, Jeri. R. Hanly, Elliot B. Koffman, Pearson Education.
2	Programming with C, Byron Gottfried, Schaum;s Outline Series
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2	<a href="https://nptel.ac.in/courses/106104128">https://nptel.ac.in/courses/106104128</a>
3	<a href="https://www.youtube.com/watch?v=rQoqCP7LX60&amp;list=PLxgZQoSe9cg1drBnejUaDD9GEJBGQ5hMt">https://www.youtube.com/watch?v=rQoqCP7LX60&amp;list=PLxgZQoSe9cg1drBnejUaDD9GEJBGQ5hMt</a>

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# Yeshwantrao Chavan College of Engineering

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## B. Tech SoE and Syllabus 2023

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Information Technology)

## B.Tech in Information Technology

SoE No.  
23IT-101

### List of Practical

SN	Unit	Name Of The Practical	Remark	CO'S Mapped	PO'S Mapped
1(A)		Introduction to Linux Operating system & it's different commands.	Manual	CO 1	PO1
1(B)		Introduction to Vi editor, Compilation and Execution of a program in Linux.	Manual	CO 1	PO1
2	II	Practical based on Arithmetic and Conditional operators.	Operators	CO 1	PO1
3	II	Practical based on Conditional and Unconditional Statements.	Conditional Statements	CO 1	PO1
4	III	Practical based on Entry Controlled Looping Statements.	For / While Loop	CO 2	PO 1, PO 2
5	III	Practical based on Exit Controlled Looping Statement	Do while Loop	CO 2	PO 1, PO 2
6	IV	Practical based on Functions and Recursion.	Functions / Recursion	CO 3	PO2, PO3
7	V	Practical based on 1-D Array.	1D Array	CO 3	PO2, PO3
8	V	Practical based on 2-D Array.	2D Array	CO 3	PO2, PO3
9	VI	Practical based on Strings.	Strings & Pointers	CO 3	PO2, PO3
10	VI	Practical based on Structures.	Structures	CO 4	PO1, PO2, PO3

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# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech SoE and Syllabus 2023**  
(Scheme of Examination w.e.f. 2023-24 onward)  
(Department of Mathematics & Humanities)

**SoE No.**  
**23FY-101**

## B.Tech First Year

### II SEMESTER

### 23GE1218 : Functional English

#### Course Outcomes:

**Upon successful completion of the course the students will be able to**

1. Understand the concept of FE (Functional English) and its application in various real-life scenarios.
2. Develop basic interactive communication skills, including greetings, asking for information, stating opinions, and providing feedback.
3. Acquire knowledge of social networking, texting, instant messaging, blogs, and discussion boards, along with the ethical considerations associated with online communication.
4. Successfully complete quizzes and assignments assessing knowledge in the covered topics of FE, social media, tenses, and effective communication.

Unit:1	Introduction to Functional English	6 Hours
What is FE? And Areas of application. Basic Interactive sentences - Greetings & Replies, Asking for information, Telling people what you do, Asking somebody's opinion, Giving your opinion, Saying someone is correct, Saying that someone is wrong, Apologizing, Praising someone's work, Saying goodbye. Introduction & Basics of Common Expressions – Offer, Request, Gratitude, Apology. Modal Verbs - Words used often: Can- could, Will – would, Shall – should, Ought to-Must, May-might. Practice exercises, Practice Conversations, Script Activity		
Unit:2	Internet & Social Media Communication	6 Hours
Introduction & Basics to Social Networking, Texting & Instant messaging, Blogs & Discussion Board- discussion with examples, Ethics of social media & communication Topic: Introduction to Creative Ads Why Ads, What's in it for me? Characteristics of ads. Assignment Quiz on the above Topics, Exercises for Evaluation		
Unit:3	TENSES	6 Hours
Introduction & Basics, Simple Tense (Past, Present, Future), Continuous Tense (Past, Present, Future) – discussion with examples. Introduction & Basics, Perfect Tense (Past, Present, Future), Perfect Continuous Tense (Past, Present, Future) – discussion with examples Introduction to Movie Magic, Learn English with films, Film Vocabulary, Describing a film, Types of Films Assessment – Letter and Email Writing, Tenses – Quiz		
Unit:4	Written Communication	5 Hours
Introduction & Basics of Writing, five methods of communication, Mind your grammar, Commonly confusing words Letters – Format, Parts of a business letter, When does communication fail?, Things to remember, Positive language not negative language, Active voice not passive voice Effective emailing -How to make an effective e-mail, Few common e-mail habits that cause problems, Parts of an e-mail, Some other important aspects.		

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**B. Tech SoE and Syllabus 2023**  
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(Department of Mathematics & Humanities)

**SoE No.**  
**23FY-101**

## B.Tech First Year

Assignment Presentation on Mad Ads, Quiz on Tenses and social media-Internet Communication  
Topic: Activity Extempore

<b>EVALUATION</b>			<b>1 Hour</b>
<b>WRITTEN TEST</b>	<b>TA=60</b>	<b>ESE=40</b>	<b>TOTAL=100</b>
<b>Total Lecture Hours</b>			<b>24 Hours</b>

### Reference Books

- 1 How to win friends & influence people – Dale Carnegie
2. Functional English for Communication - Ujjwala Kakarla
- 3 Functional English for Technical Students – Dr Prathibha Mahato & Dr Dora Thompson

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Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

(Accredited 'A++' Grade by NAAC with a score of 3.6)

Hingna Road, Wanadongri, Nagpur - 441 110



## **Bachelor of Technology SoE & Syllabus 2023 3<sup>rd</sup> Semester**

(Department of Electronics Engineering)

**B. Tech in CSE (IoT)**



Nagar Yuwak Shikshan Sanstha's  
**Yeshwantrao Chavan College of Engineering**  
 (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)  
**B.TECH SCHEME OF EXAMINATION 2023**  
 (Scheme of Examination w.e.f. 2023-24 onward)  
**(Department of Computer Technology)**  
**B. Tech in Computer Science and Engineering (IOT)**

SoE No.  
23IoT-101

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
							L	T	P	Hrs		MSEs*	TA**	ESE	
THIRD SEMESTER															
1	3	HSSM-I	GE	23GE1301	Fundamentals of Economics & Management	T	2	0	0	2	2	30	20	50	3
2	3	PC	EE	23IOT1301	Microcontroller & Interfacing	T	3	0	0	3	3	30	20	50	3
3	3	PC	EE	23IOT1302	Lab : Microcontroller & Interfacing	P	0	0	2	2	1		60	40	
4	3	PC	EE	23IOT1303	Computer Architecture Organization	T	3	0	0	3	3	30	20	50	3
5	3	PC	CT	23IOT1304	Data Structures	T	3	0	0	3	3	30	20	50	3
6	3	PC	CT	23IOT1305	Lab.: Data Structures	P	0	0	2	2	1		60	40	
7	3	PC	CT	23IOT1306	Lab: Computer Workshop	P	0	0	2	2	1		60	40	
8	3	VEC-2	CT	23IOT1307	Basics of Python Programming	T	2	0	0	2	2	30	20	50	3
9	3	CEP	CT	23IOT1308	Community Engagement Project	P	0	0	2	4	2		60	40	
10	3	OE-1	OE		Open Elective-I	T	2	0	0	2	2	30	20	50	3
11	3	MDM	CT		MD Minor Course-I	T	2	0	0	2	2	30	20	50	3
TOTAL							17	0	8	27	22				

**List of Mandatory Learning Course (MLC)**

1	3	HS	T&P	MLC2123	YCAPP3 : YCCE Communication Aptitude Preparation	A	3	0	0	3	0				
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**Open Elective - I**

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	3	OE1	GE	23OE1301	OE-I : Combinatorics
2	3	OE1	GE	23OE1302	OE-I : Fuzzy Set Theory, Arithmetic And Logic
3	3	OE1	GE	23OE1303	OE-I : Green Chemistry & Sustainability
4	3	OE1	GE	23OE1304	OE-I : Hydrogen Fuel
5	3	OE1	GE	23OE1305	OE-I : Electronic Materials And Applications
6	3	OE1	GE	23OE1306	OE-I : Laser Technology And Applications
7	3	OE1	MGT	23OE1307	OE-I : Finance And Cost Management
8	3	OE1	MGT	23OE1308	OE-I : Operation Research Techniques
9	3	OE1	MGT	23OE1309	OE-I : Project Evaluation & Management
10	3	OE1	MGT	23OE1310	OE-I : Total Quality Management
11	3	OE1	MGT	23OE1311	OE-I : Value Engineering
12	3	OE1	MGT	23OE1312	OE-I : Maintenance Management
13	3	OE1	MGT	23OE1313	OE-I : Industrial Safety
14	3	OE1	MGT	23OE1314	OE-I : Industry 4.0
15	3	OE1	MGT	23OE1315	OE-I : Operation Management
16	3	OE1	MGT	23OE1316	OE-I : Material Management
17	3	OE1	MGT	23OE1317	OE-I : Hospitality Management
18	3	OE1	MGT	23OE1318	OE-I : Human Resource Management & Organizational Behaviour
19	3	OE1	MGT	23OE1319	OE-I : Agri-Business Management
20	3	OE1	MGT	23OE1320	OE-I : Rural Marketing
21	3	OE1	MGT	23OE1321	OE-I : Marketing Management
22	3	OE1	MGT	23OE1322	OE-I : Health Care Management
23	3	OE1	MGT	23OE1323	OE-I : Designated approved online NPTEL/KKSU Course
24	3	OE1	MGT	23OE1324	OE-I : Indian Archeology
25	3	OE1	MGT	23OE1325	OE-I : Social & Positive Psychology
26	3	OE1	MGT	23OE1326	OE-I : Seismology & Earthquake

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Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech SoE and Syllabus 2023**  
(Scheme of Examination w.e.f. 2023-24 onward)  
(Department of Computer Technology)

**SoE No.  
23IoT-101**

## B.Tech in CSE (IoT)

### III SEMESTER

### 23GE1301: Fundamentals of Management & Economics

#### Course Outcomes:

Upon successful completion of the course the students will be able to

1. Develop the Managerial Perspective and perform the various functions of management for optimum utilization of Engineering Resources
2. Identify and Analyze the role of Financial Accountancy and Marketing Management in the Organization
3. Develop perspective about economy based on logical reasoning and estimate the economic outcomes.
4. Interprets comparative advantage of resources.

#### Unit I:

**7 Hrs.**

**Principles of Management:** Evolution of Management Thought: Scientific and Administrative Theory of Management, Definition and Concept of Management, Functions of Management: Planning, Organizing, Directing, Staffing and Controlling, Motivational Theories, Concept of Leadership.

#### Unit II:

**8 Hrs.**

**Marketing and Financial Management:** Marketing and Financial Management –Marketing Theories and Concept-Marketing Mix, Market Segmentation, Targeting and Positioning and Functions Financial Management and Accountancy- Accountancy Rules and Capital, Preparation of Books of Account- Journal posting of Transaction into ledger and preparation of trial Balance, Introduction of Trading Account, Profit and loss account and balance sheet.

#### Unit III:

**7 Hrs.**

**Introduction to Microeconomics:** Nature and Scope of Microeconomics, Demand Analysis: Meaning and determinants of demand, law of demand, Elasticity of Demand - types and degrees, Utility analysis, Law of diminishing marginal utility, supply- law of supply, Law of Variable proportions and Return to Scale, Classification of market structure.

#### Unit IV:

**8 Hrs.**

**Introduction to Macroeconomics:** Nature and Scope of Macroeconomics, Concept of GDP, GNP, NDP, NNP, Measurement of GDP; Economic Growth and development, Money – definition, types and function of money, Inflation – meaning, types, causes and measure to control, concept of deflation, functions of central and commercial bank, Sources of public revenue - direct and indirect taxes.

**Total Lecture 30 Hours**

			July, 2023	1.00	Applicable for AY 2023-24 Onwards
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**B. Tech SoE and Syllabus 2023**  
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(Department of Computer Technology)

**SoE No.**  
**23IoT-101**

## B.Tech in CSE (IoT)

### Textbooks:

1	Principle of Management, 9 <sup>th</sup> edition, Harold Koontz Ramchandra, Tata McGraw hills
2	Marketing Management: Planning, Implementation and Control, 3rd Edition, Ramaswamy V.S. and Namakumari S, Macmillian
3	Fundamentals of Accounting Gupta R.L. & Radhaswamy ;
4	Modern Economics, 13th Edition, H. L. Ahuja, S. Chand Publisher, 2009
5	Modern Economic Theory, 3rd edition, K. K. Devett, S. Chand Publisher, 2007
6	Principle of Economics, 7 <sup>th</sup> edition, Mankiw N. Gregory, Thomson, 2013

### Reference Books:

1	Foundations of Financial Markets and Institutions, 3 <sup>rd</sup> Edition, Fabozzi, Pretice Hall
2	Fundamentals of Financial Instruments, 2 <sup>nd</sup> Edition, Parameshwaran, Wiley India
3	Marketing Management, 3 <sup>rd</sup> Edition, Rajan Saxena, Tata McGraw Hill
4	Advance Economic Theory, 17th Edition, H. L. Ahuja, S. Chand Publisher, 2009
5	International Trade, 12 <sup>th</sup> edition, M. L. Zingan, Vindra Publication, 2007
6	Macro Economics, 11 <sup>th</sup> edition, M. L. Zingan, Vindra Publication, 2007
7	Monitory Economics:, 1 <sup>st</sup> Edition, M. L. Sheth, Himayalaya Publisher, 1995

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1	<a href="http://link.springer.com/openurl?genre=book&amp;isbn=978-1-4613-6193-0">http://link.springer.com/openurl?genre=book&amp;isbn=978-1-4613-6193-0</a>
2	<a href="https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042">https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042</a>

### MOOCs Links and additional reading, learning, video material

1	<a href="https://onlinecourses.nptel.ac.in/noc22_mg104/preview">https://onlinecourses.nptel.ac.in/noc22_mg104/preview</a>
2	<a href="https://archive.nptel.ac.in/courses/110/101/110101131/">https://archive.nptel.ac.in/courses/110/101/110101131/</a>
3	<a href="https://onlinecourses.nptel.ac.in/noc23_mg122/preview">https://onlinecourses.nptel.ac.in/noc23_mg122/preview</a>
4	<a href="https://onlinecourses.nptel.ac.in/noc21_hs52/preview">https://onlinecourses.nptel.ac.in/noc21_hs52/preview</a>
5	<a href="https://onlinecourses.nptel.ac.in/noc22_hs67/preview">https://onlinecourses.nptel.ac.in/noc22_hs67/preview</a>

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Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)




**B. Tech SoE and Syllabus 2023**  
(Scheme of Examination w.e.f. 2023-24 onward)  
(Department of Computer Technology)

**B.Tech in CSE (IoT)**

**SoE No.**  
**23IoT-101**

## III SEMESTER

### 23IOT1301 : Microcontroller & Interfacing

			July, 2023	1.00	Applicable for AY 2023-24 Onwards
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**SoE No.**  
**23IoT-101**

## **B.Tech in CSE (IoT)**

### **III SEMESTER**

### **23IOT1302 : Lab. Microcontroller & Interfacing**

			July, 2023	1.00	Applicable for AY 2023-24 Onwards
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**B.Tech in CSE (IoT)**

**SoE No.**  
**23IoT-101**

## III SEMESTER

### 23IOT1303 : Computer Architecture Organization

			July, 2023	1.00	Applicable for AY 2023-24 Onwards
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# Yeshwantrao Chavan College of Engineering

Nagar Yuwak Shikshan Sanstha's  
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(Department of Computer Technology)

**SoE No.  
23IoT-101**

## B.Tech in CSE (IoT)

### III SEMESTER 23IOT1304 : Data Structures

#### Course Outcomes :

Upon successful completion of the course the students will be able to

1. Implement applications of stacks and queues.
2. Develop applications using linked list.
3. Demonstrate various operations of tree data structure.
4. Apply the knowledge of graph data structure for solving real life problems.

<b>Unit I:</b>	<b>8 Hrs.</b>
Introduction to Data structures, classification, dynamic memory allocation, array-based implementation of stacks, queues, applications of stacks: expression conversion, applications of queue, implementation stack using queue and queue using stack, Hashing	
<b>Unit II:</b>	<b>8 Hrs.</b>
Linked list, self-referential data structure, types: singly, doubly, circular, application for polynomial evaluation, implementation of stacks and queue using linked list.	
<b>Unit III:</b>	<b>8 Hrs.</b>
Binary trees, binary search trees, terminologies, AVL, Red-Black	
<b>Unit IV:</b>	<b>8 Hrs.</b>
Splay trees, B and B+ trees, Multidimensional trees, Tries	
<b>Unit V</b>	<b>7 Hrs.</b>
Directed and Undirected Graphs, Terminologies, Graph traversals, connected and bi-connected components, Topological sort, Applications of BFS and DFS	
<b>Unit VI:</b>	<b>6 Hrs.</b>
Minimum Spanning Trees, Shortest Path Algorithms and Applications, All pair shortest paths, Introduction to Network flow Problems	
<b>Total Lecture</b>	<b>45 Hours</b>

#### Textbooks:

1.	Data Structures using C ,Latest , Reema Thareja ,Oxford publications.
2.	Data Structures, Algorithms and Applications in C++, 2 <sup>nd</sup> , S. Sahani, University Press Orient Longman (India) Pvt. Ltd.
3.	Data Structures and Algorithms in C++ ,Student, Michael T. Goodrich, R. Tamassiaand, Mount Willy, JonhWilly and sons.

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**23IoT-101**

## B.Tech in CSE (IoT)

### Reference Books:




1.	Data Structures a Pseudocode approach with C ,Latest , Richard Gilberg, B. Forouzan ,Thompsons Course Technology
2.	Data Structures and Program Design in C, Latest ,Tondo Kruse, Leung and Tondo, Pearson Publications

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1.	
2.	

### MOOCs Links and additional reading, learning, video material

1.	<a href="https://nptel.ac.in/courses/106102064">https://nptel.ac.in/courses/106102064</a>
2.	<a href="https://www.youtube.com/watch?v=I_314LpT6X8">https://www.youtube.com/watch?v=I_314LpT6X8</a>
3.	<a href="https://nptel.ac.in/courses/106106133">https://nptel.ac.in/courses/106106133</a>

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**SoE No.**  
**23IoT-101**

## **B.Tech in CSE (IoT)**

### **III SEMESTER** **23IOT1305: Lab. Data Structures**




#### **Course Outcomes**

**Upon successful completion of the course the students will be able to**

1. Implement applications of stacks and queues.
2. Develop applications using linked list.
3. Demonstrate various operations of tree data structure.
4. Apply the knowledge of graph data structure for solving real life problems

**Minimum Eight Practical's to be performed from the list as below**

SN	Experiments based on
1	Program based on Stacks and its application
2	Program based on Queue and its application
3	Implementation of one data structures using another
4	Program based on linked list
5	Program on Skip list
6	Program based on Binary tree
7	Program based on Binary Search tree
8	Program based on application of Graph in networking
9	Program based on finding shortest path using Graph
10	Mini project covering all data structures

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## **B.Tech in CSE (IoT)**

### **III SEMESTER**

### **23IOT1306 : Lab. Computer Workshop**




#### **Course Outcomes**

**Upon successful completion of the course the students will be able to**

1. Understand the fundamentals of computer hardware and working of Linux operating system
2. Use Linux commands to manage files and file systems
3. Execute Scripts
4. Debug Programs on various IDEs

**Minimum Eight Practical's to be performed from the list as below**

SN	Experiments based on
1	Installation of various software in Linux environment
2	Basics of Linux commands and its use
3	Programs based on Scripting
4	Execution of C Program through command line argument
5	Debugging in Turbo C and DEVCC++
6	Debugging using gdb debugger
7	Create project using multiple C files
8	Exploring various text editors in Linux: AWK, SED, Emacs

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## B.Tech in CSE (IoT)

### III SEMESTER

### 23IOT1307 : Basics of Python Programming

#### Course Outcomes :

**Upon successful completion of the course the students will be able to**

1. Select any framework for python programming as per their understanding.
2. Write any python program using various data structures and control statements.
3. Demonstrate skill for effective usage of file handling and concepts of classes and objects.
4. Develop advanced applications using functionalities provided under various packages of Python.

#### Unit I:

**7 Hrs.**

Python frameworks : Basic syntax, variables and expressions, basic operators, decision making

#### Unit II:

**7 Hrs.**

Control flow statements: continue, break, Loops: while, for and Functions

#### Unit III:

**8 Hrs.**

Data structures: list, dictionary, arrays, tuples, sets, strings Unit IV: [06Hrs] File handling, Classes and Objects, Introduction to Various Libraries: NumPy: Fundamental package for scientific computing  
NLTK- Natural language toolkit

#### Unit IV:

**8 Hrs.**

File handling, Classes and objects, Python patterns- Implementing Graphs NetworkX- A package for the creation, manipulation, and study of the structure, dynamics, and functions of complex networks

**Total Lecture 30 Hours**

#### Textbooks:

1. Introduction to Programming Using Python, 1<sup>st</sup>, Y. Daniel Liang Pearson
2. Python: The Complete Reference ,1<sup>st</sup>, Martin C Brown McGraw Hill

#### Reference Books:

1. Database System Concepts, Henry Korth and Others, McGraw Hill
2. Database Systems, Connolly, Pearson Publications
3. Database Systems, S. K. Singh, Pearson Education
4. Principles of Database Systems Ullman, Golgotia Publications 1998

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## **B.Tech in CSE (IoT)**

### **III SEMESTER**

### **23IOT1308 : Community Engagement Project**

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**SoE No.  
23IoT-101**

## B.Tech in CSE (IoT)

### III SEMESTER

#### Code MDM1CT103 : Sub. Name: IoT Architecture and Protocol

#### Course Outcomes :

Upon successful completion of the course the students will be able to

1. To Describe the Architectural Overview of IoT
2. Differentiate between the levels of the IoT architectures.
3. Illustrate various IoT Protocols ( Datalink, Network, Transport, Session, Service)

**Unit I:** Introduction to IoT, IoT Challenges, IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. Real-World Design Constraints- Introduction, Technical Design constraints, Data representation and visualization, Interaction and remote control.

**8/Hrs.**

**Unit II:** IOT Data Link Layer & Network Layer Protocols: PHY/MAC Layer(3GPP MTC, IEEE 802.11, IEEE 802.15), Wireless HART, ZWave, Bluetooth Low Energy, Zigbee Smart Energy, DASH7 - Network Layer-IPv4, IPv6, 6LoWPAN, 6TiSCH,ND, DHCP, ICMP, RPL, CORPL, CARP

**8 Hrs.**

**Unit III:** Transport & Session Layer Protocols: Transport Layer (TCP, MPTCP, UDP, DCCP, SCTP)-(TLS, DTLS) – Session Layer HTTP, CoAP, XMPP, AMQP, MQTT

**7 Hrs.**

**Unit IV:** Service Layer Protocols & Security: Service Layer one M2M, ETSI M2M, OMA, BBF – Security in IoT Protocols – MAC 802.15.4 , 6LoWPAN, RPL, Application Layer

**7 Hrs.**

**Total Lecture 30 Hours**

#### Textbooks:

1. Raj kamal, "Internet of Things architecture and design principles ", 1ed, Mc Graw Hill.
2. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.

#### Reference Books:

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(Department of Computer Technology)

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**23IoT-101**

## B.Tech in CSE (IoT)




1.	Peter Waher, "Learning Internet of Things", PACKT publishing, BIRMINGHAM – MUMBAI Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
2.	Peter Waher, "Learning Internet of Things", PACKT publishing, BIRMINGHAM – MUMBAI Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1	

### MOOCs Links and additional reading, learning, video material

1.	<a href="http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot_prot/index.html">http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot_prot/index.html</a>

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**SoE No.**  
**23IoT-101**

## **B.Tech in CSE (IoT)**

### **III SEMESTER** **Multidisciplinary Minor Courses**

#### **Track 1** **MDMT1IOT101 : Internet of Things (IoT)**

Courses	Sem	MDMT1IOT101 : Internet of Things (IoT)
MDM-I	3	(MDM1IOT101) IoT Architecture and Protocol
MDM-II	4	(MDM2IOT102) IoT Design Principles
MDM-III	5	(MDM3IOT103) Fog and Edge Computing
MDM-IV	6	(MDM4IOT104) Security and Privacy in IoT
MDM-V	7	(MDM5IOT105) IoT in Healthcare
MDM-VI	8	(MDM6IOT106) Cognitive IoT

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23IoT-101**

## B.Tech in CSE (IoT)

### III SEMESTER Open Elective -I : Basket

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	3	OE1	GE	23OE1301	OE-I : Combinatorics
2	3	OE1	GE	23OE1302	OE-I : Fuzzy Set Theory, Arithmetic And Logic
3	3	OE1	GE	23OE1303	OE-I : Green Chem. & Sustainability
4	3	OE1	GE	23OE1304	OE-I : Hydrogen Fuel
5	3	OE1	GE	23OE1305	OE-I : Electronic Materials And Applications
6	3	OE1	GE	23OE1306	OE-I : Laser Technology And Applications
7	3	OE1	MGT	23OE1307	OE-I : Finance And Cost Management
8	3	OE1	MGT	23OE1308	OE-I : Operation Research Techniques
9	3	OE1	MGT	23OE1309	OE-I : Project Evaluation & Management
10	3	OE1	MGT	23OE1310	OE-I : Total Quality Management
11	3	OE1	MGT	23OE1311	OE-I : Value Engineering
12	3	OE1	MGT	23OE1312	OE-I : Maintenance Management
13	3	OE1	MGT	23OE1313	OE-I : Industrial Safety
14	3	OE1	MGT	23OE1314	OE-I : Industry 4.0
15	3	OE1	MGT	23OE1315	OE-I : Operation Management
16	3	OE1	MGT	23OE1316	OE-I : Material Management
17	3	OE1	MGT	23OE1317	OE-I : Hospitality Management
18	3	OE1	MGT	23OE1318	OE-I : Human Resource Management & Organizational Behaviour
19	3	OE1	MGT	23OE1319	OE-I : Agri-Business Management
20	3	OE1	MGT	23OE1320	OE-I : Rural Marketing
21	3	OE1	MGT	23OE1321	OE-I : Marketing Management
22	3	OE1	MGT	23OE1322	OE-I : Health Care Management

Link for Open Electives syllabus: <https://vcce.edu/syllabus/>

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**SoE No.**  
**23IoT-101**

## **B.Tech in CSE (IoT)**

### **III SEMESTER**

#### **Mandatory Learning Course (MLC)**

#### **MLC2123 : YCAP3**

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Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

(Accredited 'A++' Grade by NAAC with a score of 3.6)

Hingna Road, Wanadongri, Nagpur - 441 110



## **Bachelor of Technology SoE & Syllabus 2023 4<sup>th</sup> Semester**

(Department of Electronics Engineering)

**B. Tech in CSE (IoT)**



Nagar Yuwak Shikshan Sanstha's  
**Yeshwantrao Chavan College of Engineering**  
 (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B.TECH SCHEME OF EXAMINATION 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

(Department of Computer Technology)

**B. Tech in Computer Science and Engineering (IOT)**

SoE No.  
23IoT-101

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/P	Contact Hours				Credit s	% Weightage			ESE Duration Hours
							L	T	P	Hrs		MSEs*	TA**	ESE	
FOURTH SEMESTER															
1	4	BS	GE	23GE1404	Probability Theory and Sampling Theory	T	3	0	0	3	3	30	20	50	3
2	4	HS	GE	23GE1401	Entrepreneurship Development	T	2	0	0	2	2	30	20	50	3
3	4	AEC-2	GE	23GE1405 23GE1406	Marathi Language / Hindi Language	T	2	0	0	2	2	30	20	50	3
4	4	VEC-1	CV	23CV1411	Environmental Sustainability, Pollution and Management	T	2	0	0	2	2	30	20	50	3
5	4	PC	CT	23IOT1401	Introduction to Internet of Things	T	3	0	0	3	3	30	20	50	3
		PC	CT	23IOT1402	Lab : Introduction to Internet of Things	P	0	0	2	2	1		60	40	
6	4	PC	CT	23IOT1403	Object Oriented Programming	T	3	0	0	3	3	30	20	50	3
7	4	PC	CT	23IOT1404	Lab : Object Oriented Programming	P	0	0	2	2	1		60	40	
8	4	VSEC-3	CT	23IOT1405	Lab : Vocational & Skill Enhancement Data Analysis using R	P	0	0	2	4	2		60	40	
9	4	OE-2	OE		Open Elective-II	T	2	0	0	2	2	30	20	50	3
10	4	MDM	CT		MD Minor Course-II	T	2	0	0	2	2	30	20	50	3
TOTAL							19	0	6	27	23				

**List of Mandatory Learning Course (MLC)**

1	4	HS	T&P	MLC2124	<b>YCAP4</b> : YCCE Communication Aptitude Preparation	<b>A</b>	3	0	0	3	0				
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**Open Elective - II**

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	4	OE2	GE	23OE2401	OE-II : Combinatorics
2	4	OE2	GE	23OE2402	OE-II : Fuzzy Set Theory, Arithmetic And Logic
3	4	OE2	GE	23OE2403	OE-II : Green Chem. & Sustainability
4	4	OE2	GE	23OE2404	OE-II : Hydrogen Fuel
5	4	OE2	GE	23OE2405	OE-II : Electronic Materials And Applications
6	4	OE2	GE	23OE2406	OE-II : Laser Technology And Applications
7	4	OE2	MGT	23OE2407	OE-II : Finance And Cost Management
8	4	OE2	MGT	23OE2408	OE-II : Operation Research Techniques
9	4	OE2	MGT	23OE2409	OE-II : Project Evaluation & Management
10	4	OE2	MGT	23OE2410	OE-II : Total Quality Management
11	4	OE2	MGT	23OE2411	OE-II : Value Engineering
12	4	OE2	MGT	23OE2412	OE-II : Maintenance Management
13	4	OE2	MGT	23OE2413	OE-II : Industrial Safety
14	4	OE2	MGT	23OE2414	OE-II : Industry 4.0
15	4	OE2	MGT	23OE2415	OE-II : Operation Management
16	4	OE2	MGT	23OE2416	OE-II : Material Management
17	4	OE2	MGT	23OE2417	OE-II : Hospitality Management
18	4	OE2	MGT	23OE2418	OE-II : Human Resource Management & Organizational Behaviour
19	4	OE2	MGT	23OE2419	OE-II : Agri-Business Management
20	4	OE2	MGT	23OE2420	OE-II : Rural Marketing
21	4	OE2	MGT	23OE2421	OE-II : Marketing Management
22	4	OE2	MGT	23OE2422	OE-II : Health Care Management
23	4	OE2	MGT	23OE2423	OE-II : Designated approved online NPTEL/KKSU Course
24	4	OE2	MGT	23OE2424	OE-II : Indian Archeology
25	4	OE2	MGT	23OE2425	OE-II : Social & Positive Psychology
26	4	OE2	MGT	23OE2426	OE-II : Seismology & Earthquake

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## B.Tech in CSE (IoT)

### IV SEMESTER

### 23GE1404 : Probability Theory and Sampling Theory

#### Course Outcomes:

Upon successful completion of the course the students will be able to

1. Identify an appropriate probability distribution for a given discrete or continuous random variable and compute probabilities.
2. Use probability distributions to solve a given problem
3. Apply concepts of sampling theory to find probabilities and estimate parameters of various problems.
4. Test the hypothesis and estimate confidence intervals at different levels.

<b>Unit I:</b>	<b>8 Hrs.</b>
<b>Random Variables and Probability Distributions:</b> Conditional probability, Baye's theorem. Discrete and Continuous random variables, Probability function and Distribution function, Joint distributions. Independent Random variables, Conditional Distribution.	
<b>Unit II:</b>	<b>7 Hrs.</b>
<b>Mathematical Expectation:</b> Mathematical Expectation, Variance and Standard Deviation, Moments, Moment generating function, Skewness and Kurtosis.	
<b>Unit III:</b>	<b>7 Hrs.</b>
<b>Special Probability Distributions:</b> Binomial, Geometric, Poisson, Exponential, Normal, Central Limit theorem.	
<b>Unit IV:</b>	<b>8 Hrs.</b>
<b>Sampling Theory:</b> Unbiased and efficient estimates, Point estimates and interval estimates. Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions.	
<b>Unit V:</b>	<b>7 Hrs.</b>
<b>Estimation:</b> Unbiased and efficient estimates. Point estimates and interval estimates. Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions.	
<b>Unit VI:</b>	<b>8 Hrs.</b>
<b>Hypothesis Testing:</b> Definition of hypothesis, Testing of hypothesis for large samples using normal distributions. Testing of hypothesis for small distributions (student's t-test, F-test). Goodness of fit test (Chi-square distribution).	
<b>Total Lecture</b>	<b>45 Hours</b>

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## B.Tech in CSE (IoT)

### Textbooks:

1	M. R. Spiegel, The theory and problems of probability and Statistics, 3 <sup>rd</sup> edition, Schaum series. (McGraw Hill)
2	Michael J. Evans and Jeffrey S. Rosenthal, Probability and Statistics, 2 <sup>nd</sup> edition, W. H. Freeman publisher, 2009

### Reference Books:




1	S. C.Gupta and V.K.Kapoor, Fundamentals of Mathematical statistics, 10th Edition, Sultan chand and son, 2001.
2	G Balaji, Probability and Statistics, 15 <sup>th</sup> edition, G Balaji publisher, 2017

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1	<a href="http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Applied%20Sciences%20&amp;%20Humanities/Mathematics%20and%20Humanities/">http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Applied%20Sciences%20&amp;%20Humanities/Mathematics%20and%20Humanities/</a>
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### MOOCs Links and additional reading, learning, video material

1	<a href="https://nptel.ac.in/courses/111106051">https://nptel.ac.in/courses/111106051</a>
2	<a href="https://archive.nptel.ac.in/courses/111/104/111104137/">https://archive.nptel.ac.in/courses/111/104/111104137/</a>
3	<a href="https://archive.nptel.ac.in/courses/111/106/111106135/">https://archive.nptel.ac.in/courses/111/106/111106135/</a>

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## B.Tech in CSE (IoT)

### IV SEMESTER

### 23GE1401 : Entrepreneurship Development

#### Course Outcomes:

Upon successful completion of the course the students will be able to

1. Appreciate role of entrepreneurs in society and develop entrepreneurial abilities by providing information about skill sets.
2. Develop an understanding of how and what form of business organization to choose for start up.
3. Stimulate to innovate, develop prototypes or ideas by applying theory into practice.
4. Identify the Support rendered by various Government Agencies.

#### Unit I:

**7 Hrs.**

**Entrepreneur & Entrepreneurship:** Meaning of Entrepreneur, Evolution of the concept – Theories and Models, Types of Entrepreneur, Stages in entrepreneurial process- Idea Generation, Screening, Selection and Managing Resources.

#### Unit II:

**8 Hrs.**

**Legal Compliances for Incorporating Start up:** Fundamentals of choosing the Business Organization form for startup, Incorporation of Partnership, LL.P & Co – operative, Incorporation of One Person Company, Pvt. Ltd., Pub. Ltd. and not for profit company, Financing the legal Venture and Legal Compliances.

#### Unit III:

**7 Hrs.**

**Entrepreneurship and IP Strategy:** Intellectual Property : Definition and Concept of Trade Mark, Patent, Copyright, Industrial Design, IP Strategy and Entrepreneurship.

#### Unit IV:

**8 Hrs.**

**Support to Entrepreneurs:** Financing new ventures, Business Incubators – Government Policy for Small Scale Enterprises, Growth Strategies in small industry – Expansion, Diversification, Joint Venture, Merger and Subcontracting.

**Total Lecture**

**30 Hours**

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## B.Tech in CSE (IoT)

### Student activities:

1. Interview at least four entrepreneurs or businessman and identify Traits of successful entrepreneurs.
2. Analyse case studies of any two successful entrepreneurs.
3. Download product development and innovative films from internet.
4. Identify your hobbies and interests and convert them into business idea

### Textbooks

1. Khanka. S.S., "Entrepreneurial Development" S.Chand & Co. Ltd., Ram Nagar, New Delhi, 2013.
2. Donald F Kuratko, "Entrepreneurship – Theory, Process and Practice", 9th Edition, Cengage Learning 2014.
3. Corporate Law, 33rd ed. 2016, Taxman New Delhi.
4. Narayanan, V. K., Managing technology and innovation for competitive advantage, first edition, Pearson education, New Delhi, (2006)
5. Idris, K. (2003), Intellectual property: a power tool for economic growth, second edition, WIPO publication no. 888, Switzerland
6. Khanka. S.S., "Entrepreneurial Development" S.Chand & Co. Ltd., Ram Nagar, New Delhi, 2013.
7. Ramaiya's Guide to the Companies Act, 18th ed. 2014, Lexis Nexis New Delhi.

### Reference Books




1. Mehta, Monica- The Entrepreneurial Instinct : How everyone has the innate ability to start a successful small business – McGraw – Hill Education, New Delhi 2012, ISBN 978-0-07-179742-9
2. Prasanna Chandra "Protect Preparation, Appraisal, Implementation" Tata McGraw Hill. New Delhi
3. S Anil Kumar "Entrepreneurship Development" New Age International Publishers
4. Nishith Dubey "Entrepreneurship Development" PHI Learning

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

- 1 <http://link.springer.com/openurl?genre=book&isbn=978-1-4613-6193-0>
- 2 <https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042>

### MOOCs Links and additional reading, learning, video material

- 1 [https://onlinecourses.swayam2.ac.in/cec23\\_mg24/course- entrepreneurship development](https://onlinecourses.swayam2.ac.in/cec23_mg24/course- entrepreneurship development)
- 2 [https://onlinecourses.nptel.ac.in/noc23\\_mg74/announcements?force=true-entrepreneur](https://onlinecourses.nptel.ac.in/noc23_mg74/announcements?force=true-entrepreneur)
- 3 [https://onlinecourses.nptel.ac.in/noc23\\_mg126/announcements?force=true-Business fundamentals for entrepreneurship](https://onlinecourses.nptel.ac.in/noc23_mg126/announcements?force=true-Business fundamentals for entrepreneurship)

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## B.Tech in CSE (IoT)

### IV SEMESTER 23GE1405 : Marathi Language

Course Objectives		
1. मराठी भाषेच्या समृद्धीची जाणीव करून देणे. 2. विद्यार्थ्यांमध्ये भाषा कौशल्याचा विकास करणे आणि त्यातून रोजगाराच्या संधींचा शोध घेणे.		
Course Outcomes		
3. भाषेचा जीवन व्यवहारात योग्य पद्धतीने वापर करण्याचा प्रयत्न करणे. 4. संत साहित्याच्या शिकवणुकीमुळे मानवता आणि मानवी व्यवहाराची सांगड घालणे, नैतिक मूल्ये रुजविणे. 5. विद्यार्थ्यांना रोजगाराभिमुख बनविणे.		
Unit:1	गद्य विभाग	8 Hours
१.	भारतीय लोकशाहीचे भवितव्य काय?	- डॉ. बाबासाहेब आंबेडकर
२.	काळी आई	- व्यंकटेश माडगूळकर
३.	संत तुकारामांचे अभंग	- निर्मलकुमार फडकुले
४.	माझी शाळा	- प्रकाश खरात
५.	समतेचे वारकरी संत गाडगेबाबा आणि राष्ट्रसंत तुकडोजी महाराज	- अशोक राणा
६.	लोककल्याणकारी राजा :	- शरयू तायवाडे
Unit:2	पद्य विभाग	8 Hours
१.	ज्ञानेश्वरांचे अभंग	- संत ज्ञानेश्वर
२.	वनसुधा	- वामन पंडित
३.	नवा शिपाई	- केशवसुत
४.	मेंढरं	- विठ्ठल वाघ
५.	पोरी	- अनुराधा पाटील
६.	गाव	- हेमंतकुमार कांबळे

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Unit:3	व्यावहारिक मराठी	7 Hours
१. म्हणी		
२. मुलाखतलेखन	- डॉ. वैशाली धनविजय	
३. वाक्प्रचार		
४. जाहिरातलेखन	- डॉ. अजय देशपांडे	
Unit:4	रोजगाराभिमुख मराठी व्यावहारिक कौशल्ये	7 Hours
१. प्रत्यक्ष मुलाखत कौशल्य		
२. वाचन कौशल्य - (अ) बातमी वाचन (ब) कथा वाचन		
३. ऑनलाईन कौशल्य - (अ) ग्राहक सेवा केंद्राशी संवाद, (ब) ऑनलाईन अर्ज करणे		

**Reference Books**

- पाठ्यपुस्तक : शब्दसाधना - भाग १
- रोजगाराभिमुख मराठी व्यावहारिक कौशल्ये

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## B.Tech in CSE (IoT)

### IV SEMESTER 23GE1406 : Hindi Language

#### Course Objectives

- विद्यार्थियों में देशभक्तिपरक एवं पारिवारिक मूल्यों का विकास |
- विद्यार्थियों पर्यावरण-संरक्षण के प्रति सजग करना |
- एकांकी, कहानी, निबंध आदि विधाओं के मध्य का अंतर अवगत कराना |
- हिंदी के प्रयोजनमूलक स्वरूप से परिचित कराना |
- विद्यार्थियों को आधुनिक प्रौद्योगिकी (तकनीक) का प्रयोग करने में सक्षम बनाना |.

#### Course Outcomes

- पौराणिक अथवा ऐतिहासिक घटनाओं को तार्किक आधार पर स्वीकार करेंगे | अपने परिवेश के उचित और अनुचित व्यवहारों के प्रति आकलन शक्ति बढ़ेगी |
- एकांकी, कहानी, निबंध आदि विधाओं के मध्य का अंतर बताने में सक्षम होंगे |
- कविता का रसास्वादन करने में समर्थ होंगे |
- 'अनुवाद' के स्वरूप एवं प्रक्रिया से अवगत होंगे |
- 'मार्गिक नक्शे' का दैनिक जीवन में उपयोग करने में सक्षम होंगे |

Unit:1	गद्य विभाग	8 Hours
१. भाईसाहब (कहानी)	- प्रेमचंद	
२. स्मृति (निबंध)	- श्रीराम शर्मा	
३. गिल्लू (रेखाचित्र)	- महादेवी वर्मा	
४. अभाव (कहानी)	- विष्णु प्रभाकर	
५. महाभारत की साँझ (एकांकी)	- भारतभूषण	
६. उखड़े खंबे (व्यंग्य)	- हरिशंकर परसाई	

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Unit:2	पद्य विभाग	8 Hours
१. कबीर के दोहे	- कबीरदास	
२. ले चल यहाँ भुलावा देकर	- जयशंकर प्रसाद	
३. स्नेह-निर्झर बह गया	- हैसूर्यकांत त्रिपाठी "निराला"	
४. प्रथम रश्मि	- सुमित्रानंदन पंत	
५. जीवन का झरना	- आरसीप्रसाद सिंह	
६. कविता के साथ	- दामोदर खड़से	
Unit:3	अन्य पाठ्य सामग्री	7 Hours
१. मुहावरे और लोकोक्तियाँ: पाठ्यपुस्तक में मुहावरे और लोकोक्तियाँ का अर्थ एवं वाक्य प्रयोग		
२. विज्ञापन कला : अर्थ, परिभाषा, प्रकार, शीर्षक का महत्त्व, विज्ञापन के प्रयोजन, सत्य, लक्ष्य, विज्ञापन की भाषा, अच्छे विज्ञापन के गुण इत्यादि ।		
Unit:4	कौशल्य आधारित घटक	7 Hours
१. वाचन कौशल्य (समाचार-वाचन, कहानी-वाचन)		
२. सोशल मीडिया के शिष्टाचार		
३. ऑनलाइन आवेदन, ग्राहक-सेवा केंद्र से संवाद		

### Reference Books

३. पाठ्यपुस्तक : "पलाश"

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## B.Tech in CSE (IoT)

### III/IV SEMESTER

23CV1311/23CV1411

### Environmental Sustainability, Pollution and Management

#### Course Outcomes :

**Upon successful completion of the course, the students will be able to**

The student will be able to

1. Gain insights into the efforts to safeguard the Earth's environment and resources.
2. Develop a critical understanding of the contemporary environmental issues of concern
3. Have an overview of pollution, climate change and national and global efforts to address adaptation and mitigation to changing environment through environmental management.
4. Learn about the major international treaties and our country's stand on and responses to the major international agreements.

<b>Unit:1</b>	<b>Environment and Sustainable Development</b>	<b>8 Hours</b>
The man-environment interaction; Overview of natural resources: renewable, and non-renewable energy resources; Introduction to sustainable development: Sustainable Development Goals (SDGs)- targets and indicators, challenges and strategies for SDGs; Environmental issues: Global change, Climate Change and Mitigation.		
<b>Unit:2</b>	<b>Environmental Pollution and Health</b>	<b>7 Hours</b>
Understanding pollution: Production processes and generation of wastes, Air pollution, Water pollution, Soil pollution and solid waste, Noise pollution, Thermal and Radioactive pollution. Impact on biotic and abiotic things.		
<b>Unit:3</b>	<b>Environmental Management</b>	<b>8 Hours</b>
Environmental management system: ISO 14001, Concept of Circular Economy, Life cycle analysis; Cost-benefit analysis, Environmental audit and impact assessment; Waste Management and sustainability; Ecolabeling /Eco mark scheme		
<b>Unit:4</b>	<b>Environmental Treaties and Legislation</b>	<b>7 Hours</b>
Introduction to environmental laws and regulation, An overview of instruments of international cooperation, Major International Environmental Agreements, Major Indian Environmental Legislations, Major International organizations, and initiatives		
<b>Total Lecture</b>		<b>30 Hours</b>

#### Text books

1	Chiras, D. D and Reganold, J. P. (2010). Natural Resource Conservation: Management for a Sustainable Future.10th edition, Upper Saddle River, N. J. Benjamin/Cummins/Pearson
2	Rajagopalan, R. (2011). Environmental Studies: From Crisis to Cure. India: Oxford University Press
3	Krishnamurthy, K.V. (2003) Textbook of Biodiversity, Science Publishers, Plymouth, UK

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4	Jackson, A. R., & Jackson, J. M. (2000). Environmental Science: The Natural Environment and Human Impact. Pearson Education
5	Pittock, Barrie (2009) Climate Change: The Science, Impacts and Solutions. 2nd Edition. Routledge.
6	Theodore, M. K. and Theodore, Louis (2021) Introduction to Environmental Management, 2nd Edition. CRC Press
7	Kanchi Kohli and Manju Menon (2021) Development of Environment Laws in India, Cambridge University Press

### Reference Books

1	Headrick, Daniel R. (2020) Humans versus Nature- A Global Environmental History, Oxford University Press
2	Gilbert M. Masters and W. P. (2008). An Introduction to Environmental Engineering and Science, Ela Publisher (Pearson)
3	William P. Cunningham and Mary A. (2015). Cunningham Environmental Science: A global concern, Publisher (Mc-Graw Hill, USA)
4	Varghese, Anita, Oommen, Meera Anna, Paul, Mridula Mary, Nath, Snehlata (Editors) (2022) Conservation through Sustainable Use: Lessons from India. Routledge.
5	Central Pollution Control Board Web page for various pollution standards. <a href="https://cpcb.nic.in/standards">https://cpcb.nic.in/standards</a>
6	Barnett, J. & S. O'Neill (2010). Maladaptation. Global Environmental Change—Human and Policy Dimensions 20: 211–213
7	Richard A. Marcantonio, Marc Lame (2022). Environmental Management: Concepts and Practical Skills. Cambridge University Press
8	Ministry of Environment, Forest and Climate Change (2019) A Handbook on International Environment Conventions & Programmes. <a href="https://moef.gov.in/wp-content/uploads/2020/02/convention-V-16-CURVE-web.pdf">https://moef.gov.in/wp-content/uploads/2020/02/convention-V-16-CURVE-web.pdf</a>

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1	
<b>MOOCs Links and additional reading, learning, video material</b>	
1	

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(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech SoE and Syllabus 2023**  
(Scheme of Examination w.e.f. 2023-24 onward)  
(Department of Computer Technology)

**SoE No.  
23IoT-101**

## B.Tech in CSE (IoT)

### IV SEMESTER

### 23IoT1302 : Theory of Computation

#### Course Outcomes :

**Upon successful completion of the course the students will be able to**

1. Construct automata, regular expression for any pattern
2. Write context free grammar for various languages.
3. Design push down automata and Turing Machine for a language.
4. Derive whether a problem is decidable or not.

#### Unit I:

(8 Hrs.)

Alphabet, Symbols, Sets, Strings, Language, Operations, Relations, Design of Finite State Machines, Acceptance of strings and languages, Non-Deterministic Finite Automation, Deterministic Finite Automation, Equivalence between NFA and DFA, NFA with  $\epsilon$ -transition, Minimization of FA.

**Contemporary Issues related to Topic**

#### Unit II:

(7 Hrs.)

Regular Regular sets, Regular expressions, Manipulation of regular expressions, Equivalence between RE and FA. Pumping Lemma, closure properties of regular sets (Proofs not required), Regular grammars, Right linear and left linear regular grammars, inter-conversion between LLG & RLG, Equivalence between regular grammar and F.A., Inter-conversion between RE and RG.

**Contemporary Issues related to Topic**

#### Unit III:

(7 Hrs.)

Context free grammar, Derivation trees (Syntax tree and Parse tree), Ambiguous Grammar, Context Free Language (CFL), Normal Form of grammar: Chomsky Normal form, Greibach normal form.

**Contemporary Issues related to Topic**

#### Unit IV:

(6 Hrs.)

Push down automata, definition, and model, acceptance of CFL by empty Stack and by final state, equivalence CFL and PDA, Inter-conversion, Closure of properties of CFL, DPDA & NDPDA.

**Contemporary Issues related to Topic**

#### Unit V:

(6 Hrs.)

Turing machine, Definition, Model of TM, Design of Turing Machine, Computable functions, Recursive enumerable language, Recursive Language, Properties of Recursive enumerable language, Church's hypothesis, Chomsky hierarchy of language, Linear bounded automata and context sensitive language, Universal Turing Machine

**Contemporary Issues related to Topic**

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<b>Unit VI:</b>	(6 Hrs.)
Un-decidability Problems related to Recursive enumerable language and Turing Machine, post correspondence problem. Recursive function Theory –Basis functions and operations on them. Bounded minimization preemptive $\mu$ recursive function unbounded minimization and recursive function	
<b>Contemporary Issues related to Topic</b>	
<b>Total Lecture</b>	<b>40 Hours</b>

<b>Textbooks:</b>	
1.	Introduction to Automata Theory, Languages, and computation ,3rd Edition ,Hopcroft J.E., Rajeev Motwani, Jeffrey D. Ullman Pearson Education.
2.	Introduction to languages and the Theory of Computation,3rd Edition ,John C.Martin ,Mc Graw Hill.

<b>Reference Books:</b>	
1.	Introduction to the Theory of Computation,2nd Edition,Michael Sipser, GALE CENGAGE Learning
2.	Theory of Computation, 1st Edition , Dr. O. G. Kakde ,Laxmi Publication

<b>YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]</b>	
1	<a href="https://onlinelibrary.wiley.com/doi/epdf/10.1002/0471224642">https://onlinelibrary.wiley.com/doi/epdf/10.1002/0471224642</a>

<b>MOOCs Links and additional reading, learning, video material</b>	
1.	<a href="https://www.digimat.in/nptel/courses/video/106104028/L01.html">https://www.digimat.in/nptel/courses/video/106104028/L01.html</a>
2.	<a href="https://www.digimat.in/nptel/courses/video/106104148/L38.html">https://www.digimat.in/nptel/courses/video/106104148/L38.html</a>

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(Department of Computer Technology)

**SoE No.**  
**23IoT-101**

## B.Tech in CSE (IoT)

### IV SEMESTER

### 23IOT1402 : Object Oriented Programming

#### Course Outcomes :

Upon successful completion of the course the students will be able to

1. Understand the concept of object-oriented programming and modeling.
2. Apply the knowledge of object-oriented programming to solve the given problem.
3. Analyze the problem to provide the object-oriented solution using advanced programming concepts.
4. Design the event driven web based solution for the problem.

<b>Unit I:</b>	<b>(5 Hrs.)</b>
Introduction to object oriented programming paradigm, procedure oriented programming vs OOP, features of OOP, benefits of OOP, defining class, instantiating a class. UML diagrams to represent class, objects and various relationships. Code of ethics for programmer.	
<b>Unit II:</b>	<b>(7 Hrs.)</b>
Functions in OOP, function overloading, Passing & returning Objects, pointers to members, constructors and its types, Access specifiers and packages. Inheritance, types of inheritance, run time polymorphism, abstract classes, Interface, collection interface	
<b>Unit III:</b>	<b>(7 Hrs.)</b>
Exceptions – exception hierarchy – throwing and catching exceptions – built-in exceptions, creating own exceptions, Stack Trace Elements. Input / Output Basics – Streams – Byte streams and Character streams – Reading and Writing Console – Reading and Writing Files	
<b>Unit IV:</b>	<b>(7 Hrs.)</b>
Multithreading, Differences between multi-threading and multitasking, thread life cycle, creating threads, synchronizing threads, Inter-thread communication, daemon threads, thread groups. Generic Programming – Generic classes – generic methods – Bounded Types – Restrictions and Limitations	
<b>Unit V:</b>	<b>(7 Hrs.)</b>
MVC architecture, Java web components and its architecture Graphics programming – Frame – Components – working with 2D shapes – Using color, fonts, and images	
<b>Unit VI:</b>	<b>(7 Hrs.)</b>
Basics of event handling – event handlers – adapter classes – actions – mouse events – AWT event hierarchy – Introduction to Swing – layout management – Swing Components – Text Fields, Text Areas – Buttons- Check Boxes – Radio Buttons – Lists- choices- Scrollbars – Windows –Menus – Dialog Boxes.	
<b>Total Lecture 40 Hours</b>	

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**SoE No.**  
**23IoT-101**

## B.Tech in CSE (IoT)

### Textbooks:

- |    |   |
|----|---|
| 1. | Thinking in Java , 4th Edition , Bruce Eckel, Prentice Hall |
|----|---|

### Reference Books:




- |    |   |
|----|---|
| 1. | Java Complete Reference 7 <sup>th</sup> Edition, Herbert Schildt ,McGraw-Hill |
|----|---|

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

- |   |   |
|---|---|
| 1 | <a href="http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Technology/">http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Technology/</a> |
|---|---|

### MOOCs Links and additional reading, learning, video material

- |    |   |
|----|---|
| 1. | <a href="https://www.digimat.in/nptel/courses/video/106105191/L01.html">https://www.digimat.in/nptel/courses/video/106105191/L01.html</a> |
| 2. | <a href="https://www.youtube.com/watch?v=-HafzawNIUo">https://www.youtube.com/watch?v=-HafzawNIUo</a>                                     |

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**SoE No.**  
**23IoT-101**

## **B.Tech in CSE (IoT)**

### **IV SEMESTER**

### **23IOT1403 : Lab. Object Oriented Programming**

#### **Course Outcomes**

**Upon successful completion of the course the students will be able to**

1. Understand the concept of object-oriented programming and modeling.
2. Apply the knowledge of object-oriented programming to solve the given problem.
3. Analyze the problem to provide the object-oriented solution using advanced programming concepts.
1. Design the event driven web based solution for the problem.

**Minimum Eight Practical's to be performed from the list as below**

SN	Program based on
1	Implement the concept of Class and its data members and member functions in Java/C++
2	Implement the concept of function and operator overloading in Java/C++
3	Implement the concept of friend function
4	Implement the concept of class constructor and its type in Java/C++
5	Implement the concept of Abstraction in Java/C++
6	Implement the concept of all types of inheritance in Java/C++
7	Implement the collection listener to solve the problem in Java
8	Implement the concept of run time polymorphism in Java/C++
9	Implement the concept of Files using command line arguments in Java/C++
10	Implement the concept of function templates and class template in C++
11	Implement the concept of exception in Java/C++
12	Implement the concept of applet to prepare a web application in Java
13	Implement the event driven approach to prepare the web application in Java

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23IoT-101**

## **B.Tech in CSE (IoT)**

### **IV SEMESTER**

### **23IOT1404 : Lab : Vocational & Skill Enhancement Data Analysis using R**

#### **Course Outcomes**

**Upon successful completion of the course the students will be able to**

1. Independently analyze and interpret data using R.
2. Apply statistical methods and machine learning algorithms to solve real-world problems.
3. Create professional data visualizations and reports for effective communication.
4. Work on data analysis projects from data cleaning to insights generation.

**Minimum Eight Practical's to be performed from the list as below**

SN	Experiments based on
1	Import data from CSV, Excel, databases, etc.
2	Export data to various formats.
3	Data Cleaning and preparing using R
4	Calculate descriptive statistics (mean, median, standard deviation, etc.).
5	Apply machine learning algorithms for classification and clustering tasks.
6	Create visualizations like histograms, boxplots, scatter plots.
7	Create interactive visualizations with plotly.
8	Preprocess text data (tokenization, stemming, stop word removal).
9	Integrate R with big data frameworks like Spark for large-scale data analysis.
10	Present analysis findings professionally to stakeholders.

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**SoE No.  
23IoT-101**

## B.Tech in CSE (IoT)

### IV SEMESTER

### IV SEMESTER

**Code MDM2CT203. : Sub. Name : IoT Design Principles**

#### Course Outcomes :

**Upon successful completion of the course the students will be able to**

1. Choose an appropriate communication model for given design criteria
2. Analyze IOT environments using various communication technologies
3. Understand essentials of IoT Security
4. Discuss the various domains where IOT can be applied successfully.

#### Unit I:

**8 Hrs.**

**Overview of Internet of Things:** Defining IoT, Importance of IoT , IoT Basic Characteristics, Enabling Technologies of IoT, IoT communication Models, IoT Communication API's Cloud Services: IAAS, PAAS, SAAS, IoT Specific Cloud Services RFID: Introduction to RFID and its Applications in IoT.

#### Unit II:

**8 Hrs.**

**Design Principles for IoT:** Internet- based communication, IPv4, IPv6, 6LoWPAN protocol, IP Addressing in the IoT, Message communication protocols (CoAP, MQTT, XMPP, AMQP), IEEE802.15.4, ZigBee, Bluetooth, NFC, Wireless HART, ZWave,

#### Unit III:

**6 Hrs.**

**Wireless Sensor networks: Basic Building blocks of IoT system: Sensors, Processors, gateways, Applications.** Components of sensor nodes, Node Behavior in WSNs, Applications, WSN Coverage, OGDC algorithm, Stationary and Mobile Wireless Sensor Networks.

#### Unit IV:

**8 Hrs.**

**Privacy and Security :** Introduction to web security, Vulnerabilities of IoT, Privacy, Security requirements, Threat analysis, IoT security tomography and layered attacker model, Identity Management and Establishment, Access control, Message integrity, Non-repudiation and availability .

Case Study: Wireless Patient Monitor system, Home automation concept and case study, Surveillance applications concept and, Other IoT applications

**Total Lecture 30 Hours**

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## B.Tech in CSE (IoT)

### Textbooks:

1.	Internet of Things Principles and Paradigms, Edited By Rajkumar Buyya, Amir Vahid Dastjerdi, Morgan Kaufmann, ELSEVIER
2.	Raj Kamal, "Internet of Things-Architecture and design principles", McGraw Hill Education.
3.	The Internet of Things: Connecting Objects to the Web edited by Hakima Chaouchi

### Reference Books:

1.	Fundamentals of Wireless Sensors Networks Theory and Practice, Waltenegus Dargie and Christian Poellabauer, WILEY Series
2.	Rethinking the Internet of Things: A Scalable Approach to Connecting Everything 1 st Edition, Francis DaCosta, Apress Publications
3.	Introduction to Internet of Things, Prof. Sudip Misra, NPTEL Lectures Notes, Department of Computer Science & Engineering, Indian Institute of Technology Kharagpur,

### YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1	

### MOOCs Links and additional reading, learning, video material

1.	<a href="https://onlinecourses.nptel.ac.in/noc22_cs40/preview">https://onlinecourses.nptel.ac.in/noc22_cs40/preview</a>

## IV SEMESTER Multidisciplinary Minor Courses

### Track 1

Courses	Sem	MDMT1IOT101 : Internet of Things (IoT)
MDM-I	3	(MDM1IOT101) IoT Architecture and Protocol
MDM-II	4	(MDM2IOT102) IoT Design Principles
MDM-III	5	(MDM3IOT103) Fog and Edge Computing

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## **B.Tech in CSE (IoT)**

MDM-IV	6	(MDM4IOT104) Security and Privacy in IoT
MDM-V	7	(MDM5IOT105) IoT in Healthcare
MDM-VI	8	(MDM6IOT106) Cognitive IoT

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## B.Tech in CSE (IoT)

### IV SEMESTER Open Elective -II : Basket

SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject
1	4	OE2	GE	23OE2401	OE-II : Combinatorics
2	4	OE2	GE	23OE2402	OE-II : Fuzzy Set Theory, Arithmetic And Logic
3	4	OE2	GE	23OE2403	OE-II : Green Chem. & Sustainability
4	4	OE2	GE	23OE2404	OE-II : Hydrogen Fuel
5	4	OE2	GE	23OE2405	OE-II : Electronic Materials And Applications
6	4	OE2	GE	23OE2406	OE-II : Laser Technology And Applications
7	4	OE2	MGT	23OE2407	OE-II : Finance And Cost Management
8	4	OE2	MGT	23OE2408	OE-II : Operation Research Techniques
9	4	OE2	MGT	23OE2409	OE-II : Project Evaluation & Management
10	4	OE2	MGT	23OE2410	OE-II : Total Quality Management
11	4	OE2	MGT	23OE2411	OE-II : Value Engineering
12	4	OE2	MGT	23OE2412	OE-II : Maintenance Management
13	4	OE2	MGT	23OE2413	OE-II : Industrial Safety
14	4	OE2	MGT	23OE2414	OE-II : Industry 4.0
15	4	OE2	MGT	23OE2415	OE-II : Operation Management
16	4	OE2	MGT	23OE2416	OE-II : Material Management
17	4	OE2	MGT	23OE2417	OE-II : Hospitality Management
18	4	OE2	MGT	23OE2418	OE-II : Human Resource Management & Organizational Behaviour
19	4	OE2	MGT	23OE2419	OE-II : Agri-Business Management
20	4	OE2	MGT	23OE2420	OE-II : Rural Marketing
21	4	OE2	MGT	23OE2421	OE-II : Marketing Management
22	4	OE2	MGT	23OE2422	OE-II : Health Care Management

Link for Open Electives syllabus: <https://vcce.edu/syllabus/>

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**SoE No.**  
**23IoT-101**

## **B.Tech in CSE (IoT)**

### **IV SEMESTER**

#### **Mandatory Learning Course (MLC)**

#### **MLC2124 : YCAP4**

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