

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

1st to 6th Semester

(Department of Computer Technology)

B. Tech in Computer Technology



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 Technology

SoE No.
23CT-101

S N	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	23GE1103	Differential Equations and Complex Analysis	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	ME	23ME1101	Engineering Graphics	T	1	0	0	1	1	30	20	50	3
5	1	BES	ME	23ME1102	Lab : Engineering Graphics	P	0	0	4	4	2		60	40	
6	1	BES	EL	23EL1101	Basic Electrical and Electronics Engineering	T	3	0	0	3	3	30	20	50	3
7	1	BES	CT	23CT1103	Lab : Computer WorkShop	P	0	0	2	2	1		60	40	
8	1	PC	CT	23CT1101	Introduction to Logic Building and Programming	T	2	0	0	2	2	30	20	50	2
9	1	PC	CT	23CT1102	Lab: Introduction to Logic Building and Programming	P	0	0	2	2	1		60	40	
10	1	VSEC	GE	23GE1117	Get Set Go	...	...	...	...	...	2		60	40	
11	1	CC2	GE		Liberal Learning Course (LLC2)	...	...	...	...	...	2		60	40	
TOTAL FIRST SEM							12	0	10	22	21				
MANDATORY LEARNING COURSES															
1	1	HS		GE2131	Universal Human Values (UHV)	A	2	0	0	2	0				
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	CV	23CV1201	Engineering Mechanics	T	3	0	0	3	3	30	20	50	3
7	2	BES	CV	23CV1202	Lab: Engineering Mechanics	P	0	0	2	2	1		60	40	
8	2	BES	CT	23CT1204	Object Oriented Programming	T	3	0	0	3	3	30	20	50	3
9	2	BES	CT	23CT1205	Lab : Object Oriented Programming	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							16	0	6	22	23				

Liberal Learning Course

S N	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	Skilling in Microsoft Visio and Inkscape



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(Department of Computer Technology)
B.Tech. in Computer Technology

SoE No.
23CT-101

S N	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

S N	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 Date of Release	1.00 Version	Applicable for AY 2023-24 Onwards



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							L	T	P	Hrs		MSEs*	TA**	ESE	
THIRD SEMESTER															
1	3	HSSM-1	GE	23GE1301	Fundamentals of Management & Economics	T	2	0	0	2	2	30	20	50	3
2	3	PC	CT	23CT1301	Lab : Web Technology	P	0	0	2	2	1		60	40	
3	3	PC	CT	23CT1302	Data Structures	T	3	0	0	3	3	30	20	50	3
4	3	PC	CT	23CT1303	Lab : Data Structures	P	0	0	2	2	1		60	40	
5	3	PC	CT	23CT1304	Computer Architecture & Organization	T	3	0	0	3	3	30	20	50	3
6	3	PC	CT	23CT1305	Discrete Mathematics and Probability Theory	T	3	0	0	3	3	30	20	50	3
7	3	VEC-2	CT	23CT1306	Cyber Laws	T	2	0	0	2	2	30	20	50	3
8	3	CEP	CT	23CT1307	Community Engagement Project	P	0	0	4	4	2		60	40	
9	3	OE-1	OE		Open Elective -I	T	2	0	0	2	2	30	20	50	3
10	3	MDM	CV		MD Minor Course-I	T	2	0	0	2	2	30	20	50	3
TOTAL							17	0	8	25	21				

List of Mandatory Learning Course (MLC)															
1	3	HS	T&P	MLC2123	YCAPP3 : YCCE Communication Aptitude Preparation	A	3	0	0	3	0				

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	23GE1403	Linear Algebra	T	3	0	0	3	3	30	20	50	3
2	4	HSSM-2	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	23CT1401	Operating systems	T	3	0	0	3	3	30	20	50	3
6	4	PC	CT	23CT1402	Lab : Operating systems	P	0	0	2	2	1		60	40	
7	4	PC	CT	23CT1403	Design and Analysis of Algorithms	T	3	0	0	3	3	30	20	50	3
8	4	PC	CT	23CT1404	Lab : Design and Analysis of Algorithms	P	0	0	2	2	1		60	40	
9	4	PC	CT	23CT1405	Lab : Data Analysis using R	P	0	0	0	2	1		60	40	
10	4	VSEC-3	CT	23CT1406	Lab : Python	P	0	2	2	4	2	60	40		
11	4	OE-2	OE		Open Elective -II	T	2	0	0	2	2	30	20	50	3
12	4	MDM	CT		MD Minor Course-II	T	2	0	0	2	2	30	20	50	3
TOTAL							19	2	6	29	24				

List of Mandatory Learning Course (MLC)

1	4	HS	T&P	MLC2124	YCAP4 : YCCE Communication Aptitude Preparation	A	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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							L	T	P	Hrs		MSEs*	TA**	ESE	
FIFTH SEMESTER															
1	5	PC	CT	23CT1501	Database Management System	T	3	0	0	3	3	30	20	50	3
2	5	PC	CT	23CT1502	Lab : Database Management System	P	0	0	2	2	1		60	40	
3	5	PC	CT	23CT1503	Mathematical Foundation of Data Analysis	T	3	0	0	3	3	30	20	50	3
4	5	PC	CT	23CT1504	Lab : Mathematical Foundation of Data Analysis	P	0	0	2	2	1		60	40	
5	5	PC	CT	23CT1505	Theorotical Foundation of Computer System	T	3	0	0	3	3		60	40	
6	5	PC	CT	23CT1506	Lab : Java Stack	P	0	0	2	2	1		60	40	
7	5	PE	CT		Professional Elective-I	T	2	0	0	2	2	30	20	50	3
8	5	PE	CT		Lab : Professional Elective-I	P	0	0	2	2	1		60	40	
9	5	OE-3	OE		Open Elective -III	T	3	0	0	3	3	30	20	50	3
10	5	MDM	CT		MD Minor Course-III	T	3	0	0	3	3	30	20	50	3
11	5	STR	CT	23CT1507	Internship, Seminar and Report	P	0	0	2	2	1		60	40	
TOTAL							17	0	10	27	22				

List of Mandatory Learning Course (MLC)

1	5	HS	T&P	MLC2125	YCAPP5 : YCCE Communication Aptitude Preparation	A	3	0	0	3	0				
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Professional Elective - I

1	5	PE-I	CT	23CT1521	PE-I : Computer Vision										
2	5	PE-I	CT	23CT1522	PE-I : Lab : Computer Vision										
3	5	PE-I	CT	23CT1523	PE-I : Mobile OS										
4	5	PE-I	CT	23CT1524	PE-I : Lab : Mobile OS										
5	5	PE-I	CT	23CT1525	PE-I : Embedded Systems										
6	5	PE-I	CT	23CT1526	PE-I : Lab : Embedded Systems										
7	5	PE-I	CT	23CT1527	PE-I : Computer Graphics										
8	5	PE-I	CT	23CT1528	PE-I : Lab : Computer Graphics										
9	5	PE-I	CT	23CT1529	PE-I : Introduction to Salesforce										
10	5	PE-I	CT	23CT1530	PE-I : Lab : Introduction to Salesforce										
11	5	PE-I	CT	23CT1531	PE-I : Privacy and Security in Online Social Networks										
12	5	PE-I	CT	23CT1532	PE-I : Lab : Privacy and Security in Online Social Networks										

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 Kautilya	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	NPTL	23OE3535	OE-III : Designated approved online NPTEL Course	NPTL

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SIXTH SEMESTER															
1	6	PC	CT	23CT1601	Artificial Intelligence and Machine Learning	T	3	0	0	3	3	30	20	50	3
2	6	PC	CT	23CT1602	Lab : Artificial Intelligence and Machine Learning	P	0	0	2	2	1		60	40	
3	6	PC	CT	23CT1603	Computer Networks		3	0	0	3	3		60	40	
4	6	PC	CT	23CT1604	Lab : Computer Networks		0	0	2	2	1				
5	6	PC	CT	23CT1605	Design Thinking and Research Methodology	T	2	0	0	2	2	30	20	50	3
6	6	PE	CT		Professional Elective-II	T	3	0	0	3	3	30	20	50	3
7	6	PE	CT		Lab : Professional Elective-II	P	0	0	2	2	1		60	40	
8	6	PE	CT		Professional Elective-III	T	3	0	0	3	3	30	20	50	3
9	6	MDM	CT		MD Minor Course-IV	T	3	0	0	3	3	30	20	50	3
10	6	VSEC-4	CV	23CT1606	Lab : Competitive Coding	P	0	0	4	4	2		60	40	
11	6	STR	CT	23CT1607	Project Phase I	P	0	0	4	4	2		60	40	
TOTAL							17	0	14	31	24				

List of Mandatory Learning Course (MLC)															
1	6	HS		MLC126	YCAP6 :	A	3	0	0	3	0				

Professional Elective - II					
1	6	PE-II	CT	23CT1621	PE-II : Advance Web Technologies
2	6	PE-II	CT	23CT1622	PE-II : Lab : Advance Web Technologies
3	6	PE-II	CT	23CT1623	PE-II : Internet of Things
4	6	PE-II	CT	23CT1624	PE-II : Lab : Internet of Things
5	6	PE-II	CT	23CT1625	PE-II : Natural Language Processing
6	6	PE-II	CT	23CT1626	PE-II : Lab : Natural Language Processing
7	6	PE-II	CT	23CT1627	PE-II : Dot Net Full Stack Development
8	6	PE-II	CT	23CT1628	PE-II : Lab : Dot Net Full Stack Development
9	6	PE-II	CT	23CT1629	PE-II : Realtime Systems
10	6	PE-II	CT	23CT1630	PE-II : Lab : Realtime Systems

Professional Elective - III					
1	6	PE-III	CT	23CT1641	PE-III : Wireless Sensor Network
2	6	PE-III	CT	23CT1642	PE-III : Industrial and Social Applications of Digital Twins
3	6	PE-III	CT	23CT1643	PE-III : Cyber and Digital Forensics
4	6	PE-III	CT	23CT1644	PE-III : Model-Driven Software Engineering
5	6	PE-III	CT	23CT1645	PE-III : Data Mining

		July, 2023	1.00	Applicable for AY 2023-24 Onwards
Chairperson	Dean (Acad. Matters)	Date of Release	Version	

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

1st Semester

(Department of Computer Technology)

B. Tech in Computer Technology



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 Technology

SoE No.
23CT-101

S N	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	23GE1103	Differential Equations and Complex Analysis	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	ME	23ME1101	Engineering Graphics	T	1	0	0	1	1	30	20	50	3
5	1	BES	ME	23ME1102	Lab : Engineering Graphics	P	0	0	4	4	2		60	40	
6	1	BES	EL	23EL1101	Basic Electrical and Electronics Engineering	T	3	0	0	3	3	30	20	50	3
7	1	BES	CT	23CT1103	Lab : Computer WorkShop	P	0	0	2	2	1		60	40	
8	1	PC	CT	23CT1101	Introduction to Logic Building and Programming	T	2	0	0	2	2	30	20	50	2
9	1	PC	CT	23CT1102	Lab: Introduction to Logic Building and Programming	P	0	0	2	2	1		60	40	
10	1	VSEC	GE	23GE1117	Get Set Go	...	...	...	...	...	2		60	40	
11	1	CC2	GE		Liberal Learning Course (LLC2)	...	...	...	...	...	2		60	40	
TOTAL FIRST SEM							12	0	10	22	21				
MANDATORY LEARNING COURSES															
1	1	HS		GE2131	Universal Human Values (UHV)	A	2	0	0	2	0				
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	CV	23CV1201	Engineering Mechanics	T	3	0	0	3	3	30	20	50	3
7	2	BES	CV	23CV1202	Lab: Engineering Mechanics	P	0	0	2	2	1		60	40	
8	2	BES	CT	23CT1204	Object Oriented Programming	T	3	0	0	3	3	30	20	50	3
9	2	BES	CT	23CT1205	Lab : Object Oriented Programming	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							16	0	6	22	23				

Liberal Learning Course

S N	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	Skilling 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 Computer Technology)
B.Tech. in Computer Technology

SoE No.
23CT-101

S N	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

S N	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 Date of Release	1.00 Version	Applicable for AY 2023-24 Onwards



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 Mathematics & Humanities)

SoE No.
23FY-101

B.Tech First Year

I SEMESTER

23GE1103: Differential Equations and Complex Analysis

Course Outcomes

The students will be able to

1. Use appropriate Methods to solve first order and higher order differential equations and apply it to find solutions of engineering problems.
2. Use appropriate methods to solve partial differential equations.
3. Determine the various functions of complex numbers.
4. Evaluate the integration of function of complex variables.

Unit I: Differential Equations I

(7 Hrs.)

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. (Contemporary Issues related to Topic)

Unit II: Differential Equations II

(7 Hrs.)

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. (Contemporary Issues related to Topic)

Unit III: Differential Equations III

(6 Hrs.)

Cauchy's homogeneous linear differential equations, Legendre's linear differential equations, Applications of differential equations to various fields (only up to second order). (Contemporary Issues related to Topic)

Unit IV: Partial Differential Equations

(6 Hrs.)

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. (Contemporary Issues related to Topic)

Unit V: Complex Number

(7 Hrs.)


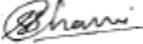
Basic concepts of complex numbers and its various forms. Separation of real and imaginary parts, De Moivre's theorem, Application of De Moivre's theorem, Exponential function of complex numbers, Circular function of complex numbers, Hyperbolic function and their inverse, Logarithm of a complex number. (Contemporary Issues related to Topic)

Unit VI: Complex Variables

(6 Hrs.)

Analytic function, Cauchy-Riemann conditions, Harmonic functions, Finding Harmonic conjugates, Taylor's and Laurent's Theorem (statement only), Examples on Taylor's and Laurent's Theorem, Evaluation integral by using Residue theorem. (Contemporary Issues related to Topic)

Total Lecture 39 Hours

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Nagar Yuwak Shikshan Sanstha's

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(Scheme of Examination w.e.f. 2023-24 onward)
(Department of Mathematics & Humanities)

SoE No.
23FY-101

B.Tech First Year

Textbooks:

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

Reference Books:


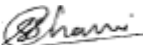
- | | |
|----|--|
| 1. | G B Thomas and R L Finney, Calculus and Analytical Geometry, 9th edition, Addison-Wesley, 1999. |
| 2. | N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, 10 th edition, Laxmi Prakashan. |

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

- | | |
|---|---|
| 1 | http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/ |
|---|---|

MOOCs Links and additional reading, learning, video material

- | | |
|----|---|
| 1. | https://nptel.ac.in/courses/111103070 |
| 2. | https://onlinecourses.nptel.ac.in/noc19_ma28/preview |
| 3. | https://nptel.ac.in/courses/111/106/111106100/ |

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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 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

(6 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

(7 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


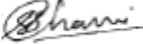
(7 Hrs.)

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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Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

SoE No.
23FY-101

B.Tech First Year



Unit VI: Optical Fibres	(6 Hrs.)
Principle, structure and classification, Acceptance angle, Numerical aperture, Losses in optical fibers, Applications as sensors. (Contemporary Issues related to Topic)	
Total Lecture	40 Hours

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

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

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

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

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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

23GE1111 : Lab. Applied Physics


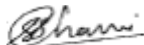
Course Outcomes:

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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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 Mechanical Engineering)

B.Tech in Mechanical Engineering

**SoE No.
23ME-101**

I SEMESTER

23ME1101 : Engineering Graphics

Course Outcomes :

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

1. Construct orthographic drawing and isometric drawing of a given object
2. Evaluate Projections of various One Dimensional, Two dimensional, Three dimensional objects
3. Develop the lateral surfaces of various solids, their section and intersection.
4. Practice the use of software tools used for Two dimensional drawings.

Unit I: Theory of Orthographic Projections:

(3 Hrs.)

Introduction, Quadrant system, Theory of orthographic projection, Projection method and principal planes, First and Third angle projections,

Unit II: Theory of Isometric Projections:

(2 Hrs.)

Theory of isometric projection, Method for drawing isometric views, Different problems on isometric projections.

Unit III: Lines:

(2 Hrs.)

Projection of points, Projection of lines, True lengths and inclinations, apparent lengths and inclinations, various positions of lines in different quadrants, Traces of lines, projection of line on auxiliary plane.

Unit IV: Planes and Solids:

(4 Hrs.)

Projection planes: (Polygonal Lamina, Circular Lamina), Projection of Perpendicular planes and oblique planes. Auxiliary views (Auxiliary planes) Projection of Solids :(Inclined to One Plane Only) - Polyhedra (Regular and Irregular Polyhedra), Solids of Revolution

Unit V: Section of Solids and Development of Surfaces:

(2 Hrs.)

Types of Section planes, Sectional top view, True shape.
Development of different solids using Radial line and parallel line methods.

Unit VI: Intersection of Surfaces of solids:

(2 Hrs.)

Intersection between similar solids, Intersection between dissimilar solids, Lines and Curves of Intersection.

Total Lecture 15 Hours

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B. Tech SoE and Syllabus 2023

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

(Department of Mechanical Engineering)

B.Tech in Mechanical Engineering

SoE No.
23ME-101

Textbooks:

- | | |
|----|--|
| 1. | D.M. Kulkarni, A. P. Rastogi and A. K. Sarkar , Engineering Graphics with AutoCAD PHI learning Pvt. Ltd., Revised Edition(2014), |
| 2. | N. D. Bhatt ,Engineering Drawing Charotar Publishing House Pvt. Ltd, 53 rd Edition 2017 |

Reference Books:




- | | |
|----|---|
| 1. | D. A. Jolhe Engineering Drawing , Tata McGraw Hill Publications , 2008, |
| 2. | K. L. Narayana & P. Kanniah , Engineering Drawing SciTech Publication , 2010 |
| 3. | R. K. Dhawan Engineering Drawing S. Chand Publication Multicolor revised edition 2015 |

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

- | | |
|---|--|
| 1 | Intranet on address 172.16.1.10. data/CCC/software / AutoCAD Software Setup. |
|---|--|

MOOCs Links and additional reading, learning, video material

- | | |
|----|---|
| 1. | https://youtube.com/playlist?list=PLLy_2iUCG87Bw9XPfEF3r3EW5UIAOv8iz |
| 2. | Eng https://nptel.ac.in/courses/112105294 |

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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 Mechanical Engineering)

B.Tech in Mechanical Engineering

**SoE No.
23ME-101**

I SEMESTER

23ME1102 : Lab. Engineering Graphics

Course Outcomes :

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

1. Construct orthographic drawing and isometric drawing of a given object
2. Evaluate Projections of various One Dimensional, Two dimensional, Three dimensional objects
3. Develop the lateral surfaces of various solids, their section and intersection.
4. Practice the use of software tools used for Two dimensional drawings.

Practical's to be performed from the list as below

SN	Experiments based on	No.of Practical's
1	Introduction of AutoCAD Basic Commands	02
2	Orthographic Projection	03
3	Isometric Projection	03
4	Projection of Straight Line	03
5	Projection of Planar Surface	03
6	Projection of Solid	03
7	Section and Development of Solid	04
8	Intersection of Surfaces	03
9	Drawing Sheet 1: Convention for various lines, Dimensioning and Orthographic Projection	02
10	Drawing Sheet 2: Projection of line, planar surface or solid. (Any one)	02
Total Practical's		28 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 Electrical Engineering)

B.Tech in Electrical Engineering

**SoE No.
23EL-101**

I SEMESTER

23EL1101 : Basic Electrical and Electronics Engineering

Course Outcomes:

1. Understand the fundamental concepts of Analog Electronic and Electrical Circuits
2. Apply the concepts of Electrical and Electronic Circuits to obtain the desired parameter
3. Analyze analog Electrical Circuits for given application.
4. Analyze analog Electronic Circuits for given application

Unit I: Circuit Elements and Energy Sources

(7 Hrs.)

Circuit Elements, Series and Parallel Combination of Resistances, Inductance and Capacitances, Energy Sources, Source Transformation, Sources with Periodic Waveforms, A.C. in Inductance and Capacitance, Star-Delta Connection. (Contemporary Issues related to Topic)

Unit II: Analysis of Network

(7 Hrs.)

Kirchhoff's Laws, Current Division, Voltage Division, Nodal and Mesh Analysis of Electric Circuits, Thevenin's Theorem (Contemporary Issues related to Topic)

Unit III: Generator and Motors

(7 Hrs.)

Introduction to Generator, Construction, working principle, Types of Generators, Introduction to DC Motor, Working Principle of DC Motor, Types of Motors. (Contemporary Issues related to Topic)

Unit IV: Diode and Transistor

(6 Hrs.)

Introduction to Semiconductor, P-N junction diodes, Biasing & Characteristics of diodes. Diode Circuits - Half wave rectifier, full wave rectifier, bridge rectifier. Introduction to BJT- NPN and PNP, Modes of operation,. (Contemporary Issues related to Topic)

Unit V: Operational Amplifier and Its Application

(7 Hrs.)

Introduction to Op-Amp, Inverting and Non-Inverting Amplifier, Linear Applications of OP-AMP like adder, Subtractor, integrator, differentiator and non-linear application using Comparator. (Contemporary Issues related to Topic)

Unit VI: Electronics Measurement

(6 Hrs.)

Introduction to Measurement System, Generalized block diagram of Measurement System, Static & dynamic characteristics of measurement system, Types of errors & their sources, Statistical analysis. (Contemporary Issues related to Topic)

Total Lecture 40 Hours

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Nagar Yuwak Shikshan Sanstha's

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(Department of Electrical Engineering)

B.Tech in Electrical Engineering

SoE No.
23EL-101

Textbooks:

1. Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford Higher Education, First Edition 2005
2. Electronics Devices and circuits, Millman Jacob, McGraw Hill Education, Fourth Edition (2015)
3. Circuit Theory (Analysis and Synthesis) , by A. Chakrabarti, Dhanpat Rai & Co., Reprint Edition 2014

Reference Books:




1. OP-AMP and Linear Integrated Circuit, by Ramakant A. Gayakwad, Prentice Hall India Learnin Private Limited, Published in 2002
2. Electrical & Electronic measurement & Instrument, A. K. Sawhney, Dhanpat Rai & Co., 18th edition 2008

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.nptel.ac.in/noc22_ee113/preview

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B. Tech SoE and Syllabus 2023

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

(Department of Computer Technology)

B.Tech in Computer Technology

SoE No.
23CT-101

I SEMESTER

23CT1103 : 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

Unit I: Computer Hardware	(4 Hrs.)
Computer Hardware, RAM, HDD, Levels of Caches, Setting environment variables, Installation of software in Linux, Installing printers	
Unit II: Introduction to Linux/Unix OS	(4 Hrs.)
Introduction to Linux/Unix OS - ls, wc, chdir, mkdir, chmod, cd, mv, df, du, netstat, ps, more, set, env, setenv, chgrp, man, rm, rmdir, grep, vi, tar, untar, uuencode, find, cat, history, ping, ifconfig, traceroute	
Unit III: Unix tools	(4 Hrs.)
Unix tools - Awk, sed, Emacs	
Unit IV: Scripting	(4 Hrs.)
Scripting – variables, conditionals, loops, finding logged in users , Parameter passing to C program from shell (argc / argv)	
Unit V: Installing Linux (or any variant)	(4 Hrs.)
Installing Linux (or any variant): Introduction to using different tools for identification of possible errors in C program – gdb, concepts of “core dump”, backtracing using “bt”, using “info” to dump all registers, creating watch-list / watch variables. DDD (Data Display Debugger) – introduction and usage	
Unit VI: IDE for code development	(4 Hrs.)
IDE for code development Using DevCpp and/or VisualStudio, Create a project using multiple .c and .h files with cross-references, Setting compiler options and linker options, Understanding different settings	
Total Lecture	24 Hours

Textbooks:

1.	Linux Pocket Guide, Daniel J. Barrett, 3rd edition, O'Reilly Media
2.	The Linux Command Line, William Shotts, 2nd edition, No Starch Press
3.	Linux for Beginners, Jason Cannon, 1st edition, Independently Published

Reference Books:

1.	Linux Command Line and Shell Scripting Bible, Richard Blum, 3rd edition, Wiley
2.	Command Line Kung Fu, Jason Cannon, 1st edition, Independently Published

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(Department of Computer Technology)

B.Tech in Computer Technology

SoE No.
23CT-101

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

1	chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/SERIES%20WISE%20BOOKS/COMPUTER%20TECHNOLOGY/COMPUTER%20TECHNOLOGY%20(G%20Series).pdf
2	chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/SERIES%20WISE%20BOOKS/COMPUTER%20TECHNOLOGY/COMPUTER%20TECHNOLOGY%20(I%20Series).pdf
3	chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/SERIES%20WISE%20BOOKS/COMPUTER%20TECHNOLOGY/COMPUTER%20TECHNOLOGY%20(PE%20Series).pdf

MOOCs Links and additional reading, learning, video material

1.	https://www.youtube.com/watch?v=19O5kFdtKb0
2.	https://www.youtube.com/watch?v=ZtqBQ68cfJc
3.	https://www.youtube.com/watch?v=kfjDWygSvnw
4.	https://www.youtube.com/watch?v=GtovwKDemnl&t=1578s
5.	https://www.youtube.com/watch?v=J7L2x1ATogk
6.	https://www.youtube.com/watch?v=85FrhrIwBtw

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 DEV++
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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(Department of Computer Technology)

B.Tech in Computer Technology

SoE No.
23CT-101

I SEMESTER

23CT1101 : Introduction to Logic Building and Programming

Course Outcomes :

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

1. Describe the basics of computer system components and operation, write algorithms and draw flowcharts.
2. Write programs using flow control statements.
3. Use functions to write modular programs.
4. Use linear data structures such as arrays and structures in programs.

Unit I:

6 Hrs.

Computer System Basics: Introduction to components of a computer system (disks, memory, processor), how program is executed, understanding of concepts such as compilers, source and object programs, etc. Introduction to algorithms and flowcharts, types of programming errors.
Basic building blocks of C: Character set, variables, identifiers & keywords, Data types, Operators: arithmetic, logical and relational operators, precedence of operators

Unit II:

6 Hrs.

Expressions, sizeof() operator, constants, typedef statement, basic input/output statements and functions (scanf, printf, getch, putch, gets, puts), Introduction to library functions, 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:

6 Hrs.

Loop Structures: While, do while and for loops, break and continue statement, "goto" statement, bitwise operators

Unit IV:

6 Hrs.

Modular programming: Concept of functions, user defined functions, function prototypes, formal parameters, actual parameters, return types, call by value, Recursive functions, comparing recursion against iteration, Concepts of a pointer, call by reference.

Unit V:

6 Hrs.

Arrays: One dimensional array, array manipulation, insertion, deletion of an element, searching techniques- Linear and binary search, sorting techniques – Bubble sort, and selection sort. Two-dimensional arrays: matrix representation, basic matrix operations such as addition, multiplication and transpose, Array as function arguments. Strings: string representation and string handling functions

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Unit VI:	6 Hrs.
Structure: Introduction, defining a structure, declaring structure variables, accessing structure members, structure initialization, array of structures.	
	Total Lecture 36 Hours

Textbooks:

1.	Computer Science: A Structured Programming Approach Using C, 3 rd , B.A.Forouzan and R.F. Gilberg, Cengage Learning
2.	The C Programming Language, 2 nd , Brian Kernighan and Dennis Ritchie, Prentice Hall

Reference Books:

1.	Let Us C, 15th, Yashavant Kanetkar, BPB
2.	Computer Programming and Data Structures, 4th, E Balagurusamy, Tata McGraw Hill

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

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MOOCs Links and additional reading, learning, video material

1.	https://onlinecourses.nptel.ac.in/noc22_cs40/preview
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B.Tech in Computer Technology

**SoE No.
23CT-101**

I SEMESTER

23CT1102 : Lab. Introduction to Logic Building and Programming

Course Outcomes :

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

1. Describe the basics of computer system components and operation, write algorithms and draw flowcharts.
2. Write programs using flow control statements.
3. Use functions to write modular programs.
4. Use linear data structures such as arrays and structures in programs.

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

Sr.	Problem Statements																												
1 A	Introduction to Linux Operating system & it's different commands.																												
1 B	Introduction to Vi editor, Compilation and Execution of a program in Linux																												
2 A	1) Write a C program to display Your Name, Address and City in different lines. 2) Write a C program to convert centigrade into Fahrenheit. Formula: $C = (F - 32) / 1.8$.																												
2 B	1) Write program using conditional operators to evaluate the following function and print the value of y. $y = 2.4x + 3$, for $x \leq 2$ $y = 3x - 5$, for $x > 2$																												
3	Write a program to implement the following table, which tries to predict if a customer would buy a product. In particular, you need to ask for inputs Age, Gender and City, and print one of the three outputs Yes, No or Cannot Say. <table><tr><th>Age</th><th>Gender</th><th>City</th><th>Will Buy?</th></tr><tr><td>25-30</td><td>M</td><td>Chennai</td><td>Yes</td></tr><tr><td>33-45</td><td>F</td><td>Bangalore</td><td>Yes</td></tr><tr><td>57-80</td><td>F</td><td>Chennai</td><td>No</td></tr><tr><td>25-30</td><td>F</td><td>Hyderabad</td><td>No</td></tr><tr><td>13-19</td><td>M</td><td>Bangalore</td><td>Yes</td></tr><tr><td>16-20</td><td>M</td><td>Chennai</td><td>No</td></tr></table>	Age	Gender	City	Will Buy?	25-30	M	Chennai	Yes	33-45	F	Bangalore	Yes	57-80	F	Chennai	No	25-30	F	Hyderabad	No	13-19	M	Bangalore	Yes	16-20	M	Chennai	No
Age	Gender	City	Will Buy?																										
25-30	M	Chennai	Yes																										
33-45	F	Bangalore	Yes																										
57-80	F	Chennai	No																										
25-30	F	Hyderabad	No																										
13-19	M	Bangalore	Yes																										
16-20	M	Chennai	No																										
4	Write a menu driven program to perform following operations. 1) To display maximum number among inputted three number. 2) To display the final prize based on assumption that if total purchase price is above 2500 rs then discount is 25% and if total prize is above 5000 then discount is 30% else 40% discount. 3) To Display percentage of 2 nd number to 1 st number if two number is entered by the user. 4) Exit.																												
5	Write a program print whether entered number is Prime or not																												
6	Write a program to print the sum of exponential series $e(x) = 1 + x/1! + x^2 / 2! + x^3 / 3! + \dots$																												

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23CT-101

7	Write a program to print following pyramid <pre> 1 1 2 3 1 2 3 4 5 1 2 3 4 5 6 7 </pre>
8	i) Write a program in C that will scan a number N and then output the sum of the powers from 1 to N. thus, if the input is 4, the output should be 288. E.g. $(1)^1 + (2)^2 + (3)^3 + (4)^4 = 1 + 4 + 27 + 256 = 288$ [1,2,3,4] Use power function to calculate the power of number. ii) Write a recursive function to print Factorial of a entered number.
9	Write a program to sort an elements using bubble Sort.
10	Produce a multiplication table. Top left hand corner will show 1x1 and bottom right shows 12x12, as below. <pre> 1 2 3 4 5 6 7 8 9 10 11 12 2 4 6 8 10 12 14 16 18 20 22 24 3 6 9 12 15 18 21 24 27 30 33 36 4 8 12 16 20 24 28 32 36 40 44 48 5 10 15 20 25 30 35 40 45 50 55 60 6 12 18 24 30 36 42 48 54 60 66 72 7 14 21 28 35 42 49 56 63 70 77 84 8 16 24 32 40 48 56 64 72 80 88 96 9 18 27 36 45 54 63 72 81 90 99 108 10 20 30 40 50 60 70 80 90 100 110 120 11 22 33 44 55 66 77 88 99 110 121 132 12 24 36 48 60 72 84 96 108 120 132 144 </pre>
11	Write a program To copy one string to another string without using library function
12	Define a structure for a student having name, roll number and marks obtained in six, subjects. Write a program to input the details for 20 students and print the same.
13	Write a program that copies a file to another file. The names of two files should be sent as command line arguments.

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B. Tech SoE and Syllabus 2023
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(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.

Unit:1	Build a foundation for success	6 Hours
<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>		
Unit:2	Increase Self Confidence	6 Hours
<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>		
Unit:3	Fundamentals of Communication	6 Hours
<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>		
Unit:4	Team Management and Organization skills	5 Hours
<p>Team Management and Organization skills, Leadership Styles, Effective Communication</p> <p>Activity- Team Presentation, Team building activities.</p>		
EVALUATION	1 Hour	EVALUATION
WRITTEN TEST		
Total Lecture Hours		24 Hours

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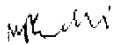

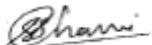
B. Tech SoE and Syllabus 2023
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(Department of Civil Engineering)

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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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

2nd Semester

(Department of Computer Technology)

B. Tech in Computer Technology



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
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(Department of Computer Technology)
B.Tech. in Computer Technology

SoE No.
23CT-101

S N	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	23GE1103	Differential Equations and Complex Analysis	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	ME	23ME1101	Engineering Graphics	T	1	0	0	1	1	30	20	50	3
5	1	BES	ME	23ME1102	Lab : Engineering Graphics	P	0	0	4	4	2		60	40	
6	1	BES	EL	23EL1101	Basic Electrical and Electronics Engineering	T	3	0	0	3	3	30	20	50	3
7	1	BES	CT	23CT1103	Lab : Computer WorkShop	P	0	0	2	2	1		60	40	
8	1	PC	CT	23CT1101	Introduction to Logic Building and Programming	T	2	0	0	2	2	30	20	50	2
9	1	PC	CT	23CT1102	Lab: Introduction to Logic Building and Programming	P	0	0	2	2	1		60	40	
10	1	VSEC	GE	23GE1117	Get Set Go	...	...	...	...	...	2		60	40	
11	1	CC2	GE		Liberal Learning Course (LLC2)	...	...	...	...	...	2		60	40	
TOTAL FIRST SEM							12	0	10	22	21				
MANDATORY LEARNING COURSES															
1	1	HS		GE2131	Universal Human Values (UHV)	A	2	0	0	2	0				
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	CV	23CV1201	Engineering Mechanics	T	3	0	0	3	3	30	20	50	3
7	2	BES	CV	23CV1202	Lab: Engineering Mechanics	P	0	0	2	2	1		60	40	
8	2	BES	CT	23CT1204	Object Oriented Programming	T	3	0	0	3	3	30	20	50	3
9	2	BES	CT	23CT1205	Lab : Object Oriented Programming	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							16	0	6	22	23				

Liberal Learning Course

S N	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	Skilling in Microsoft Visio and Inkscape



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 (Scheme of Examination w.e.f. 2023-24 onward)
(Department of Computer Technology)
B.Tech. in Computer Technology

SoE No.
23CT-101

S N	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

S N	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**

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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.

Unit I: Differential Calculus

(6 Hrs.)

Successive differentiation, n^{th} derivative of rational function, Trigonometrical transformations, n^{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. **(Contemporary Issues related to Topic)**

Unit II: Partial Differentiation

(7 Hrs.)

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. **(Contemporary Issues related to Topic)**

Unit III: Integral Calculus

(6 Hrs.)

Improper integrals: Gamma and Beta functions, applications of integral calculus in computing area, length, volumes, and surface of solids of revolutions. **(Contemporary Issues related to Topic)**

Unit IV: Multiple integrals

(6 Hrs.)

Double integral, change of order of integral, change of variables, triple integrals and its applications. **(Contemporary Issues related to Topic)**

Unit V: Vector Calculus

(7 Hrs.)



Vector fields, Vector differentiation, Gradient, Divergence and Curl, Directional derivatives with physical interpretation, Solenoidal and irrotational motions. **(Contemporary Issues related to Topic)**

Unit VI: Vector Integration & Applications

(7 Hrs.)

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. **(Contemporary Issues related to Topic)**

Total Lecture 39 Hours

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(Department of Mathematics & Humanities)

SoE No.
23FY-101

B.Tech First Year

Textbooks:

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

Reference Books:


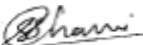
- | | |
|----|--|
| 1. | G B Thomas and R L Finney, Calculus and Analytical Geometry, 9th edition, Addison-Wesley, 1999. |
| 2. | Michael Spivak and Tom Apostol, Calculus, Vol I & Vol II 2 nd edition, Wiley. |
| 3. | N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, 10 th edition, Laxmi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

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

- | | |
|---|---|
| 1 | http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/ |
|---|---|

MOOCs Links and additional reading, learning, video material

- | | |
|----|---|
| 1. | https://nptel.ac.in/courses/111/106/111106146/ |
| 2. | https://nitkkr.ac.in/docs/5-Multiple%20Integrals%20and%20their%20Applications.pdf |

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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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SoE No.
23FY-101

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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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
	List of Experiments-Lab- I
1	Estimation of Nickel.
2	Estimation of 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.
	List of Experiments-Lab- II
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 KMnO_4 calorimetrically and determine the concentration of the given solution of KMnO_4 .
	List of Demonstration Experiments
1	Synthesis of urea formaldehyde.

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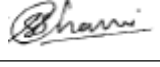
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(Department of Applied Chemistry)

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)

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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	(6 Hrs.)
Process of Communication, Levels of Communication, Flow of Communication, Networks of Communication, Classification of Barriers (Intrapersonal, Interpersonal, Organizational).	
Unit II: English Phonetics	(7 Hrs.)
Speech Mechanism, Organs of speech, Consonant and Vowels sounds symbols, word stress rules	
Unit III: Presentation & Interview Skills	(6 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	(7 Hrs.)
Report -Types, Characteristics, prewriting aspects of report and preparing writing of reports Memo- Objectives, Types, Structure and Layout Email-Etiquette, acronyms.	
Total Lecture	26 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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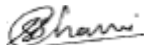
B.Tech First Year

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

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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.

Unit:1	Introduction to Indian Civilization	6 Hours
Development of Human Civilization with specific reference: Stone age: Tool Technology and Cultural Development, Indus Valley civilization, Vedic Civilization. (Contemporary Issues related to Topic)		
Unit:2	Indian Society, Culture and Literature	6 Hours
Society and its types, Culture and its Characteristics, Foundational Literature. (Contemporary Issues related to Topic)		
Unit:3	Tradition of Indian Art and Painting	7 Hours
Indian Traditional Painting, Art style folk, mural with Gandhara and Mathura school of art. (Contemporary Issues related to Topic)		
Unit:4	Indic Traditions of Architecture, Design and Planning	7 Hours
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)		
Total Lecture Hours		26 Hours

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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Reference Books


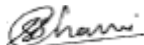
1	B S Harishankar; Art and Archaeology of India: Stone Age to the Present, 2003.
2	Gupte R S and Mahajan B D; Ajanta, Ellora and Aurangabad, 1962.
3	Dharampal, Some Aspects of Earlier Indian Society and Polity and Their Relevance Today, New Quest Publications, Pune, 1987.
4	Michel Lorblanchet, "Rock 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	https://www.researchgate.net/publication/360889208_STONE_AGE_TOOL_TECHNOLOGY_and_CULTURAL_DEVELOPMENT
2	https://scholar.google.com/citations?view_op=view_citation&hl=en&user=iT1KSV8AAAAJ&sortBy=pubdate&citation_for_view=iT1KSV8AAAAJ:UcHWp8X0CEIC

MOOCs Links and additional reading, learning, video material

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

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(Department of Civil Engineering)

B.Tech in Civil Engineering

SoE No.
23CV-101

II SEMESTER

23CV1201 : Engineering Mechanics

Course Outcomes :

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

1. Describe the fundamental concepts of statics and dynamics.
2. Apply the basic concepts of applied mechanics for solution of problems on planar force system.
3. Determine the properties of surface like centroid, moment of inertia, etc. for planar surfaces and mass moment of inertia for rigid body.
4. Analyze pin jointed truss frame structure and beam structure analytically and graphically.
5. Evaluate the dynamic variables of kinetics of particles and simple lifting machine

Unit I: Resultant of planar force System

(7 Hrs.)

Fundamental concepts, system of forces, laws of mechanics, principle of transmissibility of force, Moment of force, Principle of moment, Couple, Resultant of a planar force system, Equivalent force couple system. **(Contemporary Issues related to Topic)**

Unit II: Equilibrium of planar force System

(6 Hrs.)

Free body diagrams, Conditions of equilibrium, types of supports, types of beams, types of loads on beam, Equilibrium of a planar force system **(Contemporary Issues related to Topic)**

Unit III: Friction and Trusses

(7 Hrs.)

Friction: Coulomb's laws of dry friction, plane friction, belt friction.
Trusses: Types of trusses, assumptions in analysis of truss, Analysis of truss by method of joint. **(Contemporary Issues related to Topic)**

Unit IV: Properties of Surfaces

(6 Hrs.)

Centroid: Introduction, First Moment of Area, Centroid of composite areas.
Moment of Inertia: Introduction, Second Moment of Area, Polar moment of Inertia, Radius of Gyration, Transfer formula for moment of Inertia, Product of Inertia, Moment of Inertia, and product of inertia for composite areas, Principal Moments of Inertia. **(Contemporary Issues related to Topic)**

Unit V: Virtual Work Method and Kinetics of Particle

(7 Hrs.)

Virtual Work Method: Introduction, Principle of virtual work, Application to beam and frame.
Kinetics of Particle: Introduction, Newton's law of motion for a Particle, D'Alembert's principle, Translation of particle and connected system. **(Contemporary Issues related to Topic)**

Unit VI: Work Energy and Impulse Momentum Method

(6 Hrs.)

Work Energy Method: Introduction, Work energy equation for translation, Work energy applied to particle motion and connected system.
Impulse Momentum Method: Introduction, Linear Impulse momentum, Conservation of linear momentum, coefficient of restitution, elastic impact, Impulse momentum in plane motion. **(Contemporary Issues related to Topic)**

Total Lecture 39 Hours

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(Department of Civil Engineering)

SoE No.
23CV-101

B.Tech in Civil Engineering

Textbooks:

1. Nelson A., Engineering Mechanics (Statics and Dynamics), ed 2009, Tata Mc. Graw Hill Education Pvt. Ltd., New Delhi, 2009.
2. Dubey N.H., Engineering Mechanics (Statics and Dynamics) first edition 2013, Tata Mc. Graw Hill Education Pvt. Ltd., New Delhi, 2013.
3. Singer F.L., Engineering Mechanics (Statics and Dynamics), Harper and Rowe publication, New Delhi, 1994.

Reference Books:

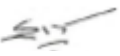


1. Timoshenko S, Young D.H and Rao J.V, Engineering Mechanics, Mc. Graw Hill Publication, New Delhi, 2007.
2. Bhattacharyya B., Engineering Mechanics, Oxford University Press, New Delhi, 2008.
3. Hibbeler R.C, Engineering Mechanics (Statics and Dynamics), Pearson Publication, Singapore, 2000.
4. Shames I.H. and Rao J.V., Engineering Mechanics (Statics and Dynamics), First Edition, Pearson Publication, New Delhi, 2003.
5. Beer F.P. and Johnston E.R; Vector Mechanics for Engineers, 9th edition Tata Mc. Graw Hill Publication, New Delhi. 2007.

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- 1 chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Civil%20Engineering/78.%20Engineering-Mechanics-Statics-and-Dinamics-E-W-Nelson-C-L-Best-W-G-McLean-1st-Ed-1997-Schaum-Outline-McGraw-Hill%20(1).pdf
- 2 chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Civil%20Engineering/79.%20Engineering%20Mechanics.%20Statics-%20MERIAM%20%20AND%20KRAIGE.pdf
- 3 chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Civil%20Engineering/81.%20Engineering%20Mechanics%201.pdf

MOOCs Links and additional reading, learning, video material

1. <https://www.youtube.com/watch?v=nGfVTNfNwnk>
2. <https://www.youtube.com/watch?v=6nguX-cEsvw>
3. <https://nptel.ac.in/courses/112103108>

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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 Civil Engineering)

SoE No.
23CV-101

B.Tech in Civil Engineering

II SEMESTER

23CV1202 : Lab. Engineering Mechanics

Course Outcomes

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

1. Describe the fundamental concepts of statics and dynamics.
2. Apply the basic concepts of applied mechanics for solution of problems on planar force system.
3. Determine the properties of surface like centroid, moment of inertia, etc. for planar surfaces and mass moment of inertia for rigid body.
4. Analyze pin jointed truss frame structure and beam structure analytically and graphically.
5. Evaluate the dynamic variables of kinetics of particles and simple lifting machine

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

SN	Experiments based on
1	To find determine the support reactions of a Simply Supported Beam experimentally and analytically.
2	To determine the forces in the members of a Jib Crane Apparatus experimentally and graphically.
3	To determine the coefficient of friction between two surfaces of different material on Plane Friction Apparatus.
4	To determine the coefficient of friction of Coil Friction Apparatus.
5	To determine the forces in members of a Shear Leg Apparatus experimentally and manually.
6	To determine the mass moment of inertia of a fly wheel using Fly Wheel Apparatus
7	To determine efficiency and law of machine of Differential Axel & Wheel machine.
8	To determine efficiency and Law of machine of Single Purchase Crab machine.
9	To determine efficiency and Law of machine of Double Purchase Crab machine.
10	To verify law of polygonal of forces using Law of Polygon Apparatus.
11	To find support reactions of a simply supported beam using graphical method and hand calculation.
12.	To find the forces in the member of truss using graphical method and hand calculation.
13.	To find (1) Principle moment of inertia and (2) Moment of inertia and product of inertia about any inclined axis for a composite figure using Mohr's circle and hand calculation,

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Nagar Yuwak Shikshan Sanstha's

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

(Department of Computer Technology)

B.Tech in Computer Technology

**SoE No.
23CT-101**

II SEMESTER

23CT1204 : 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 modelling
2. Apply the knowledge of object-oriented programming to solve the given problem
3. Analyze the problem to provide the objectoriented solution using advanced programming concepts

Unit I: Introduction to C++

(6 Hrs.)

Difference between C and C++- Evolution of C++- The Object-Oriented Technology-Disadvantage of Conventional Programming- Key Concepts of Object-Oriented Programming, Advantage of OOP- Object Oriented Language.

Unit II: Classes and Objects & Constructors and Destructor

(7 Hrs.)

Classes in C++-Declaring Objects- Access Specifiers and their Scope- Defining Member Function-Overloading Member Function- Nested class, Constructors and Destructors, Introduction- Constructors and Destructor- Characteristics of Constructor and Destructor- Application with Constructor- Constructor with Arguments (parameterized Constructor-Destructors- Anonymous Objects

Unit III: Operator Overloading and Type Conversion & Inheritance

(7 Hrs.)

The Keyword Operator- Overloading Unary Operator- Operator Return Type- Overloading Assignment Operator (=)- Rules for Overloading Operators, Inheritance, Reusability- Types of Inheritance- Virtual Base Classes- Object as a Class Member- Abstract Classes- Advantages of Inheritance-Disadvantages of Inheritance.

Unit IV: Pointers & Binding Polymorphisms and Virtual Functions

(7 Hrs.)

Pointer, Features of Pointers- Pointer Declaration- Pointer to Class- Pointer Object- The this Pointer- Pointer to Derived Classes and Base Class, Binding Polymorphisms and Virtual Functions, Introduction- Binding in C++- Virtual Functions- Rules for Virtual Function- Virtual Destructor.

Unit V: Generic Programming with Templates & Exception Handling

(7 Hrs.)

Generic Programming with Templates, Need for Templates- Definition of class Templates- Normal Function Templates- Over Loading of Template Function-Bubble Sort Using Function Templates- Difference Between Templates and Macros- Linked Lists with Templates, Exception Handling- Principles of Exception Handling- The Keywords try to throw and catch- Multiple Catch Statements –Specifying Exceptions.

Unit VI: Overview of Standard Template Library

(6 Hrs.)

Overview of Standard Template Library- STL Programming Model- Containers- Sequence Containers- Associative Containers- Algorithms- Iterators- Vectors- Lists- Maps.

Total Lecture 40 Hours

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(Department of Computer Technology)

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SoE No.
23CT-101

Textbooks:

1.	Object Oriented Programming with C++, 5th edition , Bal Gurusamy, McGraw Hill Publications.
2.	Object Oriented Programming in C++ , 3rd edition , Lafore,R , Sams Publication

Reference Books:

1.	The C++ Programming Language, 6th edition , Stroustrup.B , Pearson Education
2.	C++ The Complete Reference , 6th edition , Schildt, H , McGraw Hill Publications

MOOCs Links and additional reading, learning, video material

1.	https://nptel.ac.in/courses/106105153
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SoE No.
23CT-101

II SEMESTER

23CT1205: 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 modelling
2. Apply the knowledge of object-oriented programming to solve the given problem
1. Analyze the problem to provide the object oriented solution using advanced programming concepts

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
2	Implement the concept of function overloading
3	Implement the concept of passing object as a function argument
4	Implement the concept of friend function
5	Implement the concept of constructor and its type.
6	Implement the concept of operator overloading
7	Implement the concept of single inheritance.
8	Implement the concept of multilevel Inheritance
9	Implement the concept of each access specifiers (Private, Public and Protected).
10	Implement the concept of run time polymorphism
11	Implement the concept of Files
12	Implement the concept of command line arguments
13	Implement the concept of function templates
14	Implement the concept of Class templates.
15	Implement the concept of exception.

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(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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(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

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

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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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 3rd Semester

(Department of Computer Technology)

B. Tech in Computer Technology



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 Technology

SoE No.
23CT-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-1	GE	23GE1301	Fundamentals of Management & Economics	T	2	0	0	2	2	30	20	50	3
2	3	PC	CT	23CT1301	Lab : Web Technology	P	0	0	2	2	1		60	40	
3	3	PC	CT	23CT1302	Data Structures	T	3	0	0	3	3	30	20	50	3
4	3	PC	CT	23CT1303	Lab : Data Structures	P	0	0	2	2	1		60	40	
5	3	PC	CT	23CT1304	Computer Architecture & Organization	T	3	0	0	3	3	30	20	50	3
6	3	PC	CT	23CT1305	Discrete Mathematics and Probability Theory	T	3	0	0	3	3	30	20	50	3
7	3	VEC-2	CT	23CT1306	Cyber Laws	T	2	0	0	2	2	30	20	50	3
8	3	CEP	CT	23CT1307	Community Engagement Project	P	0	0	4	4	2		60	40	
9	3	OE-1	OE		Open Elective -I	T	2	0	0	2	2	30	20	50	3
10	3	MDM	CV		MD Minor Course-I	T	2	0	0	2	2	30	20	50	3
TOTAL							17	0	8	25	21				

List of Mandatory Learning Course (MLC)															
1	3	HS	T&P	MLC2123	YCAPP3 : YCCE Communication Aptitude Preparation	A	3	0	0	3	0				

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

(Department of Computer Technology)

B.Tech in Computer Technology

**SoE No.
23CT-101**

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

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Textbooks:

1	Principle of Management, 9 th 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 th edition, Mankiw N. Gregory, Thomson, 2013

Reference Books:

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

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.nptel.ac.in/noc22_mg104/preview
2	https://archive.nptel.ac.in/courses/110/101/110101131/
3	https://onlinecourses.nptel.ac.in/noc23_mg122/preview
4	https://onlinecourses.nptel.ac.in/noc21_hs52/preview
5	https://onlinecourses.nptel.ac.in/noc22_hs67/preview

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23CT-101**

B.Tech in Computer Technology

III SEMESTER 23CT1301: Lab. Web Technology

Course Outcomes :

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

1. Understand various internet technologies.
2. Design the web pages using HTML and CSS.
3. Implement the XML technology to store the data.
4. Develop the interactive web pages using JavaScript

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

SN	Program based on
1	[A] Introduction to internet (overview of internet, email, www, broadband, FTP) [B] Study HTML5 architecture and to implement basic HTML5 Tags.
2	Create a web form by using form tags in HTML5 (use any example)
3	Develop and demonstrate the usage of inline, internal and external style sheet using CSS.
4	Write a program in JSON to store information related to programming books along with edition and author name.
5	Introduction to XML. Program to demonstrate the use of External and Internal DTD. (Write an XML file which will display the Book information which includes the following: 1) Title of the book 2) Author Name 3) ISBN number 4) Publisher name 5) Edition 6) Price)
6	Parsing a file cd_catalog.xml and use the response as an XML DOM object and extracts the info from it with JavaScript.
7	[A] Write a program in JavaScript to perform arithmetic operations. [B] Write a Program in JavaScript To create Dialogue Boxes.
8	[A] Write a program in JavaScript to demonstrate the use of While and For Loop. [B] Write a program in JavaScript to demonstrate the use of Conditional Statements and Functions.
9	Write JavaScript to validate the following fields of the Registration page. 1. First Name (Name should contains alphabets and the length should not be less than 6 characters). 2. Password (Password should not be less than 6 characters length). 3. E-mail id (should not contain any invalid and must follow the standard pattern <u>name@domain.com</u>) 4. Mobile Number (Phone number should contain 10 digits only). 5. Last Name and Address (should not be Empty).
10	Project: Submission of Website with Report.

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B.Tech in Computer Technology

III SEMESTER 23CT1302 : 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.

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

Textbooks:

1.	Data Structures using C ,Latest , Reema Thareja ,Oxford publications.
2.	Data Structures, Algorithms and Applications in C++, 2 nd , 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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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

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MOOCs Links and additional reading, learning, video material

1.	https://nptel.ac.in/courses/106102064
2.	https://www.youtube.com/watch?v=L_314LpT6X8
3.	https://nptel.ac.in/courses/106106133

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Nagar Yuwak Shikshan Sanstha's
Yeshwantrao Chavan College of Engineering

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

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(Department of Computer Technology)

SoE No.
23CT-101

B.Tech in Computer Technology

III SEMESTER
23CT1303 : 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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**SoE No.
23CT-101**

III SEMESTER

23CT1304 : Computer Architecture and Organization

Course Outcomes :

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

1. Understand basic functionality of computer system, control unit, Memory, Input- output and storage.
2. Understand issues involved in the instruction and microinstructions execution and different addressing modes.
3. Understand the different types of Hazards and its mitigation, and working of computer peripherals.
4. Apply the arithmetic operations on signed/un-signed integer and floating point operands.
5. Apply the concept of memory circuits, organization of memory management and cache memory..

Unit I:

7 Hrs.

Basic Structure of Computer Hardware and Software: Functional Units, Basic Operational Concepts, Bus Structures, Software, addressing methods and machine program sequencing: Memory Locations, addressing and encoding of information, Instructions and Instruction sequencing

Unit II:

8 Hrs.

Addressing modes, Assembly language, Stacks, Subroutine. Instruction set : Simple RISC Processing Unit: Some fundamental concepts, Execution of a complete instruction, Single, two, three bus organization, Sequencing of control Signals

Unit III:

8 Hrs.

Processor Design, hard wired control, Microprogrammed Control: Microinstructions, Grouping of control signals, Microprogram sequencing, Micro Instructions with next Address field, perfecting microinstruction.

Unit IV:

8 Hrs.

Arithmetic (Fixed and Floating point): Number Representation, Addition of Positive numbers, Logic Design for fast adders, Addition and Subtraction, Arithmetic and Branching conditions, Multiplications of positive numbers, Signed- Operand multiplication, fast Multiplication, Booth's Algorithm

Unit V:

8 Hrs.

Integer Division, Floating point numbers and operations. The Main Memory: Basic concepts, Memory Hierarchy, semiconductor RAM memories, Memory system consideration, semiconductor ROM memories, Speed Size, and Cost, Cache Memory, Performance Considerations




Unit VI:

(6 Hrs.)

Mapping techniques, Pipelining: Basic Concepts, Data Hazards, Instruction Hazards Computer Peripherals: I/O Devices, I/O transfers – program-controlled, interrupt-driven and DMA, Interrupt handling . **Case Study:** Intel Core i5-12600K, Intel Core i7-4770 Processor, Intel Core i9-13900K, AMD Ryzen 5 7600X, AMD Ryzen 7 7700X, Intel Core2 Duo Processor.

Total Lecture

45 Hours

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Textbooks:

1. Computer Organization ,5th edition,V.Carl Hamacher, Zvonko Vranesic, McGraw Hill Publications.

Reference Books:




1. Computer Organization and Architecture 6th edition Willaiam Staliing Pearson Education
2. Computer Architecture & Organization,3rd edition,J.P. Hayes,McGraw Hill Publications.

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

- 1 <http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Technology/>

MOOCs Links and additional reading, learning, video material

1. <https://www.digimat.in/nptel/courses/video/106105163/L01.html>
2. <https://www.youtube.com/watch?v=q6oiRtKtpX4&list=PLfzBO7vcQZ1ILg0snGisdbzp4SZ2-W8ah&index=3>

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B.Tech in Computer Technology

**SoE No.
23CT-101**

III SEMESTER

23CT1305 : Discrete Mathematics and Probability Theory

Course Outcomes :

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

1. Analyze and express logic sentence in terms of predicates, quantifiers, and logical connectives.
2. Derive the solution for a given problem using deductive logic and prove the solution based on logical inference.
3. Classify algebraic structure for a given mathematical problem
4. Perform combinatorial analysis to solve counting problems.
5. Develop the given problem as graph networks and solve with techniques of graph theory.

Unit I:

8 Hrs.

Foundations: Logic and Proofs: Propositions, Truth Tables, Compound Propositions, Logical Operators, Logic and Bit Operations; Logical Equivalences, De Morgan's Laws, Satisfiability: Applications and Solving Problems; Predicates, Quantifiers: Restricted Domains, Precedence, Logical Equivalences; Rules of Inference for Propositional Logic, Use to Build Arguments, Resolution, Combination for Propositions and Quantified Statements; Proofs Terminology, Methods, Direct Proofs, Proof by Contraposition and Contradiction.

Unit II:

8 Hrs.

Sets, Functions and Relations: Introduction, Venn Diagrams, Subsets, Size of a Set, Power Sets, Cartesian Products, Set Notation with Quantifiers, Truth Sets and Quantifiers, Set Operations; Inverse Functions, Compositions and Graphs of Functions, Important Functions, Partial Functions; Sequences, Recurrence Relations, Special Integer Sequences, Summations; Countable Sets, An Uncountable Set; Functions as Relations, Relations on a Set, Properties of Relations, Combining Relations; n -ary Relations, Operations on n -ary Relations; Representing Relations Using Matrices; Closures, Transitive Closures.

Unit III:

8 Hrs.

Number Theory and Induction: Division, The Division Algorithm, Modular Arithmetic, Arithmetic Modulo m ; Primes, Trial Division, Conjectures and Open Problems About Primes, GCD and LCM, The Euclidean Algorithm, gcds as Linear Combinations; Linear Congruences, The Chinese Remainder Theorem, Fermat's Little Theorem, Pseudoprimes, Primitive Roots and Discrete Logarithms; Applications: Hashing Functions; Mathematical Induction and Examples of Proofs, Mistaken Proofs, Guidelines for Proofs; Strong Induction, Examples of Proofs.

Unit IV:

8 Hrs.

Algebraic Structures: Algebraic Systems: Examples and General Properties; Semigroups and Monoids: Homomorphism of Semigroups and Monoids, Subsemigroups and Submonoids; Groups: Definitions, Subgroups and Homomorphisms, Cosets and Lagrange's Theorem, Normal Subgroups, algebraic Systems with Two Binary Operations.

Unit V:

7 Hrs.

Counting and Discrete Probability: Basic Counting Principles, Complex Counting Problems, Subtraction and Division Rule, Tree Diagrams; The Pigeonhole Principle, The Generalized Pigeonhole Principle, Applications; Permutations, Combinations, Generating Permutations, Generating Combinations; Discrete Probability: Introduction, Probability Theory, Bernoulli Trials and the Binomial Distribution, Random Variables, Bayes' Theorem, Expected Value and Variance.

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Unit VI:	6 Hrs.
Graphs: Graph Models; Basic Terminology, Special Simple Graphs, Bipartite Graphs, Matchings, Applications of Special Types of Graphs, New Graphs from Old; Graph Representation, Adjacency and Incidence Matrices, Isomorphism of Graphs, Determining Isomorphism; Paths, Connectedness in Undirected Graphs and Directed Graphs, Paths and Isomorphism, Counting Paths Between Vertices; Euler Paths and Circuits, Hamilton Paths and Circuits, Applications of Hamilton Circuits; Planar Graphs: Euler's Formula, Kuratowski's Theorem; Graph Coloring: Introduction, Applications of Graph Colorings.	
Total Lecture	45 Hours

Textbooks:	
1.	Discrete Mathematics and Its Applications 7th Edition Kenneth H. Rosen McGraw-Hill
2.	Discrete Mathematical Structures with Applications to Computer Science J. P. Tremblay and R. Manohar McGraw-Hill Edition

Reference Books:	
1.	Discrete Mathematics 2nd Edition Norman L. Biggs Oxford University Press
2.	Schaum's Outline of Theory and Problems of Discrete Mathematics 3rd Edition Seymour Lipschutz and Marc Lars Lipson Schaum's Outlines Series, McGraw-Hill
3.	Elements of Discrete Mathematics: A Computer Oriented Approach 3rd Edition Tata McGraw-Hill C. L. Liu and D. P. Mohapatra McGraw-Hill

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1	http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Technology/

MOOCs Links and additional reading, learning, video material	
1.	https://www.digimat.in/nptel/courses/video/111104079/L01.html
2.	https://www.digimat.in/nptel/courses/video/111107058/L39.html

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III SEMESTER

23CT1306 : Cyber Laws

Course Outcomes :

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

1. Identify and explain international and national legal frameworks governing cyberspace.
2. Demonstrate familiarity with legal terminology commonly used in cyber law and technology-related legal discussions.
3. Identify different types of cybercrime and understand relevant laws and regulations for investigating and prosecuting cyber offenses.

Unit I:	7 Hrs.
Introduction: Cyber Crime: Meaning and Definition, Classification of Cyber Crimes, Causes of Cyber Crime, Impact and Effects of Cyber Crimes,	
Unit II:	8 Hrs.
Information Technology Law: Need of Legal Protection in Cyber World, Information Technology Act 2000 – Objectives, Scope, Applicability, Information Technology (Amendment) Act 2008, Recompense of Information Technology Law, Limitation of Information Technology Law	
Unit III:	8 Hrs.
Legal Protection against Cyber Crimes: Criminal Liabilities under Information Technology Act 2000, Common Cyber Crimes and Applicable Legal Provisions, Civil Liabilities under Information Technology Act 2000, Civil Liability for Corporate, Cyber Crimes under IPC and Special Laws	
Unit IV:	7 Hrs.
Case studies: Cyber Crime-Some Landmark Occurrence, Recent Trends in Cyber Laws	
Total Lectures	30

Textbooks:

1.	Cyber Crim Elaw and Practice, The Institute of Company Secretaries of India - New Delhi
2.	Information Security & Cyber Laws, by Gaurav Gupta, Sarika Gupta, Khanna Publishing House

Reference Books:

1.	Understanding Cybersecurity Law and Digital Privacy, Melissa Lukings, Arash Habibi Lashkari, Springer Cham
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III SEMESTER

23CT1307 : Community Engagement Project

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23CT-101

III SEMESTER

MDM1CT101: Foundations of Software Engineering

Course Outcomes :

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

1. Principles Understanding: grasp the fundamentals of software engineering principles and methodologies.
2. Requirements Management: proficiently elicit, analyze, specify, and validate software requirements.
3. Design Competency: ability to design software solutions considering modularity, abstraction, and reusability.
4. Design Competency: ability to design software solutions considering modularity, abstraction, and reusability.
5. Design Competency: ability to design software solutions considering modularity, abstraction, and reusability.

Unit I: Introduction to Software Engineering

8 Hrs.

Overview of Software Engineering, Software Development Lifecycle, Software Processes, Software Development Methodologies (Waterfall, Agile, etc.), Ethical and Professional Responsibilities in Software Engineering

Unit II: Requirements Engineering

7 Hrs.

Introduction to Requirements Engineering, Requirements Elicitation Techniques, Requirements Analysis and Specification, Requirements Validation and Verification, Use Cases and User Stories, Principles of Software Design

Unit III: Fundamentals of Software Testing

8 Hrs.

Unit Testing, Integration Testing, System Testing, Black box testing, White box testing

Unit IV: Software Project Management

7 Hrs.

Project Planning and Scheduling, Agile Project Management, Scrum, Kanban, and Lean methodologies
Risk Management, Quality Assurance and Control

Total Lectures

30 Hrs

Textbooks:

1. "Software Engineering: A Practitioner's Approach" by Roger S. Pressman

Reference Books:

1. "Clean Code: A Handbook of Agile Software Craftsmanship" by Robert C. Martin
2. Software Engineering, 9th Edition, Ian Sommerville, University of St Andrews, Pearson

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1	

MOOCs Links and additional reading, learning, video material

1.	https://onlinecourses.nptel.ac.in/noc21_cs65/preview
2.	https://nptelvideos.com/course.php?id=444

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III SEMESTER

Multidisciplinary Minor Courses

Track 1

MDMT1CT101 : Software Engineering and Project Management

Courses	Sem	MDMT1CT101 : Software Engineering and Project Management
MDM-I	3	(MDM1CT101) Foundation of Software Engineering
MDM-II	4	(MDM2CT102) Software Requirements and Modelling
MDM-III	5	(MDM3CT103) Functional Programming in Practice
MDM-IV	6	(MDM4CT104) Software Testing and Quality Assurance
MDM-V	7	(MDM5CT105) Software Architecture and Design
MDM-VI	8	(MDM6CT106) Software Project Management

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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://ycce.edu/syllabus/>

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III SEMESTER

Mandatory Learning Course (MLC)

MLC2123 : YCAP3

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

Hingna Road, Wanadongri, Nagpur - 441 110



Bachelor of Technology SoE & Syllabus 2023 4th Semester

(Department of Computer Technology)

B. Tech in Computer Technology



B.TECH SCHEME OF EXAMINATION 2023
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(Department of Computer Technology)
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SN	Sem	Type	BoS/ Deptt	Sub. Code	Subject	T/P	Contact Hours				Credits	% Weightage			ESE Duration Hours
							L	T	P	Hrs		MSEs*	TA**	ESE	
FOURTH SEMESTER															
1	4	BS	GE	23GE1403	Linear Algebra	T	3	0	0	3	3	30	20	50	3
2	4	HSSM-2	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	23CT1401	Operating systems	T	3	0	0	3	3	30	20	50	3
6	4	PC	CT	23CT1402	Lab : Operating systems	P	0	0	2	2	1		60	40	
7	4	PC	CT	23CT1403	Design and Analysis of Algorithms	T	3	0	0	3	3	30	20	50	3
8	4	PC	CT	23CT1404	Lab : Design and Analysis of Algorithms	P	0	0	2	2	1		60	40	
9	4	PC	CT	23CT1405	Lab : Data Analysis using R	P	0	0	0	2	1		60	40	
10	4	VSEC-3	CT	23CT1406	Lab : Python	P	0	2	2	4	2	60	40		
11	4	OE-2	OE		Open Elective -II	T	2	0	0	2	2	30	20	50	3
12	4	MDM	CT		MD Minor Course-II	T	2	0	0	2	2	30	20	50	3
TOTAL							19	2	6	29	24				

List of Mandatory Learning Course (MLC)

1	4	HS	T&P	MLC2124	YCAP4 : YCCE Communication Aptitude Preparation	A	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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(Department of Computer Technology)

B.Tech in Computer Technology

**SoE No.
23CT-101**

III /IV SEMESTER

23GE1303/ 23GE1403 : Linear Algebra

Course Outcomes:

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

- 1 Solve systems of linear equations using rank of matrix.
2. Determine eigen values and eigen vectors and solve eigen value problems.
3. Explain the concepts of vector space and subspace, span and basis.
4. Apply principles of matrix algebra to linear transformations and inner product.

Unit I:

8 Hrs.

Elementary matrix operations: Introduction to Matrices and Determinants, Solution of Linear Equations, Cramer's rule, Inverse of a Matrix.

Unit II:

7 Hrs.

Matrix Algebra: Rank of a matrix, Gaussian elimination, LU Decomposition (Crout's method), Solving Systems of Linear Equations using the tools of Matrices.

Unit III:

7 Hrs.

Diagonalization of Matrix: Eigen Values and Eigen vectors, Linear dependence and independence of Eigen Vectors, Orthogonal Eigen vector, Diagonalization of matrix, Cayley-Hamilton Theorem and Sylvester's Theorem.

Unit IV:

8 Hrs.

Vector Space: Vector Space, Subspace, Sum of Sub space, linear combination, Linear dependence and independence, Span and basis, Spanning sets, Generators.

Unit V:

7 Hrs.

Linear Transformation: Linear transformation, Ranges and Kernel (null space) of linear transformation, Inverse of linear transformation, Algebra of linear transformation, Singular and nonsingular linear transformation.

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Unit VI:	8 Hrs.
Inner product Spaces: Inner product space and Norms, orthogonal vector, the Gram Schamidt orthogonalization Process, orthogonal compliment, Adjoint of Linear operator, Normal and self-adjoint operator, Unitary and orthogonal operator, Bilinear and Quadratic form.	
	Total Lecture 45 Hours

Textbooks:	
1	Erwin Kreyzig, Advance Engineering Mathematics, 9 th Edition, John Wiley and Sons, INC.
2	Dr. B. S. Grewal, Higher Engineering Mathematics, 40 th edition, Khanna Publisher.
3	H.K. Dass, Advanced Engineering Mathematics, 8 th revised edition, S. Chand, Delhi.
4	Hoffman and Kunze, Linear Algebra, prentice Hall of India, New Delhi
5	Gilbert Strang, Linear Algebra and its Applications, Nelson Engineering (2007)

Reference Books:	
1	Chandrika Prasad, Mathematics for Engineers (19th edition), , John Wiley & Sons.
2	L.A. Pipes and Harville, Applied Mathematics for Engineers (3rd edition), McGraw Hill.
3	K.B.Datta, Matrix and Linear Algebra, , Prentice Hall of India.
4	Linear Algebra, Schaum's Solved Problem Series, Seymour Lipschutz, McGraw-Hill Book Company.

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/

MOOCs Links and additional reading, learning, video material	
1	https://nptel.ac.in/courses/111106051
2	https://archive.nptel.ac.in/courses/111/104/111104137/
3	https://archive.nptel.ac.in/courses/111/106/111106135/

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B.Tech in Computer Technology

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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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

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- 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
- 2 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

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IV SEMESTER 23GE1405 : Marathi Language

Course Objectives		
<ol style="list-style-type: none"> मराठी भाषेच्या समृद्धीची जाणीव करून देणे. विद्यार्थ्यांमध्ये भाषा कौशल्याचा विकास करणे आणि त्यातून रोजगाराच्या संधींचा शोध घेणे. 		
Course Outcomes		
<ol style="list-style-type: none"> भाषेचा जीवन व्यवहारात योग्य पद्धतीने वापर करण्याचा प्रयत्न करणे. संत साहित्याच्या शिकवणुकीमुळे मानवता आणि मानवी व्यवहाराची सांगड घालणे, नैतिक मूल्ये रुजविणे. 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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IV SEMESTER 23GE1406 : Hindi Language

Course Objectives

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

Course Outcomes

1. पौराणिक अथवा ऐतिहासिक घटनाओं को तार्किक आधार पर स्वीकार करेंगे | अपने परिवेश के उचित और अनुचित व्यवहारों के प्रति आकलन शक्ति बढ़ेगी |
2. एकांकी, कहानी, निबंध आदि विधाओं के मध्य का अंतर बताने में सक्षम होंगे |
3. कविता का रसास्वादन करने में समर्थ होंगे |
4. 'अनुवाद' के स्वरूप एवं प्रक्रिया से अवगत होंगे |
5. '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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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.

Unit:1	Environment and Sustainable Development	8 Hours
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.		
Unit:2	Environmental Pollution and Health	7 Hours
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.		
Unit:3	Environmental Management	8 Hours
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		
Unit:4	Environmental Treaties and Legislation	7 Hours
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		
Total Lecture		30 Hours

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
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

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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. https://cpcb.nic.in/standards
6	Barnett, J. & S. O'Neill (2010). Maladaptation. Global Environmental Change—Human and Policy Dimensions 20: 211–213
7	Richard A. Marcantonio, Marc Lane (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. https://moef.gov.in/wp-content/uploads/2020/02/convention-V-16-CURVE-web.pdf

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MOOCs Links and additional reading, learning, video material

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IV Semester

23CT1401: Operating Systems

Course Outcomes :

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

1. Describe the different services provided by Operating System at different level.
2. Apply knowledge of different operating system algorithms to solve a given problem.
3. Analyze various approaches used to improve system performance.
4. Differentiate various disk scheduling algorithms based on their performances.

Unit I:

(7 Hrs.)

Introduction, services provided by OS, functions of OS, system calls. Process management-introduction, process control block, process states, process context switch, threads: user level and kernel level.

Contemporary Issues related to Topic

Unit II:

(8 Hrs.)

CPU scheduling, goals of scheduling, CPU scheduling algorithms: FCFS, SJF, SRTF, RR, Priority based. Inter-process communication: process cooperation and synchronization, race condition, critical section, mutual exclusion and implementation, semaphores, classical inter-process communication problems.

Contemporary Issues related to Topic

Unit III:

(8 Hrs.)

Deadlocks: System Model, deadlock characterization-necessary conditions, resource allocation graph (RAG), methods for handling deadlock-deadlock avoidance, deadlock detection, deadlock prevention, recovery from deadlock.

Contemporary Issues related to Topic

Unit IV:

(8 Hrs.)

Memory management techniques-contiguous and non-contiguous, paging and segmentation, translation look aside buffer (TLB) and overheads.

Contemporary Issues related to Topic

Unit V:

(7 Hrs.)

Virtual memory and demand paging, page faults, page replacement algorithms, thrashing and working set model

Contemporary Issues related to Topic

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Unit VI:	(7 Hrs.)
File systems-introduction, disk space management and space allocation strategies, directory structures, disk caching, disk arm scheduling strategies: FCFS, SSTF, SCAN, CSACN, LOOK, CLOOK, File Organization: Sequential, Index, Index Sequential Contemporary Issues related to Topic	
Total Lecture	45 Hours

Textbooks:	
1.	Operating system concepts, A. Silberchatz and P.Galvin , Addison Wesley Longman Inc

Reference Books:	
1.	Modern operating systems, 1st , A.S. Tanenbaum , Prentice Hall of India publication
2.	Operating Systems, Crowley , Tata McGraw Hill

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MOOCs Links and additional reading, learning, video material	
1.	https://nptel.ac.in/courses/106102132
2.	https://www.youtube.com/watch?v=kqGhEJRdu8
3.	https://www.youtube.com/watch?v=ucVm_arB-fw

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IV SEMESTER

23CT1402 : Lab. Operating Systems

Course Outcomes

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

1. Describe the different services provided by Operating System at different level.
2. Apply knowledge of different operating system algorithms to solve a given problem.
3. Analyze various approaches used to improve system performance.
4. Differentiate various disk scheduling algorithms based on their performances.

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

SN	Program based on
1	To execute Linux process management, memory management and shell commands.
2	Write a program that illustrates the creation of child process using fork system call and printing process IDs.
3	Write a program to find sum of N numbers using thread program.
4	Write a program for Non Primitive CPU Scheduling Algorithm.(any one).
5	Write a program for Primitive CPU Scheduling Algorithm.(any one).
6	Write a program to Banker's Deadlock detection algorithm.
7	Write a program for First Fit, Worst Fit, and Best Fit Memory allocation algorithm.
8	Write a program for any two Page replacement algorithms.
9	Write a program to simulate FCFS disk scheduling algorithms.

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23CT1403 : Design & Analysis of Algorithms

Course Outcomes :

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

1. Analyze different types of asymptotic notations and find the time complexity in terms of asymptotic notations
2. Solve recurrences using various techniques.
3. Implement divide and conquer strategy, greedy strategy, dynamic programming algorithms and backtracking strategy
4. Identify and differentiate between various types of complexity classes.

Unit I:

(7 Hrs.)

Mathematical foundations, summation of arithmetic and geometric series, $\square n$, $\square n^2$, bound summations using integration, Analysis of algorithms, analyzing control structures, worst case and average case analysis, Asymptotic notations, Analysis of sorting algorithms such as selection sort, insertion sort, bubble sort, heap sort, external Sorting, lower bound proof.

Contemporary Issues related to Topic

Unit II:

(8 Hrs.)

Recursive functions and recurrence relations, solutions of recurrence relations using technique of characteristic equation and generating functions, elementary and advanced data structures with operations on them and their time complexity, Amortized analysis

Contemporary Issues related to Topic

Unit III:

(8 Hrs.)

Divide and conquer basic strategy, binary search, quick sort, merge sort, Fast Fourier Transform etc. Greedy method –basic strategy, application to job sequencing with deadlines problem, minimum cost spanning trees, single source shortest path etc.

Contemporary Issues related to Topic

Unit IV:

(7 Hrs.)

Dynamic Programming basic strategy, multistage graphs, all pair shortest path, single source shortest paths, optimal binary search trees, traveling salesman problem.

Contemporary Issues related to Topic

Unit V:

(67Hrs.)

Basic Traversal and Search Techniques, breadth first search, connected components, Backtracking basic strategy, 8 – Queen's problem, graph colouring, Hamiltonian cycles etc.

Contemporary Issues related to Topic

Unit VI:

(8 Hrs.)

NP-hard and NP-complete problems, basic concepts, non-deterministic algorithms, NP-hard and NP-complete, Cook's Theorem, decision and optimization problems, polynomial reduction.

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Contemporary Issues related to Topic

Total Lecture **45 Hours**

Textbooks:

1. Computer Algorithms Third Horowitz, Sahani, Rajsekharan Galgotia Publications Pvt. Ltd.
2. Introduction to Algorithms Third Thomas H. Cormen Prentice Hall of India.

Reference Books:




1. Fundamentals of Algorithms Second Brassard and Bratley Prentice Hall

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

- 1 [http://103.152.199.179/YCCE/E%20-%20books-Wiley-Blackwell-/New%20Microsoft%20Office%20Word%20Document%20\(2\).htm](http://103.152.199.179/YCCE/E%20-%20books-Wiley-Blackwell-/New%20Microsoft%20Office%20Word%20Document%20(2).htm)

MOOCs Links and additional reading, learning, video material

- 1 <https://archive.nptel.ac.in/courses/106/101/106101060/>
- 2 <https://www.digimat.in/nptel/courses/video/106101060/L27.html>

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IV SEMESTER

23CT1404 : Lab. Design & Analysis of Algorithms




Course Outcomes

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

1. Students should be able to design some algorithms
2. Analyze their performance with respect to selected evaluation parameters

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

SN	Program based on
1	Write a program for insertion sort and display its time complexity for different number of inputs.
2	Write a program for heap sort and compare its time complexity with insertion sort for different number of inputs.
3	Write a program for merge sort and display its time complexity for different number of inputs.
4	Write a program for quick sort and compare its time complexity with merge sort for different number of inputs.
5	Write a program for fractional knapsack problem using greedy strategy and analyse its time complexity for different number of inputs.
6	Write a program for job sequencing with deadline problem using greedy strategy and analyse its time complexity for different number of inputs.
7	Write a program for travelling salesman problem using dynamic programming and analyse its time complexity for different number of inputs.
8	Write a program for all pair shortest path using dynamic programming and analyse its time complexity for different number of inputs.
9	Write a program for 8 queen's problem using backtracking
10	Write a program for graph coloring problem using backtracking

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IV SEMESTER

23CT1405 : Lab.Data Analysis Using R

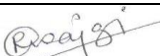

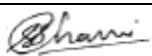
Course Outcomes

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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IV SEMESTER

23CT1406: Lab. Python

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 st , | Y. Daniel Liang | Pearson |
| 2. | Python: The Complete Reference ,1 st , | 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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IV SEMESTER

MDM2CT201 : Software Requirements and Modelling

Course Outcomes :

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

1. Choose appropriate software engineering process model, requirement engineering principles and software designing fundamentals for a given project.
2. Select appropriate testing strategy and apply testing principles for testing a given application.
3. Apply basics of software configuration management, version control and change control in software development.
4. Evaluate cost estimation, effort and severity of software risk for given application.

Unit I:

10 Hrs.

Introduction to Software Engineering: A Generic View of process, Process models: Water fall Model, RAD Model, Prototyping Model, Component Development Model, Agile Model, Requirement Engineering: Requirement Engineering Task Initialization Eliciting Requirement, Analysis Model, Negotiation, Validation. Building the Analysis mode: Requirement Analysis, Analysis Modeling Approaches, Data Modeling Concept, Object Oriented Analysis, Types of Modeling, Design Engineering: Design Concept, Design Model.

Unit II:

8 Hrs.

Testing Strategies: Strategic Approach, Strategic issues, Strategies for conventional Software, Strategies for Object Oriented Software, Validation Testing, Testing Tactics: White-Box Testing, Basis Path testing: Flow Graph Notation, Independent Program Paths, Control Structure Testing, Black Box Testing, Introduction to object oriented testing.

Unit III:

12 Hrs.

Configuration Management: Base lines, Software Configuration items, The SCM Process, Identification of Objects in the Software Configuration, Version Control, Change Control, Configuration Audit, Status Reporting, SCM Standards, Project Management, Metrics for Process and Projects, Project Estimation, Risk Management: Reactive vs. Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection.

Unit IV:

6 Hrs.

Advanced Topics in Software Engineering: Re engineering Computer aided software engineering, Open source SE tools introduction, Example-Subversion: Overview, Typical subversion usage and work flow.

Total Lecture

36 Hours

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Textbooks:

1.	Computer Science: A Structured Programming Approach Using C, 3 rd , B.A.Forouzan and R.F. Gilberg, Cengage Learning
2.	The C Programming Language, 2 nd , Brian Kernighan and Dennis Ritchie, Prentice Hall

Reference Books:




1.	Let Us C, 15th, Yashavant Kanetkar, BPB
2.	Computer Programming and Data Structures, 4th, E Balagurusamy, Tata McGraw Hill

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

1	

MOOCs Links and additional reading, learning, video material

1.	https://onlinecourses.nptel.ac.in/noc22_cs40/preview

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IV SEMESTER

Multidisciplinary Minor Courses

Track 1

MDMT1CT101 : Software Engineering and Project Management

Courses	Sem	MDMT1CT101 : Software Engineering and Project Management
MDM-I	3	(MDM1CT101) Foundation of Software Engineering
MDM-II	4	(MDM2CT102) Software Requirements and Modelling
MDM-III	5	(MDM3CT103) Functional Programming in Practice
MDM-IV	6	(MDM4CT104) Software Testing and Quality Assurance
MDM-V	7	(MDM5CT105) Software Architecture and Design
MDM-VI	8	(MDM6CT106) Software Project Management

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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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IV SEMESTER

Mandatory Learning Course (MLC)

MLC2124 : YCAP4

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