Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)
(Accredited 'A++' Grade by NAAC with a score of 3.25)
Hingna Road, Wanadongri, Nagpur - 441 110



Bachelor of Technology SoE & Syllabus 2022 1st to 6th Semester

(Department of Computer Science and Engineering

B.Tech in Computer Science and Engineering

Yeshwantrao Chavan College of Engineering

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

B.TECH SCHEME OF EXAMINATION 2022

(Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science & Engineering)

B. Tech in Computer Science & Engineering)

SoE No. 22CSE-101

	_		BoS/				C	onta	ct Ho	urs		%	Weightag	je	ESE
SN	Sem	Type	Deptt	Sub. Code	Subject	T/P	L	Т	Р	Hrs	Credits	MSEs*	TA**	ESE	Duration Hours
					FIRST SEME	STER									
1	1	BS	GE/MTH	22CSE101	Differential Equation and Complex Analysis	Т	3	1	0	4	4	30	20	50	3 Hrs
2	1	BS	GE/PHY	22CSE102	Engineering Physics	Т	3	0	0	3	3	30	20	50	3 Hrs
3	1	BS	GE/PHY	22CSE103	Lab: Engineering Physics	Р	0	0	2	2	1		60	40	
4	1	HS	GE/HUM	22CSE104	Social Science	Т	3	0	0	3	3	30	20	50	3 Hrs
5	1	BES	ME/ME	22CSE105	Engineering Graphics	Т	1	0	0	1	1	30	20	50	3 Hrs
6	1	BES	ME/ME	22CSE106	Lab: Engineering Graphics	Р	0	0	4	4	2		60	40	
7	1	BES	CT/CT	22CSE107	Elements of AIML	Т	3	0	0	3	3	30	20	50	3 Hrs
8	1	BES	CT/CT	22CSE108	Computer Workshop	Р	0	0	2	2	1		60	40	
9	1	BES	CSE/CSE	22CSE109	Introduction to Computing with Python	Т	3	0	0	3	3	30	20	50	3 Hrs
10	1	BES	CSE/CSE	22CSE110	Lab: Introduction to Computing with Python	Р	0	0	2	2	1		60	40	
					٦	TOTAL	16	1	10	27	22				

List	List of Mandatory Learning Course (MLC)											
1	1	HS	GE/T&P	MLC2121	YCAP1-Get Set Go	Α	2	0	0	2	0	
2	1	BES	GE/CHE	GE2132	Environmental Science	Α	2	0	0	2	0	

	SECOND SEMESTER														
1	2	BS	GE/MTH	22CSE201	Calculus Sequences and Series	Т	3	1	0	4	4	30	20	50	3 Hrs
2	2	BS	GE/CHE	22CSE202	Engineering Chemistry	Т	3	0	0	3	3	30	20	50	3 Hrs
3	2	BS	GE/CHE	22CSE203	Lab: Engineering Chemistry	Р	0	0	2	2	1		60	40	
4	2	HS	GE/HUM	22CSE204	Professional Communication	Т	3	0	0	3	3	30	20	50	3 Hrs
5	2	BES	CV/CV	22CSE205	Engineering Mechanics	Т	3	0	0	3	3	30	20	50	3 Hrs
6	2	BES	CV/CV	22CSE206	Lab: Engineering Mechanics	Р	0	0	2	2	1		60	40	
7	2	BES	EE/EE	22CSE207	Basic Electrical and Electronics Engineering	Т	3	0	0	3	3	30	20	50	3 Hrs
8	2	BES	IT/IT	22CSE208	Programming for Problem Solving	Т	3	0	0	3	3	30	20	50	3 Hrs
9	2	BES	IT/IT	22CSE209	Lab: Programming for Problem Solving	Р	0	0	2	2	1		60	40	
			TOTAL	18	1	6	25	22							

List	ist of Mandatory Learning Course (MLC)											
1	2	HS	GE/HUM	GE2131	Universal Human Value	Α	2	0	0	2	0	
2	2	HS	GE/T&P	MLC2122	YCAP2 -Functional English	Α	2	0	0	2	0	

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 activitied decided by course teacher, TA3 - 3 marks on class attendance

Daniele	Det -	June 2022	1.00	Applicable for
Chairperson	Dean (Acad. Matters)	Date of Release	Version	AY 2022-23 Onwards

Yeshwantrao Chavan College of Engineering

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

B.TECH SCHEME OF EXAMINATION 2022

(Scheme of Examination w.e.f. 2022-23 onward)

SoE No.

22CSE-101

(Department of Computer Science & Engineering)

B. Tech in Computer Science & Engineering)

	_	_	BoS/				С	onta	ct Ho	urs		%	Weightag	je	ESE
SN	Sem	Type	Deptt	Sub. Code	Subject	T/P	L	Т	Р	Hrs	Credits	MSEs*	TA**	ESE	Duration Hours
					THIRD SEM	ESTER	l								
1	3	PC	CSE/CSE	22CSE301	Discrete Mathematics & Graph Therory	Т	3	1	0	4	4	30	20	50	3 Hrs
2	3	PC	CSE/CSE	22CSE302	Computer Architecture and Organisation	Т	3	0	0	3	3	30	20	50	3 Hrs
3	3	PC	CSE/CSE	22CSE303	Object Oriented Programming	Т	3	0	0	3	3	30	20	50	3 Hrs
4	3	PC	CSE/CSE	22CSE304	Lab: Object Oriented Programming	Р	0	0	2	2	1		60	40	
5	3	PC	CSE/CSE	22CSE305	Data Structures I	Т	3	0	0	3	3	30	20	50	3 Hrs
6	3	PC	CSE/CSE	22CSE306	Lab: Data Structures I	Р	0	0	2	2	1		60	40	
7	3	PC	CSE/CSE	22CSE307	Web Technology	Т	3	0	0	3	3	30	20	50	3 Hrs
8	3	PC	CSE/CSE	22CSE308	Lab: Web Technology	Р	0	0	2	2	1		60	40	
		•				TOTAL	15	1	6	22	19				

List	List of Mandatory Learning Course (MLC)											
1	3	HS	T&P	MLC2123	YCCE Communication Aptitude Preparation (YCAP3)	Α	3	0	0	3	0	
2	3	BSE	CSE	AU115	Latex	Α	2	0	0	2	0	

					FOURTH SEM	MESTE	R								
1	4	BS	GE/GE	22CSE401	Linear Algebra	т	3	0	0	3	3	30	20	50	3 Hrs
2	4	HS	GE/HUM	22CSE402	Fundamentals of Management and Economics	Т	3	0	0	3	3	30	20	50	3 Hrs
3	4	PC	CSE/CSE	22CSE403	Theory of Computation	Т	3	1	0	4	4	30	20	50	3 Hrs
4	4	PC	CSE/CSE	22CSE404	Operating Systems	Т	3	0	0	3	3	30	20	50	3 Hrs
5	4	PC	CSE/CSE	22CSE405	Lab:Operating Systems	Р	0	0	2	2	1		60	40	
6	4	PC	CSE/CSE	22CSE406	Data Structures II	т	3	0	0	3	3	30	20	50	3 Hrs
7	4	PC	CSE/CSE	22CSE407	Lab: Data Structures II	Р	0	0	2	2	1		60	40	
8	4	PC	CSE/CSE	22CSE408	Introduction to Data Analysis	т	3	0	0	3	3	30	20	50	3 Hrs
9	4	PC	CSE/CSE	22CSE409	Lab: Introduction to Data Analysis	Р	0	0	2	2	1		60	40	
10	4	PC	CV/CSE	22CSE410	Environmental Sustainability, Pollution and Management	т	3	0	0	3	3	30	20	50	3 Hrs
		-		TOTAL	21	1	6	28	25						

List	List of Mandatory Learning Course (MLC)											
1	4	HS	T&P	MLC2124	YCCE Communication Aptitude Prepartion (YCAP 4)	А	3	0	0	3	0	
2	4	BSE	CSE	MLC116	Ethics in IT	Α	2	0	0	2	0	

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Daniele	Det	June 2022	1.00	Applicable for
Chairperson	Dean (Acad. Matters)	Date of Release	Version	AY 2022-23 Onwards

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B.TECH SCHEME OF EXAMINATION 2022

(Scheme of Examination w.e.f. 2022-23 onward)

SoE No.

22CSE-101

(Department of Computer Science & Engineering)

B. Tech in Computer Science & Engineering)

			BoS/				С	onta	ct Ho	urs		%	Weightag	je	ESE
SN	Sem	Type	Deptt	Sub. Code	Subject	T/P	L	T	Р	Hrs	Credits	MSEs*	TA**	ESE	Duration Hours
					FIFTH SEME	STER									
1	5	PC	CSE/CSE	22CSE501	Computer Networks	Т	3	0	0	3	3	30	20	50	3 Hrs
2	5	PC	CSE/CSE	22CSE502	Lab: Computer Networks	Р	0	0	2	2	1		60	40	
3	5	PC	CSE/CSE	22CSE503	Database Management Systems	Т	3	0	0	3	3	30	20	50	3 Hrs
4	5	PC	CSE/CSE	22CSE504	Lab: Database Management Systems	Р	0	0	2	2	1		60	40	
5	5	PC	CSE/CSE	22CSE505	Design & Analysis of Algorithms	т	3	1	0	4	4	30	20	50	3 Hrs
6	5	PC	CSE/CSE	22CSE506	Lab: Design & Analysis of Algorithms	Р	0	0	2	2	1		60	40	
7	5	PE	CSE/CSE		Professional Elective-I	Т	3	0	0	3	3	30	20	50	3 Hrs
8	5	PE	CSE/CSE		Lab: Professional Elective-I	Р	0	0	2	2	1		60	40	
9	5	OE	CSE/CSE		Open Elective - I	Т	3	0	0	3	3	30	20	50	3 Hrs
10	5	OE	CSE/CSE		Open Elective - II	Т	3	0	0	3	3	30	20	50	3 Hrs
11	5	STR	CSE/CSE	22CSE507	Industrial visit,Seminar & report	Р	0	0	1	1	1		60	40	
					1	TOTAL	18	1	9	28	24				

List of Professional Electives-I

1	5	PE-I	CSE/CSE	22CSE511	PE-I: Digital Image Processing
2	5	PE-I	CSE/CSE	22CSE512	PE-I: Lab: Digital Image Processing
3	5	PE-I	CSE/CSE	22CSE513	PE-I: Advanced Web Technologies
4	5	PE-I	CSE/CSE	22CSE514	PE-I: Lab: Advanced Web Technologies
5	5	PE-I	CSE/CSE	22CSE515	PE-I: Machine Learning
6	5	PE-I	CSE/CSE	22CSE516	PE-I: Lab: Machine learning
7	5	PE-I	CSE/CSE	22CSE517	PE-I: Mobile operating system
8	5	PE-I	CSE/CSE	22CSE518	PE-I: Lab: Mobile operating system

Open Elective-I

1	5	OE-I	CSE/CSE	22CSE531	OE I: Database System Essentials
2	5	OE-I	CSE/CSE	22CSE532	OE I: Programming with Python
3	5	OE-I	CSE/CSE	22CSE533	OE I: Introduction to Image Processing
4	5	OE-I	CSE/CSE	22CSE534	OE I: Essentials of IT

Open Elective-II

1	5	OE-II	CSE/CSE	22CSE551	OE II: Software Testing for Beginners
2	5	OE-II	CSE/CSE	22CSE552	OE II: Introduction to Web Technology
3	5	OE-II	CSE/CSE	22CSE553	OE II: Introduction to Cloud Computing
4	5	OE-II	CSE/CSE	22CSE554	OE II: Introduction to OS Concepts

List	List of Mandatory Learning Course (MLC)											
1	5	HS	T&P	MI ("2125	YCAP5: YCCE Communication Aptitude Preparation	Α	3	0	0	3	0	
2	5	BSE	R&D	MLC125	Design thinking	Α	2	0	0	2	0	

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Damele	del	June 2022	1.00	Applicable for
Chairperson	Dean (Acad. Matters)	Date of Release	Version	AY 2022-23 Onwards

Yeshwantrao Chavan College of Engineering

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

B.TECH SCHEME OF EXAMINATION 2022

(Scheme of Examination w.e.f. 2022-23 onward)

SoE No.

22CSE-101

(Department of Computer Science & Engineering)

B. Tech in Computer Science & Engineering)

			BoS/				С	onta	ct Ho	urs		%	Weightag	je	ESE
SN	Sem	Type	Deptt	Sub. Code	Subject	T/P	L	Т	Р	Hrs	Credits	MSEs*	TA**	ESE	Duration Hours
	SIXTH SEMESTER														
1	6	PC	CSE/CSE	22CSE601	Language Processor	T	3	0	0	4	4	30	20	50	3 Hrs
2	6	PC	CSE/CSE	22CSE602	Lab: Language Processor	Р	0	0	2	2	1		60	40	
3	6	PC	CSE/CSE	22CSE603	Cloud Computing	Т	3	0	0	3	3	30	20	50	3 Hrs
4	6	PC	CSE/CSE	22CSE604	Software Engineering	Т	3	0	0	3	3	30	20	50	3 Hrs
5	6	PC	CSE/CSE	22CSE605	Lab: Software Engineering	Р	0	0	2	2	1		60	40	
6	6	PE	CSE/CSE		Professional Elective-II	Т	3	0	0	3	3	30	20	50	3 Hrs
7	6	PE	CSE/CSE		Lab: Professional Elective-II	Р	0	0	2	2	1		60	40	
8	6	OE	CSE/CSE		Open Elective - III	Т	3	0	0	3	3	30	20	50	3 Hrs
9	6	OE	CSE/CSE		Open Elective - IV	Т	3	0	0	3	3	30	20	50	3 Hrs
10	6	PR	CSE/CSE	22CSE606	PROJECT PHASE 1	Р	0	0	4	4	2		60	40	
	TOTA								10	29	24				

List of Professional Electives-II

1	6	PE-II	CSE/CSE	22CSE611	PE-II: Business Intelligence
2	6	PE-II	CSE/CSE	22CSE612	PE-II: Lab: Business Intelligence
3	6	PE-II	CSE/CSE	22CSE613	PE-II: Internet of Things
4	6	PE-II	CSE/CSE	22CSE614	PE-II: Lab: Internet of Things
5	6	PE-II	CSE/CSE	22CSE615	PE-II: Neural Network and applications
6	6	PE-II	CSE/CSE	22CSE616	PE-II: Lab: Neural Network and applications
7	6	PE-II	CSE/CSE	22CSE617	PE-II: Augmented and Virtual Reality
8	6	PE-II	CSE/CSE	22CSE618	PE-II: Lab: Augmented and Virtual Reality

Open Elective-III

1	6	OE-III	CSE/CSE	22CSE631	OE III: Database System Essentials
2	6	OE-III	CSE/CSE	22CSE632	OE III: Programming with Python
3	6	OE-III	CSE/CSE	22CSE633	OE III: Introduction to Image Processing
4	7	OE-III	CSE/CSE	22CSE634	OEIII: Essentials of IT

Open Elective-IV

1	6	OE-IV	CSE/CSE	22CSE651	OE IV: Software Testing for Beginners
2	6	OE-IV	CSE/CSE	22CSE652	OE IV: Introduction to Web Technology
3	6	OE-IV	CSE/CSE	22CSE653	OE IV: Introduction to Cloud Computing
4	6	OE-IV	CSE/CSE	22CSE654	OE IV: Introduction to OS Concepts

Lis	of Mai	ndatory I	Learning Cou	rse (MLC)								
1	6	HS	T&P	MLC2126	YCAP6 : YCCE Communication Aptitude Preparation	Α	3	0	0	3	0	

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Chairperson	Dean (Acad. Matters)	Date of Release	Version	AY 2022-23 Onwards
Dams Co	Del	June 2022	1.00	Applicable for

Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

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

(Accredited 'A++' Grade by NAAC with a score of 3.25)

Hingna Road, Wanadongri, Nagpur - 441 110



Bachelor of Technology SoE & Syllabus 2022 1st Semester

(Department of Computer Science and Engineering

B.Tech in Computer Science and Engineering

Yeshwantrao Chavan College of Engineering

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

B.TECH SCHEME OF EXAMINATION 2022

(Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science & Engineering)

B. Tech in Computer Science & Engineering)

SoE No. 22CSE-101

			BoS/				C	onta	ct Ho	urs		%	Weightag	je	ESE
SN	Sem	Type	Deptt	Sub. Code	Subject	T/P	L	Т	Р	Hrs	Credits	MSEs*	TA**	ESE	Duration Hours
	FIRST SEMESTER														
1	1	BS	GE/MTH	22CSE101	Differential Equation and Complex Analysis	Т	3	1	0	4	4	30	20	50	3 Hrs
2	1	BS	GE/PHY	22CSE102	Engineering Physics	Т	3	0	0	3	3	30	20	50	3 Hrs
3	1	BS	GE/PHY	22CSE103	Lab: Engineering Physics	Р	0	0	2	2	1		60	40	
4	1	HS	GE/HUM	22CSE104	Social Science	Т	3	0	0	3	3	30	20	50	3 Hrs
5	1	BES	ME/ME	22CSE105	Engineering Graphics	Т	1	0	0	1	1	30	20	50	3 Hrs
6	1	BES	ME/ME	22CSE106	Lab: Engineering Graphics	Р	0	0	4	4	2		60	40	
7	1	BES	CT/CT	22CSE107	Elements of AIML	Т	3	0	0	3	3	30	20	50	3 Hrs
8	1	BES	CT/CT	22CSE108	Computer workshop	Р	0	0	2	2	1		60	40	
9	1	BES	CSE/CSE	22CSE109	Introduction to Computing with Python	Т	3	0	0	3	3	30	20	50	3 Hrs
10	1	BES	CSE/CSE	22CSE110	Lab: Introduction to Computing with Python	Р	0	0	2	2	1		60	40	
					1	TOTAL	16	1	10	27	22				

List	List of Mandetory Learning Course (MLC)											
1	1	HS	GE/T&P	MLC2121	YCAP1-Get Set Go	Α	2	0	0	2	0	
2	1	BES	GE/CHE	GE2132	Environmental Science	Α	2	0	0	2	0	

					SECOND SE	MESTE	R								
1	2	BS	GE/MTH	22CSE201	Calculus Sequences and Series	Т	3	1	0	4	4	30	20	50	3 Hrs
2	2	BS	GE/CHE	22CSE202	Engineering Chemistry	Т	3	0	0	3	3	30	20	50	3 Hrs
3	2	BS	GE/CHE	22CSE203	Lab: Engineering Chemistry	Р	0	0	2	2	1		60	40	
4	2	HS	GE/HUM	22CSE204	Professional Communication	Т	3	0	0	3	3	30	20	50	3 Hrs
5	2	BES	CV/CV	22CSE205	Engineering Mechanics	Т	3	0	0	3	3	30	20	50	3 Hrs
6	2	BES	CV/CV	22CSE206	Lab: Engineering Mechanics	Р	0	0	2	2	1		60	40	
7	2	BES	EE/EE	22CSE207	Basic Electrical and Electronics Engineering	Т	3	0	0	3	3	30	20	50	3 Hrs
8	2	BES	IT/IT	22CSE208	Programming for Problem Solving	Т	3	0	0	3	3	30	20	50	3 Hrs
9	2	BES	IT/IT	22CSE209	Lab: Programming for Problem Solving	Р	0	0	2	2	1		60	40	
					·	TOTAL	18	1	6	25	22				

List	List of Mandetory Learning Course (MLC)											
1	2	HS	GE/HUM	GE2131	Universal Human Value	Α	2	0	0	2	0	
2	2	HS	GE/T&P	MLC2122	YCAP2 -Functional English	Α	2	0	0	2	0	

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Chairperson	Dean (Acad. Matters)	Date of Release	1.00 Version	Applicable for AY 2022-23 Onwards
	- 106	June 2022	4.00	





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

B. Tech SoE and Syllabus 2022

(Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

I SEMESTER

22CSE101: Differential Equation and Complex Analysis

Course Outcomes

Upon successful completion of the course 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 equation, Applications of differential equations to various field (only up to second order).

(Contemporary Issues related to Topic)

Unit IV: Complex Numbers

(6 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 functions and their inverse, Logarithm of a complex number.

(Contemporary Issues related to Topic)

Unit V: Complex Variables

(7 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)

Unit VI: Statistics

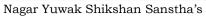
(6 Hrs.)

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)

Total Lecture | 39 Hours

Dande	April .	Shami	July 2022	1.00	Applicable for AY 2022-23 Onwards
Chairperson	Dean (Acad. Matters)	Dean OBE	Date of Release	Version	AT 2022-23 Offwarus





Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech SoE and Syllabus 2022

(Scheme of Examination w.e.f. 2022-23 onward) (Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

Tex	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:

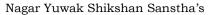
- G B Thomas and R L Finney, Calculus and Analytical Geometry, 9th edition, Addison-Wesley, 1999.
- N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, 10th edition, Laxmi Prakashan.

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

http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/ecopies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/

MO	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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SoE No. 22CSE-101

B. Tech in Computer Science and Engineering

I SEMESTER

22CSE102: Engineering 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 particle.
- 2. Justify the characteristics of semiconductor materials in terms of crystal structures, charge carriers and energy bands.
- 3. Illustrate working principle of lasers and optical fibers for their use in the field of industry.
- 4. Analyse the motion of charged particles in electric and magnetic field and its applications to electron optic devices.
- 5. Assess the characteristics of nano materials, synthesis methods and their applications.

Unit:1 Quantum Physics

(6 Hrs.)

Wave-particle duality, Davisson and Germer experiment, Wave packet, Heisenberg 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 tunnelling, Introduction to Bits and Qubits. (Contemporary Issues related to Topic)

Unit III: Semiconductor Physics

(7 Hrs.)

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

Unit IV: Fundamentals of Optical Communication

(7 Hrs.)

Interaction of radiation with matter, Population Inversion and Optical resonance cavity, diode laser, Properties and engineering applications of laser. Optical Fibre: Principle, structure and classification, Acceptance angle, Numerical aperture, Losses. (Contemporary Issues related to Topic)

Unit V: 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 (CRO), Block diagram, Application of CRO for amplitude, frequency and phase determination (Contemporary Issues related to Topic)

Unit VI: Physics of Advanced Materials

(6 Hrs.)

Introduction to Nanoscience and nanomaterials, types of nano structures (0-D, 1-D, 2-D and 3-D) and their properties (structural, electrical, optical, magnetic and mechanical), Synthesis of nanomaterials: Top down and Bottom – up approach, Applications of nanomaterials. (**Contemporary Issues related to Topic**)

Total Lecture | 40 Hours

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Textbooks:

Company, 2014.

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

2.	Hitendra K Malik, A K Singh, Engineering Physics, 2 nd Edition, Tata McGraw Hill Education Private				
	Limited, 2015.				
Ref	ference Books:				
1.	David Halliday, Robert Resnick and Jerle Walker, Fundamentals of Physics, 10 th edition, John-Wiley India, 2013.				
2.	Sanjay D Jain, Girish G Sahasrabudhe, Engineering Physics, 2 nd Edition, Universities Press, 2015.				
3.	P K Palanisamy, Engineering Physics, Revised Edition, SCITECH, 2015.				
4.	John Allision, Electronic Engineering Materials and Devices, TMH edition, 10 th reprint, Tata McGraw Hill.				
5.	Arthur Beiser, Concept of Modern Physics, 6 th edition, Tata McGraw - Hill Education, 2002.				

M. N. Avadhanulu, P. G. Kshirsagar, A Textbook of Engineering Physics, Revised 14th Edition, S. Chand &

6.	Subramanyam, Brijlal, M N Avadhanulu, Text Book of Optics, S. Chand & Company, 2006.
7.	M N Avadhanulu, An Introduction to Lasers: Theory & Applications, First Edition 2001, S. Chand &
	Company Pvt. Ltd, 2017.

8. S O Pillai, Solid State Physics, 9th edition, New Edge International Publishers, 2021.

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

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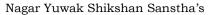
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copies%20of%20books/Applied%20Sciences%20&%20Humanities/Physics/2016

Book ThePhysicsOfSemiconductors.pdf

MOOCs Links and additional reading, learning, video material 1. http://nptel.iitm.ac.in- Quantum Physics 2. http://nptel.ac.in- CRO 3. www.digimat.in/nptel/courses/video/115102124/L36.html - LASER

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

I SEMESTER

22CSE103: Lab: Engineering 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 particle.
- 2. Justify the characteristics of semiconductor materials in terms of crystal structures, charge carriers and energy bands.
- 3. Illustrate working principle of lasers and optical fibers for their use in the field of industry.
- 4. Analyse the motion of charged particles in electric and magnetic field and its applications to electron optic devices.
- 5. Assess the characteristics of nano materials, synthesis methods and their applications.

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

SN	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 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 C.R.O.

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B.Tech in Computer Science and Engineering

I SEMESTER

22CSE104: Social Science

Course Outcomes

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

- 1. Explain the basic concepts of social sciences.
- 2. Describe the development of various Civilizations and their culture.
- 3. Explain the basic idea of Constitution of India and aware about their rights & Duties.
- 4. Analyze the Impact of Industrialization on Society and discuss the Fundamental Concepts of Society.

Unit I: Social Sciences & Its Utility

(6 Hrs.)

Meaning & Scope of Social Science, General Utility of Social Sciences to Engineers, Applied Humanities, Social Engineering, Society its types & Characteristics. (Contemporary Issues related to Topic)

Unit II: Human Civilization

(7 Hrs.)

Development of human civilization with specific reference to monumental studies of engineering skill, Ancient Indian Civilization:- a) Indus Valley Civilization b) Vedic Civilization, c) Indian Art & Architecture.

(Contemporary Issues related to Topic)

Unit III: Fundamental Concept in Social Science

(7 Hrs.)

Social Structure and Social System, Socialization, Social Control and Social Change, Culture: Characteristics and Features. (Contemporary Issues related to Topic)

Unit IV: Introduction to Constitution of India

(7 Hrs.)

Significance of Preamble, Fundamental Rights and Duties, Directive principles of state policy. Federal System Concept of industrial Democracy. (Contemporary Issues related to Topic)

Unit V: Industrial Organization & Society

(6 Hrs.)

Industrialization and its impact on society, Selection, Training & Motivation of workers, Industrial Psychology, Industrial sociology, Work Organization, Power, Authority and Status system. (Contemporary Issues related to Topic)

Unit VI: Industrial Management

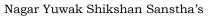
(6 Hrs.)

Labour Union Organization, Discipline in Industry, Labour Turnover, Industrial Fatigue of workers, Health and Safety of Workers.

(Contemporary Issues related to Topic)

Total Lecture | 39 Hours

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

Tex	Textbooks:			
1.	S. Shabbir & Sheikh, A New Look Into Social Sciences, S.Chand, New Delhi,1993.			
2.	C N Shankar Rao, Sociology Principles of Sociology With An Introduction To Social Thought, S. Chand,			
	New Delhi, 2010.			
3.	O P Khanna, Industrial Engineering And Management, Dhanpat Rai Publication, New Delhi, 2010.			
4.	Dr. G. N. Nimbarte, Social Science, Sankalp Publications, Nagpur.			

Ref	Reference Books:			
1.	C. N. Shankar Rao, Sociology: Principal of Sociology with an introduction to social thought, Publication: S.			
	Chand, New Delhi.			
2.	O. P. Khanna, Industrial Engineering and Management, Dhanpat Rai Publication, New Delhi.			
3.	Reader's Digest Vanished Civilizations, The Reader's Digest Association Limited, New York.			
4.	Constitution of India: Dr B. R. Ambedkar: Government of India, Government of India.			
5	B. L. Kayastha, Recent trends in Humanities and Social Sciences, 1st Ed. Akinik Publications, New Delhi			

M	MOOCs Links and additional reading, learning, video material			
1.	https://mobidrive.com/sharelink/r/4I2bDsxN9YrVI03vMZaInJ5VBpojBmR9EqKv7nin9pkN			
2.	https://mobidrive.com/sharelink/r/4I2bDsxN9YrVI03vMZaInJ2sUn37wK4V3CpGhemYRKnz			

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B.Tech in Computer Science and Engineering

I SEMESTER

22CSE105: 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. (Contemporary Issues related to Topic)

Unit II: Theory of Isometric Projections:

(2 Hrs.)

Theory of isometric projection, Method for drawing isometric views, Different problems on isometric projections. (Contemporary Issues related to Topic)

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. (Contemporary Issues related to Topic)

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. (Contemporary Issues related to Topic)

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. (Contemporary Issues related to Topic)

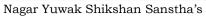
Unit VI: Intersection of Surfaces of solids:

(2 Hrs.)

Intersection between similar solids, Intersection between dissimilar solids, Lines and Curves of Intersection. (Contemporary Issues related to Topic)

Total Lecture | 15 Hours

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

	Tex	Textbooks:				
	1.	D.M. Kulkarni, A. P. Rastogi and A. K. Sarkar, Engineering Graphics with AutoCAD PHI learning Pvt. Ltd.,				
L		Revised Edition(2014),				

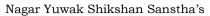
2. N. D. Bhatt Engineering Drawing Charotar Publishing House Pvt. Ltd, 53 rd Edition 2017

Ref	Reference Books:				
1.	D. A. Jolhe Engineering Drawing , Tata McGraw Hill Publications , 2008,				
2.	K. L. Narayana & P. Kannaiah, 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] Intranet on address 172.16.1.10. data/CCC/software / AutoCAD Software Setup.

M(MOOCs Links and additional reading, learning, video material			
1.	https://youtube.com/playlist?list=PLLy_2iUCG87Bw9XPfEF3r3EW5UlAOv8iz			
2.	https://nptel.ac.in/courses/112105294			

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I SEMESTER

22CSE106: Lab: Engineering Graphics

Course Outcomes

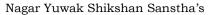
Upon successful completion of the course the students will be able to

- 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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B.Tech in Computer Science and Engineering

I SEMESTER

22CSE107: Elements of AIML

Course Outcomes:

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

- 1. Develop an understanding what is involved in AIML.
- 2. Understand learning algorithms of AIML.
- 3. Understand the deep learning.
- 4. Apply the knowledge for the selection of tool and languages for problem solving
- 5. Understand the use of AIML for real world problems.

Unit I: Introduction to Artificial Intelligence

(7 Hrs.)

What Is Artificial Intelligence? History, AI and Society, Agents and Knowledge based systems, Components of AI. (Contemporary Issues related to Topic)

Unit II: Propositional Logic

(7 Hrs.)

Propositional Logic, First order logic, limitations of logic, Search, Games and Problem Solving, Reasoning with Uncertainty. (Contemporary Issues related to Topic)

Unit III: Machine Learning

(7 Hrs.)

Supervised learning, Unsupervised learning, Reinforcement learning: Model based learning, Regression, Decision trees, Linear Discrimination, Kernel Machines and Graphical Models. (Contemporary Issues related to Topic)

Unit IV: Artificial Neural Networks and Deep Learning

(7 Hrs.)

Biological neural network, Artificial neural network, Hopfield network, Neural Associative memory, Linear networks, Backpropogation algorithm, Support Vector Machines, Basics of deep learning. (Contemporary Issues related to Topic)

Unit V: Introduction to Platforms, Tools, Frameworks and languages for AIML

(6 Hrs.)

Top AIML Softwares: Salesforce Einstein, IBM Watson, Deep Vision, Cloud Machine Learning Engine, Azure Machine Learning Studio, Nvidia Deep Learning AI, Playment; Machine learning tools: TensorFlow, Amazon Machine Learning, Accord.NET, Apache Mahout, Shogun; Programming languages: Python, R, Java, Julia, C/C++, Others: Scikit Learn, Theano, Caffe, MxNet, Keras, PyTorch, CNTK, Auto ML, OpenNN, H20: Open Source AI Platform, Google ML Kit. (Contemporary Issues related to Topic)

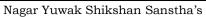
Unit VI: Applications of AI and ML

(6 Hrs.)

Working with software based AI Applications, Working with AI in hardware Applications, Health, Banking and Finance, Automobile, Surveillance, Social Media, Education, Space, etc. (Contemporary Issues related to Topic)

Total Lecture | 40 Hours

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

Te	xtbooks:					
1.	Wolfgang Ertel, "Introduction to Artificial Intelligence" 2 nd Edition, UTiCS, Springer					
2.	Ethem Alpaydın ,"Introduction to Machine Learning" 3rd Edition,The MIT Press, Cambridge,					
	Massachusetts London, England.					

Re	Reference Books:					
1.	John Paul Mueller, Luca Massaron	John Wiley & Sons				
	,"Artificial Intelligence for Dummies"	First, 2018				
2.	Steven W. Knox, Wiley" Machine Learn	ning A Concise Introduction"	First, 2018			

MC	MOOCs Links and additional reading, learning, video material						
1.	https://www.youtube.com/watch?v=kwSTs0QVRfU						
2.	https://www.youtube.com/watch?v=GHpchgLoDvI&list=PLp6ek2hDcoNB_YJCruBFjhF79f5ZHyBuz						
3.	https://nptel.ac.in/courses/106105077						

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B.Tech in Computer Science and Engineering

I SEMESTER

22CSE108: 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

(Contemporary Issues related to Topic)

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 (Contemporary Issues related to Topic)

Unit III: Unix tools (4 Hrs.)

Unix tools - Awk, sed, Emacs

(Contemporary Issues related to Topic)

Unit IV: Scripting (4 Hrs.)

Scripting – variables, conditionals, loops, finding logged in users, Parameter passing to C program from shell (argc / argv)

(Contemporary Issues related to Topic)

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

(Contemporary Issues related to Topic)

Unit VI: IDE for code development

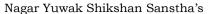
(4 Hrs.)

IDE for code development Using DevCpp and/or Visual Studio, Create a project using multiple .c and .h files with cross-references, Setting compiler options and linker options, Understanding different settings

(Contemporary Issues related to Topic)

Total Lecture 24 Hours

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

Tex	atbooks:				
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				

Re	ference 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

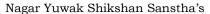
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chromeextension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20fi le/SERIES%20WISE%20BOOKS/COMPUTER%20TECHNOLOGY/COMPUTER%20TECHNOLOGY%20 (PE%20Series).pdf

MC	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=GtovwKDemnI&t=1578s					
5.	https://www.youtube.com/watch?v=J7L2x1ATOgk					
6.	https://www.youtube.com/watch?v=85FrhrIwBtw					

Davale	May	Sherri	July 2022	1.00	Applicable for AY 2022-23 Onwards
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(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech SoE and Syllabus 2022

(Scheme of Examination w.e.f. 2022-23 onward)
(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

I SEMESTER

22CSE109: Introduction to Computing with Python

Course Outcomes:

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

- 1. Understand the basic data types, built in data structures, control statements and loops and write simple programs in Python.
- 2. Apply the concepts of functions modules and packages and write programs using them.
- 3. Design and develop classes in Python.
- 4. Solve real world problems and develop interesting applications using Python

Unit:1 Introduction to Python 7 Hours Build-in Data types & variables, arithmetic operators, assignment statement, print & input function, relational and logical operators, if, if – else & nested if- else statements, writing simple programs. (Contemporary Issues

related to Topic)

Unit:2 Data Structures 6 Hours

Built in data structures: Lists, Dictionaries, Tuples, Sets, and Arrays, mutability. Usage and Comparison of built in data structures, Standard library functions in Python, Programs based on the built in data structures. (Contemporary Issues related to Topic)

Unit:3 Looping 6 Hours

Loop statements: For, while, continue and break statements, list comprehension. Bitwise operators, programs for computing GCD, LCD, Taylor's series expansion, bisection method, etc. Real world problem solving based on built in data structures and loops. (Contemporary Issues related to Topic)

Unit:4 Functions 6 Hours

User defined Functions, returning values, keyword arguments and default values, local & global variables, global statement, doc strings for functions, developing useful functions, Modules and Packages, import statement. (Contemporary Issues related to Topic)

Unit:5 | Introduction to Object oriented programming in Python

7 Hours

Features of object oriented programming, Python Objects and Classes: defining classes, member variables, doc strings for classes, Private members, Operator Overloading, inheritance and polymorphism. (Contemporary Issues related to Topic)

Unit:6 | **Application Development**

5 Hours

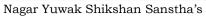
37 Hours

Basics of file handling, developing useful applications using built in and custom modules and packages. (Contemporary Issues related to Topic)

Total Lecture Hours

1 2 2 2

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Textbooks:

Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech SoE and Syllabus 2022

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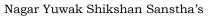
SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

1	Python Programming, A Modular Approach, Sheetal Taneja and Naveen Kumar, Pearson
Re	eference Books:
1	Introduction to Computation and Programming Using Python, John V. Guttag, Second Edition, 2016, PHI
	EEE (MIT Press).
2.	Python for Programmers, Paul Deitel and Harvey Deitel, Pearson
3.	Learn Python Programming, Fabrizio Romano, Heinrich Kruger, Third Edition, 2020, PACKT Publishing
Y	CCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]
1	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-
	copies%20of%20books/Computer%20Science%20and%20Engineering/python-basics-sample-chapters.pdf
2	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-
	copies%20of%20books/Computer%20Science%20and%20Engineering/practical-machine-learning-python-
	problem-solvers.pdf
M	OOCs Links and additional reading, learning, video material

https://onlinecourses.nptel.ac.in/noc20_cs70/preview https://onlinecourses.nptel.ac.in/noc20_cs83/preview

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

I SEMESTER

22CSE110: Lab: Introduction to Computing with Python

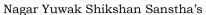
Course Outcomes:

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

1. Implement solution to the real-world problems using various Python features

Sr. No.	Experiments based on
MSPA-1	Writing simple programs using various operators and decision making
MSPA-2	Writing real world programs using built in data structures and loops
MSPA-3	Writing real world programs using user defined classes, functions and modules
MSPA-4	Develop an useful real world application using files, modules and packages, and exception handling

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

I SEMESTER Audit Course

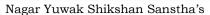
MLC2121: YCAP1-Get Set Go

Objective	Outcomes
Get Set Go program is designed to introduce students to the	The students gain more confidence and skills
real world. It gives them the skills they need to reach their	required to deal with the challenges they will face
goals and live up to their full potential at college, home and	in college and at home. Their interpersonal and
work. The program was developed with feedback from	intrapersonal skills are enhanced pushing them to
students; it consists of interactive sessions that include real-	think towards their future and aim for their goals.
life scenarios and role-playing. It can help young adults	
become more confident and better able to cope with the	
pressure and stress they face.	

Syllabus Subject: Communication Skills - 1st Year, No. of hours - 18

Unit No.	Торіс	Duration
1	Topic: Build a foundation for success - 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	2.5 Hours
2	Topic: 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	3.5 Hours
	Practice Conversations, Activity – Pause-Part-Punch, Group Activity	

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

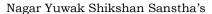
Unit No.	Topic	Duration
3	Topic: Increase Self Confidence -• Use our experiences to communicate more confidently • Communicate with clarity and conciseness • Discover how past experiences influence behavior	2.5 Hours
4	Topic: Motivate Others and Enhance Relationships-• Learning Objectives • Explain Gain Willing Cooperation Principles • Group Presentation • Explain Demonstration of Leadership Principles • Explain "Evidence" critical in establishing credibility	4 Hours
	Individual Activity – Sharing of defining moment, Skit to demonstrate Leadership Principles, Stranded on Island	

Unit	Topic	Duration
No.		
5	Topic: Fundamentals of Communication (Earn the right – Excite -Eagerness) & Elevator Pitch & Develop more Flexibility, & Recap and Summarize	3.5 Hours
6	Activities Individual Presentation, Flexibility Drills, Individual Presentations - My Vision Assignment	2 Hours

Reference Books:

1. How to win friends & influence people – Dale Carnegie

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

I SEMESTER Audit Course

GE2132: Environmental Science

Course Outcome:

Upon successful completion of the course the students will be able

- 1. To understand the basic concepts and problems and follow sustainable development practices
- 2. To enhance knowledge skills and attitude towards environment
- 3. To understand natural environment and its relationship with human activities.
- 4. To evaluate local, regional and global environmental topics related to resource use and management.

Unit I: : Introduction (2Hrs.)

Definition, scope and importance; Need for public awareness – institutions in environment, people in environment.

Unit II: : Natural Resources

(2 Hrs.)

Renewable and non-renewable and associated problems; Role of an individual in conservation of natural resources; Equitable use of resources for sustainable lifestyles.

Unit III: Ecosystems (4 Hrs.)

Concept of an ecosystem – understanding ecosystems, ecosystem degradation, resource utilization. Structure and functions of an ecosystem – producers, consumers and decomposers.

Energy flow in the ecosystem – water, carbon, oxygen, nitrogen and energy cycles, integration of cycles in nature. Ecological succession; Food chains, food webs and ecological pyramids; Ecosystem types – characteristic features, structure and functions of forest, grassland, desert and aquatic ecosystems.

Unit IV: Bio-diversity (4 Hrs.)

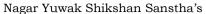
Introduction – biodiversity at genetic, species and ecosystem levels Bio-geographic classification of India. Value of biodiversity – Consumptive use value, productive use value, social, ethical, moral, aesthetic and optional vlue of biodiversity.

India as a mega-diversity nation; hotospots of biodiversity. Threats to bio-diversity – habitat loss, poaching of wildlife, man-wild life conflicts. Common endangered and endemic plant and animal species of India. Insitu and Exsitu conservation of biodiversity. Role of individual and institutions in prevention of pollution. Disaster management – Floods, earthquake, cyclone, landslides.

Unit V: Pollution (4 Hrs.)

Definition; Causes, effects and control measures of air, water, soil, marine, noise and thermal pollutions and nuclear hazards. Solid waste management – Causes, effects and control measures of urban and industrial waste.

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(Department of Computer Science and Engineering)

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B.Tech in Computer Science and Engineering

Unit VI: Social Issues and the Environment

(4 Hrs.

Unsustainable to sustainable development; Urban problems related to energy; Water conservation, rainwater harvesting, watershed management; Problems and concerns of resettlement and rehabilitation of affected people. Environmental ethics – issues and possible solutions – Resource consumption patterns and need for equitable utilization; Equity disparity in Western and Eastern countries; Urban and rural equity issues; need for gender equity.

Preserving resources for future generations. Te rights of animals; Ethical basis of environment education and awareness; Conservation ethics and traditional value systems of India.

Climate change, global warming, acid rain, Ozone layer depletion, nuclear accidents and holocasts.

Wasteland Reclamation; Consumerism and Waste products.

Environment legislations – The Environment (Protection) Act; The water (Prevention and Control of Pollution) Act; The Wildlife Protection Act; Forest Conservation Act; Issues involved in enforcement of environmental legislations – environment impact assessment (EIA), Citizens actions and action groups.

Public awareness – Using an environmental calendar of activities, self-initiation.

Unit VII: Human Population and the Environment

(4Hrs.)

Global population growth, variation among nations. Population explosion; Family Welfare Programmes - methods of sterilization; Urbanization.

Environment and human health – Climate and health, infectious diseases, water-related diseases, risk due to chemicals in food, Cancer and environment.

Human rights – equity, Nutrition and health rights, Intellectual property rights (IPRS), Community Biodiverstity registers (CBRs).

Value education – environmental values, valuing nature, valuing cultures, social justice, human heritage, equitable use of resources, common property resources, ecological degradation.

HIV / AIDS; Women and Child Welfare; Information technology in environment and human health.

Total Lecture | 24 Hours

Textbooks: Perspectives in environmental studies by A. Kaushik and C. P. Kaushik. Textbook for Environmental studies by Erach Bharucha for UGC Textbook of Environmental studies by Shanta Satyanarayan, Dr. Suresh Zade, Dr. Shashikant Sitre & Dr. Pravin Meshram. Fundamental concepts in Environmental studies by Dr. D.D. Mishra. S. Chand publications

Re	Reference Books:							
1.	Essentials of Ecology and Environmental Science by Dr. S. V.S. Rana, PHI Learning Pvt. Ltd, Delhi							
2.	Environmental Chemistry by Anil Kumar De, Wiley Eastern Limited							
3.	Environmental Science by T.G. Miller, Wadsworth Publishing Co, 13th edition.							
4.	Ecology and Environment by P. D. Sharma, Rastogi publications							

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Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

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

(Accredited 'A++' Grade by NAAC with a score of 3.25)

Hingna Road, Wanadongri, Nagpur - 441 110



Bachelor of Technology SoE & Syllabus 2022 2nd Semester

(Department of Computer Science and Engineering

B.Tech in Computer Science and Engineering

Yeshwantrao Chavan College of Engineering

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

B.TECH SCHEME OF EXAMINATION 2022

(Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science & Engineering)

B. Tech in Computer Science & Engineering)

SoE No. 22CSE-101

			BoS/				C	onta	ct Ho	urs		%	Weightag	je	ESE
SN	Sem	Type	Deptt	Sub. Code	Subject	T/P	L	Т	Р	Hrs	Credits	MSEs*	TA**	ESE	Duration Hours
					FIRST SEME	STER									
1	1	BS	GE/MTH	22CSE101	Differential Equation and Complex Analysis	Т	3	1	0	4	4	30	20	50	3 Hrs
2	1	BS	GE/PHY	22CSE102	Engineering Physics	Т	3	0	0	3	3	30	20	50	3 Hrs
3	1	BS	GE/PHY	22CSE103	Lab: Engineering Physics	Р	0	0	2	2	1		60	40	
4	1	HS	GE/HUM	22CSE104	Social Science	Т	3	0	0	3	3	30	20	50	3 Hrs
5	1	BES	ME/ME	22CSE105	Engineering Graphics	Т	1	0	0	1	1	30	20	50	3 Hrs
6	1	BES	ME/ME	22CSE106	Lab: Engineering Graphics	Р	0	0	4	4	2		60	40	
7	1	BES	CT/CT	22CSE107	Elements of AIML	Т	3	0	0	3	3	30	20	50	3 Hrs
8	1	BES	CT/CT	22CSE108	Computer workshop	Р	0	0	2	2	1		60	40	
9	1	BES	CSE/CSE	22CSE109	Introduction to Computing with Python	Т	3	0	0	3	3	30	20	50	3 Hrs
10	1	BES	CSE/CSE	22CSE110	Lab: Introduction to Computing with Python	Р	0	0	2	2	1		60	40	
					1	TOTAL	16	1	10	27	22				

List	ist of Mandetory Learning Course (MLC)											
1	1	HS	GE/T&P	MLC2121	YCAP1-Get Set Go	Α	2	0	0	2	0	
2	1	BES	GE/CHE	GE2132	Environmental Science	Α	2	0	0	2	0	

					SECOND SE	MESTE	R								
1	2	BS	GE/MTH	22CSE201	Calculus Sequences and Series	Т	3	1	0	4	4	30	20	50	3 Hrs
2	2	BS	GE/CHE	22CSE202	Engineering Chemistry	Т	3	0	0	3	3	30	20	50	3 Hrs
3	2	BS	GE/CHE	22CSE203	Lab: Engineering Chemistry	Р	0	0	2	2	1		60	40	
4	2	HS	GE/HUM	22CSE204	Professional Communication	Т	3	0	0	3	3	30	20	50	3 Hrs
5	2	BES	CV/CV	22CSE205	Engineering Mechanics	Т	3	0	0	3	3	30	20	50	3 Hrs
6	2	BES	CV/CV	22CSE206	Lab: Engineering Mechanics	Р	0	0	2	2	1		60	40	
7	2	BES	EE/EE	22CSE207	Basic Electrical and Electronics Engineering	Т	3	0	0	3	3	30	20	50	3 Hrs
8	2	BES	IT/IT	22CSE208	Programming for Problem Solving	Т	3	0	0	3	3	30	20	50	3 Hrs
9	2	BES	IT/IT	22CSE209	Lab: Programming for Problem Solving	Р	0	0	2	2	1		60	40	
					·	TOTAL	18	1	6	25	22				

List	st of Mandetory Learning Course (MLC)											
1	2	HS	GE/HUM	GE2131	Universal Human Value	Α	2	0	0	2	0	
2	2	HS	GE/T&P	MLC2122	YCAP2 -Functional English	Α	2	0	0	2	0	

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 activitied decided by course teacher, TA3 - 3 marks on class attendance

Chairperson	Dean (Acad. Matters)	Date of Release	1.00 Version	Applicable for AY 2022-23 Onwards
	- 106	June 2022	4.00	





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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B. Tech in Computer Science and Engineering

II SEMESTER

22CSE201: Calculus, Sequences and Series

Course Outcomes:

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

- 1. Apply the knowledge of differentiation, sequence and series to solve engineering problems.
- 2. Determine the derivatives of functions of several variables and develop the mathematical equation.
- 3. Apply the knowledge of Beta and Gamma functions to solve the integrals.
- 4. Evaluate the multiple integrals and apply it to compute the area and volume of various structures.

Unit I: Sequence and Series

(6 Hrs.)

Sequence, types of sequence, test of convergence of sequences, Cauchy sequence, infinite series, power series, Alternating series, tests of convergence and absolute convergence of series.

(Contemporary Issues related to Topic)

Unit II: Ordinary Differentiation

(7 Hrs.)

Successive differentiation; Leibnitz theorem, Taylor's and Maclaurin's series for functions of single variable and its applications.

(Contemporary Issues related to Topic)

Unit III: Partial Differentiation

(7 Hrs.)

First and higher order derivatives of Functions of several variables, Euler's theorem, Chain Rule, Jacobians Maxima and minima and saddle point of functions of two variables.

(Contemporary Issues related to Topic)

Unit IV: Curve Tracing and Improper Integrals

(6 Hrs.)

Tracing of curves, Beta, Gamma functions and its applications...

(Contemporary Issues related to Topic)

Unit V: Multiple integrals

(7 Hrs.)

Elementary double integrals and triple integrals, Change of variables (simple transformations) and Jacobian of transformations, Change of order of integration (Cartesian and polar)..

(Contemporary Issues related to Topic)

Unit VI: Application of Multiple Integral

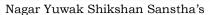
(6 Hrs.)

Surface area, Calculation of mass, Centre of gravity of an arc and Centre of gravity of an area, Volume of solid by revolution of an area (Double integral).

(Contemporary Issues related to Topic)

Total Lecture | 39 Hours

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B.Tech in Computer Science and Engineering

Tex	xtbooks:
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, 43 rd edition, Khanna Publishers.
5.	P.N.Wartikar and J.N.Wartikar, Applied Mathematics, 4 th Edition, Vidyarthi GrihaPrakashan.

Re	ference 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, VolI & Vol II 2 nd edition, Wiley.
3.	N.P. Bali and Manish Goyal. A text book of Engineering Mathematics, 10 th edition, Laxmi Prakashan.

Y	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/							

MO	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								
3.	https://nptel.ac.in/courses/111/106/111106100/								

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

II SEMESTER

22CSE202: Engineering Chemistry

Course Outcomes:

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

- 1. Illustrate different thermodynamic functions and chemical reaction rates. (L3)
- 2. Apply concepts of electrochemistry for energy storage devices. (L3)
- 3. Develop awareness about global environmental concerns. (L2)
- 4. Establish insight into engineering materials. (L2)

Unit I: Unit-I Thermodynamics

(7 Hrs.)

Introduction, Spontaneous and non-spontaneous processes, Internal energy, enthalpy, Gibb's free energy, Free energy, types of equilibrium. I and II law of thermodynamics. Entropy and its significance. Numerically on Internal energy and enthalpy change. General applications of thermodynamics in engineering. (Contemporary Issues related to Topic)

Unit II: Electrochemistry

(7 Hrs.)

Introduction, metallic and electrolytic conductance, resistance, specific resistance, conductance, specific conductance, equivalent and molar conductance. Variation of conductance with dilution. Electrode and electrode potentials. Nernst Equation. Faraday's laws and Numerical. Industrial applications: Electroforming, Electrowinning, Electrolytic refining. (Contemporary Issues related to Topic)

Unit III: Energy Storage Devices Basic concepts

(6 Hrs.)

Primary and secondary battery. Energy density, power density, energy efficiency, cycle life, shelf life.

Secondary battery: Ni-metal hydride battery, Lithium-ion battery. H2-O2 Fuel cell: Principle, working, advantages, disadvantages, applications. Differences between battery and a fuel cell. Supercapacitors: Definition, types, characteristics, and application. (Contemporary Issues related to Topic)

Unit IV: Chemical Kinetics

(6 Hrs.)

Introduction, Rate of reaction and factors influencing rate of reaction, order & molecularity of reaction. Kinetic equations of different orders: Zero Order, First Order, Second Order and numerical. (Contemporary Issues related to Topic)

Unit V: e-waste Management

(6 Hrs.)

Introduction, e-waste pollution, its impact on environment, rules of regeneration of e-waste recycling and its managements as per government norms. e -waste on Battery waste management. Control measures for e-waste Management. Nanotechnology for waste reduction and improved energy efficiency. (Contemporary Issues related to Topic)

Unit VI: Polymeric Materials

(7 Hrs.)

Conducting Polymers: Intrinsic and extrinsic conducting polymers, doping, factors responsible for conduction. General properties and applications of conducting polymers.

Liquid Crystal Polymers: Phases of LCP's, general properties and applications.

Silicon Chips: Introduction, properties and applications.

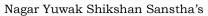
Polymers in electronic industries: Piezo, pyroelectric, Ferroelectric polymers.

Smart materials: Properties and applications of shape memory alloys, chromo active, photoactive and magneto

rheological materials. (Contemporary Issues related to Topic)

Total Lecture | 39 Hours

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Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech SoE and Syllabus 2022

(Scheme of Examination w.e.f. 2022-23 onward) (Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

Tex	Textbooks:					
1.	S S. Dara, A Text book 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	Erach Bharucha Textbook for Environmental studies for UGC. Universities press Third edition.					

Ref	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.	T.G. Miller, Environmental Science Wadsworth Publishing Co, 13th edition.					

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS] http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/SERIES%20WISE%20BOOKS/CHEMIST RŶ/

MC	MOOCs Links and additional reading, learning, video material					
1.	Silicon Chips: What is Computer Chips Made Of?					
	https://www.intel.com/content/www/us/en/history/museum-making-silicon.html					
2.	https://www.youtube.com/watch?v=XTt3gXB0a84					
3.	https://www.youtube.com/watch?v=iihYXx79QiE					
4.	https://www.youtube.com/watch?v=JfJ7MlP9Dco					
5.	https://www.youtube.com/watch?v=L2VSOccUrSk					

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II SEMESTER

22CSE203: Lab: Engineering Chemistry

Course Outcomes

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

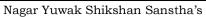
- 1. Illustrate different thermodynamic functions and chemical reaction rates. (L3)
- 2. Apply concepts of electrochemistry for energy storage devices. (L3)
- 3. Develop awareness about global environmental concerns. (L2)
- 4. Establish insight into engineering materials. (L2)

Total 10 experiments are to be performed

(4 each from Phase I and Phase II and two demonstration experiments)

SN	Experiments based on				
	List of Experiments-Phase I				
1	Determination of total hardness of water sample.				
2	Determination of alkalinity present in the water sample.				
3	Estimation of Fe ²⁺ ions by redox titration				
4	Determination of copper by iodometric titration				
5	Estimation of Nickel.				
6	To determine the strength of a given potassium dichromate solution with N/20 sodium thiosulphate solution				
7	Determination of COD of water sample.				
8	Synthesis of polyaniline.				
9	Determination of rate of the reaction of hydrolysis of ethyl acetate at room temperature and analysis of experimental data using Computational Software.				
	List of Experiments-Phase II				
1	Determination of viscosity of lubricating oil by Redwood Viscometer I or II				
2	Determination of Cation exchange capacity of an ion exchange resin				
3	Determination of molecular weight of a polymer.				
4	Oil Testing for Flash Point / Cloud Point/Pour Point/Aniline Point				
5	Proximate analysis of coal				
6	Determination of surface tension of liquids using stalagmometer.				
7	Determination of electrochemical equivalence of Copper using Faradays Law				
8	To determine the heat of solution of potassium nitrate calorimetrically.				
9	Determination of conductivity of water sample by conductivity meter.				
10.	To verify Beer-Lambert law for KMnO4 and determine the concentration of the given solution of KMnO4				

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	List of Demonstration Experiments	
1	1 Determination of pH of water sample by pH meter	
2	Synthesis of urea formaldehyde resin.	
3	Determination of consistency of grease sample by using penetrometer.	
4	Determination of Drop Point of grease sample.	

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B.Tech in Computer Science and Engineering

II SEMESTER

22CSE204: Professional Communication

Course Outcomes:

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

- 1. Apply different modes for effective communication.
- 2. Use competently phonology of English language.
- 3. Apply nuances of LSRW skills.
- 4. Communicate through different channels.

Unit I: Basics of Communication

(7 Hrs.)

Language as a tool of communication & characteristics of language Process of Communication, Levels of Communication, Flow of Communication, Networks of Communication, Classification of Barriers (Intrapersonal, Interpersonal, Organizational).

(Contemporary Issues related to Topic)

Unit II: English Phonetics

(6 Hrs.)

Speech Mechanism, Organs of speech, Consonant and Vowels sounds, Word stress rules.

(Contemporary Issues related to Topic)

Unit III: Presentation & Visual Communication

(7 Hrs.)

Presentation and audience analysis, Organizing content, Nuances of presentation, Visual Communication – Introduction & importance, Role & Psychology of color in visual communication.

(Contemporary Issues related to Topic)

Unit IV: Verbal Skills

(7 Hrs.)

Listening Skills -definition types and traits.

Group Communication- (Purpose, Different types of Group Communication, Organizational GD, GD as a part of selection process), Meeting (purposes, preparation, procedure and minutes of meeting).

(Contemporary Issues related to Topic)

Unit V: Interview Skills

(6 Hrs.)

Purpose, expectations of employer and preparation for Interview, Types, Types of Questions & Answering Techniques, Telephonic Interviews – preparation and guidelines, Reading Techniques (Exercise based on Complex Unseen passages.

(Contemporary Issues related to Topic)

Unit VI: Technical Written Communication

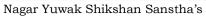
(6 Hrs.)

Memo, Email, Report -Types, Characteristics, prewriting aspects of report and preparing writing aspects of report), Types of paragraphs..

(Contemporary Issues related to Topic)

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

Te	Textbooks:					
1.	Raman & Sharma, Technical Communication, Oxford University Press.					
2.	T. Balasubramaniam, Textbook of English Phonetics for Indian Students, Macmillan India Ltd.					

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

MO	OOCs 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-superior-vocabulary-e157841139.html
3	https://www.pdfdrive.com/improve-your-communication-skills-present-with-confidence-write-with-style-learn-skills-of-persuasion-e156963640.html
4	https://www.pdfdrive.com/21-days-of-effective-communication-everyday-habits-and-exercises-to-improve-your-communication-skills-and-social-intelligence-e158273760.html

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II SEMESTER

22CSE205: 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.

Unit VI: Work Energy and Impulse Momentum Method

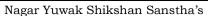
(6 Hrs.)

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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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

Tex	xtbooks:
1.	Nelson A., Engineering Mechanics (Statics and Dynamics), ed 2009, Tata Mc. Grew 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.
Ref	ference 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, 9 th edition Tata Mc. Graw Hill Publication, New Delhi. 2007.
YC	CCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]
1	chrome-
	extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20f
	ile/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
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M(OOCs 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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B.Tech in Computer Science and Engineering

II SEMESTER

22CSE206: Lab: Engineering Mechanics

Course Outcomes

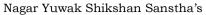
Upon successful completion of the course the students will be able to

- 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.
- Determine the properties of surface like centroid, moment of inertia, etc. for planar surfaces and mass moment of inertia for rigid body.
- Analyze pin jointed truss frame structure and beam structure analytically and graphically.
- 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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II SEMESTER

22CSE207: Basic Electrical and Electronics Engineering

Course Outcomes:

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

- 1. Understand, and explain the fundamental concepts of analog and digital electronic circuits
- 2. Understand, and explain the fundamental concepts of Electrical circuit elements
- 3. Analyse simple analog and digital electronic circuits.
- 4. Analyse simple electrical and electronic circuits for a given application.

Unit:1 CIRCUIT ELEMENTS AND ENERGY SOURCES

6 Hours

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:2 | TRANSFORMER AND MOTORS

6 Hours

Introduction to Transformer, Construction, Working principle, Types of transformers, Introduction to DC Motor, Working Principle of DC Motor, Types of Motors.

(Contemporary Issues related to Topic)

Unit:3 DIODE AND TRANSISTOR

7 Hours

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, biasing, Modes of operation.

(Contemporary Issues related to Topic)

Unit:4 NUMBER SYSTEM AND CODES

6 Hours

Introduction, Number System, Binary Number System, Signed Binary Numbers, Binary Arithmetic, 1's and 2's Complement Arithmetic, Octal Number System, Hexadecimal Number System, Codes- BCD code and Gray Code, BCD arithmetic

(Contemporary Issues related to Topic)

Unit:5 DIGITAL PRINCIPLES

7 Hours

Logic Gates, Boolean Laws & Algebras, Sum of Product & Product of Sum, k-Map (up to 3-variable).

(Contemporary Issues related to Topic)

Unit:6 LOGIC DESIGN

7 Hours

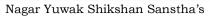
Combinational Logic Design - Adder, Subtractor, Multiplexer and Demultiplexer, Sequential Logic Circuits – Flip-flops, Registers and Introduction to counters.

(Contemporary Issues related to Topic)

Total Lecture Hours

39 Hours

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B.Tech in Computer Science and Engineering

Tex	xtbooks
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	"Modern Digital Electronics" by R. P. Jain, 4th Edition, McGraw Hill Education Private Limited,
	published in 2015

Ref	Reference Books				
1	Fundamentals of Digital Circuits. Kumar A. Anand, PHI Learning Pvt. Ltd., 18-Jul-2016				
2	Basic Electrical Engg - VK Mehta , S Chand & Company (1 December 2006).				

YC	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				

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II SEMESTER

22CSE208: Programming for Problem Solving

Course Outcomes:

On completion of this course, the student will be able to

- 1) Describe the basics of computer system components and operation, basics of algorithms and flowcharts (L2)
- 2) Develop programs using conditional statements and loops user defined functions, and pointers.(L3)
- 3) Analyze single and multi-dimensional arrays as a data structure and its use in problem solving.(L4)
- 4) Describe the basics of Strings, Structures, Unions, and File handling and its use for problem solving.(L2)

Unit I: Computer System Basics:

(6 Hrs.)

Introduction to components of a computer system (disks, memory, processor), how program is executed, understanding of concepts such as operating system, compilers, source and object programs, etc. Introduction to algorithms and flowcharts.

Basic building blocks of C: Character set, variables, identifiers & keywords, Data types, Operators: arithmetic, logical and relational operators, precedence of operators

(Contemporary Issues related to Topic)

Unit II: Basics of C Programming

(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.

(Contemporary Issues related to Topic)

Unit III: Loop Structures:

(6 Hrs.)

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

(Contemporary Issues related to Topic)

Unit IV: Modular programming:

(7 Hrs.)

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

(Contemporary Issues related to Topic)

Unit V: Arrays:

(7 Hrs.)

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, programs for basic matrix operations such as addition, multiplication and transpose, Array as function arguments. Strings: string representation and string handling functions, real life programming examples

(Contemporary Issues related to Topic)

Unit VI: Structure and Union, Concepts of files:

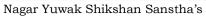
(7 Hrs.)

Introduction to structure and union, types of files, file opening in various modes, file opening and closing, fseek(), reading and writing text files, concept of pre-processor directives and macros, command line arguments, real life programming examples

(Contemporary Issues related to Topic)

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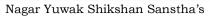
Te	Textbooks:				
1.	Mastering C, K.R. Venugopal& S.R. Prasad, TMH,2007.				
2.	Programming in ANSI C, E. Balaguruswamy, Mc Graw Hill Education				
3.	The C Programming Language J.B.W.Kernighan&D.M.Ritchie, Prentice Hall				

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

7	YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]				
1	http://103.152.199.179/YCCE/e-copies%20of%20books/7.Information%20Technology/27.c.pdf				
2	http://103.152.199.179/YCCE/DTEL%20Material/7.Information%20Technology/DTEL%20PPTs/11.ITCP_E				
	_SSG.pdf				

MO	MOOCs Links and additional reading, learning, video material		
1.	https://archive.nptel.ac.in/courses/106/104/106104128/		

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II SEMESTER

22CSE209: Lab: Programming for Problem Solving

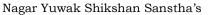
Course Outcomes

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

- 1) Describe the basics of computer system components and operation, basics of algorithms and flowcharts (L2)
- 2) Develop programs using conditional statements and loops user defined functions, and pointers.(L3)
- 3) Analyze single and multi-dimensional arrays as a data structure and its use in problem solving.(L4)
- 4) Describe the basics of Strings, Structures, Unions, and File handling and its use for problem solving.(L2)

SN	Experiments based on		
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	Practical based on Arithmetic and Conditional operators.		
3(A)	Practical based on Decision Control statements		
3(B)	Practical based on Case Control statements (switch)		
4	Practical based on Looping Statements. (for/while/do-while)		
5	Practical based on Functions and Recursion.		
6(A)	Practical based on 1-D Array. (Searching)		
6(B)	Practical based on 1-D Array. (Sorting)		
7	Practical based on 2-D Array.		
8	Practical based on Strings		
9	Practical based on Structures.		
10	Practical based on Files.		

Dande	Ab.	Sherri	July 2022	1.00	Applicable for AY 2022-23 Onwards
Chairperson	Dean (Acad. Matters)	Dean OBE	Date of Release	Version	AT 2022-23 Offwards





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B. Tech SoE and Syllabus 2022

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

II SEMESTER Audit Course

GE2131: Universal Human Value

Course Outcomes

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

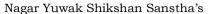
- 1.Experiential validation through the way to verify right or wrong.
- 2. Practice living in harmony with natural acceptance.
- 3. Realize the importance of relationships.
- 4. Recognize the importance of sustainable co-existence in existence.

Unit I: Course Introduction Need, Basic Guidelines, Content and Process for Value Education Understanding the need, basic guidelines, content and process for Value Education Self Exploration—what is it? - its content and process; 'Natural Acceptance' and Experiential Validationas the mechanism for self-exploration Continuous Happiness and Prosperity- A look at basic Human Aspirations Unit II: Understanding Harmony in the Human Being - Harmony in Myself! Understanding human being as a co-existence of the sentient 'I' and the material 'Body' Understanding the needs of Self ('I') and 'Body' Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer) Understanding the characteristics and activities of 'I' and harmony in 'I' Unit III: Understanding Harmony in the Family (4 Hrs.)

Understanding Harmony in the family – the basic unit of human interaction
Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship Understanding the meaning of Vishwas; Difference between intention and competence
Understanding the meaning of Samman, Difference between respect and differentiation; the other salient

Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship

Damale	Del	Sherri	July 2022	1.00	Applicable for AY 2022-23 Onwards
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Unit IV: Understanding Harmony in the Society (4 Hrs.)

Difference between intention and competence, Understanding the meaning of Samman, Difference between respect and ,differentiation; the other salient values in relationship ,Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sahasttva as comprehensive Human Goals, Visualizing a universal harmonious order in society- Undivided Society (Akhand Samaj), Universal Order (Sarvabhauma Vyavastha) - from family to world family! ,Practice Exercises and Case Studies will be taken up in Practice Sessions

Unit V: Understanding Harmony in the Nature - (4Hrs)

Whole existence as Co-existence, Understanding the harmony in the Nature Interconnectedness and mut Practice Exercises and Case Studies will be taken up in the Practice Sessions.ual fulfillment among the four orders of nature- recyclability and self-regulation in nature, Practice Exercises and Case Studies will be taken up in the Practice Sessions.

Unit VI :Understanding Harmony in the Existence - (4Hrs)

Understanding Existence as Coexistence (Sah-astitva) of mutually interacting units in all-pervasive space, Holistic perception of harmony at all levels of existence ,Practice Exercises and Case Studies will be taken up in the Practice Sessions.

Total Lecture 24 Hours

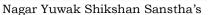
Textbooks:

The primary resource material for teaching this course consists of text book A foundation course in Human Values and professional Ethics, Excel books, 1st Edition 2011, R.R Gaur, R Sangal, G P Bagaria

Reference Books:

The teacher's manual A foundation course in Human Values and professional Ethics, Excel books, 1st Edition 2011, R.R Gaur, R Sangal, G P Bagaria

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B.Tech in Computer Science and Engineering

II SEMESTER Audit Course

MLC2122: YCAP2 -Functional English

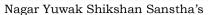
MLC2122 YCAP-II	No of Evaluations	Result of successful completion of YCAP II shall be calculated based on the basis of evaluations.
Evaluation Scheme	EVAL-I	To pass the exam a students must score 50% marks
	100 marks	

Objective	Objective
The aim of this course is to get the students to a common level in spoken English. The majority of the target group is expected to know English as a foreign/official language. Thus the objective of the course is to make the students comfortable in using it as a spoken language when the situation demands	Students will heighten their awareness of correct usage of English grammar in writing and speaking.

Syllabus Subject: Functional English – 2nd Sem , No. of hours - 20

Unit No.	Торіс	Duration
1	Introduction to Functional English - 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	2 hours
2	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	2 hours
	Practice exercises, Practice Conversations, Script Activity Quiz on the above Topics, Exercises for Evaluation	1.5 Hours 0.5 Hours

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Unit No.	Topic	Duration
3	Topic: Internet & Social Media Communication 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, Whats in it for me?, Characteristics of ads, Assignment	3 Hours
4	Topic: Tenses -1 Introduction & Basics, Simple Tense (Past, Present, Future), Continuous Tense (Past, Present, Future) – discussion with examples	4 Hours
	Assignment Presentation on Mad Ads, Quiz on Tenses and Social Media-Internet Communication	

Unit	Topic	Duration
No.		
5	Topic: Tenses -2 Introduction & Basics, Perfect Tense (Past, Present, Future), Perfect Continuous Tense (Past, Present, Future) – discussion with examples Topic: Introduction to Movie Magic Learn English with films, Film Vocabulary, Describing a film, Types of Films,	3.5 Hours
6	Topic: Written Communciation 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	3.5 Hours
	Assessment – Letter and Email Writing, Tenses - Quiz	

Reference Books: Soft Skills and Professional Communication, Francis Peters SJ, Mcgraw Hill Education Bringing out the best in People, Aubrey Daniels, Mcgraw Hill

MO	MOOCs Links and additional reading, learning, video material								
1.	1. https://www.youtube.com/channel/UCLsI5-B3rIr27hmKqE8hi4w								
2.	https://www.youtube.com/channel/UC1Y1I4shF84scQ4HBThahcg								

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Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

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

(Accredited 'A++' Grade by NAAC with a score of 3.25)

Hingna Road, Wanadongri, Nagpur - 441 110



Bachelor of Technology SoE & Syllabus 2022 3rd Semester

(Department of Computer Science and Engineering

B.Tech in Computer Science and Engineering

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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B.TECH SCHEME OF EXAMINATION 2022

(Scheme of Examination w.e.f. 2022-23 onward)

SoE No.

22CSE-101

(Department of Computer Science & Engineering)

B. Tech in Computer Science & Engineering)

	_	_	BoS/				С	onta	ct Ho	urs		%	Weightag	je	ESE
SN	Sem	Type	Deptt	Sub. Code	Subject	T/P	L	Т	Р	Hrs	Credits	MSEs*	TA**	ESE	Duration Hours
	THIRD SEMESTER														
1	3	PC	CSE/CSE	22CSE301	Discrete Mathematics & Graph Therory	Т	3	1	0	4	4	30	20	50	3 Hrs
2	3	PC	CSE/CSE	22CSE302	Computer Architecture and Organisation	Т	3	0	0	3	3	30	20	50	3 Hrs
3	3	PC	CSE/CSE	22CSE303	Object Oriented Programming	Т	3	0	0	3	3	30	20	50	3 Hrs
4	3	PC	CSE/CSE	22CSE304	Lab: Object Oriented Programming	Р	0	0	2	2	1		60	40	
5	3	PC	CSE/CSE	22CSE305	Data Structures I	Т	3	0	0	3	3	30	20	50	3 Hrs
6	3	PC	CSE/CSE	22CSE306	Lab: Data Structures I	Р	0	0	2	2	1		60	40	
7	3	PC	CSE/CSE	22CSE307	Web Technology	Т	3	0	0	3	3	30	20	50	3 Hrs
8	3	PC	CSE/CSE	22CSE308	Lab: Web Technology	Р	0	0	2	2	1		60	40	
	TOTAL								6	22	19				

List	List of Mandatory Learning Course (MLC)											
1	3	HS	T&P	MLC2123	YCCE Communication Aptitude Preparation (YCAP3)	Α	3	0	0	3	0	
2	3	BSE	CSE	AU115	Latex	Α	2	0	0	2	0	

					FOURTH SEM	MESTE	R								
1	4	BS	GE/GE	22CSE401	Linear Algebra	т	3	0	0	3	3	30	20	50	3 Hrs
2	4	HS	GE/HUM	22CSE402	Fundamentals of Management and Economics	Т	3	0	0	3	3	30	20	50	3 Hrs
3	4	PC	CSE/CSE	22CSE403	Theory of Computation	Т	3	1	0	4	4	30	20	50	3 Hrs
4	4	PC	CSE/CSE	22CSE404	Operating Systems	Т	3	0	0	3	3	30	20	50	3 Hrs
5	4	PC	CSE/CSE	22CSE405	Lab:Operating Systems	Р	0	0	2	2	1		60	40	
6	4	PC	CSE/CSE	22CSE406	Data Structures II	т	3	0	0	3	3	30	20	50	3 Hrs
7	4	PC	CSE/CSE	22CSE407	Lab: Data Structures II	Р	0	0	2	2	1		60	40	
8	4	PC	CSE/CSE	22CSE408	Introduction to Data Analysis	т	3	0	0	3	3	30	20	50	3 Hrs
9	4	PC	CSE/CSE	22CSE409	Lab: Introduction to Data Analysis	Р	0	0	2	2	1		60	40	
10	4	PC	CV/CSE	22CSE410	Environmental Sustainability, Pollution and Management	т	3	0	0	3	3	30	20	50	3 Hrs
							21	1	6	28	25				

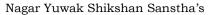
List	List of Mandatory Learning Course (MLC)											
1	4	HS	T&P	MLC2124	YCCE Communication Aptitude Prepartion (YCAP 4)	А	3	0	0	3	0	
2	4	BSE	CSE	MLC116	Ethics in IT	Α	2	0	0	2	0	

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 activitied 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 Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

III Semester

22CSE301-Discrete Mathematics & Graph Theory

Course Outcome

With the completion of this syllabus students will be familiar with mathematical, logic and set theory and their methods of solutions and graph theory, group theory with simple applications

UNIT I: Mathematical Logic and Set Theory

6

Statement and Notation: Negation, Conjunction, Disjunction, Tautologies, Truth Tables, Basic Concepts of Set Theory, Inclusion & equality of set, Power Set, Ordered Pairs and n-tuples, Operations on Sets, Partial order, Equivalence relations, mathematical induction. Propositions, Predicate, logic, formal mathematical systems.

(Contemporary Issues related to Topic)

UNIT II: Relations and Functions

Relation and Ordering, Properties of Binary in a set, Relation Matrix and Graphs, Partition and Covering of a set, Equivalence relation, Partial ordering, Partially Ordered sets, Function (Definition and Introduction), Composition of functions, Inverse Functions, Characteristics function of a set.

(Contemporary Issues related to Topic)

UNIT III: Group Theory

Groups (Definitions and Examples) Subgroups and Homomorphism, Cosets and Lagrange's theorem, Normal subgroups, Codes and Group Codes. Semi groups and Monoids (definitions and examples). Homomorphism of semi groups and monoids. Sub semi groups and monoids.

(Contemporary Issues related to Topic)

UNIT IV: Rings (Definitions and Examples)

7

Integral domain, ring homomorphism, ideas of ring polynomial, Field, Lattice.

(Contemporary Issues related to Topic)

UNIT V: Fuzzy Sets and Fuzzy Logic

Fuzzy sets and systems, crisp sets, overview of fuzzy logic and classical logic, fuzzy compliment, fuzzy union, fuzzy intersection and combinations of these fuzzy sets operations crisp and fuzzy relations.

(Contemporary Issues related to Topic)

UNIT VI: Graph Theory

7

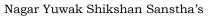
Basic concepts of graph theory, Basic definitions, Paths and circuits, Reach ability and connectedness, Matrix Representation of graphs, Tree and their representation and operations, Rooted trees, Path lengths in rooted trees, Multi graphs and weighted graphs, and graph isomorphism, shortest paths in weighted graphs, Hypergraphs, transitive closure, Spanning trees, Kruskal's algorithm, Prim's algorithm.

(Contemporary Issues related to Topic)

Total	Lectures	
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39

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Hall of India, New Delhi.

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

Tex	xt Books						
1.	Discrete Mathematics Structure with application to Computer Science, 23rd re-print, 2005, J. P. Tremblay &						
	R. Manohar ,Tata McGraw-Hills Publication Company Limited, New Delhi.						
2.	Advanced Engineering Mathematics, 8th revised edition, 2007, H.K. Dass, by.S.Chand and Company						
	Limited Delhi.						
3.	Fuzy Logic with Engineering Applications, T. J. Ross, John Wiley &Sons, Ltd. ISBN: 978-81-265-3126-4						

Kei	IETENCE BOOKS					
1.	Discrete Mathematics ,2nd edition, Lipschutz, by Schaums's Outline series, Tata McGraw-Hills Publication					
	Company Limited, New Delhi.					
2.	Discrete Mathematical structures ,3rd edition,2001, Bernard Kolman ,Robert C.Busby,Sharon Ross,Prentice					

Y	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					

M(MOOCs Links and additional reading, learning, video material					
1.	https://onlinecourses.nptel.ac.in/noc20_cs82/preview					
2.	https://onlinecourses.nptel.ac.in/noc20_cs37/preview					

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

III Semester

22CSE302 — Computer Architecture and Organization

Course Outcome

On completion of the course, student will be able to

- 1. Understand and demonstrate the basic computer architecture concepts related to the working of processors, memory systems, and input output systems.
- 2. Differentiate among various addressing modes and develop ability to write assembly language programs.
- 3. Comprehend information representation in computer and perform arithmetic operations using algorithms suitable for hardware implementation.
- 4. explain and compare techniques for improving the performance of a computer system components like CPU, main memory, input/output system and pipelining.

UNIT I: Basic Structure of Computer Hardware and Software

6

Functional Units, Basic Operational Concepts, Bus Structures, Software, processor clock and basic performance evaluation, number systems, and arithmetic operations, Memory Locations, addressing and encoding of information, instruction and instruction sequencing, branching, condition codes, zero, one and two address instructions, RISC vs CISC computers.

(Contemporary Issues related to Topic)

UNIT II: Addressing modes

Addressing modes, Stacks, and Subroutines, Processing Unit, Some fundamental concepts, Execution of a complete instruction, One, two, and three bus organization, Sequencing of control Signals, Assembly language programming.

(Contemporary Issues related to Topic)

UNIT III: Processor Design, hardwired control, Microprogrammed Control

7

Microinstructions, Grouping of control signals, Microprogram sequencing, Micro Instructions with next Address field, prefetching microinstructions.

(Contemporary Issues related to Topic)

UNIT IV: Arithmetic (Fixed and Floating point)

7

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, Booth's Algorithm , fast Multiplication, Integer Division algorithms, Floating point numbers and operations, IEEE floating point standards(Contemporary Issues related to Topic)

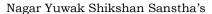
UNIT V: The Main Memory & Cache Memory

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The Main Memory: Basic concepts, Memory Hierarchy, semiconductor RAM memories, Static RAM vs Dynamic RAM, semiconductor ROM memories, DDRAM, Memory system considerations, Speed, Size and Cost. Cache Memory: cache memory mapping techniques, secondary storage devices, HDD vs SSD, Performance Considerations.

(Contemporary Issues related to Topic)

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UNIT VI: Computer Peripherals, I/O modules and I/O Devices, I/O transfers 6 Computer Peripherals, I/O modules and I/O Devices, I/O transfers, Program controlled, memory mapped and I/o mapped I/O, Interrupt handling and Interrupt driven I/O, DMA. Pipelining: Basic Concepts, Data Hazards and Instruction Hazards. Introduction to GPU and GPU Computing. (Contemporary Issues related to Topic) Total Lectures 39

Text Books

- 1 Computer Organization, 5th edition, V. Carl Hamacher, Zvonko Vranesic, McGraw Hill Publications.
- 2 Computer Architecture: A Quantitative approach, 6th edition, John L. Hennessy, David A. Patterson, MK series in computer architecture and design

Reference Books

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

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

- 1 file://172.16.1.10/cse/Ebooks/COmputer%20Organization%20Zaky%205th%20.pdf
- 2 http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-
- copies%20of%20books/Computer%20Technology/53-CAO_V.%20Carl%20Hamacher-GKY.pdf

3

MOOCs Links and additional reading, learning, video material

1. https://nptel.ac.in/courses/106105163

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B.Tech in Computer Science and Engineering

III Semester 22CSE303- Object Oriented Programming

Course Outcome

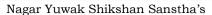
After completion of the course students will be able to:

(Contemporary Issues related to Topic)

- 1. Demonstrate the understanding of Object oriented concepts.
- 2. Analyse problem statement and identify appropriate objects and methods for problem solving.
- 3. Make use of predefined classes and frameworks for reducing coding efforts and improving performance.
- 4. Apply features of object oriented programming to write programs to solve real world problems.

UNIT I: Introduction to object oriented programming paradigm 7 Introduction to object oriented programming paradigm, procedure oriented programming vs OOP, features of OOP, benefits of OOP, defining class, instantiating a class. Declaring Classes and objects, Creating Classes and objects, methods, argument passing, Recursion, this keyword, constructors, Visibility control (Contemporary Issues related to Topic) **UNIT II:** Other Class Modifiers static, final, Abstract, Method overloading, Super keyword, Overriding (polymorphism), nested inner classes, packages (encapsulation), Interfaces (multiple Inheritances) (Contemporary Issues related to Topic) **UNIT III:** Arrays Arrays, Strings Arrays, One Dimensional Arrays, Two Dimensional Arrays, variable size arrays, Strings and String Buffer classes, Wrapper Classes (Contemporary Issues related to Topic) **UNIT IV: Exception handling mechanism** Fundamentals exception types, uncaught exception, try-catch Block, displaying description of an exception, multiple catch clauses, nested try-catch statements, throw, throws, finally, built in exceptions, creating own exception subclasses. Introduction to multithreading, life cycle of Thread, Runnable interface and Thread class. (Contemporary Issues related to Topic) **UNIT V: Collection Vector and Framework** 6 Introduction to collection framework, Vectors, Array List, Linked list, Hashset, Treeset, Hashmap, Accessing a collection via Iterator, Comparators.

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B.Tech in Computer Science and Engineering

UNIT VI: IO Steam	6
Introduction to stream classes, use of stream classes, I/O stream, bytes stream, character stream,	predefined stream
reading console input, reading character, reading string, writing console output, the print wri	te class, reading &
writing files, transient and volatile modifiers, Introduction to AWT, Working with Windows,	Graphics and Text
Introduction to Swings.	
(Contemporary Issues related to Topic)	
Total Lectures	39
Text Books	
Text Books 1. Java Complete Reference, 7 th , Herbert Schildt, McGraw-Hill	
Java Complete Reference, 7 th , Herbert Schildt, McGraw-Hill	
Java Complete Reference, 7th, Herbert Schildt, McGraw-Hill Reference Books	
Java Complete Reference, 7th, Herbert Schildt, McGraw-Hill Reference Books Thinking in Java, 4th, Bruce Eckel, Prentice Hall	
Java Complete Reference, 7th, Herbert Schildt, McGraw-Hill Reference Books Thinking in Java, 4th, Bruce Eckel, Prentice Hall	
Java Complete Reference, 7th, Herbert Schildt, McGraw-Hill Reference Books Thinking in Java, 4th, Bruce Eckel, Prentice Hall	
 Java Complete Reference, 7th, Herbert Schildt, McGraw-Hill Reference Books Thinking in Java, 4th, Bruce Eckel, Prentice Hall Programming with Java, E. Balagurusamy, TATA McGraw-Hill 	

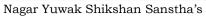
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	Links and	addifional	reading	learning	video mater	เลเ

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Chairperson	Dean (Acad. Matters)	Dean OBE	Date of Release	Version	AT 2022-23 Offwards





Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University) B. Tech SoE and Syllabus 2022 (Scheme of Examination w.e.f. 2022-23 onward) SoE No 22CSE-1

(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

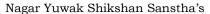
III Semester

22CSE304- Lab.: Object Oriented Programming

List of Experiment

Sr. No.	Experiments based on
1	Implement the concept of Class and its data members and member functions in Java
2	Implement the concept of method overloading in Java
3	Implement the concept of class constructor and its type in Java
4	Implement the concept of Abstraction in Java
5	Implement the concept of all types of inheritance in Java
6	Implement the concept of arrays in Java
7	Implement the concept of run time polymorphism in Java
8	Implement the concept of Files in Java
9	Implement the concept of exception in Java
10	Implement the concept of swing to prepare a web application in Java

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

III Semester 22CSE305- Data Structures I

Course Outcome

- 1. To review programming concepts and understand fundamental concepts in data structures
- 2. To apply and analyse algorithms for performing operations on data structures
- 3. To Evaluate the performance of data structures and its applications.
- 4. Simulate the algorithms for performing operations on data structures.

UNIT I:

Types and operations, Iterative constructs and loop invariants, Quantifiers and loops, Structured programming and modular design, Illustrative examples, Scope rules, parameter passing mechanisms, recursion, program stack and function invocations including recursion

(Contemporary Issues related to Topic)

UNIT II: 7

Overview of arrays and array based algorithms - searching and sorting: mergesort, quick sort, Sparse matrices. (Contemporary Issues related to Topic)

UNIT III:

Structures (Records) and array of structures (records). Database implementation using array of records. Dynamic memory allocation and deallocation. Dynamically allocated single and multi-dimensional arrays, polynomial representation.

(Contemporary Issues related to Topic)

UNIT IV:

Concept of an Abstract Data Type (ADT), Lists as dynamic structures, operations on lists, implementation of linked list using arrays and its operations. Introduction to linked list implementation using self-referential-structures/pointers.

(Contemporary Issues related to Topic)

UNIT V:

Stack, Queues and its operations. Implementation of stacks and queues using both array-based and pointer-based structures. Applications of stacks and queues.

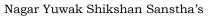
(Contemporary Issues related to Topic)

UNIT VI: 6

File organisation, examples of using file, file access methods, Hashing and collision resolution techniques (Contemporary Issues related to Topic)

Total Lectures 39

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B.Tech in Computer Science and Engineering

TE	TEXT BOOKS							
1.	Data Structures and Program Design in C, Robert Kruse, G. L. Tondo and B. Leung ,PHI-EEE							
2.	Fundamentals of Data Structures in C, Ellis Horowitz, Satraj Sahni and Susan, Anderson-Freed, W. H.							
	Freeman and Company.							
3.	How to Solve it by Computer, R. G. Dromey, Pearson Education							

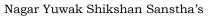
Ref	erence Books
1.	Data Structures with C, Seymour Lipschutz, TMH

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS] 1 http://103.152.199.179/YCCE/Suported% 20file/Supprted% 20file/ecopies%20of%20books/Computer%20Science%20and%20Engineering/Book%20Fundamentals%20of%20Dat a%20Structure%20(1982)%20by%20Ellis%20Horowitz%20and%20Sartaj%20Sahni.pdf http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-

copies%20of%20books/Computer%20Science%20and%20Engineering/Data%20Structures%20Succinctly%20 Part% 201.pdf

MO	MOOCs Links and additional reading, learning, video material				
1.	https://nptel.ac.in/courses/106102064				
2.	https://archive.nptel.ac.in/courses/106/106/106106127/				

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

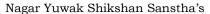
III Semester

22CSE306- Lab.: Data Structures I

List of Experiment

Sr. No.	Experiments based on
1	C Programs for using various loop constructs
2	C Program for generating list
3	C Programs for illustrating recursion
4	C Programs for allocating memory dynamically for a single dimensional array and sorting it .
5	C Program for allocating memory dynamically for two-dimensional array , printing it
6	C Program to create a link list and print it.
7	C Program/s to create stack using array and link list
8	C Program/s to create Queue using array and link list
9	C Program to create file for storing, perform file operations
10	C Program on hashing

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

III Semester

22CSE307 – Web Technology

Course Outcome

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

- 1. Design Web pages using HTML5
- 2. Build an interactive website with CSS3
- 3. Develop basic programming skills using JavaScript
- 4. Create XML documents and Schemas.

UNIT I: Introduction to internet

6

Overview of Internet, Intranet, WWW, Internet Protocols (HTTP, FTP, SMTP), Email, broadband.

(Contemporary Issues related to Topic)

UNIT II: Introduction to HTML5

7

Web server, Web Client/Browser, Structure of an HTML Program, Basic HTML Tags(Headings, Paragraph, Division, Text formatting, Image, Anchors), HTML Lists (Ordered Lists, Unordered Lists, Description Lists), HTML Attributes, HTML Links (Href Attribute, Target Attribute).

(Contemporary Issues related to Topic)

UNIT III: Table handling in HTML and Creating Forms

7

Table handling in HTML: width and border attribute, CELLPADDING attribute, CELLSPACING attribute, COLSPAN and ROWSPAN attributes, background color attribute, HTML Forms: Elements to Capturing Form Data, Properties of Form Elements, HTML Layout Elements(Semantic Elements), HTML style attribute, HTML class and id attribute.

(Contemporary Issues related to Topic)

UNIT IV: Cascading Style Sheets (CSS3)

6

Introduction to CSS, Differences between CSS3 and earlier CSS specifications, CSS Syntax, CSS selectors, Inserting CSS: Inline, Internal, External, CSS properties: Background, Text, Font, Border, Margin, Padding, List, Dimension, and Classification.

(Contemporary Issues related to Topic)

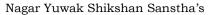
UNIT V: Java Script

7

Introduction to Java Script, Functions of Javascript, Variables and Data Types, Operators, Loops and control statement: if Statement, if...else Statement, else if Statement, JavaScript Switch Statement, JavaScript Functions, JavaScript Loops: for loop, while loop, do...while loop, Dialog Boxes, JavaScript Events.

(Contemporary Issues related to Topic)

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(Department of Computer Science and Engineering)

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SoE No.

B.Tech in Computer Science and Engineering

UNIT VI: Introduction to XML What is XML?, Features of XML, XML Syntax and Structure Rules(Start tags, End tags, Empty elements, XML tag attributes),XML Document Type Declaration(DTD, Internal DTD's, External DTD's. (Contemporary Issues related to Topic) Total Lectures 39

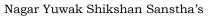
Te	xt Books
1.	Web Technologies Black Book: HTML, JavaScript, PHP, Java, JSP, XML and AJAX, 1st Edition, Dreamtech
	Press

Reference Books HTML & CSS: The Complete Reference, Fifth Edition, Thomas A. Powell, The McGraw-Hill Companies, Inc. Web Technologies, Ivan Bayross, BPB Publication

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MOOCs Links and additional reading, learning, video material 1. https://onlinecourses.swayam2.ac.in/nou20_cs05/preview

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SoE No. 22CSE-101

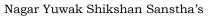
B.Tech in Computer Science and Engineering

III Semester 22CSE308- Lab.: Web Technology

List of Experiment

Sr. No.	Experiments based on
1	Implement basic HTML Tags.
	Write a HTML code to illustrate the usage of the following - Ordered Lists - Unordered Lists - Description Lists
2	Write a HTML code to display data in tabular form (row* column) using HTML table tags
	Write a HTML code to create a home page having three links: About us, Services and Contact us create separate web pages for the three links.
3	Create web forms by using form tags in HTML. (Use any example)
4	Develop and demonstrate the usage of inline, internal and external style sheet using CSS3.
5	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 name@domain.com)
	4. Mobile Number (Phone number should contain 10 digits only).
	5. Last Name and Address (should not be Empty).
6	Introduction to XML program to demonstrate the use of External and Internal DTD
7	Create a web page which show the use of Canvas & SVG.
8	Develop a small web application using suitable web service framework and implement it.

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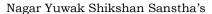
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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

III Semester Audit Course MLC2123 - YCCE Communication Aptitude Preparation (YCAP3)

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(Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science and Engineering)

SoE No. 22CSE-101

Total Lectures

24 Hrs

B.Tech in Computer Science and Engineering

III Semester
Audit Course
MLC115: Latex

Course Outcomes

After studying this course the student will be able to:

- i) Create and typeset a LaTeX document.
- ii) Typeset a mathematical document using LaTex.
- iii) Learn about pictures and graphics in LaTex.
- iv) Create beamer presentations.
- v) Create web page using HTML.

Unit I: Getting Started with LaTeX Introduction to TeX and LaTeX, Typesetting a simple document, Adding basic information to a document, Environments, Footnotes, Sectioning and displayed material. Unit II: LaTeX /Document Structure 6 LaTeX /Document Structure, Document classes, Packages, The document environment, Book structure, References Unit III: Mathematical Typesetting with LaTeX 6 Accents and symbols, Mathematical typesetting (elementary and advanced): Subscript/ Superscript, Fractions, Roots, Ellipsis, Mathematical Symbols, Arrays, Delimiters, Multiline formulas, Spacing and changing style in math mode. Unit IV: Graphics and Beamer Presentation in LaTeX 6 Graphics in LaTeX, Simple pictures using PSTricks, Plotting of functions, Beamer presentation.

Text Books:

- 1. A Student's Guide to the Study, Practice, and Tools of Modern Mathematics, Bindner, Donald & Erickson, Martin CRC Press, Taylor & Francis Group
- 2 LaTeX: A Document Preparation System, User's Guide and Reference Manual, Lamport, Leslie, Pearson Education

Reference Book:

1. LaTeX and Friends, Dongen, M. R. C. van, Springer-Verlag

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

1 http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/ecopies%20of%20books/Computer%20Science%20and%20Engineering/

MOOCs Links and additional reading, learning, video material

1. https://onlinecourses.swayam2.ac.in/aic20_sp17/preview

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Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)
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Hingna Road, Wanadongri, Nagpur - 441 110



Bachelor of Technology SoE & Syllabus 2022 4th Semester

(Department of Computer Science and Engineering

B.Tech in Computer Science and Engineering

Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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B.TECH SCHEME OF EXAMINATION 2022

(Scheme of Examination w.e.f. 2022-23 onward)

SoE No.

22CSE-101

(Department of Computer Science & Engineering)

B. Tech in Computer Science & Engineering)

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SN	Sem	Type	Deptt	Sub. Code	Subject	T/P	L	Т	Р	Hrs	Credits	MSEs*	TA**	ESE	Duration Hours
	THIRD SEMESTER														
1	3	PC	CSE/CSE	22CSE301	Discrete Mathematics & Graph Therory	Т	3	1	0	4	4	30	20	50	3 Hrs
2	3	PC	CSE/CSE	22CSE302	Computer Architecture and Organisation	Т	3	0	0	3	3	30	20	50	3 Hrs
3	3	PC	CSE/CSE	22CSE303	Object Oriented Programming	Т	3	0	0	3	3	30	20	50	3 Hrs
4	3	PC	CSE/CSE	22CSE304	Lab: Object Oriented Programming	Р	0	0	2	2	1		60	40	
5	3	PC	CSE/CSE	22CSE305	Data Structures I	Т	3	0	0	3	3	30	20	50	3 Hrs
6	3	PC	CSE/CSE	22CSE306	Lab: Data Structures I	Р	0	0	2	2	1		60	40	
7	3	PC	CSE/CSE	22CSE307	Web Technology	Т	3	0	0	3	3	30	20	50	3 Hrs
8	3	PC	CSE/CSE	22CSE308	Lab: Web Technology	Р	0	0	2	2	1		60	40	
	TOTAL 15 1 6 22 19														

List	of Mar	ndatory	Learning Cou	irse (MLC)								
1	3	HS	T&P	MLC2123	YCCE Communication Aptitude Preparation (YCAP3)	Α	3	0	0	3	0	
2	3	BSE	CSE	AU115	Latex	Α	2	0	0	2	0	

					FOURTH SEM	MESTE	R								
1	4	BS	GE/GE	22CSE401	Linear Algebra	т	3	0	0	3	3	30	20	50	3 Hrs
2	4	HS	GE/HUM	22CSE402	Fundamentals of Management and Economics	Т	3	0	0	3	3	30	20	50	3 Hrs
3	4	PC	CSE/CSE	22CSE403	Theory of Computation	Т	3	1	0	4	4	30	20	50	3 Hrs
4	4	PC	CSE/CSE	22CSE404	Operating Systems	Т	3	0	0	3	3	30	20	50	3 Hrs
5	4	PC	CSE/CSE	22CSE405	Lab:Operating Systems	Р	0	0	2	2	1		60	40	
6	4	PC	CSE/CSE	22CSE406	Data Structures II	т	3	0	0	3	3	30	20	50	3 Hrs
7	4	PC	CSE/CSE	22CSE407	Lab: Data Structures II	Р	0	0	2	2	1		60	40	
8	4	PC	CSE/CSE	22CSE408	Introduction to Data Analysis	т	3	0	0	3	3	30	20	50	3 Hrs
9	4	PC	CSE/CSE	22CSE409	Lab: Introduction to Data Analysis	Р	0	0	2	2	1		60	40	
10	4	PC	CV/CSE	22CSE410	Environmental Sustainability, Pollution and Management	т	3	0	0	3	3	30	20	50	3 Hrs
		-		•	1	TOTAL	21	1	6	28	25				

List	List of Mandatory Learning Course (MLC)											
1	4	HS	T&P	MLC2124	YCCE Communication Aptitude Prepartion (YCAP 4)	А	3	0	0	3	0	
2	4	BSE	CSE	MLC116	Ethics in IT	Α	2	0	0	2	0	

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 activitied decided by course teacher, TA3 - 3 marks on class attendance

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

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

IV Semester 22CSE401- Linear Algebra

Course Outcome

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: Vector Space 6

Vector Space, Subspace, Sum of Sub space, linear combination, Linear Span and basis, Spanning sets, Generators. (Contemporary Issues related to Topic)

UNIT II: Linear Transformation

6

Linear transformation, Ranges and Kernel (null space) of linear transformation, Inverse of linear transformation, Algebra of linear transformation, Singular and non-singular linear transformation.

(Contemporary Issues related to Topic)

UNIT III: Matrix Algebra

Matrix Representation of linear transform, composition of Linear Transform and Matrix Multiplication, Matrix associated with linear Map, linear map associated with Matrix, Inevitability and Isomorphism's, the change of coordinate matrix.

(Contemporary Issues related to Topic)

UNIT IV: Elementary matrix operations

7

Matrix Representation of linear transform, composition of Linear Transform and Matrix Multiplication, Matrix associated with linear Map, linear map associated with Matrix, Inevitability and Isomorphism's, the change of coordinate matrix.

(Contemporary Issues related to Topic)

UNIT V: 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.

(Contemporary Issues related to Topic)

UNIT VI: Inner product Spaces

(

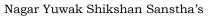
Inner product space and Norms, orthogonal vector, the Gram Schamidt orthogonalization Process, orthogonal compliment, Adjoint of Linear operator, Normal and self-adjoint operator, Unitary and orthogonal operator, Bilinear and Quadratic form.

(Contemporary Issues related to Topic)

Total Lectures

39

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B. Tech SoE and Syllabus 2022

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B.Tech in Computer Science and Engineering

Tex	Text Books					
1.	Advance Engineering Mathematics, 9th Edition (September 2009), Kreyszig Wiley					
2.	Higher Engineering Mathematics, 40th edition, (2010), B.S. Grewal, Khanna Publishers (2006)					
3.	Advanced Engineering Mathematics, 8th revised edition, 2007, H.K. Dass, S.Chand and Company Limited					
4.	Linear Algebra, Hoffman and Kunze, prentice Hall of India, New Delhi					
5.	Linear Algebra and its Applications, GlbertStrang, Nelson Engineering (2007)					

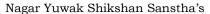
Ref	Reference Books					
1.	Mathematics for Engineers, 19th edition, (2007), Chandrika Prasad, JohnWiley & Sons					
2.	Applied Mathematics for Engineers, 3rd edition, (1970), L.A. Pipes and Harville, McGraw Hill					
3.	Matrix and Linear Algebra, K.B.Datta, prentice Hall of India, New Delhi					
4.	A text book of Engineering Mathematics, Reprint 2008, N.P. Bali and Manish Goyal, Laxmi Prakashan					

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http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/ecopies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanitie s/

MO	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 SoE and Syllabus 2022

(Scheme of Examination w.e.f. 2022-23 onward)
(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

IV Semester

22CSE402 – Fundamentals of Economics and management

Course Outcomes:

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

- 1. Explain the Functions of Management and identify tools and techniques of Marketing of goods and services
- 2. Analyze the role of Financial Accountancy and 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: Principles of Management

7

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

(Contemporary Issues related to Topic)

UNIT II: Marketing Management

Marketing Management - Definition & scope, Selling & Modern Concepts of Marketing, Market Research, Customer Behaviors, Product Launching, Sales Promotion, Pricing, Channels of Distribution, Advertising, Market Segmentation, Marketing Mix, Positioning, Targeting

(Contemporary Issues related to Topic)

UNIT III: Financial Accountancy and Management

Definition & Functions of Finance department, Sources of finance, Types of capital, Types of Taxes, Introduction of Accountancy and its rules, Preparation of Books of Account- Jounal, Posting of transaction into ledger and preparation of trial balance, Introduction of trading account, profit and loss account and balance sheet

(Contemporary Issues related to Topic)

UNIT IV: Introduction to Economics and engineering Economy

(

Economics and engineering economy, Utility analysis- Cardinal, ordinal, Law of diminishing marginal utility, Laws of demand and supply, elasticity of demand, its measurement and application.

(Contemporary Issues related to Topic)

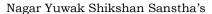
UNIT V: Engineering Production and Costs

(

Factors of Production: Land, Labour, Capital, Enterprise and their peculiarities, Concepts and types of costs, Law of Variable proportions (Law of diminishing marginal returns) and Return to Scale (Increasing, constant and decreasing), Economies and diseconomies of scale. Inflation: Meaning, types, causes and consequences, measures to control inflation, Concepts of deflation and Stagflation.

(Contemporary Issues related to Topic)

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B.Tech in Computer Science and Engineering

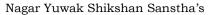
UNIT VI: Market structures - equilibrium output and price Forms of market structures: Perfect competition, monopolistic competition, oligopoly, duopoly and monopoly, Demand and revenue curves for firm and industry in various forms of market structure, Total, average and marginal revenue curves, equilibrium of firms and industries under various forms of market structures, Price discrimination. (Contemporary Issues related to Topic) **Total Lectures** 39 Text Books Principles of Management, 9th edition, Harold Koontz Ramchandra, Tata McGrow hills Marketing Management: Planning, Implementation and Control, 3rd Edition, Ramaswamy V.S. and Namakumari S, Macmillian, Tata McGraw Hill Financial Services, 19th Edition, Khan M Y, Tata McGraw Hill 3. Modern Economics, 13th Edition, H. L. Ahuja, S. Chand Publisher 4. Modern Economic Theory, 3rd Edition, K. K. Devett, S. Chand Publisher 5. Principle of Economics, 7th edition, Mankiw N. Gregory, Thomson 6. **Reference Books** Foundations of Financial Markets and Institutions, 3rd Edition, Fabozzi, Pretice Hall Fundamentals of Financial Instruments, 2nd 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
5.	International Trade, 12th Edition, M. L. Zingan, Vindra Publication
6.	Macro Economics, 11th Edition, M. L. Zingan, Vindra Publication
7.	Monitory Economics, M. L. Zingan, Himalaya Publisher
8.	Economics of Development and Planning,12th Edition,S. K. Misra and V. K. Puri,Himalaya Publishing
	House

7	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/				

MC	MOOCs Links and additional reading, learning, video material		
1.	https://archive.nptel.ac.in/courses/110/105/110105075/		

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

IV Semester 222CSE403 – Theory of Computation

Course Outcome

- Apply basic properties of formal languages and to design finite automata for regular expression and Regular Grammar.
- 2. Construct context free grammar for various languages.
- Solve various problems of push down automata for context free language
- Design Turing Machines for given any computational problem.

UNIT I:

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

(Contemporary Issues related to Topic)

UNIT II:

Regular Regular sets, Regular expressions, Manipulation of regular expressions, Equivalence between RE and FA. Pumping Lemma, closure properties of regular sets, Regular grammars, Right linear and left linear regular grammars, inter-conversion between LLG & RLG, Equivalence between regular grammar and F.A., Interconversion between RE and RG.

(Contemporary Issues related to Topic)

UNIT III:

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

(Contemporary Issues related to Topic)

UNIT IV:

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

(Contemporary Issues related to Topic)

UNIT V: 6

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

(Contemporary Issues related to Topic)

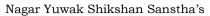
UNIT VI:

Un-decidability Problems related to Recursive enumerable language and Turing Machine, post correspondence problem. Recursive function Theory –Basis functions and operations on them. Bounded minimization preemptive u recursive function unbounded minimization and recursive function

(Contemporary Issues related to Topic)

Total Lectures 39

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B.Tech in Computer Science and Engineering

Tex	Text Books				
1.	Introduction to Automata Theory, Languages, and computation,3 rd Edition,Hopcroft J.E., Rajeev Motwani,				
	Jeffrey D. Ullman, Pearson Education				
2.	Introduction to languages and the Theory of Computation, 3 rd Edition, John C. Martin, Mc Graw Hill				

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

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

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MC	MOOCs Links and additional reading, learning, video material			
1.	https://nptel.ac.in/courses/106104028			
2.	https://onlinecourses.nptel.ac.in/noc23_cs31/preview			

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(Department of Computer Science and Engineering)

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B.Tech in Computer Science and Engineering

IV Semester 222CSE404- Operating Systems

Course Outcome

After undergoing this course student will be able to

- 1. Understand the fundamental concepts in Operating Systems (OS) and understand how various hardware features support OS functionality.
- 2. Explain various OS mechanisms and policies for managing system resources.
- 3. Analyse algorithms and techniques for managing various OS resources in a multiprogramming and other environments.
- 4. Evaluate the performance of algorithms for managing various OS resources.

UNIT I: Introduction to OS

5

Evolution of OS, basic hardware support necessary for modern operating systems, Layered Structural of OS, process concept, process state transitions, Services provided by OS, system calls, privileged instructions, Dual mode of operation, I/O bound and CPU bound processes, concept of multiprogramming and multiprocessing. (Contemporary Issues related to Topic)

UNIT II: Process management

process control block, process context switch, process versus threads, CPU scheduling, goals of scheduling, CPU scheduling algorithms, Algorithmic evaluation of CPU scheduling algorithms, multi-queue scheduling, multithreading

(Contemporary Issues related to Topic)

UNIT III: Interprocess communication and Synchronization

Operations on processes, Interprocess communication, process cooperation and synchronization, race condition, critical region, mutual exclusion and implementation, semaphores, classic problems of Synchronization using semaphores, other synchronization constructs.

(Contemporary Issues related to Topic)

UNIT IV: Memory management techniques

6

Contiguous allocation, static and dynamic partitioning, non-contiguous allocation, paging, translation look aside buffer (TLB) and overheads, segmentation.

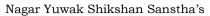
(Contemporary Issues related to Topic)

UNIT V: Virtual memory

Demand paging, page replacement algorithms, thrashing, working set model. Deadlocks: necessary conditions, deadlock detection, deadlock avoidance, deadlock prevention, recovery from deadlock.

(Contemporary Issues related to Topic)

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

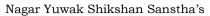
B.Tech in Computer Science and Engineering

Uľ	NIT VI: File systems	7
arı	roduction, Access methods, Directory Structure disk space management and space allocation strate a scheduling strategies: FCFS, SSTF, SCAN, CSACN, LOOK, CLOOK, Selecting a disk scheduling contemporary Issues related to Topic)	•
<u>(C</u>	Total Lectures	39
То	xt Books	
1	Operating system Principles, 9th Edition, A. Silberchatz and P.Galvin, John Wiley & Sons Inc.	
2.	Operating Systems Internals and Design Principles, William Staling, Pearson	
<u></u>	operaning systems into the seeight simulation of the seeing seein	
Re	ference Books	
1	Operating Systems: A Design-Oriented Approach , Charles Crowley ,McGraw Hill	
2.	Operating system concepts and Design, Milan MilenKovic ,Tata McGraw Hill	
Y	CCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-	
	copies%20of%20books/Computer%20Science%20and%20Engineering/Operating%20System%20C	Concept%2
	08thedition.pdf	
2	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-	

M(MOOCs Links and additional reading, learning, video material		
1.	https://archive.nptel.ac.in/courses/106/105/106105214/		
2.	https://archive.nptel.ac.in/courses/106/102/106102132/		

copies%20of%20books/Computer%20Science%20and%20Engineering/Operating%20System.pdf

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B. Tech SoE and Syllabus 2022 (Scheme of Examination w.e.f. 2022-23 onward) (Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

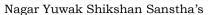
IV Semester

222CSE405- Lab.: Operating Systems

List of Experiment

Experiments based on
Study of Window task manger(Exploring various tabs: application, processes, services, networking,
performance)
Study of Advanced Linux shell commands (Process management, memory management, networking,
etc.)
Write a program that illustrates the creation of child process using fork system call. Each child and
parent Processes perform different task.
Write a multithreaded program to multiply two given matrices.
Simulate:
a. Any preemptive CPU Scheduling Algorithm
b. Any Non-preemptive CPU Scheduling Algorithm
Write a program to perform Inter-Process-Communication using shared memory or, pipes or message
queues.
Write a program that solves two process Producer-Consumer problem with bounded buffer using
semaphores.
OR
Write a program that gives a deadlock and starvation free solution to the Dining Philosohers problem
using semaphores.
Simulate:
a. First Fit(Static Memory allocation algorithm) and
b. Worst Fit(Dynamic Memory allocation algorithm)
Simulate any one of the following page replacement algorithms:
FIFO, LRU, Optimal
Write a program to simulate Banker's Deadlock avoidance algorithm.

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(Department of Computer Science and Engineering)

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B.Tech in Computer Science and Engineering

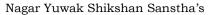
IV Semester 222CSE406- Data Structures II

Course Outcome

- 1. Create and manipulate various data structures like linked list, disjoint sets, trees, graph for real world problem
- 2. Apply appropriate data structure for implementation of real world applications
- 3. Analyze the performance of operations performed on data structures.
- 4. Design application by using data structures for real world problems.

Total Lectures	39
Spanning trees, topological sort, shortest path algorithm, all-pairs shortest paths (Contemporary Issues related to Topic)	
UNIT VI: Graphs Representation & traversals	6
Tries and Pattern matching algorithms (Contemporary Issues related to Topic)	1
UNIT V: Multidimensional trees	6
Height-balanced (AVL) trees, Splay tree, Red-black trees, Multi-way trees-B and B+ and applications (Contemporary Issues related to Topic)	•
UNIT IV: Balanced trees	7
Binary trees, binary trees- basic algorithms and various traversals. Binary Search Trees (BSTs) a deletion in BSTs. Heaps and heap sort (Contemporary Issues related to Topic)	nd insertion
UNIT III: Binary Trees	7
Data structures for disjoint set representation and operations, sorting, searching (Contemporary Issues related to Topic)	
UNIT II: Sets	6
Singly-linked lists, doubly linked lists and circular linked lists. Operations on linked list: travers deletion of nodes, list reversal, Applications of lists in polynomial representation, multi-precision Multi linked structures, implementation of priority queues. (Contemporary Issues related to Topic)	
UNIT I: Linked Lists	7

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B.Tech in Computer Science and Engineering

TEX	TEXT BOOKS:				
1.	Data Structures and Program Design in C, Robert Kruse, G. L. Tondo and B. Leung ,PHI-EEE				
2.	Fundamentals of Data Structures in C, Ellis Horowitz, Satraj Sahni and Susan, Anderson-Freed, W. H.				
	Freeman and Company.				
3	How to Solve it by Computer, R. G. Dromey, Pearson Education				

Ref	ference books:
1.	Data Structures with C, Seymour Lipschutz, TMH

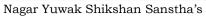
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a%20Structure%20(1982)%20by%20Ellis%20Horowitz%20and%20Sartaj%20Sahni.pdf

http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/ecopies%20of%20books/Computer%20Science%20and%20Engineering/Data%20Structures%20Succinctly%20 Part% 201.pdf

MOOCs Links and additional reading, learning, video material https://nptel.ac.in/courses/106102064 https://archive.nptel.ac.in/courses/106/106/106106127/

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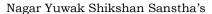
B.Tech in Computer Science and Engineering

IV Semester 222CSE407 Lab- Data Structures II

List of Experiment

Experiments based on
Program/s based on operations on singly linked list
Program/s based on operations on doubly linked list
Program based on Binary trees- traversal
Programs based on Binary search tree
Programs based on Tries
Program based on Balanced trees
programs based on Graph operations - traversal

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B.Tech in Computer Science and Engineering

IV Semester

22CSE408- Introduction to Data Analysis

Course Outcomes

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

- 1. Apply fundamental concepts of statistics and probability for data analysis.
- 2. Apply appropriate statistical methods on simple datasets.
- 3. Formulate and solve problems in a systematic manner.
- 4. Conduct investigation and Interpret output obtained from statistical analysis on datasets.
- 5. Obtain hands on experience with some popular software (like R) for analysis and visualization of data.

UNIT I: INTRODUCTION TO STATISTICS & PROBABILITY

7

The role of statistics. Grouping and displaying data. Measures of central tendency and dispersion, Basic terminology in probability, probability rules, Probabilities under conditions of statistical independence, probabilities under conditions of statistical dependence.

(Contemporary Issues related to Topic)

UNIT II: PROBABILITY DISTRIBUTION:

6

What is probability distribution, random variables, use of expected value in decision making, and various probability distributions: Binomial, Poisson, Uniform and Normal distributions.

(Contemporary Issues related to Topic)

UNIT III: SAMPLING DISTRIBUTION:

Introduction to sampling distributions, sampling distribution of mean and proportion, application of central limit theorem, sampling techniques.

ESTIMATION THEORY: Estimation: Point and Interval estimates ,confidence intervals ,calculating interval estimates for population parameters of large sample and small samples, determining the sample size

(Contemporary Issues related to Topic)

UNIT IV: TESTING OF HYPOTHESIS

7

Introduction, null hypothesis, tests of hypothesis and significance, type I and type II errors, one tailed and two tailed tests, p-value one sample tests for means and proportions of large samples (z-test), one sample tests for means of small samples (t-test), Chi-square tests for goodness of fit. Analysis of variance.

(Contemporary Issues related to Topic)

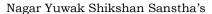
UNIT V: NON-PARAMETRIC METHODS

6

Sign test for paired data. Rank sum test. Mann –Whitney U test and Kruskal Wallis H test. One sample run test, rank correlation. Kolmogorov-Smirnov –test.

(Contemporary Issues related to Topic)

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UNIT VI: REGRESSION and CORRELATION	6
Estimation of regression line by least square method, linear regressions, Multivariate regression analysis,	,Correlation
(Contemporary Issues related to Topic)	
Total Lectures	39

Tex	Text Books:				
1.	Introduction to probability and statistics for engineers and scientist, Sheldon M. Ross ,3 rd Edition,Elsevier				
2.	Statistics for Management, Richard I. Levin & David S. Rubin, 7th Edition, Pearson Education				
3.	Probability and Statistics, Murray R. Spiegel, John J.Schiller, R AluSrinivasan, Third Edition, Mc Graw Hill				
	education				

Ref	Reference Book:				
1.	Practical Statistics for Data Scientists, 50 Essential Concepts, Peter Bruce & Andrew Bruce				
2.	An Introduction to Statistical Learning with Applications in R, Gareth James, Daniela Witten, Trevor				
	Hastie & Robert Tibshirani				

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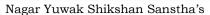
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- http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/ecopies%20of%20books/Computer%20Science%20and%20Engineering/The%20Art%20of%20R%20Program ming.pdf

MOOCs Links and additional reading, learning, video material

https://onlinecourses.nptel.ac.in/noc21_ma74/preview

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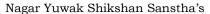
IV Semester

22CSE409- Lab: Introduction to Data Analysis

List of Experiment

Sr. No.	Experiments based on	
1.	Implement basic functionality of R	
2.	Implement data import and export functionality in R	
3.	Implement R functions to calculate basic statistics of data source	
4.	Apply the visualization techniques in R to understand data	
5.	Solve the problems using probability distributions in R	
6.	Analyze the data using sampling technique	
7.	Analyze the data to find out estimated value	
8.	Analyze the data using hypothesis testing	
9.	Implement integration of R and java using packages	
10.	Case study on data analysis and visualization	

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

B. Tech SoE and Syllabus 2022

(Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

IV SEMESTER

22CSE410: 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, Natural Resources and Sustainable Development

6 Hours

The man-environment interaction; Environmental Ethics and emergence of environmentalism;

Overview of natural resources: Definition of resource; Classification of natural resources- biotic and abiotic, water, soil and mineral resources, renewable, and non-renewable energy resources;

Introduction to sustainable development: Sustainable Development Goals (SDGs)- targets and indicators, challenges and strategies for SDGs

Unit:2 Environmental Issues, Conservation of Biodiversity and Ecosystems

6 Hours

Environmental issues and scales: Land use and Land cover change, Global change;

Biodiversity and its distribution, Ecosystems and ecosystem services, Threats to biodiversity and ecosystems, National and international policies for conservation.

Unit:3 | 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 human health

Unit:4 | Climate Change: Impacts, Adaptation and Mitigation

7 Hours

Understanding climate change, Impacts, vulnerability and adaptation to climate change, Mitigation of climate change

Unit:5 | Environmental Management

7 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:6 | Environmental Treaties and Legislation

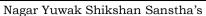
6 Hours

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

39 Hours

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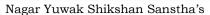


Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University) B. Tech SoE and Syllabus 2022 (Scheme of Examination w.e.f. 2022-23 onward) (Department of Computer Science and Engineering)

SoE No. 22CSE-101

Tex	xt 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
	ference 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 Lame (2022). Environmental Management: Concepts and Practical
	Skills. Cambridge University Press
8	Ministry of Environment, Forest and Climate Change (2019) A Handbook on International
	Environment Conventions & Programmes. https://moef.gov.in/wp-content/uploads/2020/02/
	convention-V-16-CURVE-web.pdf

Damade	100	Shami	July 2022	1.00	Applicable for AY 2022-23 Onwards
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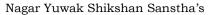
(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

IV Semester Audit Course MLC2124 - YCCE Communication Aptitude Preparation (YCAP4)

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

B. Tech SoE and Syllabus 2022

(Scheme of Examination w.e.f. 2022-23 onward)
(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

IV Semester

Audit Course: MLC116- Ethics in IT

Course Outcomes

On completion of this course students will be able to

CO1: Adapt the global ethical principles and modern ethical issues.

CO2: Apprehend ethics in the business relationships and practices of IT.

CO3: Implement trustworthy computing to manage risk and security vulnerabilities.

CO4: Analyse concerns of privacy, privacy rights in information-gathering practices in IT.

UNIT I:

An overview of Ethics: Brief about ethics, Ethics in the Business World, Ethics in IT.

Ethics for IT professionals and IT users: IT professionals: Changing Professional Services, Professional Relationships, Codes of Ethics, awareness of IT malpractices, IT Users: Common Ethical Issues for IT Users, Supporting the Ethical Practices of IT Users.

UNIT II:

Introduction: IT security incidents, Types of Exploits, Types of Perpetrators, Laws for Prosecuting Computer Attacks, Implementing Trustworthy Computing, Risk and Vulnerability Assessment, Educating Employees, Contractors, and Part-Time Workers, Establishing a Security Policy Privacy: The right of Privacy, Privacy Protection and the Law, Key Privacy and Anonymity Issues Identity Theft, Consumer Profiling, Treating Consumer Data Responsibility, Workplace Monitoring Freedom of Expression: Defamation and Hate Speech, Key issues, Controlling Access to Information on the Internet, Anonymity on the Internet, Corporate Blogging, Pornography

UNIT III:

Social Networking: Brief about Social Networking, Social Networking Ethical Issues: Cyber bullying, Cyber stalking, Encounters with Sexual Predators, Uploading of Inappropriate Material, Online Virtual Worlds: Crime in Virtual Worlds, Educational and Business Uses of Virtual Worlds. Ethics of IT Organization: Key Ethical Issues for Organizations, of Workers, Outsourcing, Whistle blowing, Code of Ethics and Professional Conduct.

UNIT IV:

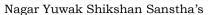
Malware, Medical Implants, Abusive Workplace Behaviour, Automated Active Response Weaponry, Malicious Inputs to Content Filters.

Total Lectures 24

Text Books:

- 1. Ethics in Information Technology, George Reynolds, 5th Edition, Cengage learning
- 2. Professional Ethics, R. Subramanian, Second Edition, OXFORD University Press

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SoE No. 22CSE-101

Ref	Reference Books:				
1.	An Introduction to Ethics, William Lillie, Allied Publishers				
2.	Engineering Ethics, Charles b. Fleddermann, Prentice Hall				
3.	Engineering Ethics & Human Values, M.Govindarajan, S.Natarajan & V.S.Senthilkumar, PHI Learning				

Y (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%20Science%20and%20Engineering/			

MOOCs Links and additional reading, learning, video material							
1. https://onlineco	ourses.nptel.ac.in/noc19_hs35/preview						

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Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

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

(Accredited 'A++' Grade by NAAC with a score of 3.25)

Hingna Road, Wanadongri, Nagpur - 441 110



Bachelor of Technology SoE & Syllabus 2022 5th Semester

(Department of Computer Science and Engineering

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 2022

(Scheme of Examination w.e.f. 2022-23 onward)

SoE No.

22CSE-101

(Department of Computer Science & Engineering)

B. Tech in Computer Science & Engineering)

			BoS/				С	onta	ct Ho	urs		%	Weightag	je	ESE
SN	Sem	Type	Deptt	Sub. Code	Sub. Code Subject T/		L	T	Р	Hrs	Credits	MSEs*	TA**	ESE	Duration Hours
	FIFTH SEMESTER														
1	5	PC	CSE/CSE	22CSE501	Computer Networks	Т	3	0	0	3	3	30	20	50	3 Hrs
2	5	PC	CSE/CSE	22CSE502	Lab: Computer Networks	Р	0	0	2	2	1		60	40	
3	5	PC	CSE/CSE	22CSE503	Database Management Systems	Т	3	0	0	3	3	30	20	50	3 Hrs
4	5	PC	CSE/CSE	22CSE504	Lab: Database Management Systems	Р	0	0	2	2	1		60	40	
5	5	PC	CSE/CSE	22CSE505	Design & Analysis of Algorithms	т	3	1	0	4	4	30	20	50	3 Hrs
6	5	PC	CSE/CSE	22CSE506	Lab: Design & Analysis of Algorithms	Р	0	0	2	2	1		60	40	
7	5	PE	CSE/CSE		Professional Elective-I	Т	3	0	0	3	3	30	20	50	3 Hrs
8	5	PE	CSE/CSE		Lab: Professional Elective-I	Р	0	0	2	2	1		60	40	
9	5	OE	CSE/CSE		Open Elective - I	Т	3	0	0	3	3	30	20	50	3 Hrs
10	5	OE	CSE/CSE		Open Elective - II	Т	3	0	0	3	3	30	20	50	3 Hrs
11	5	STR	CSE/CSE	22CSE507	Industrial visit,Seminar & report	Р	0	0	1	1	1		60	40	
					1	TOTAL	18	1	9	28	24				

List of Professional Electives-I

1	5	PE-I	CSE/CSE	22CSE511	PE-I: Digital Image Processing
2	5	PE-I	CSE/CSE	22CSE512	PE-I: Lab: Digital Image Processing
3	5	PE-I	CSE/CSE	22CSE513	PE-I: Advanced Web Technologies
4	5	PE-I	CSE/CSE	22CSE514	PE-I: Lab: Advanced Web Technologies
5	5	PE-I	CSE/CSE	22CSE515	PE-I: Machine Learning
6	5	PE-I	CSE/CSE	22CSE516	PE-I: Lab: Machine learning
7	5	PE-I	CSE/CSE	22CSE517	PE-I: Mobile operating system
8	5	PE-I	CSE/CSE	22CSE518	PE-I: Lab: Mobile operating system

Open Elective-I

1	5	OE-I	CSE/CSE	22CSE531	OE I: Database System Essentials
2	5	OE-I	CSE/CSE	22CSE532	OE I: Programming with Python
3	5	OE-I	CSE/CSE	22CSE533	OE I: Introduction to Image Processing
4	5	OE-I	CSE/CSE	22CSE534	OE I: Essentials of IT

Open Elective-II

1	5	OE-II	CSE/CSE	22CSE551	OE II: Software Testing for Beginners
2	5	OE-II	CSE/CSE	22CSE552	OE II: Introduction to Web Technology
3	5	OE-II	CSE/CSE	22CSE553	OE II: Introduction to Cloud Computing
4	5	OE-II	CSE/CSE	22CSE554	OE II: Introduction to OS Concepts

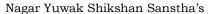
List	ist of Mandatory Learning Course (MLC)											
1	5	HS	T&P	MI ("2125	YCAP5: YCCE Communication Aptitude Preparation	Α	3	0	0	3	0	
2	5	BSE	R&D	MLC125	Design thinking	Α	2	0	0	2	0	

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 activitied 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 Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester 22CSE501 – Computer Networks

Course Outcome

- 1. Identify appropriate design issues and explain network reference model.
- 2. Select appropriate protocol at various layers for the given application.
- 3. Solve problems in the networking domain.

between two application, MAC

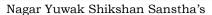
Transmission Impairments, Transmission Media:

- 4. Analyze the performance of network using different tools
- 5. Design computer networks and sub-networks

Unit No.	Contents	Max. Hrs.
1	Introduction to computer networks and Internet:	5
	luction to computer networks and Internet, The uses of computer networks, LAN's, 's, Heterogeneous Networks Network Topologies, Physical Mediums, Concept of	
Protoc mode	cols, design issues for layers. Layered Architecture: The OSI reference model. TCP/IP I, Comparison of OSI & TCP/IP reference models, Various Losses in the Internet, Brief I buter Network.	reference
2	Application Layer:	7
(Over Messa	s of Socket Programming, Transport Layer Programming Interface(TCP, UDP), Protocoview, Persistent and Non-Persistent, Message Format, Cookies, Cachess), SMTP (Cage Formats), IMAP, POP, DNS; FTP; Telnet, SSH; Peer-to-Peer Applications, Ecol; Conte Distribution Networks;	Overview,
3	Transport Layer:	7
Princi Trip	onship Between Transport and Network Layer, TCP and UDP; Multiplexing and Demul ples of Reliable Data Transfer; Go-Back-N and Selective Repeat; TCP: Segment Structure Fime Estimation, Reliable Data Transfer, State Transitions, Flow Control, Congestion Segment Structure	re, Round
4	Network Layer, Subnets:	7
Route Addre	ept of IP Address, Netmask, Subnet; CIDR; Design of a LAN and WAN,r, Routers, Functor; Switching; Queueing: Causes, Delays; IPV4: Datagram Format, Fragmentation; ess Translation; IPv6 Introduction; Multicasting, , Routing algorithms: Link State, Distantong; OSPF, BGP, RIP; Routing Policies	Network
5	Link Layer:	5

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Review of fundamentals of link layer protocols; Error-Detection and -Correction Techniques Ethernet Switches, LANs, LinkLayer Switches, VLANs, Complete tracking of traversal of a packet over internet





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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

Transmission Impairments, Transmission Media: Guided, unguided, Architecture of the Internet, Wireless LANs: IEEE 802.11, IEEE 802., The Public Switched Telephone Network, Switching: circuit, packet and message switching, Modems.

Total Lastumes	26
Total Lectures	30

Text	Text Books								
1	Computer Networking: A Top-Down Approach, Kurose and Ross, Pearson Publication								
2	Computer Networks, Behrouz A. Forouzan, McGraw-Hill Publication								
3	Computer Networks ,A.S. Tanenbaum, Pearson Publication								

Refe	Reference Books						
1	Computer Networks A Systems Approach, ISBN: 9780123850591, Larry Peterson Bruce Davie, Elsevier						
2	Data and computer Communication, ISBN-81-297-0206-1, William Stallings, Pearson Education						

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(Department of Computer Science and Engineering)

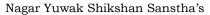
SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester 22CSE502 - Lab: Computer Networks

Sr. No.	List of Experiment
1	Study of Network Devices and Network cables.
2	Study of basic network command and Network configuration commands.
3	Create two Networks using star topology and add a resource (printer) to the network using CISCO Packet Tracer. Also show the transmission of packet from one host to other.
4	Configuring VLAN in a network using CISCO Packet Tracer.
5	Configure routers in a network using Static routing protocol in Cisco Packet Tracer and show transmission of packet from one network to another.
6	To implement Routing algorithm OSPF: Open Source Shortest Path First using Cisco Packet Tracer.
7	Use traffic monitoring tool Wire shark to observe network traffic with packet detail.
8	Case Study on Network at YCCE.
9	Advanced Practical: Study of NS2 tool.

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester

22CSE503: Database Management Systems

Course Outcome

Upon successful completion of the course, the student will be able to:

- 1. Analyze & compare different levels of abstraction & data independence.
- 2. Design Entity Relationship Diagram for any scenario.
- 3. Solve queries based on relational algebra & SQL.
- 4. Identify functional dependencies & normalize the database and apply ACID properties.
- Analyze transaction management, various concurrency control protocols and crash recovery methods.

Unit No.	. Contents				
1	Introduction to Database Management System:	5			
G 1.E		1 1			

General File System and Database system Concepts and Architecture, Data Models, Schemas and Instances, Abstraction & Different Levels of Data Abstraction, Data Independence: Logical & Physical Independence.

2 Entity-Relationship Model:

5

Entities and Entity Sets, Relationships and Relationship Sets, Attributes, Mapping Constraints, Keys, Entity Relationship Diagram, Reducing E-R Diagrams to Tables, Generalization, Aggregation, Design of an E-R Database Scheme

3 SOL and Advanced SOL

6

SQL: Data definition language (DDL), Data Manipulation Language (DML), Basic structure of SQL Queries, Set operations, Null Values, Nested subqueries, views, modification of database, transaction, Joins.

Advanced SQL: SQL data types & schemas, Integrity Constraints, Domain Constraints, Assertions, triggers, Advanced SQL Features.

4 Relational Data Model:

7

Structure of Relational Databases, **Relational Database Design**: Pitfalls in Relational Database Design, Functional Dependencies, Normalization using Functional Dependencies, Alternative Approaches to Database design. **Relational Algebra**: Structure of relational databases, Fundamental Relational-Algebra Operations, Additional relational algebra operations, extended relational algebra operations, modification of the databases

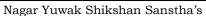
5 Data Storage and Querying & Transaction Management

7

Data Storage and Querying: Storage and File Structure, Indexing and Hashing, Query Processing, query-evaluation.

Transaction Management: ACID Properties, Implementation of ACID Properties, Database processes to support ACID Properties, Schedules, and Testing of Serializability.

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SoE No. 22CSE-101

6	Concurrency Control & Crash Recovery	6
	oncurrency Control: Lock-based Protocols, Timestamp Based Protocols, Valid	
	ultiple Granularity, Multi version Timestamp Protocol, Transaction isolation levels,	
	rash Recovery: Failure Classification, Log Based Recovery, Buffer Manager	nent, Checkpoints
Sh	adow Paging.	26
	Total Lectures	36
Te	xt Books	
1	Database System Concepts, Korth, Silberschatz, sudarshan, McGraw-Hill public	ation
2	Fundamentals of Database Systems, Elmasri, Navathe & Gupta, Pearson Educati	on.
Re	ference Books	
1	SQL & PL / SQL for Oracle 11g Black Book Kindle Edition,3rd Edition, Dreamtech Press	Or. P.S. Deshpande
2	Database Systems, 3rd Edition, Connolly, Begg, Pearson Education	
3	Database Systems, 6th Edition,S. K. Singh,Pearson Education	
YC	CCE 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	
M	OOCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc21_cs04/preview	
2	https://onlinecourses.nptel.ac.in/noc22_cs80/preview	

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

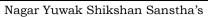
B.Tech in Computer Science and Engineering

V Semester

22CSE504- Lab.: Database Management Systems

Sr. No.	List of Experiment
1	Creating a schema -To implement different basic Data Definition Language (DDL) & Data
	Manipulation Language(DML) Commands in SQL.
2	To design an ER Diagram.
3	 Answer each of the following questions. The questions are based on the following relational schema: Emp(eid: integer, ename: string, age: integer, salary: real) Works(eid: integer, did: integer, pcttime: integer) Dept(did: integer, dname: string, budget: real, managerid: integer) a. Give an example of a foreign key constraint that involves the Dept relation. What are the options for enforcing this constraint when a user attempts to delete a Dept tuple? b. Write the SQL statements required to create the preceding relations, including appropriate versions of all primary and foreign key integrity constraints. c. Define the Dept relation in SQL so that every department is guaranteed to have a manager. d. Write an SQL statement to add John Doe as an employee with eid = 101, age = 32 and salary = 15, 000. e. Write an SQL statement to give every employee a 10 percent raise. f. Write an SQL statement to delete the Toy department.
4	Given a schema, apply BETWEENAND, NOT BETWEEN, IN, NOT IN, IS NULL, IS NOT NULL clause on created database.
5	Given a schema, implement aggregate function & grouping commands.
6	Given a schema, implement basic set operations in SQL
7	Write the following queries in SQL for the following schema. Suppliers(sid: integer, sname: string, address: string) Parts(pid: integer, pname: string, color: string) Catalog(sid: integer, pid: integer, cost: real) 1. Find the pnames of parts for which there is some supplier. 2. Find the snames of suppliers who supply every part. 3. Find the snames of suppliers who supply every red part. 4. Find the pnames of parts supplied by Acme Widget Suppliers and by no one else. 5. Find the sids of suppliers who supply a red part and a green part. 6. Find the sids of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part). 7. For each part, find the sname of the supplier who charges the most for that part. 8. Find the sids of suppliers who supply only red parts.

Daniele	Med	Sherri	July 2022	1.00	Applicable for AY 2022-23 Onwards
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SoE No. 22CSE-101

8	To create and manipulate various database object of table using views.
9	To implement Transaction Control Language (TCL) commands.
10	To display file database connectivity using JDBC.
11	Write a program in PL/SQL to check given number is even or odd

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester

22CSE505 - Design & Analysis of Algorithms

Course Outcome

After completion of the course, student will be able to:

CO1: Remember the concepts of algorithms,

CO2: Understand time requirements of an algorithm and mathematical techniques used in analysis of algorithms.

CO3: Analyze the Complexities of different algorithms for a wide variety of foundational problems occurring in computer science applications.

CO4: Apply the knowledge of different algorithms with discussions on complexity. **CO5:** Evaluate the knowledge of algorithms with Complexity and NP-completeness.

Unit No.	Contents	Max. Hrs.
Unit 1: In	troduction to Mathematical foundations	6

Mathematical foundations, summation of arithmetic and geometric series, Σn , $\Sigma n2$, 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.

Unit 2: Recursive Relation 7

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.

Unit 3: Divide and conquer, Greedy method

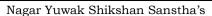
Divide and conquer basic strategy, binary search, quick sort, merge sort, Fast Fourier Transform etc. Greedy method –basic strategy, application to job sequencing with deadlines problem, minimum cost spanning trees, single source shortest path etc.

Unit 4: Dynamic Programming

6

Dynamic Programming basic strategy, multistage graphs, all pair shortest path, single source shortest paths, optimal binary search trees, traveling salesman problem, Matrix Chain Multiplication, Longest Common Subsequent.

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Un	it 5: Backtracking	6				
Bas	Basic Traversal and Search Techniques, breadth first search, connected components, Backtracking basic					
stra	strategy, 8 – Queen"s problem, graph colouring, Hamiltonian cycles etc.					
Un	it 6: Introduction to P and NP	6				
NP	-hard and NP-complete problems basic concepts, non-deterministic algorithms, NP-	hard and NP-				
con	nplete, Cook"s Theorem, decision and optimization problems, polynomial reduction.					
Tex	xt Books					
1	Algorithm Design, Klienberg and Tardos, Pearson					
2	Computer Algorithms, Horowitz, Sahani, Rajsekharan, Galgotia Publications Pvt. Ltd	l.				
3	Introduction to Algorithms, Thomas H. Cormen, Prentice Hall of India.					
	Reference Books					
1	Fundamentals of Algorithms, Brassard and Bratley, Prentice Hall					
	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://archive.nptel.ac.in/courses/106/101/106101060/					
2	https://archive.nptel.ac.in/courses/106/101/106101060/					

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(Department of Computer Science and Engineering)

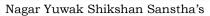
SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester 22CSE506 - Lab.: Design & Analysis of Algorithms

List of Experiment
To Compute and Analyze its time complexity of various sorting algorithm.
Bubble sort
Insertion sort
Selection Sort
To implement and compute time complexity of given problem using Divide and
Conquer algorithm.
Merge sort
Quick sort
Binary Search
To implement and compute time complexity of Job sequencing problem using Greedy
Method for different number of inputs.
To implement and compute time complexity of Knapsack Problem using Greedy
Method for different number of inputs.
To implement and compute time complexity of Dijikstra Problem using Greedy
programming for different number of inputs.
To implement the given problem using minimum cost spanning trees.
Kruskal Algorithm
Prim Algorithm
To implement and compute time complexity of All Pair Shortest Path using dynamic
programming for different number of inputs.
To implement and compute time complexity of Travelling Salesman Problem using
dynamic programming for different number of inputs.
To implement and compute time complexity of 8 Queens's problem using
backtracking for different number of inputs.
To implement and compute time complexity of Graph coloring problem using
backtracking for different number of inputs.

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B.Tech in Computer Science and Engineering

V Semester

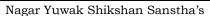
22CSE511 – PE I: Digital Image Processing

Course Outcome

- 1. Describe Basic relationships between pixels.
- 2. Compare various image enhancement techniques in spatial domain and frequency domain.
- 3. Illustrate different image compression techniques to understand the advantage of image compression
- 4. Demonstrate the applications of similarity based and dissimilarity-based approaches for image segmentation.
- 5. Interpret various representation techniques

Unit No.	Contents	Max. rs.
1	Introduction: Fundamental Steps in Image Processing, Elements of DIP	5
	systems, Elements of Visual Perception, Fundamentals of Image processing, A	
	Simple Image Model, Sampling and Quantization, Some Basic Relationships	
	between Pixels.	
2	Image Enhancement in the Spatial Domain: Introduction to Spatial and	6
	Frequency methods, Basic Gray Level Transformations, Histogram Equalization,	
	Image Subtraction, Image Averaging, Basics of Spatial Filtering, Smoothing	
	Spatial Filters, Sharpening Spatial Filters.	
3	Transforms: Introduction to the Fourier Transform, Discrete Fourier	7
	Transformation, Fourier Properties, 2DFT, inverse Fourier transform, Image	
	Enhancement in the frequency Domain: Filtering in the Frequency Domain,	
	Correspondence between Filtering in the Spatial and Frequency Domain,	
	Smoothing Frequency-Domain Filters, Sharpening Frequency-Domain Filters,	
	Homomorphic Filtering.	
4	Image Compression: Fundamentals of Image compression, coding redundancy,	6
	spatial and temporal redundancy, Measuring Image Information, Fidelity criteria,	
	Image compression models, Basic compression methods, Huffman coding,	
	arithmetic coding, LZW coding, run length coding.	
5	\Image Segmentation: Point Detection, Line Detection, Edge Detection,	6
	Gradient Operator, Edge Linking and Boundary Detection, Thresholding,	
	Region-oriented Segmentation.	

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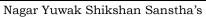
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6	Image Representation: Chain Codes, Polygonal Approximations, Signatures,	6
	Boundary Segments, Skeleton of a Region. Description: Boundary Descriptors,	
	Shape Numbers, Regional Descriptors, Topological Descriptors. Introduction to	
	color image processing: RGB and HSI color models.	
	Total Lectures	36

Tex	Text books:						
1	Digital Image Processing, 3rd edition 2007, Rafael C. Gonzalez and Richard, E. Woods, Prentice Hall						
2	Digital Image Processing, S Jayaraman, Tata McGraw Hill						
Ref	erence books:						
1	Fundamentals of Digital Image Processing, A K Jain, Prentice Hall, 1988						
2	Image Processing Principles & Applications, TinkuAcharya&Ajoy K. Ray, Willey Inter-Science						

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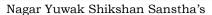
SoE No. 22CSE-101

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V Semester 22CSE512 – PE I: Lab: Digital Image Processing

Sr. No.	List of Experiment
1	1. Write a program in MATLAB for following Point processing techniques in spatial domain
	a. Negation of an image
	b. Thresholding of an image
	c. Contrast Stretching of an image
2	. Write a Program in MATLAB to Create a Histogram of a given Image OR
	https://cse19-iiith.vlabs.ac.in/objective.php?exp=histo
3	Write a program in MATLAB to perform following smoothing operations on an image
	a. Average filter
	b. Ordered Statistics filter
4	. Write a program in MATLAB to sharp an image using Laplacian mask.
5	. Write a program in MATLAB to segment an image using multilevel thresholding OR
	https://cse19-iiith.vlabs.ac.in/objective.php?exp=segment
6	. Write a program in MATLAB to apply split and merge algorithm on a given image.
7	Write a program in MATLAB to find the code chain of a given image.
8	Write a program in MATLAB to find Euler number of image a given image.
9	Write a program using OpenCV tool to detect the object present in an image.
10	Write a program using OpenCV tool to detect and track the object present in video.

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester

22CSE513 -PE I: Advanced Web Technologies

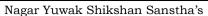
Course Outcomes:

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

- 1. Understand fundamental concepts of Web Services.
- 2. Design modern interactive web pages using HTML5, CSS3, Javascript.
- 3. Develop advanced client side programming.
- 4. Develop fast, flexible, and scalable backend applications using node; and mongoDB.

Unit:1	Introduction to Web Technology	6 Hours				
Client, Servers and Communication, Internet Protocols (HTTP,FTP, SMTP),WWW.Web Basics: Web						
	eb Servers, Tier Technology and its types, Static and Dynamic Web Page.	Client side and				
Server side S						
Unit:2	HTML5,CSS3	7 Hours				
HTML5: Str	ucture of an HTML Program, Basic HTML Tags (Headings, Paragraph,	Division, Text				
formatting, I	mage, Anchors), HTML Lists (Ordered Lists, Unordered Lists, Description	n Lists), HTML				
Links (href a	ttribute, target attribute), HTML colors, Table handling in HTML, HTML L	ayout Elements,				
	and id Attribute, HTML Forms, HTML Responsive Web Design.					
	, Internal, External, CSS3 selectors, CSS3- Colors, Backgrounds, Borders,					
CSS3 Box M	lodel, CSS3 Navigation Bar (Vertical, Horizontal), Introduction to Bootstrap					
Unit:3	Client Side Scripting with JavaScript	7 Hours				
Introduction		in JavaScript,				
	to JavaScript, Variables and Data Types, Operators and Expressions	in JavaScript, Dialog Boxes,				
Functions 1	to JavaScript, Variables and Data Types, Operators and Expressions	Dialog Boxes,				
Functions l JavaScript E	to JavaScript, Variables and Data Types, Operators and Expressions In JavaScript, Arrays, Loops and control statement, RegExp,	Dialog Boxes,				
Functions l JavaScript E	to JavaScript, Variables and Data Types, Operators and Expressions in JavaScript, Arrays, Loops and control statement, RegExp, wents. Event Handling and Form Validation, Error Handling, Handling	Dialog Boxes,				
Functions I JavaScript E JSON. Introd Unit:4	to JavaScript, Variables and Data Types, Operators and Expressions in JavaScript, Arrays, Loops and control statement, RegExp, vents. Event Handling and Form Validation, Error Handling, Handling luction to Web Frameworks- React JS, Angular JS. Advanced Client side programming	Dialog Boxes, Cookies, XML, 6 Hours				
Functions I JavaScript E JSON. Introd Unit:4	to JavaScript, Variables and Data Types, Operators and Expressions in JavaScript, Arrays, Loops and control statement, RegExp, vents. Event Handling and Form Validation, Error Handling, Handling luction to Web Frameworks- React JS, Angular JS.	Dialog Boxes, Cookies, XML, 6 Hours				
Functions I JavaScript E JSON. Introd Unit:4	to JavaScript, Variables and Data Types, Operators and Expressions in JavaScript, Arrays, Loops and control statement, RegExp, vents. Event Handling and Form Validation, Error Handling, Handling luction to Web Frameworks- React JS, Angular JS. Advanced Client side programming Server-Sent Event (SSE), WebRTC, Web Graphics, Canvas, WebGL, Web	Dialog Boxes, Cookies, XML, 6 Hours				
Functions I JavaScript E JSON. Introd Unit:4 WebSockets, Libraries: Mo Unit:5	to JavaScript, Variables and Data Types, Operators and Expressions in JavaScript, Arrays, Loops and control statement, RegExp, vents. Event Handling and Form Validation, Error Handling, Handling luction to Web Frameworks- React JS, Angular JS. Advanced Client side programming Server-Sent Event (SSE), WebRTC, Web Graphics, Canvas, WebGL, Web odernizr, Polyfills, Polymer.	Dialog Boxes, Cookies, XML, 6 Hours Workers, SVG.				
Functions I JavaScript E JSON. Introd Unit:4 WebSockets, Libraries: Mo Unit:5	to JavaScript, Variables and Data Types, Operators and Expressions in JavaScript, Arrays, Loops and control statement, RegExp, vents. Event Handling and Form Validation, Error Handling, Handling luction to Web Frameworks- React JS, Angular JS. Advanced Client side programming	Dialog Boxes, Cookies, XML, 6 Hours Workers, SVG.				
Functions I JavaScript E JSON. Introduction, Unit:4 WebSockets, Libraries: McUnit:5 Introduction, Unit:6	to JavaScript, Variables and Data Types, Operators and Expressions in JavaScript, Arrays, Loops and control statement, RegExp, wents. Event Handling and Form Validation, Error Handling, Handling luction to Web Frameworks- React JS, Angular JS. Advanced Client side programming Server-Sent Event (SSE), WebRTC, Web Graphics, Canvas, WebGL, Web odernizr, Polyfills, Polymer. Introduction to Node.js Modules, HTTP Module, File System Module, URL Module, NPM, Events Node.js and Database Connectivity with MongoDB to MongoDB, Creating a Database, Create Collection, Insert, Find, Delete,	Dialog Boxes, Cookies, XML, 6 Hours Workers, SVG. 6 Hours , Upload Files. 6 Hours				
Functions I JavaScript E JSON. Introduction, Unit:4 WebSockets, Libraries: McUnit:5 Introduction, Unit:6	to JavaScript, Variables and Data Types, Operators and Expressions in JavaScript, Arrays, Loops and control statement, RegExp, vents. Event Handling and Form Validation, Error Handling, Handling luction to Web Frameworks- React JS, Angular JS. Advanced Client side programming	Dialog Boxes, Cookies, XML, 6 Hours Workers, SVG. 6 Hours , Upload Files. 6 Hours				

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Textbool	ks				
1	HTML & CSS: The Complete Reference, Fifth Edition, Thomas A. Powell				
2	Web Technologies: Html, Javascript, Php, Java, Jsp, Asp.Net, Xml And Ajax, Black Book ,				
	Kogent Learning Solutions Inc., Dreamtech Press				
Reference	Reference Books				
1	Pro HTML5 with CSS, JavaScript, and Multimedia., Mark J. Collins				
2	Web Development with MongoDB and Node., Bruno Joseph D'mello				
YCCE e	YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]				
1	http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/book%20details/CSE.aspx				
2	http://link.springer.com/openurl?genre=book&isbn=978-1-4613-5409-3				
MOOCs	MOOCs Links and additional reading, learning, video material				
1	https://onlinecourses.swayam2.ac.in/nou20_cs05/preview				

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester

22CSE514-Lab PE I: Advanced Web Technologies

Sr. No.	Experiments based on
1	Write a HTML code to create single page website using Layout Elements
2	Write a HTML code to create responsive website using <meta/> tags.
3	Create a JavaScript Calculator using the JavaScript, HTML and CSS programming languages.
4	Creating Image Slider Using JavaScript, HTML, And CSS
5	Write JavaScript code to validate the following fields of the Registration form.
	First Name:
	Last Name:
	Password:
	Email ID:
	Mobile Number:
	Address:
6	Write a script which creates and retrieves Cookies information
7	Create a web page which shows the use of Canvas & SVG
8	Creating the MongoDB Database in Robo 3T GUI
9	Create a simple "Hello, World!" server using Node.js and Express.
10	Create a RESTful API that performs CRUD operations on a database

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B.Tech in Computer Science and Engineering

V Semester 22CSE515– PE I: Machine Learning

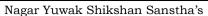
Course Outcomes:

After undergoing the course, student will be able to:

- 1. Understand various supervised machine learning algorithms
- 2. Understand various unsupervised machine learning algorithms
- 3. apply supervised and unsupervised learning on the given set of samples and design the model to accomplish the given task.
- 4. understand various performance evaluation measures for supervised and unsupervised learning

Unit:1	Introduction to machine learning	6 Hours					
Overview of Ma	Overview of Machine Learning, Types of Machine Learning: Supervised, Unsupervised, Reinforcement						
learning, Classi	fication, Regression, Supervised and Unsupervised Learning, Learning A	ssociations,					
Machine Learning	g Workflow, Examples of Machine Learning Applications.						
Unit:2	Supervised Learning-1	6 Hours					
Linear and poly	nomial regression, classification with k-Nearest Neighbours, Naive Bayes	Classifiers,					
Decision Trees,	Generalization, logistic regression, bias and variance, Overfitting, and Under	fitting					
Unit:3	Supervised Learning-2	6 Hours					
Random forests	, Kernelized Support Vector Machines, Uncertainty in Multiclass Classifica	tion, feature					
engineering and	selection, evaluation metrics for supervised learning						
Unit:4	Unsupervised Learning	6 Hours					
k-Means Cluste	ring, Choosing the Number of Clusters, Semi-Supervised Learning, Intr	roduction to					
Principle Compo	onent Analysis, evaluation metrics for unsupervised learning						
Unit:5	Design and Analysis of Machine Learning Experiments	6 Hours					
Factors, Respon	ise, and Strategy of Experimentation, Randomization, Hypothesis testing,	Replication,					
and Blocking,	Guidelines for Machine Learning Experiments , Cross-Validation and	Resampling					
Methods, K-Fold Cross-Validation, Comparing Two Classification Algorithms.							
Unit :6	Advances in Machine Learning	6 Hours					
Introduction to learning using Neural networks, types of artificial neuron and activation functions,							
Feedforward vs. Recurrent networks, multi-layer feedforward networks, Introduction to deep learning,							
deep learning fra	deep learning frameworks.						
	Total Lecture Hours	36 Hours					

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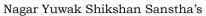




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Te	extbooks							
1	Introduction to Machine Learning", Ethem Alpaydin, The MIT Press, second edition							
2	Deep learning:Ian Goodfellow, Yoshua Bengio, and Aaron Courville, Deep Learning (http://www.deeplearningbook.org/)							
Re	eference Books							
1	Machine Learning", Tom Mitchell, McGraw-Hill Science/Engineering/Math, 1997							
2	Introduction to Machine Learning with Python, A Guide for Data Scientists Andreas C. Müller and Sarah Guido ORIELLY							
3	Christopher M. Bishop, Pattern Recognition and Machine Learning. http://research.microsoft.com/enus/um/people/cmbishop/prml/.							
	CCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]							
1	http://103.152.199.179/YCCE/e-							
	copies%20of%20books/7.Information%20Technology/60.Introduction_to_Machine_Learning							
	_2eEthem_Alpaydin.pdf							
M	OOCs Links and additional reading, learning, video material							
1	https://onlinecourses.nptel.ac.in/noc21_cs24/preview							
2	https://onlinecourses.nptel.ac.in/noc21_cs85/preview							

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SoE No. 22CSE-101

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V Semester 22CSE516- Lab: Machine Learning

Sr. No.	Experiments based on
1	a) Linear regression using linear least squares fit method
	b) Linear regression with Ordinary least squares method using ML Library
2	a) Implementing linear classifier using Linear discriminant function
	b) Implementing polynomial regression
3	Program for Classification using KNN algorithm
4	Implementing KNN for regression
5	Implementing Naïve Bayes Classifier
6	Decision Trees using Scikit-learn
7	Implementing SVM Classifier
8	Implementing K-means clustering
9	Dimensionality reduction using Principal Component Analysis
10	Implementing a feed forward Neural Network based estimation using Scikit learn
11	Experiment on classification using Pre-trained deep network

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B.Tech in Computer Science and Engineering

V Semester

22CSE517 - PE I: Mobile Operating System

Course Outcomes:

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

- 1. Understand the basics of mobile programming.
- 2. Apply mobile programming concepts.
- 3. Design user interfaces.
- 4. Design mobile database.
- 5. Analyse inter application communication.

Unit No.	Contents	Max. Hrs.
1	Introduction to Mobile Programming	5
	Mobility Technology Trends, Mobile Ecosystem Overview, Mobile Devices Overview, Mobile Development, Methodology, Wireless Networks Overview, Proximity Technologies.	
2	Introduction to Android Android Overview, Basic building blocks, Introduction to Activities/Fragments, Introduction to Services, broadcast receivers, content providers, Android Application Structure, Source Files, Resources, Assets, Manifest, Basic IDE Operation (Android Studio), Project Creation and Handling (App Creation through Wizard), Running App on AVD and Device, DDMS and Debugging, Layout Overview, Linear Layout, Relative Layout, Frame Layout, Widgets (UI Controls) Overview, Text View, Image View, button.	6
3	User Interface Designing Notifications, Toast, Dialog, Listview and Adapter, View Re-usability, Spinner, Complex View, Android Component overview, Intent Resolution, Activity Stack, Launch Modes, Activity Flags, Service Overview, Service Lifecycle, Service Usage and Applicability, Message Binder.	6
4	Data Management Data Storage Overview, Persistant v/s Local, Shared Preferences, Internal Storage, SQLite Data Base, Thread, process overview, Async Task, Loaders, Handlers, Intent and Intent Filters, Broadcast receiver Overview, Manifest Registration vs Component Registration, Unregistration, SMS, Boot, Network	6

Daniele	1	Sherri	July 2022	1.00	Applicable for AY 2022-23 Onwards
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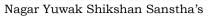
SoE No. 22CSE-101

	etc., Action Bar and Context Menu.	
5	Inter - Application Communication Inter app communication requirement overview, Intents Based, Gallery, Camera, SMS App, Contacts, Content provider Overview ,Need and Usage, Content Provider structure, URI Permissions, Views, triggers, Network communication basics, Connecting to server/ request creation, Response Formats XML/JSON, Rest / Web Services.	6
6	Advanced User Interface Designing Style and Themes, View and layout animation, Localization, Orientation and Config Change Handling, Handling multiple resolution devices, Device and Tablet consideration, Support Library, Application Signing, Application Distribution, Application Publishing, Google Play, Query solving topics, Recycling view adapter, SQLite DB, Drawer, Tab Layout (view Pager 2), http request using retrofit, Navigation Drawer, Android Application Architecture and Unit Testing, Introduction to Jetpack, Introduction to Daggers, Introduction to AndroidX	7
	Total Lecture Hours	36

Refe	Reference Books						
SN	Title	Edition	Authors	Publisher			
1	Programming the Mobile Web, 2nd ed., 2013, Maximiliano Firtman, O'Reilly Media, Inc.						

Text	Text Books							
SN	Title	Edition	Authors	Publisher				
1	Mobile Design and Developm	nent,2009,Brian Fli	ng,O'Reilly Media, Inc					
2	Android Programming: The Big Nerd Ranch Guide,2nd edition, 2015,Bill Phillips, Chris Stewart,							
	Brian Hardy, and Kris	tin Marsicano, Big	Nerd Ranch LLC					

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester

22CSE518 PE I: Mobile Operating System Lab

Experiments based on
Study of Mobile Apps Architecture.
Installation of Android Studio.
Modification to Android Manifest File.
Develop an application that takes the name from a text box and shows hello message along
with the name entered in text box, when the user clicks the OK button.
Create a screen that has input boxes for User Name, Password, Address, Gender (radio buttons
for male and female), Age (numeric), Date of Birth (Date Picket), State (Spinner) and a
Submit button. on clicking the submit button, print all the data below the Submit Button (use
any layout).
Design an android application to create page using Intent and one Button and pass the Values
from one Activity to second Activity.
Design an android application Send SMS using Intent.
Develop an application to demonstrate fragment manager.
Create a user registration application that stores the user details in a database table.
Design & Develop an application based on inter application communication.

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Unit No.

Unit:1

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

Max. Hrs.

36 Hours

6 Hours

Total Lectures Hours

B.Tech in Computer Science and Engineering

V Semester

22CSE531 – OE I: Database System Essentials

Course Outcome

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

- 1. Understand the basics concepts of Database System and its modelling, compare SQL and NoSQL databases.
- 2. Solve queries based on SQL and procedures using PL-SQL, & Analyse data dependencies & normalization.
- 3. Understand Query Processing and evaluate queries.

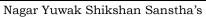
Contents

Database System Essentials:

4. Understand ACID Properties and database system Architecture.

Unit:2	Relational Databases:	7 Hours
Introduction	on, SQL, DDL, DML, DCL, Database Integrity and Security, Relational-Datal	base Design
Object-O	riented Databases, Object-Relational Databases, database constraints, functional of	dependencie
and norma	llization.	
Unit:3	Data Storage and Querying:	6 Hours
Storage a	nd File Structure, Indexing and Hashing, Data Retrieval, Query Processing,	data-acces
_	s, query-evaluation	
Tinit.1	Transaction Management:	6 Hours
Unit:4	Transaction Management.	0 110015
	on, transaction atomicity, consistency, isolation, and durability, concurren	
Introduction		
Introduction serializabi	on, transaction atomicity, consistency, isolation, and durability, concurred lity, locking, time stamping. Deadlock issues.	ncy contro
Introduction serializabi Unit:5	on, transaction atomicity, consistency, isolation, and durability, concurred lity, locking, time stamping. Deadlock issues. Database System Architecture:	6 Hours
Introduction serializabi Unit:5	on, transaction atomicity, consistency, isolation, and durability, concurred lity, locking, time stamping. Deadlock issues.	6 Hours

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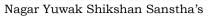
SoE No. 22CSE-101

Tex	xt Books
1	Database System Concepts, 7th Edition, Silberschatz-Korth-Sudarshan, McGraw-Hill, 2019
	• •

Refe	Reference Books				
1	Fundamentals of Database Systems, 5th Edition, Elmasri, Navathe & Gupta, Pearson Education				
2	2 Database Systems, 5th Edition, S. K. Singh, Pearson Education				

YCCE e	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	MOOCs Links and additional reading, learning, video material			
1	https://onlinecourses.nptel.ac.in/noc21_cs04/preview			
2	https://onlinecourses.nptel.ac.in/noc22_cs80/preview			

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester 22CSE532– OE I: Programming with Python

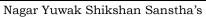
Course Outcome

- Upon successful completion of the course the students will be able to:
- 1. Understand the basic data types, built in data structures, control statements and loops and write simple programs in Python.
- 2. Apply the concepts of functions modules and packages and write programs using them.
- 3. Design and develop classes in Python.

Unit	Contents	Max.			
No.					
Unit:1	Introduction to Python: Build-in Data types & variables, arithmetic operators,	7 Hours			
	assignment statement, print & input function, relational and logical operators, if,				
	if – else & nested if- else statements, writing simple programs.				
Unit:2	Data Structures: Built in data structures: Lists, Dictionaries, Tuples, Sets, and	6 Hours			
	Arrays. Programs based on the built in data structures				
Unit:3	Looping: Loop statements: For, while, continue and break statements, list	6 Hours			
	comprehension. Bitwise operators, Real world problem solving based on loops.				
Unit:4	Functions: Library functions in Python standard library, user defined Functions,	6 Hours			
	returning values, local & global variables , global statement, doc strings for				
	functions, developing useful functions, Modules and Packages, import statement.				
Unit:5	Introduction to Object oriented programming in Python: Features of object	7 Hours			
	oriented programming, Python Object and Classes: defining classes, member				
	variables, doc strings for classes, Private members, Operator Overloading,				
	inheritance and polymorphism.				
Unit	Application Development: Developing applications using libraries and				
	packages, File handling, Exception handling, developing applications using				
	Python				
	Total Lectures Hours	37 Hours			

Tex	Text Books				
SN	Title				
1	Learn Python Programming, Third Edition, Fabrizio Romano, Heinrich Kruger, PACKT Publishing				

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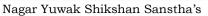


SoE No. 22CSE-101

Refe	Reference Books				
SN	Title				
1	Introduction to Computation and Programming Using Python, Second Edition, John V. Guttag, PHI EEE (MIT Press)				

MOOCs Links and additional reading, learning, video material				
1	https://onlinecourses.nptel.ac.in/noc20_cs70/preview			
2	https://onlinecourses.nptel.ac.in/noc20_cs83/preview			

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester 22CSE533 - OE I: Introduction to Image Processing

Course Outcome

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

CO1: Understand basic principles of image processing.

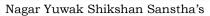
CO2: Analyze images using processing algorithms/Techniques.

CO3: Apply the concepts to implements basic image processing algorithms/operations.

Unit No.	Contents	Max. Hrs.
Unit:1	Fundamentals of Image Processing: Digital Image Fundamentals:	6 Hours
	Elements of Visual Perception, Light and the Electromagnetic Spectrum,	
	Image Sensing and Acquisition, Image Sampling and Quantization, Some	
	Basic Relationships between Pixels, Linear and Nonlinear Operations.	
Unit:2	Image Transformations: Image Enhancement in the Spatial Domain:	7 Hours
	Basic Grey Level Transformations, Histogram Processing, Basics of	
	Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters.	
Unit:3	Image Processing: Color Image Processing: Color Fundamentals, Color	6 Hours
	Models, Pseudocolor Image Processing, Basics of Full-Color Image	
	Processing, Color Transformations, Smoothing and Sharpening, Color	
	Segmentation	
Unit:4	Image Segmentation :Detection of Discontinuities, Edge Linking and	6 Hours
	Boundary Detection, Thresholding, Region-Based Segmentation,	
	Segmentation by Morphological Watersheds	
Unit:5	Image Compression: Fundamentals, Some Basic	6 Hours
	Compression Methods -Run Length Coding, Huffman Coding, Arithmetic	
	Coding, Bit Plane Coding, Block Truncation Coding. JPEG Compression.	
Unit :6	Morphological Image Processing: Morphological Image Processing:	6 Hours
	Preliminaries, Erosion and Dilation, Opening and Closing, Hit or Miss	
	Transformation, Some Basic Morphological Algorithms, Grey Scale	
	Morphology.	
	Total Lectures Hours	37 Hours

Text Books				
1	Digital Image Processing, (DIP/3e), 3 rd edition, Gonzalez and Woods, Prentice Hall - 2008			

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SoE No. 22CSE-101

R	Reference Books				
1	Digital Image Processing, Kenneth R Castleman, Pearson Education				
2	Fundamentals of Digital image Processing, Anil Jain.K, Prentice Hall of India				

YC	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/19-2016_Book_DigitalImageProcessing.pdf				
MO	MOOCs Links and additional reading, learning, video material				
1	https://onlinecourses.nptel.ac.in/noc21_cs04/preview				
2	https://onlinecourses.nptel.ac.in/noc22_cs80/preview				

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester

22CSE534 – OE I: Essentials of IT

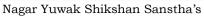
Course Outcomes

Upon successful completion of the course, the student will be able to:

- 1. Develop algorithm and write pseudo code for a given problem statement.
- 2. Construct Entity-Relationship Model and design RDBMS for a given problem statement.
- 3. Design static and dynamic web pages using HTML and Javascript and write simple programs in Javascript.
- 4. Apply software engineering concepts in any software project implementation.

Unit No.	Contents	Max. Hrs.
Unit:1	Programming fundamentals of Java: problem solving skills, Algorithm – representation using pseudo code, algorithm properties. Programming in java-programming constructs in JAVA, control structures type casting, SDLC overview and need for Object oriented approach, object oriented concepts, introduction to UML.	8 Hours
Unit:2	OO fundamentals – Java Implementation: OO fundamentals, coding standards, reference variables and objects in memory, methods, "this" reference. Data structures: data structures, linear data structures, non-linear data structures.	8 Hours
Unit:3	Data base basics- data storage, need for DBMS, functions of DBMS, data perspectives in DBMS, types of data models, relational model and keys, Database Design – Database life cycle, Data requirements, logical design – ER modeling, converting ER model to relational schema, functional dependency, normalization.	8 Hours
Unit:4	SQL – need for SQL, types of SQL statements, data types in SQL, SELECT statement with various operators, single row and multi row functions, group by and having clauses.	8 Hours
Unit:5	Introduction to web technologies: Computer Networks, HTML tags and CSS, Implementation of Java Scripts, Operators and control structures, function and dialog boxes, DOM element.	8 Hours
Unit:6	Software Engineering – Basics, SE models and approaches, Requirement developing activities, software design and construction, software testing, introduction to user experience, Project categories and project management phases, software quality.	8 Hours
	Total Lectures Hours	48Hours

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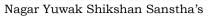
SoE No. 22CSE-101

Tex	Text Books				
1	Java: The complete reference, Herbert Schildt, McGraw-Hill				
2	Database System Concepts, Silberschatcz, Korth, Sudarshan, McGraw-Hill Education				
3	Software Engineering: A Practitioner's Approach, Roger Pressman, McGraw Hill Higher Education				

Reference Books		

MO	MOOCs Links and additional reading, learning, video material			
1	https://onlinecourses.nptel.ac.in/noc20_cs58/preview			
2	https://onlinecourses.nptel.ac.in/noc21_cs65/preview			
3	https://onlinecourses.nptel.ac.in/noc21_cs04/preview			

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester 22CSE551 – OE II: Software Testing for Beginners

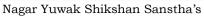
Course Outcome

Upon successful completion of this course, the student will be able to:

- 1. Formulate problem by following Software testing life cycle.
- 2. Design Manual Test cases for Software Project.
- Demonstrate utilization of testing automation though testing tool.

Unit	Contents	Max. Hrs.
No.		
1	Software Testing Basics: Basic concepts of Testing: Need of Testing, Basic	6
	concepts-errors, faults, defects, failures, objective of testing, central issue in	
	testing, Testing activities, V-Model, Sources of information for test cases,	
	Monitoring and Measuring Test Execution, Test tools and Automation, Limitation	
	of Testing.	
2	Unit Testing: Unit Testing: Concepts of Unit Testing, Static Unit Testing, Defect	6
	Prevention, Dynamic Unit Testing, Mutation Testing, Debugging, Tools for Unit	
	Testing.	
3	Control Flow Testing: Control Flow Testing: Outline of Control Flow Testing,	7
	Control Flow Graphs, Path in Control Flow Graph, Path selection criteria, All path	
	coverage criteria, Statement coverage, Path coverage.	
4	Integration Testing: Data Flow and System Integration Testing: Introduction Data	7
	flow testing, Data flow graph, Data flow testing criteria, Fundamentals of System	
	Integration: Types of interfaces and interface errors, System integration testing,	
	Software and Hardware integration.	
5	System Testing: System Testing: Taxonomy of system test, Basic Test,	6
	Functionality test, Robustness test, Performance test, Scalability test, Stress test,	
	Load and Stability test, Reliability test, Regression test, Documentation Test.	
6	Test Cases: Test Design: Test cases, Necessity of test case documentation, Test	6
	case design methods, Functional specification-based test case design, Use case	
	bases, application based test case design, level of test execution.	
	Total Lectures Hours	38Hours

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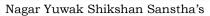
SoE No. 22CSE-101

Text E	Text Books					
S.No	Title					
1	Software Testing and Quality Assurance, Kshirsagar Naik and PriyadarshiniTripathi, Wiley					
	Publication					
2	Software Testing Principles, Techniques and Tools, M.G. Limaye, McGraw Hills					

Reference Books				
1	Foundations of Software Testing, Aditya P. Mathur, Pearson Education			
2	Software Testing Tools, Dr. K. V. K. K. Prasad, Dream Tech			

M(MOOCs Links and additional reading, learning, video material			
1	https://onlinecourses.nptel.ac.in/noc21_cs13/preview			
2	https://onlinecourses.nptel.ac.in/noc19_cs71/preview			

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester 22CSE552 – OE II: Introduction to Web Technology

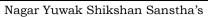
Course Outcomes:

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

- 1. Design Web pages using HTML5
- 2. Build an interactive website with CSS3
- 3. Develop basic programming skills using JavaScript
- 4. Create XML documents and Schemas.

Unit	Contents				
No.	Contents	Hrs.			
Unit:1	Introduction to internet: Overview of Internet, Intranet, WWW, Internet Protocols	6 Hours			
	(HTTP, FTP, SMTP), Email, broadband.				
Unit:2	Introduction to HTML5: Web server, Web Client/Browser, Structure of an HTML	6 Hours			
	Program, Basic HTML Tags(Headings, Paragraph, Division, Text formatting,				
	Image, Anchors), HTML Lists (Ordered Lists, Unordered Lists, Description Lists),				
	HTML Attributes, HTML Links (Href Attribute, Target Attribute).				
Unit:3	Table handling in HTML and Creating Forms: Table handling in HTML: width	6 Hours			
	and border attribute, CELLPADDING attribute, CELLSPACING attribute,				
	COLSPAN and ROWSPAN attributes, background color attribute, HTML Forms:				
	Elements to Capturing Form Data, Properties of Form Elements, HTML Layout				
	Elements(Semantic Elements), HTML style attribute, HTML class and id attribute.				
Unit:4	Cascading Style Sheets (CSS3): Introduction to CSS, Differences between CSS3	6 Hours			
	and earlier CSS specifications, CSS Syntax, CSS selectors, Inserting CSS: Inline,				
	Internal, External, CSS properties: Background, Text, Font, Border, Margin,				
	Padding, List, Dimension, and Classification.				
Unit:5	Java Script: Introduction to Java Script, Functions of Javascript, Variables and Data	6 Hours			
	Types, Operators, Loops and control statement: if Statement, ifelse Statement, else				
	if Statement, JavaScript Switch Statement, JavaScript Functions, JavaScript Loops:				
	for loop, while loop, dowhile loop, Dialog Boxes, JavaScript Events.				
Unit	Introduction to XML: What is XML?, Features of XML, XML Syntax and	6 Hours			
:6	Structure Rules(Start tags, End tags, Empty elements, XML tag attributes),XML				
	Document Type Declaration(DTD, Internal DTD's, External DTD's.				
	Total Lectures Hours	36			

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SoE No. 22CSE-101

Text Books				
S No	Title			
1	Web Technologies Black Book: HTML, JavaScript, PHP, Java, JSP, XML and AJAX			
	Kogent Learning Solutions Inc.			

	Reference Books				
S No	Title				
1	HTML & CSS: The Complete Reference, Fifth Edition, Thomas A. Powell, The McGraw-Hill				
	Companies, Inc				
2	Web Technologies, Ivan Bayross, BPB Publication				

M	MOOCs Links and additional reading, learning, video material			
1	https://nptel.ac.in/courses/106105084			
2	https://www.youtube.com/watch?v=uUhOEj4z8Fo			
3	https://www.youtube.com/watch?v=mU6anWqZJcc			

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester 22CSE553 – OE II: Introduction to Cloud Computing

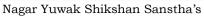
Course Outcomes:

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

- 1. Understand Cloud Computing Models.
- 2. Apply Cloud Concepts & Technologies.
- 3. Analyse Cloud Services & Platforms
- 4. Use MapReduce to process Big Data on Apache Hadoop.

Unit No.	Contents	Max. Hrs.			
Unit:1	Introduction to Cloud Computing: Definition of Cloud Computing, Characteristics of Cloud Computing, Cloud Models (Service & Deployment), Cloud Services Examples (IaaS, PaaS, SaaS), Cloud-based Services and	6 Hours			
	Applications (Cloud computing for Healthcare, Manufacturing Industry and Education).				
Unit:2	Cloud Concepts & Technologies: Virtualization, Load balancing, Scalability & Elasticity, Monitoring, Identity & Access Management, Service Level Agreements	6 Hours			
Unit:3	Unit:3 Cloud Services & Platforms: Compute Services (Amazon Elastic Compute Cloud, Google Compute Engine, Windows Azure Virtual Machines), Storage Services (Amazon Simple Storage services, Google Cloud Storage, Windows Azure Storage), Database Services (Amazon Relational Data Store, Google Cloud SQL, Windows Azure SQL Database), Application Services (Application Runtimes & Frameworks) Identity & Access Management Services (Amazon Identity & Access Management, Windows Azure Active Directory), Open Source Private Cloud Software (CloudStack, Eucalyptus, OpenStack).				
Unit:4	Hadoop & MapReduce: Apache Hadoop, Hadoop MapReduce Job Execution, NameNode, Secondary NameNode, JobTracker, TaskTracker, DataNode, MapReduce Job Execution Workflow, Hadoop Schedulers, Hadoop Cluster Setup.	6 Hours			
Unit:5	Cloud Application Design: Design Considerations for Cloud Applications, Scalability, Reliability & Availability, Security, IaaS, SaaS Services for Cloud Applications.	6 Hours			
Unit :6	Cloud Security: Introduction, CSA Cloud Security Architecture, Authentication, Single Sign On (SSO), Authorization.	6 Hours			

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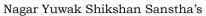
SoE No. 22CSE-101

Text Boo	Text Books				
1	CLOUD COMPUTING A Hands -on Approach, Arshdeep Bahga & Vijay Madisetti, Wiley				
	Publication				

Refere	Reference Books					
1	CLOUD COMPUTING, Michael Miller, PEARSON PUBLICATION					
2	Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather,					
	Subra Kumaraswamy, and Shahed Latif, O'Reilly					
3	Cloud Computing Bible, Barrie Sosinsky, John Wiley & Sons					

M	OOCs Links and additional reading, learning, video material			
1	https://onlinecourses.nptel.ac.in/noc21_cs14/preview			
2	https://www.simplilearn.com/			

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Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech SoE and Syllabus 2022

(Scheme of Examination w.e.f. 2022-23 onward) (Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester 22CSE554 – OE II: Introduction to OS Concepts

Course Outcomes:

Upon successful completion of the course, the student will be able to:

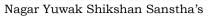
- 1. Use LINUX operating system.
- 2. Write Shell scripts

Unit No.	Contents	Max. Hrs.			
Unit:1	Introduction: History of Linux and Unix, Linux Overview, Linux releases, open linux.				
Unit:2	Linux Commands and Filters: Mkdir, CD, rmdir, pwd, ls, who, whoami, cat, more, fail, head, concept of, mv, chmod, grep,wc, comm., split, sort, diff, kill, write, wall, merge, mail, news	6 Hours			
Unit:3	Shell: The command line special characters and file arguments, standard input/output and redirection, pipes, redirecting and piping with standard errors, shell scripts, jobs.	6 Hours			
Unit:4	Linux file Structure: Linux files, file structure, listing displaying and printing files, managing directories, file and directory operations.				
Unit:5	Vi Editor: Vi editing commands advanced Vi editing commands, line editing commands, options in Vi	6 Hours			
Unit :6	System Administration: System management, managing users, installing and managing devices, floppy disk management, file system administration, backups	7 Hours			

Text B	Text Books					
1	Linux – The Complete Reference Tata, Richard Peterson, McGraw Hill, New Delhi					
2	Linux – Install and Configuration Black Book, Die Annleblanc and Issac Yates, IDG Book					
	India Private Ltd.,					
3	Unleashed Linux, Tech Media Publishers					

R	Reference Books					
1 Linux Pocket Guide, Daniel J.Barrett, O'Reilly Media						
2	The Linux Command Line, William Shotts, No Starch Press					
M	MOOCs Links and additional reading, learning, video material					
1	https://onlinecourses.nptel.ac.in/noc21_cs88/preview#:~:text=Operating%20System%20					
	Fundamentals%201%20Course%20layout%20Week%201%3A,is%20free%20to%20enroll%20and%					
	20 learn%20from.%20					
2	https://onlinecourses.nptel.ac.in/noc21_cs72/preview					

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Chairperson	Dean (Acad. Matters)	Dean OBE	Date of Release	Version	AT 2022 20 Offwards





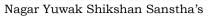
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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester 22CSE507: Industrial visit, Seminar & report

Davide	Med	Sherri	July 2022	1.00	Applicable for
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(Department of Computer Science and Engineering)

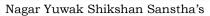
SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester **Audit Course**

MLC2125: YCAP5: YCCE Communication Aptitude Preparation

Damed	Sport	Shami	July 2022	1.00	Applicable for AY 2022-23 Onwards
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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

V Semester **Audit Course** MLC125: YCAP5: Design thinking

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Yeshwantrao Chavan College of Engineering (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

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

(Accredited 'A++' Grade by NAAC with a score of 3.25)

Hingna Road, Wanadongri, Nagpur - 441 110



Bachelor of Technology SoE & Syllabus 2022 6th Semester

(Department of Computer Science and Engineering

Yeshwantrao Chavan College of Engineering

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

B.TECH SCHEME OF EXAMINATION 2022

(Scheme of Examination w.e.f. 2022-23 onward)

SoE No.

22CSE-101

(Department of Computer Science & Engineering)

B. Tech in Computer Science & Engineering)

			BoS/				С	onta	ct Ho	urs		%	Weightag	je	ESE
SN	Sem	Type	Deptt	Sub. Code	Subject	T/P	L	Т	Р	Hrs	Credits MSEs	MSEs*	TA**	ESE	Duration Hours
					SIXTH SEMI	STER									
1	6	PC	CSE/CSE	22CSE601	Language Processor	T	3	0	0	4	4	30	20	50	3 Hrs
2	6	PC	CSE/CSE	22CSE602	Lab: Language Processor	Р	0	0	2	2	1		60	40	
3	6	PC	CSE/CSE	22CSE603	Cloud Computing	Т	3	0	0	3	3	30	20	50	3 Hrs
4	6	PC	CSE/CSE	22CSE604	Software Engineering	Т	3	0	0	3	3	30	20	50	3 Hrs
5	6	PC	CSE/CSE	22CSE605	Lab: Software Engineering	Р	0	0	2	2	1		60	40	
6	6	PE	CSE/CSE		Professional Elective-II	Т	3	0	0	3	3	30	20	50	3 Hrs
7	6	PE	CSE/CSE		Lab: Professional Elective-II	Р	0	0	2	2	1		60	40	
8	6	OE	CSE/CSE		Open Elective - III	Т	3	0	0	3	3	30	20	50	3 Hrs
9	6	OE	CSE/CSE		Open Elective - IV	Т	3	0	0	3	3	30	20	50	3 Hrs
10	6	PR	CSE/CSE	22CSE606	PROJECT PHASE 1	Р	0	0	4	4	2		60	40	
					1	OTAL	18	0	10	29	24				

List of Professional Electives-II

1	6	PE-II	CSE/CSE	22CSE611	PE-II: Business Intelligence
2	6	PE-II	CSE/CSE	22CSE612	PE-II: Lab: Business Intelligence
3	6	PE-II	CSE/CSE	22CSE613	PE-II: Internet of Things
4	6	PE-II	CSE/CSE	22CSE614	PE-II: Lab: Internet of Things
5	6	PE-II	CSE/CSE	22CSE615	PE-II: Neural Network and applications
6	6	PE-II	CSE/CSE	22CSE616	PE-II: Lab: Neural Network and applications
7	6	PE-II	CSE/CSE	22CSE617	PE-II: Augmented and Virtual Reality
8	6	PE-II	CSE/CSE	22CSE618	PE-II: Lab: Augmented and Virtual Reality

Open Elective-III

1	6	OE-III	CSE/CSE	22CSE631	OE III: Database System Essentials
2	6	OE-III	CSE/CSE	22CSE632	OE III: Programming with Python
3	6	OE-III	CSE/CSE	22CSE633	OE III: Introduction to Image Processing
4	7	OE-III	CSE/CSE	22CSE634	OEIII: Essentials of IT

Open Elective-IV

1	6	OE-IV	CSE/CSE	22CSE651	OE IV: Software Testing for Beginners
2	6	OE-IV	CSE/CSE	22CSE652	OE IV: Introduction to Web Technology
3	6	OE-IV	CSE/CSE	22CSE653	OE IV: Introduction to Cloud Computing
4	6	OE-IV	CSE/CSE	22CSE654	OE IV: Introduction to OS Concepts

Lis	of Mai	ndatory I	Learning Cou	rse (MLC)								
1	6	HS	T&P	MLC2126	YCAP6 : YCCE Communication Aptitude Preparation	Α	3	0	0	3	0	

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 activitied decided by course teacher, TA3 - 3 marks on class attendance

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

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B. Tech SoE and Syllabus 2022

(Department of Computer Science and Engineering)

(Scheme of Examination w.e.f. 2022-23 onward)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

VI Semester 22CSE601 – Language Processor

Course Outcome

Upon successful completion of the course, the student will be able to:

- Understand basic concepts of compiler design, Lexical analysis process and apply the knowledge of LEX/Flex tool.
- 2. Explain the role of a syntax analyzer and distinguish between different types of parsers, design and implement a parser using a YACC tool.
- 3. Apply the knowledge of Syntax directed translation to create intermediate code generation
- 4. Demonstrate the use of a symbol table throughout compilation.
- 5. Apply various code optimizing transformations and code generation techniques.

Unit No.			Contents			Max Hrs.	
1	Introduction:					6	
	Introduction to Compilation Process, Compilers & Translators, Phase structure of Compiler, Design of Lexical Analysis.						
2	CFG, LL(1):					7	
	Specifying Syntactic Structure of Programming Language using Context Free Grammars, The role of Parser, Top-down Parsing, Bottom Up Parsing, Predictive Parsers, Recursive Decent Parser.						
3	Parser:					7	
	nction of efficient LR Paction of Parsing table, In	* '	* *	cal Collection of	set of items and	d	
4	Syntax Directed Trai	nslation:				6	
5	Symbol Tables:		1		11' * '	6	
/ Biason	,	ciarations, Case 5	tatements, Ose of C	compiler writing	g tools (Lex/ Fie		
	ts, Representing scope ic phase and semantic p		r detection and Re	covery: Error h	andling, Lexica	1-pnase,	
6	Code Ontimization &	Code Generatio	n:			7	
Introdu DAG re Probler	6 Code Optimization & Code Generation: Introduction to Code Optimization, The principle sources of optimization, Loop optimization, The DAG representation, Introductory Data Flow analysis, Introduction to Code Generation: Object programs, Problems in Code Generation, Register allocation and assignment, Code generation from DAG, Peephole optimization.						
				Tot	tal Lectures 3	9	
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B. Tech SoE and Syllabus 2022 (Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science and Engineering)

SoE No. 22CSE-101

Te	Text Books					
1	Compilers Principles, Techniques & Tools, 2nd Edition, Alfred V. Aho, Jeffrey D. Ullman & Ravi Sethi, Pearson Education					
2	Principles of Compiler Design, Alfred V. Aho, Jeffrey D. Ullman, Narosa Publishing House					

Refe	Reference Books			
1	Compiler Design, Dr. O.G. Kakde, Laxmi Publication			
2	Introduction to Compiling Techniques: First Course Using ANSI C, Lex and Yacc, J. P. Bennett, McGraw-Hill Publication			

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B. Tech SoE and Syllabus 2022 (Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

VI Semester 22CSE602 - Lab: Language Processor

Sr. No.	List of Experiment
1	Implement a Lexical Analyzer using FLEX and develop: A. Program For converting all small case letters to UPPER case letters and Vice-Versa. B. Program to count the words, spaces, and lines in a given input file.
2	Study the LEX/Flex and YACC/Bison tool and Develop: A. LEX program to eliminate comment lines (Single and Multiple) in a text(C program) file and copy the resulting program into a separate file. B. YACC program to recognize valid identifier, operators and keywords in the given text (C program) file.
3	A. Develop a LEX program to recognize valid arithmetic expression. Identifiers in the expression could be only integers and operators could be + and *. Count the identifiers & operators present and print them separately. B. Develop a YACC program to evaluate arithmetic expression involving operators: +, -, *, and /.
4	Develop, Implement and execute a program using YACC tool to recognize all strings ending with b preceded by n a's using the grammar a n b (note: input n value), also create DFA of given grammar using JFLAP
5	Develop a program to find FIRST and FOLLOW of all variables. Write a suitable data structure to store a context fee grammar. Prerequisite is to eliminate left recursion from the grammar before storing
6	Design and Simulate Predictive / LL (1) Parsing Table using JFLAP for the grammar rules: $A \rightarrow aBa, B \rightarrow bB$.
7	Design and Simulate SLR(1) parsing using JFLAP for the grammar rules: $E \rightarrow E+T \mid T, T \rightarrow T*F \mid F, F \rightarrow (E) \mid id$ and parse the sentence: $id + id * id$.
8	Develop a program for intermediate code generator to generate three address code using LEX & YACC.

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

VI Semester 22CSE603 –Cloud Computing

Course Outcomes:

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

- 1. Explain software and hardware support for enterprise and cloud computing.
- 2. Perform data modelling for enterprise and cloud knowledge bases.
- 3. Design enterprise and cloud software applications.
- 4. Implement and run distributed and cloud applications.
- 5. Ensure security and privacy in enterprise and cloud application while implementing cloud applications methodologies.

Unit:1 Introduction to Cloud Computing

6 Hours

Defining Cloud Computing; Cloud Types and different models-The NIST model, The Cloud Cube Model, Deployment models, Service models; Examining the Characteristics of Cloud Computing; Benefits of cloud computing; Disadvantages of cloud computing; Assessing the Role of Open Standards.

Unit:2 Cloud Architecture, Services and Applications

6 Hours

Exploring the Cloud Computing Stack, Connecting to the Cloud, Infrastructure as a Service, Platform as a Service, Saas Vs. Paas, Using PaaS Application Frame works, Software as a Service, Identity as a Service, Compliance as a Service.

Unit:3 Abstraction and Virtualization

6 Hours

Introduction to Virtualization Technologies, Load Balancing and Virtualization, Understanding Hypervisors, Understanding Machine Imaging, Porting Applications, Virtual Machines Provisioning and Manageability Virtual Machine Migration Services, Virtual Machine Provisioning and Migration in Action, Provisioning in the Cloud Context.

Unit:4 | **Exploring Cloud Infrastructures**

6 Hours

Managing the Cloud-Administrating the Clouds, Management responsibilities, Lifecycle management Cloud Management Products, Emerging Cloud Management Standards, Understanding Service Oriented Architecture- Introducing Service Oriented Architecture.

Unit:5 | Managing & Securing the Cloud

6 Hours

Administrating the Clouds, Cloud Management Products, Emerging Cloud Management Standards, Securing the Cloud, Securing Data, the security boundary, Security service boundary, Security mapping, Brokered cloud storage access, Establishing Identity and Presence.

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B. Tech SoE and Syllabus 2022 (Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science and Engineering)

SoE No. 22CSE-101

Uni	6 Advance Clouds and Case Studies	6 Hours
Recoand the l	Computing Cost Analysis, basic, Selecting an IaaS Provider, Capacity Playery in Cloud Computing, AWS Cloud architectural principles, basic/core characteristing in the AWS Cloud, the key services on the AWS Platform and their compulling, account management, and pricing models, Introduction to Amazon EC2. Cae, Dropbox.	teristics of deploying non use cases, Defin
Tota	Lecture Hours	36 Hour
Tex	oooks	
1	Cloud Computing: Web-Based Applications That Change the Way You Work and Michael Miller, Springer	d Collaborate Onlin
2	Cloud Computing (Principles and Paradigms), Edited by Rajkumar Buyya, James Goscinski, John Wiley & Sons, Inc., Rajkumar Buyya, James Broberg, Andrze Wiley & Sons, Inc. Publication	•
Refe	rence Books	
1	Mastering cloud computing, Rajkumar buyya, Christian vecchiola, S Thamarai S Hill Education Private Limited	Selvi, Tata Mc-Gra
2	Cloud Computing a Practical Approach, Anthony T .Velte, Toby J. Velte, Robert Graw-HILL	Elsenpeter, Tata M
3	Cloud computing bible, Barrie sosinsky, Wiley publishing	
4	https://cloud.google.com/appengine/docs https://www.chef.io/solutions/cloud-management/ https://aws.amazon.com/documentation https://dev.twitter.com/overview/documentation https://developers.facebook.com/ https://www.cloudfoundry.org/ https://puppet.com/blog/implement-a-message-queue-your-cloud-applicati	
YC	E e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/DTEL%20Material/7.Information%20Technology/18.CC%20PPT_ADG.pdf	DTEL%20PPTs
<u>MO</u>	OCs Links and additional reading, learning, video material	
1	https://onlinecourses.nptel.ac.in/noc21_cs14/preview	
2	https://nptel.ac.in/courses/106105167	

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B.Tech in Computer Science and Engineering

VI Semester 22CSE604 – Software Engineering

Course Outcome

Reporting, SCM Standards.

UNIT V:

Upon successful completion of the course, the student 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.
- 5. Perform basic operations on Sub-version for software version control.

UNIT I:	6
Introduction to Software Engineering, A Generic View of process, Process models: Water fall Model Model, Prototyping Model, Component Development Model, Agile Model, Requirement Engineering Requirement Engineering Task Initialization Eliciting Requirement, Developing Use Case, Analysis Model, Negotiation, Validation.	
UNIT II:	6
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 III:	7
Testing Strategies: Strategic Approach, Strategic issues, Strategies for conventional Software, Strate for Object Oriented Software, Validation Testing, Testing Tactics: White-Box Testing, Basis Path test Flow Graph Notation, Independent Program Paths, Control Structure Testing, Black Box Testing, Introduction to object oriented testing.	_
UNIT IV:	7
Configuration Management: Base lines, Software Configuration items, The SCM Process, Identificat	ion of

Project Management, Metrics for Process and Projects, Project Estimation, Risk Management: Reactive vs.

Objects in the Software Configuration, Version Control, Change Control, Configuration Audit, Status

Project Management, Metrics for Process and Projects, Project Estimation, Risk Management: Reactive vs. Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection.

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B.Tech in Computer Science and Engineering

UNIT VI:	6
Advanced Topics in Software Engineering: Re engineering Computer aided software engineering, Op source SE tools introduction, Example-Subversion: Overview, Typical subversion usage and work flo	
Total Lectures	39

Text Books

- 1.Software Engineering-A Practitioner's Approach, 6th Edition, Roger S. Pressman, McGraw Hill
- 2. Software Engineering, 9th Edition, Ian Sommerville, Pearson

Reference Books

1. Object Oriented Software Engineering, 6th Edition, Leth Bridge, TATA McGraw Hill

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

- http://103.152.199.179/YCCE/e-copies%20of%20books/7.Information%20Technology/45.Object_Oriented_Software_Engineering__Practical_Software_Development_using_UML_and_Java%20hal%2056.pdf
- 2 http://103.152.199.179/YCCE/e-copies%20of%20books/7.Information%20Technology/17.2017_Book_Concise%20Guide%20to%20SE.pdf

MOOCs Links and additional reading, learning, video material

1. https://archive.nptel.ac.in/courses/106/105/106105182/

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

VI Semester 22CSE605 - Lab.: Software Engineering

Sr. No.	List of Experiment
1	Introduction to Software Engineering fundamentals, UML and RATIONAL ROSE Interface.
2	To study and create Software Requirement Specification document for given case study.
3	To study and draw UML Use Case diagram for the given case study.
4	To study and draw UML Class diagram for given Case Study.
5	To study and draw UML Activity diagram for given Case Study.
6	To study and draw UML Sequence Diagram for given Case Study.
7	To study and draw State Diagram for given Case Study.
8	Write a Program to find out the Estimation (cost and effort) by using COCOMO model.
9	To Perform Manual and Automated testing using CASE tool for given Case Study.
10	To Study and execute Version Control using Subversion

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B. Tech SoE and Syllabus 2022 (Scheme of Examination w.e.f. 2022-23 onward)

(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

VI Semester

22CSE611 – PE II: Business Intelligence

Course Outcome

After completion of the course Students will be able to:

- Assemble BI as a Process, identify its application in various domains and functional area, its roles and responsibilities.
- ➤ Identify functions of building blocks in N_tier BI ecosystem
- ➤ Identify different stages in Lifecycle of a BI project.
- ➤ Differentiate between traditional BI and self-service BI (PO1-2)
- 1. Apply SQL as a universal language for BI (PO2-3)
- 2. Model a business scenario; identify the metrics, indicators, various dimensions, and aggregation strategies and make recommendations to achieve the business goal (PO3-3)
- 3. Obtain hands on experience with some popular BI software for analysis, reporting, visualization of results

(PO1-2, PO2-2, PO3-2, PO5-3)

Unit No.	Contents	Max. Hrs.
1	Introduction to Business Intelligence :	8

What is business intelligence, why do we need BI, EIS,MIS,DSS& BI, information pyramid-data, information, Knowledge & intelligence. Basis For operational, tactical & strategic decision making, OLTP vs. OLAP, Requirement gathering in BI through business question BI in various domains and functional area

2 SQL the universal language for Business Intelligence :

7

Introduction to RDBMS, Language for retrieving data from a database, various clauses in a SQL retrieving data from multiple tables- joins filtering, sorting & grouping datasets, Introduction to DDL & DML statements, various built- in functions in SQL, Use of sub- queries, data dictionary and dynamic SQL.

3 **Principles of Dimensional modeling:**

7

Foundation for fact based decision making, star and snowflake schema, Pros& cons of the star/snowflake schema dimensional model, Slowly changing dimension tables, Fact-less fact strategy, Time dimension.

Business Intelligence system architecture:

6

Need for enterprise class business intelligence infrastructure, The BI ecosystem, Building blocks of a n- tier BI system-servers & communication protocols ,The central repository-metadata, Information consumption user interfaces-desktop vs. web vs. Mobile. Open architecture, Scalability, performance in BI-in memory analytics.

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5	BI Project Lifecycle:	6				
report	al BI project lifecycle, Requirements gathering & analysis-functional & non- functional requires and dashboards design- mock – up and storyboarding, Testing in a BI project, BI project yment, Post production support, Applications of BI, BI best practices	ements,				
6	Self-service Analytics:	6				
paradi	is Self-service Analytics, What are the use cases of self-service analytics, Business Paradigm and the Paradigm Shift with self-service analytics, Challenges of Self-service Analytics. luction to MicroStrategy Desktop – Overview	vs IT				
	Total Lectures	39				
Text 1	Books	•				
1	Data Warehousing ETL toolkit, Indian edition, Ralph Kimball and Margy Ross, wiley					
2	Fundamentals of Business Analytics, R.N.Prasad, Seema Acharya, wiley					
3	Business Intelligence: The Savvy Manager's Guide, David Loshin					
Refer	rence Books					
	Data Warehousing in the real world A practical guide for building Decision Support System, Anahory, Dennis Murray, PEARSON	Sam				
YCCI	E e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]					
-	o://103.152.199.179/YCCE/e-copies%20of%20books/7.Information%20Technology/26.Busing atelligence_%20The%20Sav%20-%20David%20Loshin_1391.pdf	ess				
2. http	o://103.152.199.179/YCCE/Suported%20file/Supprted%20file/book%20details/CSD.aspx					
MOO	Cs Links and additional reading, learning, video material					
	https://onlinecourses.nptel.ac.in/noc21_mg65/preview					
2 h	https://nptel.ac.in/courses/110107092					

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B.Tech in Computer Science and Engineering

VI Semester

22CSE612 – PE II: Lab: Business Intelligence

Sr. No.	Name of Practical				
1	Exploring HR schema of Oracle, Implementation of queries based on range, relational				
	operators, sorting, and concatenation.				
2	Implementation of queries based on character matching, aggregate functions, set operations				
3	Implementation of queries based on Joins (joining 2 or more tables), sub queries.				
4	a. Design a multidimensional data cube for given data Using EXCEL				
	b. Perform OLAP- slicing operation on it				
5	Creation Of Dashboard Using EXCEL				
6	Exploring Tableau OR/ MICROSTRATEGY ANALYTIC DESKTOP (MSTR): Installation tool, Importing Data from file, Data Wrangling (Editing Data).				
7	Visualization Of Data Using different visualizations in Tableau/ MSTR analytic desktop, Filtering data, and delivering Insights from data				
8	Create reports and Dashboard with defined insights /requirements in Tableau/MSTR analytic desktop. (Sample Data to be provided)				

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B.Tech in Computer Science and Engineering

VI Semester 22CSE613 – PE II: Internet of Things

Course Outcome

- 1. Develop various IOT environments
- 2. Demonstrate IOT architecture and its enabling technologies
- 3. Analyze IOT environments using various communication technologies
- 4. Apply various IOT enabling technologies for creation of IOT environments

Unit No.	Contents	Max. Hrs.
1	Introduction:	6
Comr	epts behind the Internet of Things, Characteristics of IoT, IoT enabling technologies, IoT munication Model, IoT architecture, Applications of IoT, Transducers, Sensors, Sensor classes, Actuators and its types.	Sensor
2	IOT Protocols:	7
	cation layer: MQTT, COAP, XMPP, AMQP, Network Layer: IPv4, IPv6, 6LoWPAN, IoT munication protocols: IEEE802.15.4, ZigBee, Wireless HART, Zwave, Bluetooth, NFC, RFID.	
3	Wireless Sensor networks:	6
	ponents of sensor nodes, Node Behavior in WSNs, Applications, WSN Coverage, OGDC algorithms and Mobile Wireless Sensor Networks.	thm,
4	Cloud Computing:	6
	nt Trends in Computing, Characteristics, Components of Cloud Computing, Service Models, byment Models, Service Management, Cloud Security, IoT Data analytics, Case studies, Middle T	eware
5	Machine to Machine Communication:	6
	types, IP and Non IP based M2M network operability in Internet of Things: Current Challenges in IoT, Interoperability, Types of Interoperability	ability
6	Software-Defined Networking:	6
	nt Network to SDN, SDN Architecture, Challenges, OpenFlow Protocol, APIs in SDN, Controment, Recent Advances of SDN in IoT, Industrial internet of things, Case studies	ller
	Total Lectures	37

Text Books Internet of Things: A Hands-On Approach, Arsheep Bahga, Vijay Madisetti, Universities Press **Reference Books** Introduction to IOT, S.Misra, A. Mukherjee, A.Roy, Cambridge university press

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B.Tech in Computer Science and Engineering

VI Semester 22CSE614 – PE II: Lab: Internet of Things

Sr. No.	List of Experiment
1	To study IoT Kit
2	Design a sketch for running of LED's
3	Design a sketch to monitor state of switch by establishing serial communication between Arduino and computer
4	Design a sketch to read analog value of potentiometer by establishing serial communication between arduino and computer
5	Design a sketch for blinking LED's without using delay
6	Design a sketch to develop switch based binary LED counter. Also observe output on serial monitor
7	Design a sketch to create a simple digital clock using LCD display
8	Design a sketch to make use of EEPROM to control devices(LED)
9	To log data of temperature sensor over internet and monitor it from anywhere in the world
10	Use of ESP-32

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B.Tech in Computer Science and Engineering

VI Semester

22CSE615 – PE II: Neural Network and Applications

Course Outcome

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

- CO 1: understand the basic concepts, underlying mathematics, and differences between Networks
- CO 2: Apply popular neural network algorithms for solving classification and regression problems
- CO 3: Identify and Analyse various ways of selecting suitable model parameters for different neural network algorithms.
- CO 4: Design multi-layer feed-forward neural networks and CNNs using deep learning concepts

Unit No.	Contents	Max. Hrs.
1	Introduction to Biological and Artificial Neural Networks:	6
Rules	ogical Neurons, General Artificial Neuron Model, MP Neuron, Perceptrons, Neural Networks, types of neural networks, feedforward vs recurrent all networks	rk learning
2	Perceptrons and Machine Learning Basics:	6
desce Mach classi	le Discrete Perceptron algorithm, linear machine and minimum distance classification ent and Single Continuous Perceptron algorithm nine learning basics: supervised vs unsupervised learning, various Machine learning ification, regression, machine Translation, Anomaly detection, etc. Capacity, Overlar fitting, bias and variance.	tasks like
3	Multilayer Perceptrons and Backpropagation Algorithm	6
Stoch	propagation, algorithm, Momentum Based Gradient Descent (GD), Nesterov Accele nastic GD, AdaGrad, RMSProp, Adam, Applications of s for classification and regression, Performance measures	
4	Regularization:	5
	L2 Regularization, Early stopping, Dataset augmentation, Parameter sharing and tying, Injectut, any other recent topics.	cting noise
5	Introduction to Deep Networks:	6
Alex	ory of deep learning, Types of deep networks, Introduction to Convolutional Neural Networks, ZF-Net, VGGNet, GoogLeNet, ResNet, Transfering using CNNs, comparison of shallow and deep networks.	ks, LeNet,
6	Autoencoders:	5
	encoders, Regularization in auto encoders, Denoising auto encoders, Sparse auto ders, Contractive auto encoders.	
	Total Lectu	res 37
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Tex	t Books
1	Deep Learning, Ian Goodfellow, Yoshua Bengio, Aaron Courville, MIT Press
2	Introduction to artificial neural system, Jacek M. Zurada
Ref	erence Books
1	Deep learning with python, Francois Chollet, Manning
2	Pattern Recognition and Machine Learning, Christopher Bishop, Springer
3	Neural Networks: A Systematic Introduction, Raul Rojas, Springer
4	Deep Learning, Amit Das, Saptarshi Goswami, Prabir Mitra, Amlan Chakrabarti, Pearson

YC	CE 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
MO	OOCs Links and additional reading, learning, video material
1	Deep Learning – Prof. Mitesh Khapra (IIT Ropar), Swayam Course
	https://onlinecourses.nptel.ac.in/noc22_cs124/preview
2	Neural Networks and Deep Learning, Andrew Ng
	https://www.coursera.org/learn/neural-networks-deep-learning#syllabus

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VI Semester

22CSE616 – PE II: LAB: Neural Network and Applications

Sr. No.	List of Experiment
1	Design and Implement 3-input gates using Mc Culloch Pit's Model of a neuron.
2	Find the weights for 3-input NAND gate using Single Discrete Perceptron Training Algorithm
3	Implement a Linear Machine using discrete perceptron to classify binary image patterns.
4	Implementing a classifier using feed forward Neural Network using Scikit learn
5	Implementing a feed forward Neural Network based regression using Scikit learn
6	Experiment on classification using Pre-trained deep network
7	Comparing Shallow and Deep Networks(CNN) for digit classification using MNIST dataset
8	Developing a real-world application using CNN.

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B.Tech in Computer Science and Engineering

VI Semester

22CSE617– PE II: Augmented and Virtual Reality

Course Outcome

Upon completion of the course the students will be able to

- 1. Understand the basic concepts of Virtual and Augmented Reality
- 2. Identify the differences in AR/VR concepts and technologies
- 3. Understand the fundamental concepts relating to Virtual Reality such as presence, immersion, and engagement
- 4. Evaluate usability of AR/VR applications and critique their use of AR/VR capabilities
- 5. Design and prototype effective AR/VR applications using UNITY platform for business, industry, non-profit and government organizations

No.	Contents	Max Hrs.
1	Introduction to Augmented Reality (AR)	6
	nition and Scope, A Brief History of Augmented Reality ,Displays (Multimodal Displays, Spatia lay Model, and Visual Displays), Strong vs Weak AR, Applications of AR, Challenges in AR	1
2	Introduction to Virtual Reality (VR)	6
envir	nition and Scope, Types of VR, Characteristics of VR, Basic VR environments, Limitations of V conments, Immersion Vs Presence, Key hardware requirements for VR	R
3	Interaction design for AR/VR environments	6
	action design process, Identifying user needs, AR/VR design considerations, Typical AR/VR Intuphors, Affordances in AR/VR, Human Information Processing.	erface
4	AR/VR and UNITY	7
UX c	gn for Perception and cognition, User experience(UX) guidelines for AR/VR challenges for AR/VR, Prototyping for AR/VR, Evaluation of the developed AR/VR prototype. It wiew: Windows, Interface, Navigation, Terminology, Game Objects, Hierarchy, Parenting O	Unity
Ovei		Objects
5	Introduction to UNITY	Objects 6
5 Asset		
5 Asset	Introduction to UNITY t Store, Importing Plug-ins, Creating a Terrain, Materials, Colors, Transparency	
5 Asset Introd 6 Vufo Over	Introduction to UNITY t Store, Importing Plug-ins, Creating a Terrain, Materials, Colors, Transparency duction to Monobehaviors: Awake, Start, Update	6

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Tex	Text Books		
1	Sherman, W. R., & Craig, A. B. (2003). Understanding virtual reality. San Francisco, CA: Morgan Kauffman.		
2	Schmalstieg, D., & Hollerer, T. (2016). Augmented reality: principles and practice. Addison-Wesley Professional.		

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

1. http://lavalle.pl/vr/book.html

MOOCs Links and additional reading, learning, video material

- 1. https://nptel.ac.in/courses/106/106/106106138/
- 2.https://www.coursera.org/learn/introduction-virtual-reality
- 3.https://www.udemy.com/course/fundamentals-of-augmented-reality-virtual-reality-101-ar-vr/

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VI Semester

22CSE618 – PE II: LAB: Augmented and Virtual Reality

Sr.	List of practical
No	
1	Creating and Managing Unity projects
	Install the Unity Editor for the first time
	Create and manage projects in the Unity Hub
2	Unity Editor Essentials
	Identify and use essential features of the Unity Editor.
	Create and Manage Scenes
	Navigate in 3D space in the Scene view
	Navigate in 2D space in the Scene view
3	Real-time Industry Essentials
	Understand Unity's history and role within the industries that rely on real-time creation.
	Describe the real-time production cycle
4	Scene Building Essentials
	Identify the default elements in a new Scene
	Create GameObjects
	Manipulate GameObjects
	Work with components and Scripts
	Change the appearance of GameObjects
	Implement basic physics for GameObjects
5	Publishing
	Create and share a basic build
6	Level 1 Job Preparation
	Prepare yourself for the job search

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VI Semester

22CSE631 – OE III: Database System Essentials

Course Outcome

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

- 1. Understand the basics concepts of Database System and its modelling, compare SQL and NoSQL databases.
- 2. Solve queries based on SQL and procedures using PL-SQL, & Analyse data dependencies & normalization.
- 3. Understand Query Processing and evaluate queries.
- 4. Understand ACID Properties and database system Architecture.

Ī				
Unit No.	Contents	Max. Hrs.		
Unit:1	Database System Essentials:	6 Hours		
Purpose	of Database systems, Example of Database Applications, Basic Terminologies, Data Mo	dels,		
Entity-R	Lelationship Model, Relational Model.			
Unit:2	Relational Databases:	7 Hours		
Introduc	tion, SQL, DDL, DML, DCL, Database Integrity and Security, Relational-Database Des	ign,		
Object-0	Driented Databases, Object-Relational Databases, database constraints, functional depen	dencies and		
normaliz	ation.			
Unit:3	Data Storage and Querying:	6 Hours		
Storage a	and File Structure, Indexing and Hashing, Data Retrieval, Query Processing, data-access	techniques,		
query-ev	aluation			
Unit:4	Transaction Management:	6 Hours		
Introduc	tion, transaction atomicity, consistency, isolation, and durability, concurrency control, se	rializability,		
locking,	time stamping. Deadlock issues.			
Unit:5	Database System Architecture:	6 Hours		
Centraliz	Centralized systems, client-server systems, parallel and distributed architectures, and network types			
Unit:6	PL-SQL and No SQL:	6 Hours		
Introduc	Introduction to Pl-SQL, Block Structure: Variables, Decision Structures & Loops, Basic Pl-SQL			
program	ming. Overview of NoSQL Databases, SQL Vs NO SQL, Types of NoSQL Database			
	Total Lectures	36		

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Tex	xt Books
1	Database System Concepts, 7th Edition, Silberschatz–Korth–Sudarshan, McGraw–Hill, 2019

Reference Books				
1	Fundamentals of Database Systems, 5th Edition, Elmasri, Navathe & Gupta, Pearson Education			
2	Database Systems, 5th Edition, S. K. Singh, Pearson Education			

YC	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			
MO	MOOCs Links and additional reading, learning, video material			
1	https://onlinecourses.nptel.ac.in/noc21_cs04/preview			
2	https://onlinecourses.nptel.ac.in/noc22_cs80/preview			

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VI Semester

22CSE632– OE III: Programming with Python

Course Outcome

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

- 1. Understand the basic data types, built in data structures, control statements and loops and write simple programs in Python.
- 2. Apply the concepts of functions modules and packages and write programs using them.
- 3. Design and develop classes in Python.

Unit No.	Contents	Max. Hrs.
Unit:1	Introduction to Python : Build-in Data types & variables, arithmetic operators, assignment statement, print & input function, relational and logical operators, if, if — else & nested if- else statements, writing simple programs.	7 Hours
Unit:2	Data Structures: Built in data structures: Lists, Dictionaries, Tuples, Sets, and Arrays. Programs based on the built in data structures	6 Hours
Unit:3	Looping: Loop statements: For, while, continue and break statements, list comprehension. Bitwise operators, Real world problem solving based on loops.	6 Hours
Unit:4	Functions: Library functions in Python standard library, user defined Functions, returning values, local & global variables, global statement, doc strings for functions, developing useful functions, Modules and Packages, import statement.	6 Hours
Unit:5	Introduction to Object oriented programming in Python: Features of object oriented programming, Python Object and Classes: defining classes, member variables, doc strings for classes, Private members, Operator Overloading, inheritance and polymorphism.	7 Hours
Unit :6	Application Development: Developing applications using libraries and packages, File handling, Exception handling, developing applications using Python	5 Hours

Tex	Text Books		
SN	Title		
1	Learn Python Programming, Third Edition, Fabrizio Romano, Heinrich Kruger PACKT Publishing		

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Refe	eference Books		
SN	Title		
1	Introduction to Computation and Programming Using Python, Second Edition, John V. Guttag PHI EEE (MIT Press)		

MO	MOOCs Links and additional reading, learning, video material			
1	https://onlinecourses.nptel.ac.in/noc20_cs70/preview			
2	https://onlinecourses.nptel.ac.in/noc20_cs83/preview			

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VI Semester

22CSE633-OE I: Introduction to Image Processing

Course Outcome

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

CO1: Understand basic principles of image processing.

CO2: Analyze images using processing algorithms/Techniques.

CO3: Apply the concepts to implements basic image processing algorithms/operations.

Unit No.	Contents	Max. Hrs.
Unit:1	Fundamentals of Image Processing: Digital Image Fundamentals: Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization, Some Basic Relationships between Pixels, Linear and Nonlinear Operations.	6 Hours
Unit:2	Image Transformations: Image Enhancement in the Spatial Domain: Basic Grey Level Transformations, Histogram Processing, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters.	7 Hours
Unit:3	Image Processing: Color Image Processing: Color Fundamentals, Color Models, Pseudocolor Image Processing, Basics of Full-Color Image Processing, Color Transformations, Smoothing and Sharpening, Color Segmentation	6 Hours
Unit:4	Image Segmentation :Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation, Segmentation by Morphological Watersheds	6 Hours
Unit:5	Image Compression: Image Compression: Fundamentals, Some Basic Compression Methods -Run Length Coding, Huffman Coding, Arithmetic Coding, Bit Plane Coding, Block Truncation Coding. JPEG Compression.	6 Hours
Unit :6	Morphological Image Processing: Morphological Image Processing: Preliminaries, Erosion and Dilation, Opening and Closing, Hit or Miss Transformation, Some Basic Morphological Algorithms, Grey Scale Morphology.	6 Hours

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Tex	t Books
1	Digital Image Processing, (DIP/3e), 3 rd edition, Gonzalez and Woods, Prentice Hall - 2008

Ref	Reference Books			
1	Digital Image Processing, Kenneth R Castleman, Pearson Education			
2	Fundamentals of Digital image Processing, Anil Jain.K, Prentice Hall of India			

YC	CCE 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/19-2016_Book_DigitalImageProcessing.pdf
MO	OOCs Links and additional reading, learning, video material
1	https://onlinecourses.nptel.ac.in/noc21_cs04/preview
2	https://onlinecourses.nptel.ac.in/noc22_cs80/preview

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(Department of Computer Science and Engineering)

SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

VI Semester

22CSE634- OE I: Essentials of IT

Course Outcomes

Upon successful completion of the course, the student will be able to:

- 1. Develop algorithm and write pseudo code for a given problem statement.
- 2. Construct Entity-Relationship Model and design RDBMS for a given problem statement.
- 3. Design static and dynamic web pages using HTML and Javascript and write simple programs in Javascript.
- 4. Apply software engineering concepts in any software project implementation.

Unit No.	Contents	Max. Hrs.
Unit:1	Programming fundamentals of Java: problem solving skills, Algorithm – representation using pseudo code, algorithm properties. Programming in java-programming constructs in JAVA, control structures type casting, SDLC overview and need for Object oriented approach, object oriented concepts, introduction to UML.	8 Hours
Unit:2	OO fundamentals – Java Implementation: OO fundamentals, coding standards, reference variables and objects in memory, methods, "this" reference. Data structures: data structures, linear data structures, non- linear data structures.	8 Hours
Unit:3	Data base basics- data storage, need for DBMS, functions of DBMS, data perspectives in DBMS, types of data models, relational model and keys, Database Design – Database life cycle, Data requirements, logical design – ER modeling, converting ER model to relational schema, functional dependency, normalization.	8 Hours
Unit:4	SQL – need for SQL, types of SQL statements, data types in SQL, SELECT statement with various operators, single row and multi row functions, group by and having clauses.	8 Hours
Unit:5	Introduction to web technologies: Computer Networks, HTML tags and CSS, Implementation of Java Scripts, Operators and control structures, function and dialog boxes, DOM element.	8 Hours
Unit:6	Software Engineering – Basics, SE models and approaches, Requirement developing activities, software design and construction, software testing, introduction to user experience, Project categories and project management phases, software quality.	8 Hours

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Tex	Text Books				
1	Java: The complete reference, Herbert Schildt, McGraw-Hill				
2	Database System Concepts, Silberschatcz, Korth, Sudarshan, McGraw-Hill Education				
3	Software Engineering: A Practitioner's Approach, Roger Pressman, McGraw Hill Higher Education				

Reference Books		

MC	MOOCs Links and additional reading, learning, video material				
1	https://onlinecourses.nptel.ac.in/noc20_cs58/preview				
2	https://onlinecourses.nptel.ac.in/noc21_cs65/preview				
3	https://onlinecourses.nptel.ac.in/noc21_cs04/preview				

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B.Tech in Computer Science and Engineering

VI Semester

22CSE651 – OE IV: Software Testing for Beginners

Course Outcome

Upon successful completion of this course, the student will be able to:

- 1. Formulate problem by following Software testing life cycle.
- 2. Design Manual Test cases for Software Project.
- 3. Demonstrate utilization of testing automation though testing tool.

Unit	Contents	Max.
No.		Hrs.
1	Software Testing Basics: Basic concepts of Testing: Need of Testing, Basic concepts-errors, faults, defects, failures, objective of testing, central issue in testing, Testing activities, V-Model, Sources of information for test cases, Monitoring and Measuring Test Execution, Test tools and Automation, Limitation of Testing.	6
2	Unit Testing: Unit Testing: Concepts of Unit Testing, Static Unit Testing, Defect Prevention, Dynamic Unit Testing, Mutation Testing, Debugging, Tools for Unit Testing.	6
3	Control Flow Testing: Control Flow Testing: Outline of Control Flow Testing, Control Flow Graphs, Path in Control Flow Graph, Path selection criteria, All path coverage criteria, Statement coverage, Path coverage.	7
4	Integration Testing: Data Flow and System Integration Testing: Introduction Data flow testing, Data flow graph, Data flow testing criteria, Fundamentals of System Integration: Types of interfaces and interface errors, System integration testing, Software and Hardware integration.	7
5	System Testing: System Testing: Taxonomy of system test, Basic Test, Functionality test, Robustness test, Performance test, Scalability test, Stress test, Load and Stability test, Reliability test, Regression test, Documentation Test.	6
6	Test Cases: Test Design: Test cases, Necessity of test case documentation, Test case design methods, Functional specification-based test case design, Use case bases, application based test case design, level of test execution.	6

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Text Books				
S.No	Title			
1	Software Testing and Quality Assurance, Kshirsagar Naik and PriyadarshiniTripathi, Wiley			
	Publication			
2	Software Testing Principles, Techniques and Tools, M.G. Limaye, McGraw Hills			

Reference Books				
S.No	Title			
1	Foundations of Software Testing, Aditya P. Mathur, Pearson Education			
2	Software Testing Tools, Dr. K. V. K. K. Prasad, Dream Tech			

MC	MOOCs Links and additional reading, learning, video material				
1	https://onlinecourses.nptel.ac.in/noc21_cs13/preview				
2	https://onlinecourses.nptel.ac.in/noc19_cs71/preview				

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B.Tech in Computer Science and Engineering

VI Semester

22CSE652 – OE IV: Introduction to Web Technology

Course Outcomes:

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

- Design Web pages using HTML5 1.
- Build an interactive website with CSS3 2.
- 3. Develop basic programming skills using JavaScript
- 4. Create XML documents and Schemas.

Unit No.	Contents	Max. Hrs.
Unit:1	Introduction to internet: Overview of Internet, Intranet, WWW, Internet Protocols (HTTP, FTP, SMTP), Email, broadband.	6 Hours
Unit:2	Introduction to HTML5: Web server, Web Client/Browser, Structure of an HTML Program, Basic HTML Tags(Headings, Paragraph, Division, Text formatting, Image, Anchors), HTML Lists (Ordered Lists, Unordered Lists, Description Lists), HTML Attributes, HTML Links (Href Attribute, Target Attribute).	6 Hours
Unit:3	Table handling in HTML and Creating Forms: Table handling in HTML: width and border attribute, CELLPADDING attribute, CELLSPACING attribute, COLSPAN and ROWSPAN attributes, background color attribute, HTML Forms: Elements to Capturing Form Data, Properties of Form Elements, HTML Layout Elements(Semantic Elements), HTML style attribute, HTML class and id attribute.	6 Hours
Unit:4	Cascading Style Sheets (CSS3): Introduction to CSS, Differences between CSS3 and earlier CSS specifications, CSS Syntax, CSS selectors, Inserting CSS: Inline, Internal, External, CSS properties: Background, Text, Font, Border, Margin, Padding, List, Dimension, and Classification.	6 Hours
Unit:5	Java Script: Introduction to Java Script, Functions of Javascript, Variables and Data Types, Operators, Loops and control statement: if Statement, ifelse Statement, else if Statement, JavaScript Switch Statement, JavaScript Functions, JavaScript Loops: for loop, while loop, dowhile loop, Dialog Boxes, JavaScript Events.	6 Hours
Unit :6	Introduction to XML: What is XML?, Features of XML, XML Syntax and Structure Rules(Start tags, End tags, Empty elements, XML tag attributes),XML Document Type Declaration(DTD, Internal DTD's, External DTD's.	6 Hours

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Text B	Text Books			
S No	Title			
1	Web Technologies Black Book: HTML, JavaScript, PHP, Java, JSP, XML and AJAX			
	Kogent Learning Solutions Inc.			

Refere	Reference Books			
S No	Title			
1	HTML & CSS: The Complete Reference, Fifth Edition, Thomas A. Powell, The McGraw-Hill			
	Companies, Inc			
2	Web Technologies, Ivan Bayross, BPB Publication			

M(MOOCs Links and additional reading, learning, video material			
1	https://nptel.ac.in/courses/106105084			
2	https://www.youtube.com/watch?v=uUhOEj4z8Fo			
3	https://www.youtube.com/watch?v=mU6anWqZJcc			

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SoE No. 22CSE-101

B.Tech in Computer Science and Engineering

VI Semester

22CSE653 – OE II: Introduction to Cloud Computing

Course Outcomes:

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

- 1. Understand Cloud Computing Models.
- 2. Apply Cloud Concepts & Technologies.
- 3. Analyse Cloud Services & Platforms
- 4. Use MapReduce to process Big Data on Apache Hadoop.

Unit No.	Contents	Max. Hrs.
Unit:1	Introduction to Cloud Computing: Definition of Cloud Computing, Characteristics of Cloud Computing, Cloud Models (Service & Deployment), Cloud Services Examples (IaaS, PaaS, SaaS), Cloud-based Services and Applications (Cloud computing for Healthcare, Manufacturing Industry and Education).	6 Hours
Unit:2	Cloud Concepts & Technologies: Virtualization, Load balancing, Scalability & Elasticity, Monitoring, Identity & Access Management, Service Level Agreements	6 Hours
Unit:3	Cloud Services & Platforms: Compute Services (Amazon Elastic Compute Cloud, Google Compute Engine, Windows Azure Virtual Machines), Storage Services (Amazon Simple Storage services, Google Cloud Storage, Windows Azure Storage), Database Services (Amazon Relational Data Store, Google Cloud SQL, Windows Azure SQL Database), Application Services (Application Runtimes & Frameworks) Identity & Access Management Services (Amazon Identity & Access Management, Windows Azure Active Directory), Open Source Private Cloud Software (Cloud Stack, Eucalyptus, OpenStack).	6 Hours
Unit:4	Hadoop & MapReduce: Apache Hadoop, Hadoop MapReduce Job Execution, NameNode, Secondary NameNode, JobTracker, TaskTracker, DataNode, MapReduce Job Execution Workflow, Hadoop Schedulers, Hadoop Cluster Setup.	6 Hours
Unit:5	Cloud Application Design: Design Considerations for Cloud Applications, Scalability, Reliability & Availability, Security, IaaS, SaaS Services for Cloud Applications.	6 Hours
Unit :6	Cloud Security: Introduction, CSA Cloud Security Architecture, Authentication, Single Sign On (SSO), Authorization.	6 Hours

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Text B	Text Books			
1	CLOUD COMPUTING A Hands -on Approach, Arshdeep Bahga & Vijay Madisetti, Wiley			
	Publication			

Refere	Reference Books			
1	CLOUD COMPUTING, Michael Miller, PEARSON PUBLICATION			
2	Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather,			
	Subra Kumaraswamy, and Shahed Latif, O'Reilly			
3	Cloud Computing Bible, Barrie Sosinsky, John Wiley & Sons			

M	MOOCs Links and additional reading, learning, video material			
1	https://onlinecourses.nptel.ac.in/noc21_cs14/preview			
2	https://www.simplilearn.com/			

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B.Tech in Computer Science and Engineering

VI Semester

22CSE654 – OE II: Introduction to OS Concepts

Course Outcomes:

Upon successful completion of the course, the student will be able to:

- 1. Use LINUX operating system.
- 2. Write Shell scripts

Unit No.	Contents	Max. Hrs.
Unit:1	Introduction: History of Linux and Unix, Linux Overview, Linux releases, open linux.	7 Hours
Unit:2	Linux Commands and Filters: Mkdir, CD, rmdir, pwd, ls, who, whoami, cat, more, fail, head, concept of, mv, chmod, grep,wc, comm., split, sort, diff, kill, write, wall, merge, mail, news	6 Hours
Unit:3	Shell: The command line special characters and file arguments, standard input/output and redirection, pipes, redirecting and piping with standard errors, shell scripts, jobs.	6 Hours
Unit:4	Linux file Structure: Linux files, file structure, listing displaying and printing files, managing directories, file and directory operations.	6 Hours
Unit:5	Vi Editor: Vi editing commands advanced Vi editing commands, line editing commands, options in Vi	6 Hours
Unit :6	System Administration: System management, managing users, installing and managing devices, floppy disk management, file system administration, backups	7 Hours

Text Books					
1	Linux – The Complete Reference Tata, Richard Peterson, McGraw Hill, New Delhi				
2	Linux – Install and Configuration Black Book, Die Annleblanc and Issac Yates, IDG Books India				
	Private Ltd.,				
3	Unleashed Linux, Tech Media Publishers				

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R	Reference Books					
1		Linux Pocket Guide, Daniel J.Barrett, O'Reilly Media				
2	2	The Linux Command Line, William Shotts, No Starch Press				

M	MOOCs Links and additional reading, learning, video material				
1	https://onlinecourses.nptel.ac.in/noc21_cs88/preview#:~:text=Operating%20System%20				
	Fundamentals%201%20Course%20layout%20Week%201%3A,is%20free%20to%20enroll%20and%20				
	learn%20from.%20				
2	https://onlinecourses.nptel.ac.in/noc21_cs72/preview				

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VI Semester Audit Course

MLC2126 – YCAP6 : YCCE Communication Aptitude Preparation

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