

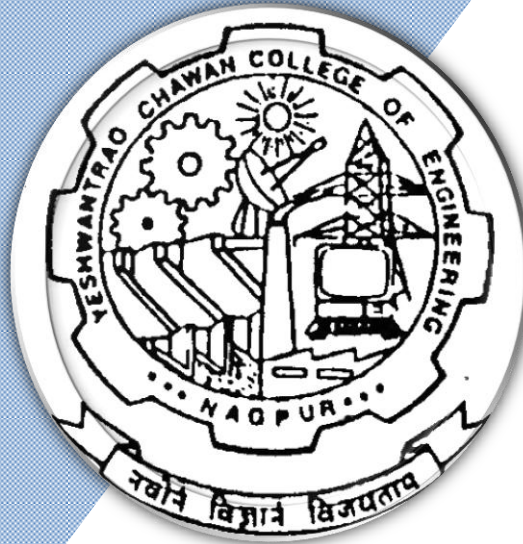
Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

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

Hingna Road, Wanadongri, Nagpur - 441 110



Bachelor of Technology

SoE & Syllabus 2022

1st to 4th Semester

(Department of Computer Science and Engineering)

B.Tech in Computer Science and Engineering

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)

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

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

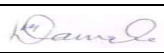

SECOND SEMESTER															
1	2	BS	GE/MTH	22CSE201	Calculus Sequences and Series	T	3	1	0	4	4	30	20	50	3 Hrs
2	2	BS	GE/CHE	22CSE202	Engineering Chemistry	T	3	0	0	3	3	30	20	50	3 Hrs
3	2	BS	GE/CHE	22CSE203	Lab: Engineering Chemistry	P	0	0	2	2	1		60	40	
4	2	HS	GE/HUM	22CSE204	Professional Communication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

List of Mandatory Learning Course (MLC)															
1	2	HS	GE/HUM	GE2131	Universal Human Value	A	2	0	0	2	0				
2	2	HS	GE/T&P	MLC2122	YCAP2 -Functional English	A	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 activities decided by course teacher, TA3 - 3 marks on class attendance

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

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

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)

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

List of Mandatory Learning Course (MLC)

1	3	HS	T&P	MLC2123	YCCE Communication Aptitude Preparation (YCAP3)	A	3	0	0	3	0				
2	3	BSE	CSE	AU115	Latex	A	2	0	0	2	0				

FOURTH SEMESTER

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

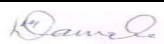

List of Mandatory Learning Course (MLC)

1	4	HS	T&P	MLC2124	YCCE Communication Aptitude Preparation (YCAP 4)	A	3	0	0	3	0				
2	4	BSE	CSE	MLC116	Ethics in IT	A	2	0	0	2	0				

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

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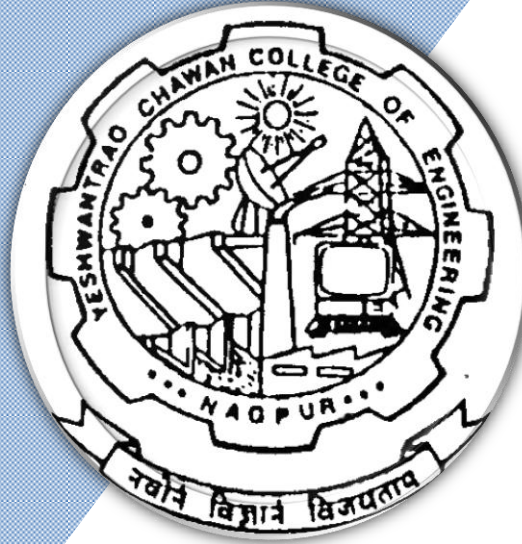
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Hingna Road, Wanadongri, Nagpur - 441 110



Bachelor of Technology SoE & Syllabus 2022 1st Semester

(Department of Computer Science and Engineering)

B.Tech in Computer Science and Engineering

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)

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

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

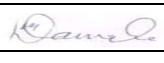

SECOND SEMESTER															
1	2	BS	GE/MTH	22CSE201	Calculus Sequences and Series	T	3	1	0	4	4	30	20	50	3 Hrs
2	2	BS	GE/CHE	22CSE202	Engineering Chemistry	T	3	0	0	3	3	30	20	50	3 Hrs
3	2	BS	GE/CHE	22CSE203	Lab: Engineering Chemistry	P	0	0	2	2	1		60	40	
4	2	HS	GE/HUM	22CSE204	Professional Communication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

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

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

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Chairperson	Dean (Acad. Matters)	Date of Release	Version	



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

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

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

YCCE-CSE-1



Nagar Yuwak Shikshan Sanstha's

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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

Textbooks:

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

Reference Books:

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

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

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

MOOCs Links and additional reading, learning, video material

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

			July 2022	1.00	Applicable for AY 2022-23 Onwards
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YCCE-CSE-2



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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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

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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(Department of Computer Science and Engineering)

SoE No.
22CSE-101

B.Tech in Computer Science and Engineering

Textbooks:

1.	M. N. Avadhanulu, P. G. Kshirsagar, A Textbook of Engineering Physics, Revised 14th Edition, S. Chand & Company, 2014.
2.	Hitendra K Malik, A K Singh, Engineering Physics, 2 nd Edition, Tata McGraw Hill Education Private Limited, 2015.

Reference 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.
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]

1	chrome- http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Physics/Eisberg%20&%20Resnick%20-%20Quantum%20Physics.pdf
2	chrome- http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Physics/2016_Book_ThePhysicsOfSemiconductors.pdf

MOOCs Links and additional reading, learning, video material

1.	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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(Department of Computer Science and Engineering)

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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SoE No.
22CSE-101

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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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.

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, 1 st Ed., Akinik Publications, New Delhi.

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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22CSE-101

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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Textbooks:

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

Reference Books:

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

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

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

MOOCs Links and additional reading, learning, video material

1. https://youtube.com/playlist?list=PLLy_2iUCG87Bw9XPfEF3r3EW5UIAOv8iz
2. <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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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, Backpropagation 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, H2O: 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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B.Tech in Computer Science and Engineering

Textbooks:

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

Reference Books:

1.	John Paul Mueller, Luca Massaron John Wiley & Sons ,"Artificial Intelligence for Dummies" First, 2018
2.	Steven W. Knox, Wiley" Machine Learning A Concise Introduction" First, 2018

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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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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Textbooks:

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

Reference Books:

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

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

MOOCs Links and additional reading, learning, video material

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

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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
Basics of file handling, developing useful applications using built in and custom modules and packages. (Contemporary Issues related to Topic)		
Total Lecture Hours		37 Hours

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Textbooks:

- | | |
|---|--|
| 1 | Python Programming, A Modular Approach, Sheetal Taneja and Naveen Kumar, Pearson |
|---|--|

Reference 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 |

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- | | |
|---|---|
| 1 | http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/python-basics-sample-chapters.pdf |
| 2 | http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/practical-machine-learning-python-problem-solvers.pdf |

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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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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I SEMESTER

Audit Course

MLC2121: YCAP1-Get Set Go

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

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

Unit No.	Topic	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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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 No.	Topic	Duration
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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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 value of biodiversity.

India as a mega-diversity nation; hotspots 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. In situ and Ex situ 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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Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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(Department of Computer Science and Engineering)




SoE No.
22CSE-101

B.Tech in Computer Science and Engineering

Unit VI: Social Issues and the Environment	(4 Hrs.)
<p>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.</p> <p>Preserving resources for future generations. Te rights of animals; Ethical basis of environment education and awareness; Conservation ethics and traditional value systems of India.</p> <p>Climate change, global warming, acid rain, Ozone layer depletion, nuclear accidents and holocausts.</p> <p>Wasteland Reclamation; Consumerism and Waste products.</p> <p>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.</p> <p>Public awareness – Using an environmental calendar of activities, self-initiation.</p>	
Unit VII : Human Population and the Environment	(4Hrs.)
<p>Global population growth, variation among nations. Population explosion; Family Welfare Programmes – methods of sterilization; Urbanization.</p> <p>Environment and human health – Climate and health, infectious diseases, water-related diseases, risk due to chemicals in food, Cancer and environment.</p> <p>Human rights – equity, Nutrition and health rights, Intellectual property rights (IPRS), Community Biodiversity registers (CBRs).</p> <p>Value education – environmental values, valuing nature, valuing cultures, social justice, human heritage, equitable use of resources, common property resources, ecological degradation.</p> <p>HIV / AIDS; Women and Child Welfare; Information technology in environment and human health.</p>	
Total Lecture 24 Hours	

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

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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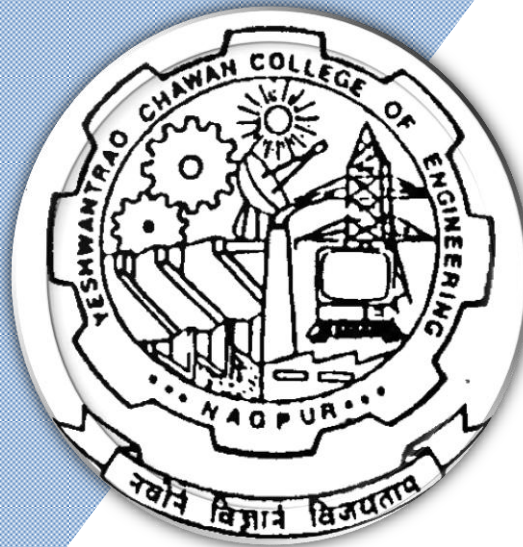
Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

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

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

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)

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

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

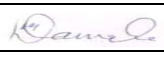

SECOND SEMESTER															
1	2	BS	GE/MTH	22CSE201	Calculus Sequences and Series	T	3	1	0	4	4	30	20	50	3 Hrs
2	2	BS	GE/CHE	22CSE202	Engineering Chemistry	T	3	0	0	3	3	30	20	50	3 Hrs
3	2	BS	GE/CHE	22CSE203	Lab: Engineering Chemistry	P	0	0	2	2	1		60	40	
4	2	HS	GE/HUM	22CSE204	Professional Communication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

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

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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(Department of Computer Science and Engineering)

B.Tech in Computer Science and Engineering

SoE No.
22CSE-101

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

Reference Books:




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

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

1	http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/
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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, Electro winning, 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. H ₂ -O ₂ 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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SoE No.
22CSE-101

B.Tech in Computer Science and Engineering

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.

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]

1	http://103.152.199.179/YCCE/Supported%20file/Supprted%20file/SERIES%20WISE%20BOOKS/CHEMISTRY/
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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=i1hYXx79QiE
4.	https://www.youtube.com/watch?v=JfJ7MIP9Dco
5.	https://www.youtube.com/watch?v=L2VSOccUrSk

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SoE No.
22CSE-101

B.Tech in Computer Science and Engineering

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 KMnO ₄ and determine the concentration of the given solution of KMnO ₄

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22CSE-101**

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List of Demonstration Experiments	
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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SoE No.
22CSE-101

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)	
Total Lecture	39 Hours

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B.Tech in Computer Science and Engineering

Textbooks:




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

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.

MOOCs Links and additional reading, learning, video material

1. <https://dl.uswr.ac.ir/bitstream/Hannan/141245/1/9781138219120.pdf>
2. <https://www.pdfdrive.com/word-power-made-easy-the-complete-handbook-for-building-a-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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22CSE-101

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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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(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

Textbooks:	
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.
Reference Books:	
1.	Timoshenko S, Young D.H and Rao J.V, Engineering Mechanics, Mc. Graw Hill Publication, New Delhi, 2007.
2.	Bhattacharyya B., Engineering Mechanics, Oxford University Press, New Delhi, 2008.
3.	Hibbeler R.C, Engineering Mechanics (Statics and Dynamics), Pearson Publication, Singapore, 2000.
4.	Shames I.H. and Rao J.V., Engineering Mechanics (Statics and Dynamics), First Edition, Pearson Publication, New Delhi, 2003.
5.	Beer F.P. and Johnston E.R; Vector Mechanics for Engineers, 9 th edition Tata Mc. Graw Hill Publication, New Delhi. 2007.
YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Civil%20Engineering/78.%20Engineering-Mechanics-Statics-and-Dinamics-E-W-Nelson-C-L-Best-W-G-McLean-1st-Ed-1997-Schaum-Outline-McGraw-Hill%20(1).pdf
2	chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Civil%20Engineering/79.%20Engineering%20Mechanics.%20Statics-%20MERIAM%20%20AND%20KRAIGE.pdf
3	chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Civil%20Engineering/81.%20Engineering%20Mechanics%201.pdf
MOOCs Links and additional reading, learning, video material	
1.	https://www.youtube.com/watch?v=nGfVTNfNwnk
2.	https://www.youtube.com/watch?v=6nguX-cEsvw
3.	https://nptel.ac.in/courses/112103108

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22CSE-101

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.
3. Determine the properties of surface like centroid, moment of inertia, etc. for planar surfaces and mass moment of inertia for rigid body.
4. Analyze pin jointed truss frame structure and beam structure analytically and graphically.
5. Evaluate the dynamic variables of kinetics of particles and simple lifting machine

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

SN	Experiments based on
1	To find determine the support reactions of a Simply Supported Beam experimentally and analytically.
2	To determine the forces in the members of a Jib Crane Apparatus experimentally and graphically.
3	To determine the coefficient of friction between two surfaces of different material on Plane Friction Apparatus.
4	To determine the coefficient of friction of Coil Friction Apparatus.
5	To determine the forces in members of a Shear Leg Apparatus experimentally and manually.
6	To determine the mass moment of inertia of a fly wheel using Fly Wheel Apparatus
7	To determine efficiency and law of machine of Differential Axel & Wheel machine.
8	To determine efficiency and Law of machine of Single Purchase Crab machine.
9	To determine efficiency and Law of machine of Double Purchase Crab machine.
10	To verify law of polygon 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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22CSE-101

B.Tech in Computer Science and Engineering

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

Textbooks




1	Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford Higher Education, First Edition 2005
2	Electronics Devices and circuits, Millman Jacob, McGraw Hill Education, Fourth Edition (2015)
3	"Modern Digital Electronics" by R. P. Jain, 4th Edition, McGraw Hill Education Private Limited, published in 2015

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).

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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B.Tech in Computer Science and Engineering

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)

Total Lecture 39 Hours

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B.Tech in Computer Science and Engineering

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

Reference Books:

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

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

1	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

MOOCs Links and additional reading, learning, video material

1.	https://archive.nptel.ac.in/courses/106/104/106104128/
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22CSE-101

B.Tech in Computer Science and Engineering

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.

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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 (4 Hrs.)

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 Validation- as 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! (4 Hrs.)

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 values in relationship

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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, Sahastva 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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II SEMESTER

Audit Course

MLC2122: YCAP2 -Functional English

MLC2122	No of Evaluations	Result of successful completion of YCAP II shall be calculated based on the basis of evaluations. To pass the exam a students must score 50% marks
YCAP-II		
Evaluation Scheme	EVAl-I 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.	Topic	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	1.5 Hours
	Quiz on the above Topics, Exercises for Evaluation	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	3 Hours
	Topic: Introduction to Creative Ads Why Ads, Whats in it for me?, Characteristics of ads, Assignment	
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 No.	Topic	Duration
5	Topic: Tenses -2 Introduction & Basics, Perfect Tense (Past, Present, Future), Perfect Continuous Tense (Past, Present, Future) – discussion with examples	3.5 Hours
	Topic: Introduction to Movie Magic Learn English with films, Film Vocabulary, Describing a film, Types of Films,	
6	Topic: Written Communication 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:

1. Soft Skills and Professional Communication, Francis Peters SJ, Mcgraw Hill Education
2. Bringing out the best in People, Aubrey Daniels, Mcgraw Hill

MOOCs Links and additional reading, learning, video material

1. <https://www.youtube.com/channel/UCLsI5-B3rIr27hmKqE8hi4w>
2. <https://www.youtube.com/channel/UC1Y1I4shF84scQ4HBThahcg>

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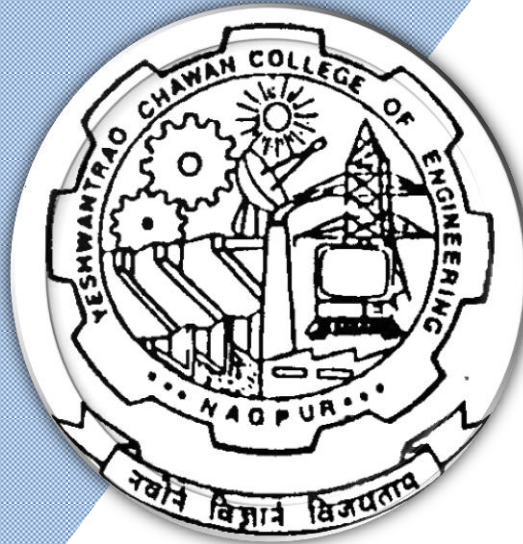
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Yeshwantrao Chavan College of Engineering

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

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

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

B.TECH SCHEME OF EXAMINATION 2022
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(Department of Computer Science & Engineering)
B. Tech in Computer Science & Engineering)

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

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

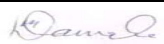

FOURTH SEMESTER															
1	4	BS	GE/GE	22CSE401	Linear Algebra	T	3	0	0	3	3	30	20	50	3 Hrs
2	4	HS	GE/HUM	22CSE402	Fundamentals of Management and Economics	T	3	0	0	3	3	30	20	50	3 Hrs
3	4	PC	CSE/CSE	22CSE403	Theory of Computation	T	3	1	0	4	4	30	20	50	3 Hrs
4	4	PC	CSE/CSE	22CSE404	Operating Systems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

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

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

6

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

7

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

6

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

39

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(Department of Computer Science and Engineering)

SoE No.
22CSE-101

B.Tech in Computer Science and Engineering

Text 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.	Fuzzy Logic with Engineering Applications, T. J. Ross, John Wiley & Sons, Ltd. ISBN: 978-81-265-3126-4

Reference Books


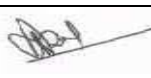
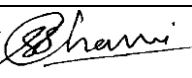
1.	Discrete Mathematics ,2nd edition, Lipschutz, by Schaums's Outline series, Tata McGraw-Hills Publication Company Limited, New Delhi.
2.	Discrete Mathematical structures ,3rd edition,2001, Bernard Kolman ,Robert C.Busby,Sharon Ross,Prentice Hall of India, New Delhi.

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

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

MOOCs Links and additional reading, learning, video material

1.	https://onlinecourses.nptel.ac.in/noc20_cs82/preview
2.	https://onlinecourses.nptel.ac.in/noc20_cs37/preview

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(Department of Computer Science and Engineering)

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

7

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

6

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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(Department of Computer Science and Engineering)

SoE No.
22CSE-101

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:

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

7

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

7

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

6

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, Treaset, Hashmap, Accessing a collection via Iterator, Comparators.
(Contemporary Issues related to Topic)

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22CSE-101

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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 write 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

1. Java Complete Reference, 7th, Herbert Schildt, McGraw-Hill

Reference Books




1. Thinking in Java, 4th, Bruce Eckel, Prentice Hall
2. Programming with Java, E. Balagurusamy, TATA McGraw-Hill

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

1. http://103.152.199.179/YCCE/Supported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/JAVA_Complete_Reference_Fifth_Edition.pdf
2. http://103.152.199.179/YCCE/Supported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/thinking_in_java_4th_edition.pdf

MOOCs Links and additional reading, learning, video material

1. https://onlinecourses.nptel.ac.in/noc22_cs47/preview

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(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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(Department of Computer Science and Engineering)

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:

6

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:

7

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:

6

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:

7

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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SoE No.
22CSE-101

B.Tech in Computer Science and Engineering

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

Reference Books




1.	Data Structures with C, Seymour Lipschutz, TMH
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YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1	http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/Book%20Fundamentals%20of%20Data%20Structure%20(1982)%20by%20Ellis%20Horowitz%20and%20Sartaj%20Sahni.pdf
2	http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/Data%20Structures%20Succinctly%20Part%201.pdf

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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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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UNIT VI: Introduction to XML	6
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

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

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

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/HTML.._the_complete_reference.pdf
2	http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/JavaScript%20Programmer's%20Reference.pdf

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

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(Department of Computer Science and Engineering)

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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SoE No.
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B.Tech in Computer Science and Engineering

III Semester

Audit Course

MLC2123 - YCCE Communication Aptitude Preparation (YCAP3)

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YCCE-CSE-14



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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

III Semester

Audit Course

MLC115 : Latex

Course Outcomes

After studying this course the student will be able to:

- Create and typeset a LaTeX document.
- Typeset a mathematical document using LaTeX.
- Learn about pictures and graphics in LaTeX.
- Create beamer presentations.
- Create web page using HTML.

Unit I: Getting Started with LaTeX

6

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.

Total Lectures 24 Hrs

Text Books:

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

Reference Book:

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

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

- <http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/>

MOOCs Links and additional reading, learning, video material

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

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

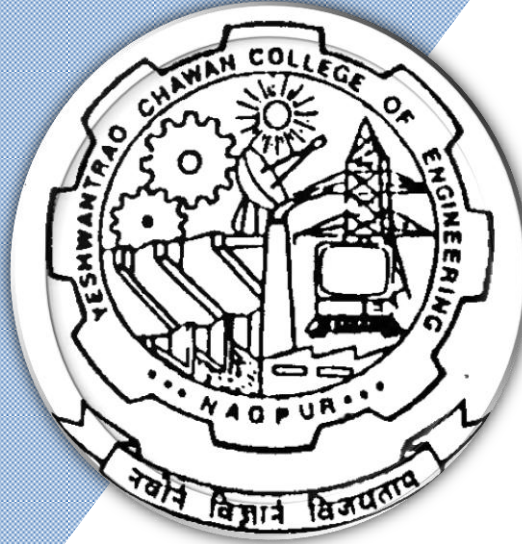
Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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

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

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

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)

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

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

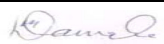

FOURTH SEMESTER															
1	4	BS	GE/GE	22CSE401	Linear Algebra	T	3	0	0	3	3	30	20	50	3 Hrs
2	4	HS	GE/HUM	22CSE402	Fundamentals of Management and Economics	T	3	0	0	3	3	30	20	50	3 Hrs
3	4	PC	CSE/CSE	22CSE403	Theory of Computation	T	3	1	0	4	4	30	20	50	3 Hrs
4	4	PC	CSE/CSE	22CSE404	Operating Systems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

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

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

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 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

7

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

6

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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YCCE-CSE-1



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(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

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, Gilbert Strang, Nelson Engineering (2007)

Reference Books




1.	Mathematics for Engineers, 19th edition, (2007), Chandrika Prasad, John Wiley & 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

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

1	http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/
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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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YCCE-CSE-2



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(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

7

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

7

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- Journal, 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

6

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

6

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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SoE No.
22CSE-101

B.Tech in Computer Science and Engineering

UNIT VI: Market structures - equilibrium output and price	6
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	
1.	Principles of Management, 9 th edition, Harold Koontz Ramchandra, Tata McGraw hills
2.	Marketing Management: Planning, Implementation and Control, 3rd Edition, Ramaswamy V.S. and Namakumari S, Macmillian, Tata McGraw Hill
3.	Financial Services, 19 th Edition, Khan M Y, Tata McGraw Hill
4.	Modern Economics, 13th Edition, H. L. Ahuja, S. Chand Publisher
5.	Modern Economic Theory, 3rd Edition, K. K. Devett, S. Chand Publisher
6.	Principle of Economics, 7th edition, Mankiw N. Gregory, Thomson

Reference Books	
1.	Foundations of Financial Markets and Institutions, 3 rd Edition, Fabozzi, Prentice Hall
2.	Fundamentals of Financial Instruments, 2 nd Edition, Parameshwaran, Wiley India
3.	Marketing Management, 3 rd Edition, Rajan Saxena, Tata McGraw Hill
4.	Advance Economic Theory, 17th Edition, H. L. Ahuja, S. Chand Publisher
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

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/

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

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**SoE No.
22CSE-101**

B.Tech in Computer Science and Engineering

IV Semester

222CSE403– Theory of Computation

Course Outcome

1. 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.
3. Solve various problems of push down automata for context free language
4. Design Turing Machines for given any computational problem.

UNIT I:

7

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:

7

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., Inter-conversion between RE and RG.

(Contemporary Issues related to Topic)

UNIT III:

7

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

(Contemporary Issues related to Topic)

UNIT IV:

6

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:

6

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 μ recursive function unbounded minimization and recursive function

(Contemporary Issues related to Topic)

Total Lectures

39

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22CSE-101

B.Tech in Computer Science and Engineering

Text Books

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

Reference Books

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

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

1. <http://103.152.199.179/YCCE/Supported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/Introction%20to%20Theory%20of%20computation%20by%20Micheal%20Sipser%20Ist%20Ed..pdf>

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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SoE No.
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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

7

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

7

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

7

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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YCCE-CSE-7



Nagar Yuwak Shikshan Sanstha's

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B.Tech in Computer Science and Engineering

UNIT VI: File systems	7
Introduction, Access methods, Directory Structure disk space management and space allocation strategies, disk arm scheduling strategies: FCFS, SSTF, SCAN, CSACN, LOOK, CLOOK, Selecting a disk scheduling algorithm. (Contemporary Issues related to Topic)	
Total Lectures	39

Text 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

Reference Books	
1	Operating Systems: A Design-Oriented Approach , Charles Crowley ,McGraw Hill
2	Operating system concepts and Design, Milan MilenKovic ,Tata McGraw Hill

YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]	
1	http://103.152.199.179/YCCE/Supported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/Operating%20System%20Concept%2008thedition.pdf
2	http://103.152.199.179/YCCE/Supported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/Operating%20System.pdf

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/

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SoE No.
22CSE-101




B.Tech in Computer Science and Engineering

IV Semester

222CSE405– Lab.: Operating Systems

List of Experiment

Sr. No.	Experiments based on
1	Study of Window task manger(Exploring various tabs: application, processes, services, networking, performance)
2	Study of Advanced Linux shell commands (Process management, memory management, networking, etc.)
3	Write a program that illustrates the creation of child process using fork system call. Each child and parent Processes perform different task.
4	Write a multithreaded program to multiply two given matrices.
5	Simulate: a. Any preemptive CPU Scheduling Algorithm b. Any Non-preemptive CPU Scheduling Algorithm
6	Write a program to perform Inter-Process-Communication using shared memory or, pipes or message queues.
7	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 Philosophers problem using semaphores.
8	Simulate: a. First Fit(Static Memory allocation algorithm) and b. Worst Fit(Dynamic Memory allocation algorithm)
9	Simulate any one of the following page replacement algorithms: FIFO, LRU, Optimal
10	Write a program to simulate Banker's Deadlock avoidance algorithm.

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(Department of Computer Science and Engineering)

SoE No.
22CSE-101

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.

UNIT I: Linked Lists

7

Singly-linked lists, doubly linked lists and circular linked lists. Operations on linked list: traversal, addition, deletion of nodes, list reversal, Applications of lists in polynomial representation, multi-precision arithmetic. Multi linked structures, implementation of priority queues.
(Contemporary Issues related to Topic)

UNIT II: Sets

6

Data structures for disjoint set representation and operations, sorting, searching
(Contemporary Issues related to Topic)

UNIT III: Binary Trees

7

Binary trees, binary trees- basic algorithms and various traversals. Binary Search Trees (BSTs) and insertion, deletion in BSTs. Heaps and heap sort
(Contemporary Issues related to Topic)

UNIT IV: Balanced trees

7

Height-balanced (AVL) trees, Splay tree, Red-black trees, Multi-way trees-B and B+ and applications
(Contemporary Issues related to Topic)

UNIT V: Multidimensional trees

6

Tries and Pattern matching algorithms
(Contemporary Issues related to Topic)

UNIT VI: Graphs Representation & traversals

6

Spanning trees, topological sort, shortest path algorithm, all-pairs shortest paths
(Contemporary Issues related to Topic)

Total Lectures

39

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B.Tech in Computer Science and Engineering

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

Reference books:

1.	Data Structures with C, Seymour Lipschutz, TMH
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YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]

1	http://103.152.199.179/YCCE/Supported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/Book%20Fundamentals%20of%20Data%20Structure%20(1982)%20by%20Ellis%20Horowitz%20and%20Sartaj%20Sahni.pdf
2	http://103.152.199.179/YCCE/Supported%20file/Supprted%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/Data%20Structures%20Succinctly%20Part%201.pdf

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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B.Tech in Computer Science and Engineering

IV Semester

222CSE407 Lab– Data Structures II

List of Experiment

Sr. No.	Experiments based on
1	Program/s based on operations on singly linked list
2	Program/s based on operations on doubly linked list
3	Program based on Binary trees- traversal
4	Programs based on Binary search tree
5	Programs based on Tries
6	Program based on Balanced trees
7	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:

7

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 ,Correlation analysis, (Contemporary Issues related to Topic)	
Total Lectures	39

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, 7 th Edition, Pearson Education
3.	Probability and Statistics , Murray R. Spiegel, John J.Schiller, R AluSrinivasan, Third Edition, Mc Graw Hill education

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

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

1	http://103.152.199.179/YCCE/Supported%20file/Supported%20file/SERIES%20WISE%20BOOKS/COMPUTER%20SCIENCE/COMPUTER%20SCIENCE%20(E%20Series).pdf
2	http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/The%20Art%20of%20R%20Programming.pdf

MOOCs Links and additional reading, learning, video material

1.	https://onlinecourses.nptel.ac.in/noc21_ma74/preview
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B.Tech in Computer Science and Engineering

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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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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Text books

1	Chiras, D. D and Reganold, J. P. (2010). Natural Resource Conservation: Management for a Sustainable Future. 10th edition, Upper Saddle River, N. J. Benjamin/Cummins/Pearson
2	Rajagopalan, R. (2011). Environmental Studies: From Crisis to Cure. India: Oxford University Press
3	Krishnamurthy, K.V. (2003) Textbook of Biodiversity, Science Publishers, Plymouth, UK
4	Jackson, A. R., & Jackson, J. M. (2000). Environmental Science: The Natural Environment and Human Impact. Pearson Education
5	Pittock, Barrie (2009) Climate Change: The Science, Impacts and Solutions. 2nd Edition. Routledge.
6	Theodore, M. K. and Theodore, Louis (2021) Introduction to Environmental Management, 2nd Edition. CRC Press
7	Kanchi Kohli and Manju Menon (2021) Development of Environment Laws in India, Cambridge University Press

Reference Books

1	Headrick, Daniel R. (2020) Humans versus Nature- A Global Environmental History, Oxford University Press
2	Gilbert M. Masters and W. P. (2008). An Introduction to Environmental Engineering and Science, Ela Publisher (Pearson)
3	William P. Cunningham and Mary A. (2015). Cunningham Environmental Science: A global concern, Publisher (Mc-Graw Hill, USA)
4	Varghese, Anita, Oommen, Meera Anna, Paul, Mridula Mary, Nath, Snehlata (Editors) (2022) Conservation through Sustainable Use: Lessons from India. Routledge.
5	Central Pollution Control Board Web page for various pollution standards. https://cpcb.nic.in/standards
6	Barnett, J. & S. O'Neill (2010). Maladaptation. Global Environmental Change—Human and Policy Dimensions 20: 211–213
7	Richard A. Marcantonio, Marc 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

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IV Semester

Audit Course

MLC2124 - YCCE Communication Aptitude Preparation (YCAP4)

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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:

6

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:

6

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:

6

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:

6

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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22CSE-101**

B.Tech in Computer Science and Engineering

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

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

1	http://103.152.199.179/YCCE/Supported%20file/Supported%20file/e-copies%20of%20books/Computer%20Science%20and%20Engineering/
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MOOCs Links and additional reading, learning, video material

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