Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester: B. Tech -1st	Branch: Common to all Branches			
Subject: Engineering Mathematics I	Code: 3000A02AT014			
Maximum/ Minimum- Passing Marks: Maximum: 100 Minimum: 35	Periods/Week:			
	L	T	P	Ass. Hours
	3	1	0	1/Week
Class Tests: 2 (Mandatory)	Assignments: 2 (Minimum)			
Duration (ESE): 3 hours	Total Credits: 4			

Course Objectives

The objective of the course is aimed to;

1) Develop the basic mathematical skills of engineering students that are imperative for effective understanding of engineering subjects.

2) Also, the topics introduced will serve as basic tools for specialized studies in many fields of engineering and technology.

3) This course includes: Matrices, Differential Calculus, Partial Differentiation, Integral Calculus and Ordinary Differential Equations.

Course Outcomes

On successful completion of the course, the students will be able to:

CO1:- Apply the concept of Rank of Matrices and Cayley-Hamilton Theorem. Problems on solution of a system of linear equations by matrix method. Implement the concept of Eigen values and Eigen vectors in engineering problems.

CO2:- Apply the method of Successive Differentiation for Expansion of functions and Tracing of simple curves.

CO3:- Solve the problems of Maxima& Minima of functions of two variables and use Jacobians in formulation of practical problems.

CO4:- Apply integration for Rectification, Quadrature and Volume of revolution and apply Differentiation under the integral sign to definite integrals.

CO5:- Solve Linear as well as Nonlinear Differential Equations of first order. Also, to solve Linear Differential Equations of Higher Order.

UNIT– I: Matrices

Rank of matrix by elementary transformation (Echelon and Normal form); Inverse of the matrix by Gauss-Jordan's method; Consistency of a system of linear equations (Homogeneous and Non-homogeneous); Eigen values and Eigen vectors; Cayley- Hamilton theorem with applications. **[12Hrs]**

UNIT–II: Differential Calculus

Successive differentiation; Leibnitz theorem; Fundamental theorems: Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem (without proof); Expansion of functions in Taylor's and Maclaurin's series; Tracing of simple curves. **[12Hrs]**

UNIT–III: Partial Differentiation
Partial derivatives; Euler's theorem on Homogeneous functions; Jacobians; Maxima and Minima of function of two variables; Method of Lagrange's undetermined multipliers. **[12Hrs]**

UNIT–IV: Integral Calculus
Reduction formulae; Application of integrals to rectification Quadrature Volume of revolution; Differentiation under integral sign. **[12Hrs]**

UNIT–V: Ordinary Differential Equation
Exact differential equations; Reducible to exact form; Nonlinear first order differential equation (solvable for p, x and y); Linear differential equation of higher order with constant coefficients; Method of variation of parameters; Cauchy's and Legendre's differential equations. **[12Hrs]**

TextBooks:

S.No.	Title	Authors	Edition	Publisher
1)	Higher Engineering Mathematics	B.S. Grewal	44th Edition,2017	KhannaPublishers
2)	Advanced Engineering Mathematics	H.K. Dass	28th Edition, 2012	S. Chand Publication
3)	Advanced Engineering Mathematics	Erwin Kreyszig	9th Edition, 2006	John Wiley & Sons
4)	Applied Engineering Mathematics	MadanMohanSingh	2nd Edition,2016	B S Publications
5)	Engineering Mathematics (Hindi)	S. C. Goyal	6th Edition, 2022	Khanna Publishers
6)	Engineering Ganit(Vol 1 aur 2)	R. K. Jain	10th Edition, 2023	Vikas Publishing House

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1)	Calculus and Analytic geometry	G.B. Thomas and R.L. Finney	9th Edition2002	Pearson, Reprint
2)	Engineering Mathematics for first year	T. Veerarajan	2008	Tata Mc Graw -Hill, New Delhi
3)	Higher Engineering Mathematics	B.V.Raman	11th Reprint 2010	Tata Mc Graw Hill New Delhi
4)	A text book of Engineering Mathematics	N.P. Bali and Manish Goyal	Reprint, 2010.	Laxmi Publications
5)	Ganit aur Uske Anuprayog	V. K. Singh	5th Edition, 2021	Arihant Publication

E- resources/ Web Sources: NPTEL You Tube Channel

- SWAYAM Portal: Online Lectures on Engineering Mathematics. (https://onlinecourses swayam2.ac.in/cec20_ma02/preview)

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester-1st/2nd	Branch:Circuit Branch
Subject:Engineering Physics - A	Code: 3000A03AT015
Maximum/Minimum- Passing marks:100/35	Periods/week: L: 3 | T: -- | P: -- | Ass. Hours: 1/week
Class Tests: 2 (Mandatory)	Assignments: 2 (Minimum)
Duration (ESE): 3 hours	TotalCredits: 3

Course Objectives:

1. Understand the basic principles of band theory of solids and semiconductors.
2. Understand the underlying mechanism involved in construction and working principle of p-n junction diode.
3. Study of principles of interference & diffraction with applications.
4. Study the principle and types of lasers and optical fibres.
5. Study the fundamental concepts related to dielectrics and electron trajectories in uniform electric and magnetic fields.

UNIT I:SEMICONDUCTORS [09 Hrs]

Classification of solids on the basis of conductivity, Formation of Energy bands in solids and their diagrams (Energy level approach), Types of electronic materials: Conductors, Semiconductors, and Insulators on the basis of energy band theory, Concept of Fermi Level, Intrinsic semiconductor, Carrier concentration, Doped or extrinsic semiconductor: n and p-type semiconductors, Fermi level in Intrinsic and Extrinsic semiconductors, Dependence of Fermi level on impurity concentration and temperature, Law of mass action, Charge neutrality condition, Carrier transport: Drift, Diffusion and Total current.

UNITII:SEMICONDUCTOR DIODE [09Hrs]

p-n Junction diode, Formation of p-n Junction, Depletion region, Potential barrier and its calculation, Energyband structure of p-n junction diode at equilibrium, Forward and Reverse biasing with energy band diagram, Voltage-Ampere Characteristic of p-n junction diode. Light Emitting Diode, Solar cell, Photo diode and characteristics.

UNITIII:WAVE OPTICS [09Hrs]

Superposition of waves, Interference of light by division of wave front: Fresnel's bi-prism and its application (thickness of thin transparent sheet), Interference of light by division of amplitude: Wedge shaped film, Newton's rings and its applications (wavelength and refractive index), Fraunhofer diffraction from a single slit, Diffraction grating, Rayleigh's criterion for the limit of resolution, Resolving power of grating.

UNIT IV: LASERS AND FIBRE OPTICS [09 Hrs]

Einstein's theory of matter-radiation interaction and A and B coefficients, Amplification of light by population inversion in optical resonator, Different types of lasers: Solid-state laser (Nd:YAG laser), Gas laser (CO_2 laser), Semiconductor Laser. Properties of laser beam & its applications.

Fibre Optics: Introduction, Total internal reflection, Propagation of light through optical fibre, Acceptance angle and acceptance cone, Numerical aperture, Types of optical fibre on the basis of Modes of propagation & Index profile, V-number, Fibre Losses (attenuation) and Dispersion, Advantages & Applications.

UNITV: DILECTRICS AND ELECTRON BALLISTICS [09 Hrs]

Dielectrics: Dielectric constant, Dielectric Polarization, Bound and free charges, Relation withpolarization, Gauss's law in dielectrics, Dielectric susceptibility, Displacement vector D, E, andP vectors, Polar and nonpolar dielectrics, Different types of polarization, Temperature andfrequency dependence of total polarization.

Electron ballistics: Motion of charged particles in transverse electric and magnetic field, Aston and Bainbridge mass spectrograph.

CourseOutcomes:

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

1. Analyze the concept of band theory and visualize semiconductor using band theory.
2. Identify the role of p-n junction diode in science and engineering applications.
3. Explain wave optics concept and apply it tosolve related problems in science and engineering.
4. Analyze various aspects of Lasers and optical fibres and their applications in diverse fields.
5. Learn to apply the concepts of dielectric and electron ballistics.

TextBooks:

S. No.	Title	Authors	Edition	Publisher
1.	Engineering Physics	P. G. Kshirsagar & M. N. Avadhanulu	Latest	S. Chand Publications
2.	Engineering Physics	R. K. Gaur, S. L. Gupta	4th	Dhanpat Rai Publications
3.	Textbook of Engineering Physics	S.O. Pillai, Sivakami	Latest	New Age International Publishers
4.	Applied Physics	Navneet Gupta	Latest	Dhanpat Rai & Co.
5.	Concepts of Modern Physics	Auther Beiser	7th	Tata McGraw Hill
6	अन्प्रयुक्तभौतिकी	एम डी केला		दीपक प्रकाशन
7	इंजीनियरिंग भौतिक विज्ञान	आर के गर्ग, आलोक प्रकाश मित्तल		दीपक प्रकाशन

ReferenceBooks:

S. No.	Title	Authors	Edition	Publisher
1.	Optics	A. Ghatak	4th	McGraw Hill Education
2.	A Text Book of Optics	N. Subrahmanyam & Brijlal	25th	S. Chand Publication
3.	Solid State Physics	S. O. Pillai	8th	New Age International
4.	Introduction to Solid State Physics	Charles Kittel	8th	Wiley
5.	Semiconductor Optoelectronics: Physics and Technology	J. Singh	2nd	McGraw-Hill Inc
6.	Concept of modern physics	Arther Beiser	6h	McGraw-Hill Inc
7.	Principles of Lasers	O. Svelto	5th	Springer Science & Business Media
8.	Lasers & Non-Linear Optics	B. B. Laud	3rd	New Age International
9.	Fibre Optics and Lasers	Ajoy Ghatak and K. Thyagarajan	1st	Macmillan India Ltd.

10.	Principles of Physics	Halliday, Resnick and walker	11th	Global Edition
11.	Modern Physics for Engineers	S.P. Taneja	7th	R. Chand
12.	Engineering Physics	Malik and Singh	1st	Tata McGraw Hill
13.	Unified Physics- Second & Third Yr.	R. P. Goyal	Latest	Shiva Lal Agrawal and Company
14	यूनिफाइड भौतिकी – द्वितीय एवं तृतीय वर्ष	आर. पी. गोयल		शिवा लाल अग्रवाल एंड कंपनी

E-resources/Web Sources:

- https://archive.nptel.ac.in/courses/115/106/115106133/
- https://onlinecourses.nptel.ac.in/noc25_ph03/preview
- https://onlinecourses.nptel.ac.in/noc25_ch04/preview
- https://onlinecourses.nptel.ac.in/noc25_ph04/preview
- https://onlinecourses.nptel.ac.in/noc25_ph06/preview
- https://onlinecourses.swayam2.ac.in/nou25_ma02/preview

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester-1st/2nd	**Branch:(Non-Circuit Branch)**
Subject:Engineering Physics - B	**Code: 3000A04AT015**
Maximum/Minimum-Passing marks:100/35	**Periods/week:**

L	T	P	Ass. Hours
3	--	--	1/week

Class Tests: 2 (Mandatory)	**Assignments: 2 (Minimum)**
Duration (ESE): 3 hours	**TotalCredits:3**

Course Objectives:

1. What the concept of forces means in Physics and the significance of the net force on an object.
2. To understand the nature of the different types of friction forces.
3. The meaning of a body's moment of inertia about a rotation axis.
4. Learn how to use the relationship between total work and change in kinetic energy.
5. To develop and understanding of the behavior of fluids as rest or in motion.

UNIT I:FORCES AND FORCE SYSTEM; EQUILIBRIUM [09 Hrs]

Idealisation of bodies, Rigid body, Force, Concept of resultant of several forces, Composition of forces (Polygon Law), Resolution of forces into components, Resultant of forces, Equilibrium of Concurrent forces in a plane, Moment of force, Varignon's theorem, Constraint, Action and reaction, Types of support and support reaction, Free body diagrams, Parallel forces in a plane.

UNITII:FRICTION [09Hrs]

(a) Introduction, Types of friction, limiting friction, Laws of friction, Static and dynamic friction, Angle of friction, Angle of repose, Cone of friction, Friction on body, Wedge friction, Belt and rope friction, Ladder friction, Belt drives, Ratio of tensions, Simple screw jack.

(b) Principle of virtual work.

UNITIII: MOMENT OF INERTIA [09Hrs]

Introduction, Centre of gravity, Centre of mass, Moment of Inertia, Plate,Cylinder, Cone, Sphere.Centroid of one dimensional and twodimensional body, Centroid of composite sections. Moment of inertia of rectangular plane, Polar moment of inertia, radius of gyration of area, Theorems of moment of inertia, Product of inertia of plane section, Displacement of axes, Rotation of axes, Principal axes, Principle of moment of Inertia.

UNIT IV: KINETICS AND KINEMATICS [09Hrs]

Rectilinear motion of Particle; Displacement, Velocity, Acceleration, D'Alembert's principle, Work and energy principle, Principle of conservation of energy, Power, Impulse and Momentum principle.

UNITV: FLUID PROPERTIES [09 Hrs]

Introduction, Mass density, Weight density, Specific volume, Specific gravity, Viscosity, Ideal, Real, Newtonian and Non-Newtonian fluids, Compressibility and bulk modulus, Surface tension, capillarity, Vapour pressure, Pressure in fluid, Pascal's law, Hydrostatic law, Manometry, Hydrostatic force on submerged plane and curved surface, Buoyancy and floatation

CourseOutcomes:

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

1. Apply basic concepts and analyze the system of forces.

2. Analyze the systems by applying law of friction.
3. Calculate the moment of inertia of bodies with various shapes.
4. Analyze problem related to kinetics and kinematics of particles.
5. Apply the key concepts of density, pressure, Buoyancy in fluids.

TextBooks:

S. No.	Title	Authors	Edition	Publisher
1	University Physics	Hugh D. Young Roger A. Freedman	Latest	Pearson Education Limited
2	Engineering Mechanics	A. K. Tayal	Latest	Umesh Publications
3	Textbook of Fluid Mechanics and Hydraulic Machines	R. K. Bansal	Latest	Laxmi Publications (P) Ltd.
4	भौतिक शास्त्र (यांत्रिकी परिचय)	ए. बी. भट्टाचार्य, अतनु गुप्ता	प्रथम 2021	Khanna Book Publishing Co. (P) Ltd. AICTE अनुशंसित पाठ्यपुस्तक – मॉडल पाठ्यक्रम के अनुसार (AICTE e-कुम्भ मे उपलब्ध)
5	इंजीनियरिंग यांत्रिकी	भानकर भारत गोकलदास	प्रथम 2021	Khanna Book Publishing Co. (P) Ltd. AICTE अनुशंसित पाठ्यपुस्तक – मॉडल पाठ्यक्रम के अनुसार (AICTE e-कुम्भ मे उपलब्ध)

ReferenceBooks:

S. No.	Title	Authors	Edition	Publisher
1.	Engineering Mechanics	S. Timoshenko and D.H. Young	Latest	Tata McGraw Hill
2.	Engineering Physics	R. K. Gaur, S. L. Gupta	4th	Dhanpat Rai Publications
3.	Physics(Introductionto Mechanics)	A.B. Bhattacharya	1st 2021	Khanna Book Publishing Co. (P) Ltd. As per AICTE prescribed Syllabus under NEP-2020 (Available in AICTE e-Kumbh)
4	Engineering Mechanics: Principles of Statics and Dynamics	R.C. Hibbeler	Latest	Pearson
5	Engineering Mechanics (Statics and Dynamics)	D.S. Kumar	Latest	S.K. Kataria& Sons
6	Engineering Mechanics	S. S. Bhavikatti and K.G. Rajeshkerappa	Latest	New Age International
7	Unified Physics- First Year	R. P. Goyal	Latest	Shiva Lal Agrawal and Company
8	यूनिफाइड भौतिकी – प्रथम वर्ष	आर. पी. गोयल		शिवा लाल अग्रवाल एंड कंपनी

E-resources/Web Sources:

- https://archive.nptel.ac.in/courses/115/106/115106133/
- https://onlinecourses.nptel.ac.in/noc25_ph03/preview
- https://onlinecourses.nptel.ac.in/noc25_ch04/preview
- https://onlinecourses.nptel.ac.in/noc25_ph04/preview
- https://onlinecourses.nptel.ac.in/noc25_ph06/preview
- https://onlinecourses.swayam2.ac.in/nou25_ma02/preview

Chhattisgarh Swami Vivekanand Technical University, Bhilai(CG)

Semester- B.Tech-1st Sem (Common to all)	Branch: Electrical Engineering			
Subject: Basic Electrical Engineering	Code: 3000A05AT024			
Maximum/Minimum Passing Marks:100/35	Periods/week:			
	L	T	P	Ass. Hours
	3	-	-	1/week
Class Tests: 2 (Mandatory)	Assignments: 2 (Minimum)			
Duration (ESE): 3 Hours	Total Credits: 3			

Course Objectives:

- To impart a basic knowledge of electrical quantities such as current, voltage, power, energy and frequency.
- To provide working knowledge for the analysis of single phase AC circuits.
- To provide working knowledge of three phase AC circuits.
- To introduce an analogy between electric and magnetic circuits.
- To introduce the concepts of transformers and its importance.

Course Outcomes:

On successful completion of the course, the students will be able:

CO1 To apply network theorems to solve electrical DC circuits.
CO2 To formulate and solve complex AC circuits.
CO3 To draw phasor diagrams for 3 phase balanced star and delta connected systems.
CO4 To solve series and parallel magnetic circuits.
CO5 To explain the basic operating principle, types, operating performance of Transformers.

Unit I: DC Circuits: [09 Hrs]

Active, passive, unilateral, bilateral, linear, nonlinear, lumped and distributed networks, classification of voltage & current sources (Ideal, Practical, independent & dependent type), Kirchhoff's Laws, mesh and nodal analysis, Superposition Theorem, Thevenins Theorem. (Only Independent Sources)

Unit II: Single phase AC circuit: [09 Hrs]

Pure Sinusoidal waveforms: frequency, cycle, time period, peak value, root mean square value, average value, form factor and peak factor, phasor representation of alternating quantities, concept of phase difference, the j operator, rectangular and polar form, solution of series, parallel and series-parallel RLC circuits, power (active, reactive and apparent power) and power factor.

Unit III: Three Phase AC circuits: [09 Hrs]

Introduction, phase sequence, balanced supply voltage and balanced load, connection of Three-phase Windings (delta and star connection): line and phase quantities, phasor diagrams, three phase power equations in balanced conditions.

Unit IV: Magnetic Circuits: [09 Hrs]

Introduction, magneto-motive force (MMF), magnetic field strength, magnetic flux, reluctance, comparison of the electric and magnetic circuits. Solution of series and series – parallel, magnetic circuits (only for constant permeability materials) leakage flux and fringing.

Unit V: Single phase Transformers: [09 Hrs]

Introduction, principles of operation, Construction, EMF equation, classification of transformers, ideal transformer and practical transformer, phasor diagram at no load, Nameplate rating. Losses and Efficiency, Condition for Maximum Efficiency.

Text Books:

1. Basic Electrical Engineering D P Kothari & I J Nagrath, Mc Graw Hills, Fourth Edition.
2. A Textbook of Electrical Technology, Volume I, B L Theraja, A K Theraja, S Chand & Company Ltd.
3. A textbook of Electrical Technology, Volume II, B L Theraja, A K Theraja, S Chand & Company Ltd.
4. Electric Machines, Ashfaq Hussain , Dhanpat Rai & Co.
5. Basic Electrical Engineering in Hindi, Mr. M. L. Anwani, Dhanpat Rai & Co. (P) Ltd

Reference Books:

1. ABC of Electrical Engineering, Jain & Jain, Dhanpat Rai Publishing Company, Third Edition.
2. Elements of Electrical Engineering, Sumant Singhare & Saurabh Singhare, Electronics Publication Engineering Series.
3. Basic Electrical Engineering in Hindi , Dinesh Kumar Sharma, university books.

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Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester: B Tech. 1st Sem	**Branch: Common to All Branch**
Subject: Professional Communication Skills	**Code: 3000A06DT046**
Total Periods: 30	**Credit: 2**
End Semester Exam: 50/17	**Assessment Hrs: 1/Week**
Teacher's Assessment: 10	**Class Test: 10**

Course Objectives:

- To enable students to communicate effectively to meet workplace challenges and exchange information beneficially in various professional contexts.
- To make the students proficient in language and to use different communication skills and principles to function effectively in a professional settings.

Course Outcomes

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

CO1: Demonstrate a better understanding of the communication process by identifying, explaining, and applying current communication theories

CO2: Develop clear and error-free language proficiency to communicate fluently in English

CO3: Listen, read and comprehend and synthesize information from different sources and respond appropriately.

CO4: Learn the various oral communication situations to elicit desired results.

CO5: Understand and appropriately apply modes of expression in written communication and develop the fundamental skills and techniques in drafting effective business documents and research papers.

Syllabus

Unit 1: Fundamentals of Communication (6Hours)

1.1 Communication: Definition, Objectives, Process and Elements, Principles of Communication

1.2 Types: Verbal and Non-verbal Communication

1.3 Barriers to Communication: Physical, Mechanical, Linguistic, Psychological and Organizational Barriers

Unit 2: Functional Grammar and Vocabulary Building (6 Hours)

2.1 Vocabulary Building: Prefixes, Suffixes, Synonyms, Antonyms, Homonyms, Homophones, One Word Substitution

2.2 Identifying Common Errors in English Usage: Word to tenses, Articles, Prepositions, Collocations, Subject-Verb Agreement

2.3 Misplaced Modifiers

Unit 3: Reading and Listening Comprehension (6 Hours)

3.1 Reading: Definition, Importance, Reading Speed, Strategies for effective reading (PSQ5R), Reading Comprehension.

3.2 Listening: Definition, Difference between hearing and listening, Process, Purposes, Measures for Effective Listening, Barriers.

3.3 Note-Making and Note-Taking, Information-Transfer

Unit 4: Speaking Skills for Professional Contexts. (6 Hours)
4.1 Speaking:Importance and Principles of Effective Speaking
4.2 PowerPointPresentation: Planning, Designing, Making the Speech/Presentation, Do's and Don'ts
4.3 JobInterviews**:** Preparations**,** Ethics**.**

Unit 5: Professional Writing Skills (6 Hours)
5.1 Business Letters: Elements, Types- Enquiry, Sending Quotations, Placing of Orders, Complaints, Reminders
5.2 Applications for Job;Resume, CV.
5.3 Technical Report Writing: Characteristics, Components and their importance
Suggested Readings

S.No.	Title	Author(s)	Publisher
1	Business Correspondence and Report Writing	R C Sharma & Krishna Mohan	Tata McGraw Hill New Delhi
2	Essentials of Business Communication	J S Korlahalli &Rajendra Pal	S Chand & Sons, Delhi
3	Developing Communication Skills	Krishna Mohan &Meera Banerjee	Macmilan India Ltd
4	CommunicationSkills	Sanjay Kumar and PushpLata	Oxford University Press 2011
5	Practical English Usage	Michael Swan	OUP 1995
6	Remedial English Grammar	F T Wood	Macmillan 2007
7	Textbook of English Phonetics for Indian Students	T Balasubramaniam	Macmillan Publishers 2012
8	Fundamentals of Communication Skills	Chandra Shekhar Sharma	Srijanpeeth Prakshan 2023
9	Interview Skills for Professionals	Chandra Shekhar Sharma	Srijanpeeth Prakshan 2024
10	Effective Technical Communication	M Ashraf Rizvi	Tata McGraw Hill New Delhi
11	Fundamentals of Technical Communication	Meenakshi Raman &Sangeetha Sharma	Macmillan India Ltd
12	Technical Writing and Professional Communication for Non-native Speakers of English	Thomas N Huckin and Leslie A Olsen	McGraw Hill
13	Communication Skills: Theory and Practice, Eighth Edition	Prerna Malhotra, Deb DulalHalder	Book Age Publications, New Delhi
14	English and Communication Skills for Students of Science and Engineering	S.P. Dhanavel	Orient Blackswan Ltd. 2009
15	On Writing Well	William Zinsser	Harper Resource Book. 20014
16	Study Writing	Liz Hamp-Lyons and Ben Heasly	Cambridge University Press 2006
17	Exercises in Spoken English. Parts. I-III.	CIEFL, Hyderabad	Oxford University Press
18	Word Power Made Easy	Norman Lewis	W R Goyal Publishers and Distributors 2009
19	Enrich Your English, CIEFL	SR Inthira and V. Saraswathi	OUP 1997
20	Longman Dictionary of Common Errors	N.D. Turton and J.B. Heaton	Longman 1998
21	Oxford A-Z of English Usage ed.	Jeremy Butterfield	OUP 2007

E-resources/Web Sources:

- Communication Skills in English- https://onlinecourses.swayam2.ac.in/ntr25_ed62/preview
- Soft Skills - https://onlinecourses.swayam2.ac.in/nou25_mg12/preview
- English Communication - https://onlinecourses.swayam2.ac.in/cec25_hs31/preview
- Learning English- https://archive.nptel.ac.in/courses/109/106/109106201/

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester-I	**Branch: All Branches**
Subject:Foundation Course on Ancient Indian Knowledge Systems	**Code: 3000A07ET046**
Total Theory Periods: 2	**L: 2 T:0 P:0 Ass. Hours:01/week**
Total marks in End semester Exam: 50/17 **CT Marks : 10**	**Total Credits: 2** **Teacher Assessment :10**

Course Objectives:

1. To briefly introduce different areas of science and technology of Indian Knowledge System and Indian perspective of modern scientific view.
2. To give a brief overview of selected areas of IKS, ancient mathematics, astronomy, literature and arts.
3. To give foundation knowledge on work done by Indian Mathematicians in the fields such as Astronomy, Astrology, Geometry, Algebra, and Arithmetic etc

CourseOutcomes:

1. Student understand the various pramanas used in the Indian Knowledge System.
2. Study of Indian Mathematics will reveal to students how it is embedded in Indian art, architecture, music, and religious practices, fostering a deeper understanding and appreciation of Indian culture.
3. They have been introduced to some fields of IKS used in present Science and Technology.
4. They have been introduced to some fields of IKS like Ayurved and Yoga.

UNIT I: INTRODUCTION (8Hours)

Introduction to IKS & Its importance, Introduction & importance of IKS, Various IKS Systems, Shastra – Foundational Literature of Bharatvarsha, What is Shastra?, Importance of Shashtra, Classification of Shashtra – Vaidic&Avaidic (with examples of important Literature), Bhartiya Education System and its philosophy, History of BES from Ancient to Modern, Domains of Education: Gurukul, Pathshala, Vidyalay, Vishvavidyalay.

UNITII:FOUNDATIONAL CONCEPTS FOR SCIENCE AND TECHNOLOGY (7Hours)

Linguistics, Introduction to Indian Mathematics, Indian Mathematicians and their Contributions, Number systems in India - Historical evidence, and Units of Measurement, Measurements for time, distance, and weight Knowledge: Framework and Classification.

UNITIII: Science, Engineering and Technology in IKS` (7Hours)

Astronomy, Engineering and Technology: Metals and Metalworking, Science and technology heritage of India: Physical structures Temples Watershed management Dyes, arts and perfume production.

Surgical-techniques Shipbuilding.

UNIT IV: AYURVEDA & YOGA IN IKS (8Hours)

Health, Wellness and Psychology, Ayurveda for Life, Health and Well-being: Introduction to Ayurveda: understanding Human body and Panchamahabhuta, the communication between body & mind, health regimen for wellbeing, introduction to yoga (raja yoga, astang yoga, gyan yoga).

TextBooks: (Hindi and English language as per availability)

1. B. Mahadevan, VinayakRajat Bhat, NagendraPavana (2022) Introduction to Indian Knowledge System: Concepts and Applications.
2. A Concise History of Science in India – Bose, Sen &Subbarayappa- INSA Publications
3. Dikshit, S. B. (1969, 1981). BharatiyaJyotish Sastra (in Marathi) Poona (1896). (Transl. RV Vaidya, Vol.1). New Delhi: Government of India Press.
4. Sen, S. N., and Shukla, K. S. (Ed.) (2000). History of Astronomy in India, 2nd Revised Edition. New Delhi: Indian National Science Academy.

ReferenceBooks: (Hindi and English language both)

1. Iyengar, R. N. (2016) Astronomy in Vedic texts, History of Indian Astronomy, A Handbook - Volume brought out on the occasion of IX International Conference on Oriental Astronomy November 14–18.
2. Encyclopedia of Classical Indian Sciences- Roddam Narasimha, Universities Press
3. NCERT Modules of KPTI
4. Thompson R.L. (2007) The Cosmology of the BhāgavataPurāṇa (First Indian Edition) MLBD Publn. Delhi.
5. Altekar A.S. (1944) Education in Ancient India.
6. Agrawala V.S. (1953) India as known to Panini.

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester- 1st – B. Tech	Branch: Common to all
Subject: Fundamentals of Computers & IT Lab	Code: 3000A02CL022
Maximum/Minimum-Passing marks: 40/20 Teacher Assessment: 20 Teacher Hours: 60	Periods/week: L: - | T: - | P: 04 | Ass. Hours: 1/week Credit: 02

Course Objectives:

1. To understand the basic components and functionality of computer systems.
2. To develop proficiency in using operating systems and essential software tools.
3. To gain hands-on experience in basic programming concepts, including variables, loops, and decision-making statements.
4. To learn techniques for handling data, working with files, and managing exceptions.
5. To build a foundation for applying computational thinking to solve real-world problems.

List of Experiments: (Each student is required to perform a minimum of 15 experiments.)

1. Disassembly of computer and identify the front and rear panel ports and connectors on a PC cabinet Open the cabinet and identify various motherboards components, connector's slots, ports (USB, VGA, DVI, and HDMI), cables and Connectors.

    - Identify Motherboard Components and connections. CPU (Processor) RAM (Memory) Hard Drive Connections Mechanical vs. Solid State Drives ROM Drives Graphic Cards, Sound Cards, Install & configure add-on cards
    - Check various front panel connections on motherboard (power switch, reset switch and HDD Led).
    - Check power and reset switch connection. Replace faulty power switch from cabinet and assemble a new one.
    - Check DDR3 and DDR4 RAM's FSB. Insert it on memory slot. Test and understand various beep sounds in case of trouble.
    - Find the CMOS/ROM BIOS chip on mother board
    - Install a Hard Drive. Identify and check data and power cable and SATA and SACH ports in motherboards

2. Motherboard Installation - Removing the Motherboard carefully and Install it again.
    - Removing the Processor, Installing the Processor. Understand and identify various different processor sockets
    - Find the CMOS Battery. Test it with multimeter. Replace it.
    - Boot the PC through a BOOTABLE DVD of OS.
    - Partition the disk, Format the drive.

3. **Install Windows windows 11/Ubuntu/Mint/Fedora or other**
    - Practice keyboard shortcuts of mouse activities.
    - How to Backup/Restore your Windows partition with the bootable image
    - Open windows explorer and find different drives, files and folders, their size and other properties.
    - Use Power shell commands Open Device Manager, find various devices and install appropriate driver software (audio, video, chipset, LAN, WLAN, printer and monitor). Use & practice WMIC console.

4. **Basic OS operations -** MOUSE OPERATIONS, Utilities and Accessories, Installation, and configuration of OS

5. **Experimenting with internal and external DOS** Commands - INTERNAL COMMANDS: SET, PATH, DIR, MD, CD, CD..,BREAK EXTERNAL COMMANDS: ATTRIB,TREE,CHKDSK,APPEND

6. **Write a business letter to company's higher authority for assigning project proposal using different types of formatting in MS word**
   Steps:
   - Select blank document
   - Save file with appropriate name
   - Type letter
   - Format subject of letter to highlight it
   - Select entire text to make it aligned and justified
   - Apply border to page
   - Add bullets to your documents attached list

7. **Create a calendar in MS word and display specific holiday list of the same month**
   Steps:
   - Open blank document
   - Save file with appropriate name
   - Go to insert tab > select table
   - MS Word gives option to add pre-defined templates for calendars Go to quick tables > Select a template for calendars
   - Calendar will appear on the screen
   - Now add the specific holidays in the calendar, by typing the name of the off For e.g. 2nd October- Gandhi Jayanti (You can change the month and days as per your requirement.)
   - Marked off cab be formatted with different color Home tab> Font group> Font color/Font highlight option

8. **Create a Time table in MS Word**
   Steps:
   1. click on the start button on your desktop> select MS Office > select MS Word > MS word will open, select blank document
   2. Save your file with an appropriate name. Go to File menu > Save as> select the file name and location and click save.
   3. Go to insert tab> Select tables
   4. Select 7x7 Table
   5. Fill in the required details such as timings, Break and subjects.
   6. In the tables Merge the cells for showing 'break' Select the columns to be merged
   7. Mark Labs period with Desired colorHome tab > Font group > desired color from font color option
   8. Fill the break with different color Home tab > Font group > desired color from text highlight color option
   9. Write course detail on top of the time table and add shade to the course details on the top Home tab> paragraph group > borders and shading> Shading

9. **Create your personal CV using Different types of Bullet and Numbering**
   Steps:
   1. Click on the start button on your desktop> select MS Office > select MS Word > MS word will open, select blank document
   2. Save your file with an appropriate name. Go to File menu > Save as> select the file name and location and click save.
   3. Go to Insert tab > Select page number option in header and footer group> select the position of page number to the bottom of the page and Alignment to Center > Click Ok.
   4. Go to Insert tab > Select Table option > from insert table option, choose 2 columns and 1row.In the first column, enter your name. Go to home tab, font group> increase the font size, make it bold In the second

column, type your personal details- Contact number and e mail ID. Go to home tab, font group> increase the font size, change the font style to italics and color to green for your mobile number and E mail ID.

5. Create another table to fill in the educational qualification, skills and career objective. Go to insert tab> select tables> choose 3 row and 1 column Define career objective in first column Educational qualification in 2nd column Skills in 3rd column
6. Go to home tab select different bullets and numberings for mentioned skills and subskills
7. Also apply bullets to the headings
8. Bold the heading 'career objective' and increase the font size
10. Select the heading 'career objective'> go to home tab > select format painter by a double
11. Click> copy formatting to other heads- educational qualification and skills.
9. Within educational qualification table, insert another 4x4 table and fill your details of school and college percentage and year of passing.
10. select the table with name and contact details> go to home page> borders and shading>select green border with 3 weight.

11. Create a word Doc using Smart -Art

Steps

1. click on the start button on your desktop> select MS Office > select MS Word > MSword will open, select blank document
2. Save your file with an appropriate name. Go to File menu > Save as> select the filename and location and click save.
3. Place the insertion point in the document where you want the SmartArt graphic to appear.
4. From the Insert tab, select the SmartArt command in Illustrations group.
5. A dialog box will appear. Select a category on the left (Hierarchy or list or any other option), choose the desired Smart Art graphic, then click OK
6. The SmartArt graphic will appear in your document.
7. Select the SmartArt graphic. The SmartArt task pane will appear to the left.
8. Enter text next to each bullet in the task pane. The text will appear in the graphic and will resize to fit inside the shape.
9. Select the smart art, on the tabs you will see 2 options- Design and Format, then click the
10. Design tab or Format tab. You can change the color, layout and style of the SmartArt, text style, shape fill etc. from these 2 tabs

12. Create a word doc and show different types of formatting and display the content of the document in 2 column format.

Steps

1. Click on the start button on your desktop> select MS Office > select MS Word > MS word will open, select blank document
2. Save your file with an appropriate name. Go to File menu > Save as> select the filename and location and click save.
3. Write the content that you want to display in 2 column format
4. You can add the pictures to enhance your document Insert> pictures>clipart/ pictures from your computer
5. Now select the text that you want to display in 2 column format.
6. Go to layout tab > page set up group > select column option
7. Various options such as 2 column, 3 column, multi column will appear Choose 2 column option
8. For formatting the text, select the headings in your text Go to home tab> font group> mark B for bold, highlight the headings with desired color, select U for underlining the text Now, go to paragraph group and add bullets to the heading
9. Add page border Go to borders and shading tab in paragraph group of home tab > select page border, add weight to it to increase the width

13. Create a word document and encrypted the document

Microsoft Word 2007 includes a feature that allows you to password-protect documents from changing content. You encrypt a document by setting a password that another user will not be able to open it.

Steps:

1. click on the start button on your desktop> select MS Office > select MS Word > MS word will open, select blank document
2. Save your file with an appropriate name. Go to File menu > Save as> select the file name and location and click save.
3. Click the Office button and move the cursor over the Prepare option.
4. Click Encrypt Document in the menu that appears.5.
5. In the pop-up window, type the password to encrypt the document, and click OK. A new message box will appear, asking you to retype the password. Re-enter and click OK. You have successfully encrypted your document.
6. Try to include at least one number and one non-alphanumeric character in your password to make it harder to crack.
7. Encrypted document can contain any information as per the user.
8. Note: For versions of MS word that do not have prepare option, follow the following: Start button > Save as> to the left of save button, Tool option appears. Select it. Then select General options > Encryption option asks for password > Enter the password

14. Mail Merge using MS Word

Steps

1. click on the start button on your desktop> select MS Office > select MS Word > MS word will open, select blank document
2. Save your file with an appropriate name. Go to File menu > Save as> select the file name and location and click save.
3. Go to mail merge option in mailing tab2.
4. Select step by step mail merge wizard3.
5. Select the document type- letters Click next: starting document4.
6. Select the document- Use the current document5.
7. Select recipients. Click Type a new list.
8. Click Create Type the recipient list- Name, address and add ward name option.
9. Click ok, once list is complete. It gives you an option to save the list. Save the list by any name in your computer.
10. Write your letter
11. Add greetings, address and ward name in the letter
12. Preview your letters
13. Complete the merge

15. Create a Power point presentation

Steps

1. Click the Start button.
2. Click All Programs option from the menu.
3. Search for Microsoft Office option
4. Search for Microsoft PowerPoint within Microsoft office
5. click the option, MS PPT will open
6. Click blank presentation
7. Selecting a Theme for Your Presentation on the Design tab, in the Themes group, click the document theme that you want, or click more to see all available document themes.
8. Choosing a Layout for New Slide on the Home tab, in the Slides group, click Layout.
9. In the slide, as per the layout selected, write title of the slide in title placeholder
10. Write the content of your presentation in the content placeholder
11. Insert related pictures from the insert menu >Pictures

12. Insert Chart Go to insert menu> chart> bar chart> select the desired design of chart In excel sheet that will open with chart, edit the data as per your presentation
13. Add animations to your slides Animation tab> Animation group> select the animation style

16. Create power point presentation with including Animation and types of Graph plots.
Steps:

1. Click the Start button.
2. Click All Programs option from the menu.
3. Search for Microsoft Office option
4. Search for Microsoft PowerPoint within Microsoft office
5. Click the option, MS PPT will open
6. Click blank presentation
7. Selecting a Theme for Your Presentation
8. On the Design tab, in the Themes group, click the document theme that you want, or click more to see all available document themes.
9. Choosing a Layout for New Slide on the Home tab, in the Slides group, click Layout.
10. In the slide, as per the layout selected, write title of the slide in title placeholder
11. Write the content of your presentation in the content placeholder
12. Insert related pictures from the insert menu >Pictures
13. Insert Chart Go to insert menu> chart> bar chart> select the desired design of chart in excel sheet that will open with chart, edit the data as per your presentation
14. Add animations to your slides Animation tab> Animation group> select the animation style. You can apply animation to text as well as pictures
15. Click 'all at once or one by one' to animate list of text
16. Click 'animation pane' in animation tab to see all the animations applied to text and slides.

17. **Create an electronic spread sheet which shows the attendance, Assignment and sessional marks of Students. Use formula to calculate avg. assignment marks, Avg Sessional marks and total marks**
Steps:

1. Go to start button> MS office > MS excel > Blank sheet
2. Start typing the data heading- student's name, marks, roll no., attendance, sessional and assignment marks in different columns
3. In a column, add heading 'average marks' and 'total marks'

Serial no.	College Roll No.	Name	Sessional Marks (out of	Marks for Attendance (out of 5)	Assigment Marks (out of 5)	Average marks of students	Total marks obtained (out of 15

4. Now under the heading average, use formula: '=' average (select the range of cells containing marks of the students {attendance, sessional and assignment marks student wise})
5. Now under the heading total marks, select all marks, student wise and use sum formula to add all the marks {= sum (cell range)}
6. We have obtained the average and total marks of the students

18. **Create an electronic spread sheet which shows the attendance, Assignment and sessional marks of Students. Use formula to calculate avg. assignment marks, Avg Sessional marks and total marks. Display the percentage in column and pie chart**
Steps:

1. Go to start button> MS office > MS excel > Blank sheet
2. Start typing the data heading- student's name, marks, roll no., attendance, sessional and assignment marks in different columns
3. In a column, add heading 'average marks' and 'total marks'

Serial no.	College Roll No.	Name	Sessional Marks (out of	Marks for Attendance (out of 5)	Assigment Marks (out of 5)	Average marks of students	Total marks obtained (out of 15

4. Now under the heading average, use formula: '=' average (select the range of cells containing marks of the students {attendance, sessional and assignment marks student wise})
5. Now under the heading total marks, select all marks, student wise and use sum formula to add all the marks {= sum (cell range)}
6. We have obtained the average and total marks of the students.
7. Now add another column 'Percentage' and 'Total marks (15)'
8. In percentage column, to calculate percentage, type = (select marks obtained cell) /(Select total marks 15 cell)
9. Select the data> go to insert> Charts> Select the suitable type of chart- pie and column chart to represent the percentage.
10. Chart will appear. Now right click and select 'select data' option to choose percentage and student's name option specifically by selecting columns with relevant data (Name of the student and percentage)

Course Outcomes:

1. Students will gain a solid understanding of basic computer hardware, software, and operating systems.
2. Students will become proficient in using MS Office tools for word processing, spreadsheets, and presentations.
3. Students will develop the skills to write, document, and present their work effectively during project development.
4. Students will build a strong foundation in programming and computational thinking for solving real-world problems.
5. Students will gain awareness of and familiarity with online applications and services related to Digital India initiatives.

E-resources/Web Sources:

- Introduction to computer science-https://archive.nptel.ac.in/courses/106/101/106101238/

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG)

Semester: 1st/2nd	**Branch: Non-Circuit Branch**
Subject:Engineering Physics Lab - B	**Code: 3000A04AL015**
Maximum/Minimum- **Passing marks:40/20** **Teacher Assessment: 20**	**Periods/week:** L: -- T: -- P: 2 Ass. Hours: -
	TotalCredits:1

Course Objectives:

1. To study the surface tension of water by using Jaeger's and capillary rise methods.
2. To calculate acceleration due to gravity and the moment of inertia of a flywheel.
3. To determine the wavelength by laser diffraction, and the horizontal component of earth's magnetic field-H.
4. To calculate the coefficient of viscosity by different methods.
5. To analyze thermal conductivity and the mechanical equivalent of heat.

LIST OF EXPERIMENTS

[BRANCHES:CIVIL/MECHANICAL/MECHATRONICS/BIO-PHYSICS/CHEMICAL/BIOTECHNOLOGY]

1. To determine the surface tension of water at laboratory temperature by Jaeger's Method.
2. To determine the surface tension of water by capillary rise method.
3. To accurately measure the acceleration due to gravity with the help of a reversible physical pendulum (or bar pendulum).
4. To determine the moment of inertia of a flywheel about its own axis of rotation.
5. To determine wavelength of a given laser source using a diffraction grating.
6. To determine the value of H, the horizontal component of earth's magnetic field by deflection and vibration magnetometer.
7. To determine the coefficient of viscosity by Stoke's method.
8. To determine the coefficient of viscosity by Poiseuille's method.
9. To determine thermal conductivity of a bad conductor by LEE's disk method.
10. To determine the mechanical equivalent of heat by Calender-Barnes method.

CourseOutcomes:

Students will be able to:

1. Determine the surface tension of water using different methods.
2. Calculate acceleration due to gravity and the moment of inertia of a flywheel.
3. Determine the wavelength of light using the laser diffraction method and calculate the horizontal component of Earth's magnetic field-H.
4. Apply various methods to calculate the coefficient of viscosity and understand the principles behind each technique.
5. Analyze the thermal conductivity of materials and determine the mechanical equivalent of heat.

TextBooks:

S. No.	Title	Authors	Edition	Publisher
1.	A Textbook of Engineering Physics Practical	R. Das, C. S. Robinson, Rajesh Kumar and Prashant Kumar Sahu	Second	University Science Press (Laxmi Publication), New Delhi
2.	Experiments in Engineering Physics	M.N. Avadhanulu, A.A. Dani, P.M. Pokley	Latest	S. Chand Publications, New Delhi.

ReferenceBooks: (Hindi and English language both)

E-resources/Web Sources:

- **https://www.youtube.com/watch?v=LiyxHJw_oG0&list=PLuj0MqGVQvgp31abJfYJwNzCY4bPZ9ASK**

Chhattisgarh Swami Vivekanand Technical University, Bhilai (CG).

Semester: 1st/2nd	**Branch: Circuit Branch**
Subject: Engineering Physics Lab - A	**Code: 3000A03AL015**
Maximum/Minimum- **Passing marks:40/20** **Teacher Assessment: 20**	**Periods/week:** L: -- T: -- P: 2 Ass. Hours: -
	Total Credits:1

Course Course Objectives:

1. To study the interaction of light with optical fibers and analyze the diffraction of a laser beam.
2. To analyze the characteristics of solar cells, photoresistors, and photocells.
3. To examine the properties of a semiconductor diode by determining the forbidden energy gap and studying its characteristic curves.
4. To determine the specific resistance of a wire and the frequency of an A.C. source accurately.
5. To know the concepts of interference and diffraction using bi-prism and grating experiments respectively.

LIST OF EXPERIMENTS

BRANCHES: IT/CSE/CS(A.I.)/CS(D.S.)/E&TC/EE/EEE/E&I

1. To determine the Numerical Aperture (NA) of an optical fiber.
2. To determine the wavelength of a given LASER source using a diffraction grating.
3. To study characteristics of a solar cell.
4. To study the characteristics of a Photo resistor.
5. To determine the value of plank's constant (h) using a photocell.
6. To determine the forbidden energy gap of a P-N junction diode.
7. To study the characteristic curve of a P-N junction diode.
8. To determine the specific resistance of a given wire using a carry foster bridge.
9. To determine fringe width of an interference pattern using Fresnel's bi-prism.
10. To determine the frequency of A.C. mains by a Sonometer.
11. To determine the resolving power of plane transmission grating.
12. To determine the radius of curvature of plano convex lens by Newton's rings method.

Course Outcomes:

Students will be able to:

1. Demonstrate an understanding of the interaction of light with optical fibers and the diffraction principles applicable to laser beams.
2. Evaluate the performance and characteristics of solar cells, photoresistors, and photocells in various applications.
3. Determine the forbidden energy gap of semiconductor diodes and analyze their characteristic curves.
4. Calculate the specific resistance of a wire. Measure the frequency of an A.C. source
5. Calculate the fringe width using bi-prism and resolving power of grating.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1.	A Textbook of Engineering Physics Practical	R. Das, C. S. Robinson, Rajesh Kumar and Prashant Kumar Sahu	Second	University Science Press (Laxmi Publication), New Delhi
2.	Experiments in Engineering Physics	M.N. Avadhanulu, A.A. Dani, P.M. Pokley	Latest	S. Chand Publications, New Delhi

E-resources/Web Sources:

- https://www.youtube.com/watch?v=LiyxHJw_oG0&list=PLuj0MqGVQvgp31abJfYJwNzCY4bPZ9ASK

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester- B. Tech–1st Sem (Common to all)	Branch: Electrical Engineering			
Subject: Basic Electrical Engineering Lab	Code: 3000A05AL024			
Maximum/Minimum-Passing marks: 40/20 Teacher Assessment: 20	Periods/week:			
	L	T	P	Ass. Hour
	-	-	2	-
Duration (ESE):	Total Credits: 1			

Course Objectives:

1. To provide comprehensive idea about D C circuits, theorems and their applications.
2. To provide fundamental and working knowledge for the analysis of AC circuits.
3. To introduce students with fundamental concepts of polyphase electrical system.
4. To impart basic ideas of magnetic circuits and their significance in Electrical Engineering.
5. To highlight the importance of transformers and its impact on global and societal context.

Course Outcomes:

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

1. Analyze DC circuits using KVL, KCL, Thevenin's and Superposition theorem.
2. Illustrate the basics of R, L, C circuit elements and can provide solution for ac circuits along with phasor diagram.
3. Comprehend the concept and applications of polyphase electrical system.
4. Understand and solve the problem pertaining to magnetic circuits.
5. Understand the construction, working and principle of single phase Transformer.

List of Experiments

S.N	List of Experiments
1.	Verification of Kirchhoff's Voltage Law and Kirchhoff's Current Law.
2.	Verification of Thevenin`s Theorem and Superposition Theorem. (C)
3.	To determine V– I characteristics of Incandescent lamp.
4.	To measure R and L of choke coil.
5.	To observe and measure the voltage and current waveform of the series RLC circuit using DSO and Multi-meter. To find the voltage ,current , power and power factor of the series RLC circuit and draw the phasor diagram.(C)
6.	To observe and measure the voltage and current waveform of the parallel RLC circuit using DSO and Multi-meter. To find the voltage, current, power and power factor of the series RLC circuit and draw the phasor diagram.
7.	Connection of three phase load in Star configuration and measurement of all Line and Phase quantities of the circuit. Also observe it`s waveform pattern using DSO.
8.	Connection of three phase load in Delta configuration and measurement of all Line and Phase quantities of the circuit. Also observe it`s waveform pattern using DSO.
9.	To plot the B-H curve of a magnetic material.
10.	Study of single phase transformer (Name plate, tapping, rating) and determination of efficiency by Direct Loading. (C)
11.	To study core and shell type transformers.
12.	To perform ratio test and polarity test of a single phase transformer.

Text Books:

1. Basic Electrical Engineering D P Kothari & I J Nagrath, Mc Graw Hills, Fourth Edition.

2. A textbook of Electrical Technology, Volume I and II B L Theraja, A K Theraja, S Chand & Company Ltd
3. Electric Machines, Ashfaq Hussain, Dhanpat Rai & Co.
4. Laboratory manual for Electrical Machines. D P Kothari, B.S. Umre. Wiley

Reference Books:

1. ABC of Electrical Engineering, Jain & Jain, Dhanpat Rai Publishing Company, Third Edition.
2. Elements of Electrical Engineering, Sumant Singhare & Saurabh Singhare, Electronics Publication Engineering Series.
3. Basic Electrical Engineering (with Lab Manual) by S.K. Sahdev

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

<table>
<tr><td>Semester- 1st Sem- B.Tech</td><td colspan="4">Branch: Common for All</td></tr>
<tr><td>Subject: Sports and Yoga</td><td colspan="4">Code: 3000A06FL046</td></tr>
<tr><td rowspan="4">Maximum/Minimum-Passing marks: -
Class Test Marks: -
Teacher Assessment: 30
Teaching Hours: 30</td><td colspan="4">Periods/week:</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Ass. Hours/week</td></tr>
<tr><td>-</td><td>-</td><td>2</td><td>-</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>Class Tests: 0</td><td colspan="4">Assignments: -</td></tr>
<tr><td>Duration (ESE): -</td><td colspan="4">Total Credits: -</td></tr>
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Course Objectives

I. To develop both physical fitness and mental well-being through an integrated approach.
II. To help build strength, stamina, teamwork, and agility
III. To enhance mental and physical well being through yoga
IV. To create self-inspiration-driven academiccally sound youth who can balance, focus, and manage stress.
V. Encourage a healthy, active lifestyle and promote overall personal development in body, mind and spirit.

Sports

The sports component of this course focuses on enhancing physical fitness, coordination, and teamwork through a variety of structured games and activities. Participants will engage in individual and team sports such as athletics, badminton, volleyball, and basketball, aimed at building endurance, agility, and strategic thinking. Emphasis will be placed on sportsmanship, discipline, and the development of motor skills, while also promoting an active and healthy lifestyle through regular participation and practice.

Yoga

The yoga component introduces learners to the fundamentals of asanas (postures), pranayama (breathing techniques), and relaxation practices that support both physical and mental well-being. Sessions will cover basic standing, sitting, and supine postures to improve flexibility, balance, and core strength, alongside breathing exercises for stress relief and mental clarity. The course will encourage mindful movement, body awareness, and the integration of short yoga routines into daily life for long-term health benefits.

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<table>
<tr><td>Semester- 1st Sem- B.Tech</td><td colspan="4">Branch: Common for All</td></tr>
<tr><td>Subject: Social Service/Community Services</td><td colspan="4">Code: 3000A07FL046</td></tr>
<tr><td rowspan="3">Maximum/Minimum-Passing marks: -
Class Test Marks: -
Teacher Assessment: 30
Teaching Hours: 30</td><td colspan="4">Periods/week:</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Ass. Hours/week</td></tr>
<tr><td>-</td><td>-</td><td>2</td><td>-</td></tr>
<tr><td>Class Tests: 0</td><td colspan="4">Assignments: -</td></tr>
<tr><td>Duration (ESE): -</td><td colspan="4">Total Credits: -</td></tr>
</table>

Course Objectives

This course aims to develop a sense of social responsibility, empathy, and civic engagement among first-year engineering students. It encourages them to understand community needs, work collaboratively on real-life problems, and contribute meaningfully to society. Through hands-on participation in community development projects, students will learn how engineering knowledge can address local challenges, promote sustainable solutions, and foster inclusive growth. The course also focuses on building soft skills like teamwork, communication, and leadership while instilling ethical values.

Syllabus & Activities:

The course will include orientation sessions on social issues such as sanitation, environmental conservation, digital literacy, rural development, and health awareness. Students will engage in fieldwork with NGOs, local self-government bodies, or campus-based community projects. Activities may involve cleanliness drives, tree plantation, basic technology workshops for the underprivileged, assisting in disaster relief preparedness, or creating low-cost solutions for local problems. The program will conclude with a reflective report and presentation, where students analyze their contribution, challenges faced, and lessons learned for future community-oriented work.

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<table>
<tr><td>Semester – 1st Sem - B.Tech</td><td colspan="4">Branch: Electronics & Telecommunication Engineering/ Mechatronics/ Electronics & Computer/ Electronics & communication Engg. (VLSI Design and Technology)</td></tr>
<tr><td>Subject: Basic Electronics Engineering</td><td colspan="4">Code: 3028A01CT028</td></tr>
<tr><td rowspan="3">Maximum/Minimum Passing Marks:100/35</td><td colspan="4">Periods/week:</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Ass. Hours</td></tr>
<tr><td>3</td><td>1</td><td>-</td><td>1/week</td></tr>
<tr><td>Class Tests: 2 (Mandatory)</td><td colspan="4">Assignments: 2 (Minimum)</td></tr>
<tr><td>Duration (ESE): 3 Hours</td><td colspan="4">Total Credits: 04</td></tr>
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Course Objectives:

1. To illustrate the basics of number system with conversion and study of logic gates.
2. To illustrate minimization techniques and study of combinational circuits.
3. To understand the working and characteristics of BJT.
4. To understand the working and characteristics of JFET and MOSFET.
5. To study fundamentals of Electronic measurement systems.

UNIT- I: (12 Hrs)

Introduction to Number Systems and Logic: Number Systems and Conversions; Decimal, Binary, BCD, Octal, and Hexadecimal, Gray Code, Excess-3 Code, Basic Logic Gates: AND, OR, NOT, EX-OR, EX-NOR. Universal Gates: NAND, NOR.

UNIT-II: **(12 Hrs)**

Minimization Techniques: Canonical and Standard Forms (SOP, POS), Simplification using uptoFour variable Karnaugh Maps (K-Maps).Minimization using Four Variable Tabular Methods.

Basic Combinational Circuits: Half Adder, Full Adder, Half Subtractor and Full Subtractor.

UNIT-III: **(12 Hrs)**

Bipolar Junction Transistor & Its Configurations: Introduction, Construction: NPN and PNP TransistorsCharacteristics (Input/output).CE, CB, CC Configuration, relationship between α, β, and γ. Transistor as a switch and as an amplifier in CE mode only.Thermal runaway, Early-effect.**(No numerical analysis required)**

UNIT-IV: (12 Hrs)

Field Effect Transistors (JFET and MOSFET): Construction, Symbol, Basic Operation, V-I Characteristics.Configuration:CS, CG and CD. FET Parameters: Drain resistance, Trans-conductance, Amplification factor.JFET and MOSFET as a switch. **(No numerical analysis required)**

UNIT-V: (12 Hrs)

Measuring Instruments: Need and importance of Electronic measurement systems, Block diagram, Working principle and applications: CRO (Cathode Ray Oscilloscope), DSO (Digital Storage Oscilloscope), Digital Multimeter and Function Generator. Study of Lissajous pattern.

Text Books:

S. No.	Title	Author(s)	Publisher
1.	Integrated Electronics: Analog & Digital Circuit Systems	Jacob Millman &Halkias	Tata McGraw Hill
2.	Electronic Devices and Circuits	S. Salivahanan	McGraw Hill Education
3.	Digital Electronics	Morris M Mano	Pearson Education
4.	A Course in Electrical and Electronic Measurements and Instrumentation	A.K. Sawhney	Dhanpat Rai & Co.

Reference Books:

S. No.	Title	Author(s)	Publisher
1.	Electronic Devices and Circuit Theory	Robert L. Boylestad & L. Nashelsky & K. L. Kishore	PHI
2.	Fundamental of Digital Circuits	A.Anand Kumar	PHI

Course Outcomes:

On the completion of this course, students will beable to:-

1. Interpret the number system and verify the truth table of Logic Gates
2. Simplify Boolean expressions using minimization techniques and implement basic arithmetic circuits like adders and subtractors.
3. Recognize the working of all type of BJT configurations.
4. Recognize the working of all type of JFET and MOSFET configurations.
5. Describe the applications of CRO, DSO, Digital Multimeter and Function Generator.

NPTEL Link:

1. https://nptel.ac.in/courses/108106181
2. https://nptel.ac.in/courses/108105113
3. https://nptel.ac.in/courses/108105153

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI(C.G.)

Semester- I	**Branch: Branch: Electronics & Telecommunication Engineering/ Mechatronics/ Electronics & Computer/ Electronics & communication Engg. (VLSI Design and Technology)**			
Subject: Basic Electronics Engineering Laboratory	**Code: 3028A01CL028**			
Maximum/Minimum Passing Marks:40/20	**Periods/week:**			
	L	**T**	**P**	**Ass. Hours**
	-	**-**	**2**	**-**
Duration (ESE): 3 Hours	**Total Credits: 01**			

Course Objectives:

1. To introduce basic digital logic gates and their implementation in arithmetic and logic circuits.
2. To enhance circuit designing and problem-solving skills by constructing combinational logic circuits like adders and subtractors.
3. To understand the configurations and applications of transistor amplifiers (CE, CB, CC) through hands-on experiments.
4. To familiarize students with the fundamental characteristics of semiconductor devices such as FET and MOSFET through practical ability.
5. To familiarize students with the Lissajous patterns and operation of DSO, Digital Multimeter and Function Generator.

List of Experiments: (Minimum Ten Experiments are to be performed by each student)

1. To perform and verify the truth table of all Basic & Universal Gates.
2. To design and implement an X- OR Gate Using NAND/NOR Gates.
3. To design and implement a Half Adder using Logic Gates and Verify its Truth table.
4. To design and implement a Full Adder and Verify its truth table.
5. To design and implement a Half Subtractorusing Basic Gates and verify its truth table.
6. To design and implement a Full Subtractorusing Basic Gates and verify its truth table
7. To perform and plot the characteristics of a semiconductor p-n junction diode anddetermine the cut-in voltage, reverse resistance, static resistance and dynamic resistance.

8. To perform and plot the characteristics of a Zener diode and determine thebreakdown voltage, reverse resistance, static resistance and dynamic resistance.
9. To perform and draw the input & output characteristics of CE configuration of BJT amplifier.
10. To perform and draw the input & output characteristics of CB configuration of BJT amplifier.
11. To perform and draw the input & output characteristics of CC configuration of BJT amplifier.
12. To perform and draw the input & output characteristics of CS configuration of JFET amplifier.
13. To perform and draw the input & output characteristics of CS configuration of MOSFET amplifier.
14. To study the operation of DSO, Digital Multimeter and Function Generator.
15. To study and observe the Lissajous Pattern on CRO.

Course Outcomes:

On the completion of this course, students will be able to:-

1. Apply practical knowledge to implement Basic and Universal logic gates.
2. Design and implement combinational circuits such as Adders and Subtractors.
3. Identify and demonstrate the working of various amplifier configurations (CE, CB, and CC).
4. Verify the V-I characteristics of JFET and MOSFET.
5. Operate and observe the working of DSO, Digital Multimeter and Function Generator

NPTEL Link:

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2. https://nptel.ac.in/courses/108105113
3. https://nptel.ac.in/courses/108105153