UJJAIN ENGINEERING COLLEGE, UJJAIN. (MP) – 456 010

Syllabus for Four Years Bachelor of Technology Degree Course as per NEP-2020 Model Curriculum

July-2023

SUBJECT		Contact Hours per Week			Credits	Max. Marks	Min Pass Marks
Code	Title	L	T	P			
CM-1401	E-Waste Management	3	1	0	4 + 0	70	22

UNIT - I :

Introduction : E-waste; composition and generation. Global context in e-waste; E-waste pollutants, E waste hazardous properties, Effects of pollutant (E-waste) on human health and surrounding environment, domestic e-waste disposal, Basic principles of E-waste management, Component of E-waste management, Technologies for recovery of resources from electronic waste, resource recovery potential of e-waste, steps in recycling and recovery of materials-mechanical processing, technologies for recovery of materials, occupational and environmental health perspectives of recycling e-waste in India.

UNIT - II :

Global Trade Scenario in E-Waste : Essential factors in global waste trade economy, Waste trading as essential part of electronic recycling, Free trade agreements as a means of waste trading. Import of hazardous e-waste in Indian; India's stand on liberalizing import rules, E-Waste economy in the organized and unorganized sector. Estimation and recycling of e-waste in metro cities of India.

UNIT - III :

E-Waste Control : Need for stringent health safeguards and environmental protection laws in India, Extended Producers Responsibility (EPR), Import of e-waste permissions, Producer-Public-Government cooperation, Administrative and Engineering controls, monitoring of compliance of rules, Effective regulatory mechanism strengthened by manpower and technical expertise, Reduction of waste at source.

UNIT - IV :

Recovery, Recycling and Treatment of E-Waste : Emerging recycling and recovery technologies, Guidelines for environmentally sound management of e-waste, environmentally sound treatment technology for e-waste, Guidelines for establishment of integrated e-waste recycling and treatment facility, Recycling and Safe disposal of used batteries in compliance with all legislation, case studies and unique initiatives from around the world.

UNIT - V :

Legislative Provisions : E-Waste (Management and Handling) Rules, 2011; and E- Waste (Management) Rules, 2016-Salient Features and its likely implication. Government Assistance for TSDFs. The international legislation: the Basel Convention, The Bamako Convention. The Rotterdam Convention. Waste Electrical and Electronic Equipment (WEEE) Directive in the European Union, Restrictions of Hazardous Substances (RoHS) Directive.

References :-

1. Johri R., E-Waste: implications, regulations, and managements in India and current global best practices, TERI press, New Delhi.
2. Hester R.E., and Harrison R.M, Electronic Waste Management. Science, 2009.
3. Fowler B, Electronic Waste-1st Edition(Toxicology and Public Health Issues), 2017 Elsevier.
4. Electronic Waste Management Rules, 2016, Govt of India, Available online at CPCB website.

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Code	Title	L	T	P			
EE-1401	Basic Electrical Engineering	2	1	2	3 + 1	70	22

UNIT - I :

D.C. Circuits : Circuit reduction by series, parallel, star delta transformation, circuit analysis by mesh and nodal method, voltage and current source representation dependent and independent sources, source conversion, superposition theorem, Thevenin s theorem.

UNIT - II :

A.C. Circuits : Generation of alternating voltages, RMS & average value, form and peak factors, phasor representation polar rectangular and exponential form, circuit parameters, R-L, R-C and RLC series and series parallel circuits. Instantaneous and average power, active and reactive power, power factor, 3-Phase balanced and unbalanced supply, star and delta connections.

UNIT - III :

Magnetic Circuits : Flux MMF and their relation, analogy between magnetic and electric circuits, saturation, B-H curves, fringing and leakage flux, AC excitation in magnetic circuits, induced voltage, hysteresis effect and eddy currents.

UNIT - IV :

Transformer : Single–phase transformer, basic concepts and constructional features, types of transformer, voltage, current and impedance transformation, equivalent circuits, phasor diagram, voltage regulation, losses and efficiency, OC and SC test, all day efficiency.

UNIT - V :

Rotating Electrical Machine : Constructional features and working principle of DC machine, 3-phase induction motor and synchronous machine.

References :-

1. Vincent Del Toro - Electrical Engineering Fundamentals, PHI Learning.
2. Nagrath & Kothari - Basic Electrical Engineering, TMH.
3. Mittle & Mittal - Basic Electrical Engineering, III Edition TMH.
4. Cathey – Basic Electrical Engineering, Schaum Series, TMH.
5. Hughes – Electrical Technology, Pearson.
6. Fitzarald & Batham – Basic Electrical Engineering.

List of Experiments :-

(1) Verification of KCL & KVL.
(2) Study & measurement of power and power factor in R-L series circuit.
(3) Study & measurement of power and power factor in R-C series circuit.
(4) Study & measurement of power and power factor in R-L-C series circuit.
(5) Study of Transformer.
(6) Determination of equivalent circuit parameters by O.C. and S.C. test & estimation of voltage regulation & efficiency of transformer.
(7) Measurement of various lines and phase quantities for a 3 phase circuit.

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SUBJECT		Contact Hours per Week			Credits	Max. Marks	Min Pass Marks
Code	Title	L	T	P			
EE-1402	E-Workshop	0	0	4	0 + 2	60	

List of Exercises / Experiments :

1. Identification of different types of power cables and insulated wires. To make different types of joints in wires and cables.
2. Design of wiring circuit for two light points, two sockets (5A and 16A) and a fan control with two way switch.
3. Wiring of power distribution arrangement of a house using single phase MCBs, ELCB, Main switch and energy meter with an estimated load of 3 kW.
4. Identification of Inverter and Vehicle type batteries.
5. Demonstration of Pipe, Plate and Chemical (electrode) Earthling Schemes.
6. Identification of electronic components : Diodes, Transistors, SCR, FET, MOSFET, IGBT, GTO, Resistors, Capacitors, variable resistors and variable capacitors and use of multimeter for testing of above components.
7. Familiarization / Identification of testing instruments – DSO, Power Supplies, Function Generators.
8. Demonstration and use of tools like Pliers, Cutters, Wire Strippers, Screw Drivers, Tweezers, Crimping Tool.
9. Soldering and De-soldering practice in connectors and general purpose PCB.
10. Design and fabrication of single sided PCB with paint and manual etching.
11. Demonstration and working of various modules of general PC. Use of UPS.
12. Identification of various data cables, LAN components. Demonstration of main server and its components.

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SUBJECT		Contact Hours per Week			Credits	Max. Marks	Min Pass Marks
Code	Title	L	T	P			
EN-1401	English	3	1	0	4 + 0	70	22

UNIT - I :

Communication and Speaking Skills : Linguistic techniques, Modern usages, Reading comprehension, Phonetics, Oral Presentation, Telephonic conversation, Speech, Debate Listening skills, Communication : process, types, style, barriers.

UNIT - II :

Soft Skills for Professional Excellence : Introduction and importance of soft skills, Interpersonal & intrapersonal communication, leadership, Motivation, Time management, Team spirit, Self-awareness, Goal setting, Conflict management.

UNIT - III :

Business Correspondence and Letter Writing : Formal letters: characteristics and Format, Types of business letters : sales letter, enquiry letter, Quotations, complain and adjustment letters, Applications, Resume : format and structure, E-mail etiquettes.

UNIT - IV :

Writing skills : Precise writing, Noting and Drafting, Note making, slogan writing, Precis, Advertising, Technical Description of simple engineering objects and process, Application of linguistic ability : writing definitions of Engineering terms, objects, process and principles.

UNIT - V :

Report Writing : Report - meaning and characteristics, classification of reports, Format of Report, various types of technical reports, progress report, lab report, observation report, survey report, project report, report of trouble**.**

References :-

1. Business Correspondence and Report Writing-By Sharma, TMH.
2. Living English Structure- By W. S. Allen, Longmans.
3. English Grammar- Ehrlich, Schaumseries, TMH.
4. Soft Skills and Professional communication-By Peter Francis, TMH (New Delhi)
5. New International Business English- By Joans and Alexander (OUP).
6. Effective Technical Communication- Rizvi, TMH.
7. Professional Communication Skills -ByA. K. Jain, Dr. Pravin S. R. Bhatia, Dr. A. M. Sheikh, S. Chand.

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SUBJECT		Contact Hours per Week			Credits	Max. Marks	Min Pass Marks
Code	Title	L	T	P			
EN-1402	Language Lab	0	0	2	0 + 1	30	

Detailed Course Content :

1. Communication lab.
2. Listening Skills.
3. Speaking Skills
   (i) Phonetic symbols, pronunciation
   (ii) Conversation : Telephonic, face to face, formal and informal situations.
   (iii) Oral presentation
   (iv) Group discussion
   (v) Interview skills
4. Seminars.

Suggested Text/Reference Books/Softwares :-

1. Globerina software for language laboratory.
2. Clarity's tense buster software.
3. Spears language lab software.

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July-2023

SUBJECT		Contact Hours per Week			Credits	Max. Marks	Min Pass Marks
Code	Title	L	T	P			
MA-2402	Mathematics – II	3	1	0	4 + 0	70	22

UNIT - I :

Sequences and Series : Convergence of sequence and series, tests for convergence; Power series, Taylor's series, series for exponential, trigonometric and logarithm functions; Fourier series: Half range sine and cosine series, Parseval's theorem.

UNIT - II :

Multivariable Calculus (Differentiation) : Limit, Continuity and Partial derivatives, Directional derivatives, Total derivative; Tangent plane and Normal line; Maxima, Minima and Saddle points; Method of Lagrange multipliers; Gradient, Curl and Divergence.

UNIT - III :

Multivariable Calculus (Integration) : Multiple Integration: Double integrals (Cartesian), change of order of integration in double integrals, Change of variables (Cartesian to polar), Applications: areas and volumes, Center of mass and Gravity (constant and variable densities); Triple integrals (Cartesian), Simple applications involving cubes, sphere and rectangular parallelepipeds; Scalar line integrals, vector line integrals, scalar surface integrals, vector surface integrals, Theorems of Green, Gauss and Stokes.

UNIT - IV :

First Order Ordinary Differential Equations : Exact, linear and Bernoulli's equations, Euler's equations, Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type. Second order linear diff. equations with constants coefficients. Cauchy-Euler equation.

UNIT - V :

Ordinary Differential Equations of Higher Orders : Second order linear differential equations with variable coefficients, Different methods of solution including the method of variation of parameters, Power series solutions; Legendre polynomials, Bessel functions of the first kind and their properties.

Assessment Policy

Sr. No.	Particulars	Marks	Policy
1	Mid Semester Exam (MST)	20	At least two mid semester tests will be conducted of 20 marks each. The final Mid Semester Marks shall be the average of the two higher mid semester marks.
2	**Quizzes, Assignments, Tutorials and Regularity**		
(i)	Quizzes	04	Two quizzes will be conducted of 2 (two) marks each.
(ii)	Assignments	04	Two assignments will be conducted of 2 (two) marks each.
(iii)	Tutorials and Regularity	02	Every Thursday/Friday a tutorial sheet will be given to the students. Students have to submit, solution of these tutorial sheets on the next Monday. Marks for regularity will be awarded only if the student attend more than or equal to 75%.
3	End Semester Examination	70	Question Paper for end semester examination will have **05 (Five)** question, one question from each module (unit). Internal choices will be given.

Contd. … 2

References :-

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3. R.K. Jain, S.R.K. Iyenger, Advanced Engineering Mathematics, Narosa Publications.
4. W.E. Boyce and R.C. DiPrima, Elementary Differential Equations and Boundary Value Problems, 9th Edn., Wiley India, 2009.
5. S.L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.
6. E.A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall India, 1995.
7. E.L. Ince, Ordinary Differential Equations, Dover Publications, 1958.

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SUBJECT		Contact Hours per Week			Credits	Max. Marks	Min Pass Marks
Code	Title	L	T	P			
ME-1402	Engineering Graphics and CAD	2	0	4	2 + 2	70	22

UNIT - I :

Scales : Representative fractions, Plain scale, Diagonal scale, scale of chord.

Conic Sections : Construction of ellipse, parabola and hyperbola by different methods, normal and tangent.

UNIT - II :

Projection : Types of projection, orthographic projection, first angle and third angle projection, projection of points and lines, projection of lines inclined to both the planes, true inclinations and true length of straight lines, traces of straight lines.

Projection of Planes : Projection of planes inclined to both the planes.

UNIT - III :

Projection of Solids : Projection of polyhedrons (pyramids and prisms), and solids of revolution (cylinder and cone).

Section of Solids : Section of right solids by normal and inclined planes.

UNIT - IV :

Development of Surfaces : Parallel line and radial line method for right solids.

Isometric Projections : Isometric view and projection from orthographic projections. Conversion of pictorial view into orthographic view.

UNIT - V :

Computer Aided Design (CAD) : Cartesian and polar coordinate system, absolute and relative coordinate system.

Basic Drawing Commands : line, point, rectangle, polygon, circle, arc, ellipse and polyline.

Basic E**diting Commands** : basic object selection method, erase, move, copy, offset, fillet, trim, chamfer and extrude command (Conversion of 2D to 3D solid modeling).

References :-

1. Engineering Drawing by N.D. Bhatt and V.M. Panchal; Charotar Publishing House Pvt. Ltd.
2. Engineering Drawing and Graphics by Basant Agrawal and C.M. Agrawal; McGraw Hill.
3. Engineering Graphics by D.A. Hindoliya; B.S. Publications.
4. Engineering Drawing by P.S. Gill; S.K. Kataria and Sons.
5. Machine Drawing by N.D. Bhatt; Charotar Publishing House Pvt.
6. Engineering Drawing and Graphics by K. Venugopal; New Age International.

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