Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Program Name: Bachelor of Technology

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BTMA201	BS	Applied Mathematics II	60	20	20	-	-	3	1	-	4

Course Objective

To introduce the students with the Fundamentals of the Calculus of Matrices, Differential Equations and Numerical Analysis

Course Outcomes

After the successful completion of this course students will be able to

1. *Understand and apply the basics of the calculus of matrices.*
2. *Solve the fundamental problems of the ordinary differential equations.*
3. *Apply the advanced techniques to solve of the ordinary differential equations.*
4. *Know and apply the techniques of the numerical analysis for the solution of the ODE and PDE.*

Course Content:

UNIT – I
Calculus of Matrices
Systems of linear equations and their solutions. Matrices, determinants, rank and inverse. Linear transformations. Range space and rank, null space and nullity. Eigenvalues and eigenvectors. Similarity transformations. Diagonalization of Hermitian matrices. Bilinear and quadratic forms.

UNIT – II
Differential Equation
Ordinary Differential Equations: First order linear and nonlinear ordinary differential equations, exactness and integrating factors. Ordinary linear differential equations of n-th order, solutions of homogeneous and non-homogeneous equations. Operator method. Method of undetermined coefficients and variation of parameters.

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Program Name: Bachelor of Technology

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			END SEM	MST	Q/A	END SEM	Q/A				
BTMA201	BS	**Applied Mathematics II**	60	20	20	-	-	3	1	-	4

UNIT – III

Differential Equation

Power series methods for solutions of ordinary differential equations. Legendre equation and Legendre polynomials, Bessel equation and Bessel functions of first and second kind.

UNIT – IV

Numerical Analysis

Interpolation and Curve Fitting: Introduction to Interpolation; Calculus of Finite Differences; Finite Difference and Divided Difference Tables; Newton-Gregory Polynomial Form; Lagrange Polynomial Interpolation; Theoretical Errors in Interpolation; Spline Interpolation; Approximation by Least Square Method. **Numerical Differentiation and Integration:** Discrete Approximation of Derivatives: Forward, Backward and Central Finite Difference Forms, Numerical Integration, Simple Newton-Cotes Rules: Trapezoidal and Simpson's (1/3) Rules; Weddle's Rule

UNIT – V

Numerical Solution of ODE & PDE: Euler's Method for Numerical Solution of ODE; Modified Euler's Method; Runge-Kutta Method (RK2, RK4), Error estimate; Multistep Methods: Predictor-Corrector method, finite difference methods, numerical solutions of elliptic, parabolic, and hyperbolic partial differential equations.

Texts:

- G. Strang, Linear Algebra And Its Applications, 4th Edition, Brooks/Cole, 2006
- S. L. Ross, Differential Equations, 3rd Edition, Wiley, 1984.
- E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall, 1995.
- W.E. Boyce and R.C. DiPrima, Elementary Differential Equations and Boundary Value Problems, 7th Edition, Wiley, 2001.
- K. E. Atkinson, Numerical Analysis, John Wiley, Low Price Edition (2004).
- S. D. Conte and C. de Boor, Elementary Numerical Analysis - An Algorithmic Approach, McGraw-Hill,2005.

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Program Name: Bachelor of Technology

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BTMA201	BS	Applied Mathematics II	60	20	20	-	-	3	1	-	4

- B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, Delhi

References:

- E. Kreyszig, Advanced Engineering Mathematics, 9th Edition, Wiley, 2005.
- R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 5th Ed, Wiley, 1999.
- J. Stewart, Calculus: Early Transcendentals, 5th Ed, Thomas Learning (Brooks/ Cole), Indian Reprint, 2003.
- J. Stoer and R. Bulirsch, Introduction to Numerical Analysis, 2nd Edition, Texts in Applied Mathematics, Vol. 12, Springer Verlag, 2002

- M.K Jain, S.R.K Iyengar and R.K Jain, Numerical methods for scientific and engineering computation (Fourth Edition), New Age International (P) Limited, New Delhi, 2004.
- S. C. Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists, McGraw-Hill 2008.
- J.D.Hoffman, Numerical Methods for Engineers and Scientists, McGraw-Hill, 2001.

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Choice Based Credit System (CBCS) in the Light of NEP-2020
B.Tech. in Electrical Engineering
(Common to EE/EX/EC)
(2021-2025)

COURSE CODE	CATE-GORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEE404	DCC	Electromagnetic Field Theory	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives(CEOs):
The objective of this course is to-
1. Obtain an understanding of physical laws governing electromagnetic effects in the form of Maxwell's equations
2. Understand the concepts of static and time varying fields with an emphasis on wave propagation

Course Outcomes (COs):
After completion of this course students should be able to
1. Apply vector calculus to determine the electric and magnetic fields and energy stored due to specified charge and current distribution.
2. Apply Maxwell's equation in Differential and integral forms for the solution of appropriate problems involving static as well as time varying fields.
3. Discuss and analyze propagation of electromagnetic waves in free space, dielectric and conducting media

Syllabus

UNIT I **10 Hrs.**

ElectrostaticsI

Introduction to various Co-ordinate systems and Co-ordinate transformations, Vector calculus, Divergence and Stokes theorem, Laplacian of a scalar and vector, Coulomb's law, Electric field intensity, Electric fields due to: point, line, surface and volume charge distributions, Electric flux density, Gauss's law and its application, Electric potential, Potential gradient, Electric dipole: dipole moment, potential & electric field intensity due to dipole, Energy stored in electrostatic fields, Method of images.

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COURSE CODE	CATE-GORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEE404	DCC	Electromagnetic Field Theory	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT II **8 Hrs.**

Electrostatics II

Poisson's and Laplace's equations, Solution of Laplace's equation, Uniqueness theorem, Capacitor and capacitance, Electric boundary conditions, Different electric currents and current densities , Behavior of different electrical materials in electric field, Equation of continuity and relaxation time, Ohms law in point form.

UNIT III **8 Hrs.**

Magnetostatics I

Magnetic field intensity, Magnetic flux, Magnetic flux density, Biot-Savart Law, Magnetic field due to: straight conductors, circular loop, infinite sheet of current, Ampere's circuital law and its application, Magnetic scalar and vector potential, Force on a moving charge and current elements, Force and torque on closed circuit, Magnetic dipole, Magnetic polarization, Self and mutual inductance, Energy stored in magnetic fields, Magnetic boundary conditions.

UNIT IV **9 Hrs.**

Magnetostatics II

Faraday's Law, Induced EMF for time varying fields, Displacement current, Maxwell's equation in point form, Maxwell's equation in integral form, Concept of retarded potential, Poynting vector theorem, Complex poynting vector.

UNIT V **9 Hrs.**

Electromagnetic Waves

Solution of wave equation, Propagation of plane EM wave in: perfect dielectric, lossy medium and good conductor, Media-attenuation, Phase velocity, Group velocity, Skin depth. Reflection and refraction of plane electromagnetic waves at boundaries for normal & oblique incidence, Snell's law of refraction, Brewster angle, Polarization of electromagnetic wave: linear, circular and elliptical polarization.Transmission Line parameters and equations.

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BTEE404	DCC	Electromagnetic Field Theory	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Textbooks:

1. Matthew. N.O. Sadiku, "Elements of Electromagnetics", Oxford University Press, First Indian Edition, 2010.
2. Shankar Prasad Ghosh, Lipika Datta, "Electromagnetic Field Theory", McGraw Hill,1st edition, 2012
3. Gangadhar.K.A, "Field theory", Khanna Publishers, New Delhi, 15thedition, 2004.
4. Umesh Sinha , "Transmission Lines and Networks", Satya Prakashan, 2003.

References:

1. William Hayt, "Engineering Electromagnetics", McGraw Hill, 7th edition, 2011.
2. David K Cheng, "Field and Wave Electromagnetics",Pearson Education, 2ndedition, 2004.
3. John D. Kraus, "Electromagnetics" McGraw Hill, 5th edition, 1999.
4. Narayana Rao N, "Elements of Engineering Electro Magnetics", Prentice Hall of India, 6th edition, 2008.

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ML307 ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY

SUBJECT CODE	CATEGORY	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
ML-307	Compulsory	Environmental Management and Sustainability	60	20	20	0	0	4	0	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher's Assessment** shall be based upon following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

1. To create awareness towards various environmental problems.
2. To create awareness among students towards issues of sustainable development.
3. To expose students towards environment friendly practices of organizations.
4. To sensitize students to act responsibly towards environment.

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes

1. The course will give students an overview of various environmental concerns and practical challenges in environmental management and sustainability.
2. Emphasis is given to make students practice environment friendly behavior in day-to-day activities.

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COURSE CONTENT

Unit I: Introduction to Environment Pollution and Control

1. Pollution and its types (Air, Water, and Soil): Causes, Effects and Control measures
2. Municipal Solid Waste: Definition, Composition, Effects
3. Electronic Waste: Definition, Composition, Effects
4. Plastic Pollution: Causes, Effects and Control Measures

Unit II: Climate Change and Environmental Challenges

1. Global Warming and Green House Effect
2. Depletion of the Ozone Layer
3. Acid Rain
4. Nuclear Hazards

Unit III: Environmental Management and Sustainable Development

1. Environmental Management and Sustainable Development: An overview
2. Sustainable Development Goals (17 SDGs)
3. Significance of Sustainable Development
4. Environment Friendly Practices At Workplace and Home (Three Rs' of Waste Management, Water Conservation, Energy Conservation)

Unit 1V: Environmental Acts

1. The Water (Prevention and Control of Pollution) Act, 1974: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
2. The Air (Prevention and Control of Pollution) Act, 1981:Objectives, Definition of Pollution under this act, Powers and Functions of Boards
3. The Environment (Protection) Act, 1986: Objectives, Definition of important terms used in this Act, Details about the act.
4. Environmental Impact Assessment: Concept and Benefits

Unit V:Role of Individuals, Corporate and Society

1. Environmental Values
2. Positive and Adverse Impact of Technological Developments on Society and Environment
3. Role of an individual/ Corporate/ Society in environmental conservation
4. Case Studies: The Bhopal Gas Tragedy, New Delhi's Air Pollution, Arsenic Pollution in Ground Water (West Bengal), Narmada Valley Project, Cauvery Water Dispute,Fukushima Daiichi Disaster (Japan), Ozone Hole over Antarctica, Ganga Pollution, Deterioration of Taj Mahal, Uttarakhand flash floods

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Suggested Readings:

1. Rogers, P.P., Jalal, K.F. , Boyd, J.A.(Latest Edition) . **An Introduction to Sustainable Development.** Earthscan
2. Kalam, A.P.J. (Latest Edition) .***Target 3 Billon: Innovative Solutions Towards Sustainable Development.*** Penguin Books
3. Kaushik , A. and Kaushik (Latest Edition).***Perspectives in Environmental Studies***. New Delhi: New Age International Publishers.
4. Dhameja, S.K. (Latest Edition). ***Environmental Studies***. S.K. Kataria and Sons.New Delhi
5. Bharucha,E. (Latest Edition). ***Environmental Studies for Undergraduate Courses.*** New Delhi: University Grants Commission.
6. Wright, R. T. (Latest Edition). ***Environmental Science: towards a sustainable future*** .New Delhi: PHL Learning Private Ltd.
7. Rajagopalan, R. (Latest Edition). ***Environmental Studies***. New York: Oxford University Press.

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COURSE CODE	CATE-GORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEC102	BEC	Fundamentals of Electronics Engineering	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):
The subject aims to provide the student with:
1. An understanding of basic Electronics Engg. abstractions on which analysis and design of electronic circuits and systems are based.
2. To familiarize the working and characteristics of diodes, transistors, MOSFETS and some measuring instruments.

Course Outcomes (COs):
Students will:
1. Learn how to develop and employ circuit models for elementary electronic components, e.g., resistors, sources, inductors, capacitors, diodes and transistors.
2. Be able to utilize various methods of circuit analysis, including simplified methods such as series-parallel reductions, voltage and current dividers, etc.
3. Be able to understand the primitives of Boolean algebra, used to describe the processing of binary circuits.

Syllabus

UNIT I **8 Hrs.**

Introduction: Evolution and Impact of Electronics in industries and in society, Familiarization with Resistors, Capacitors, Inductors, Transformers and Electro-mechanical components, PN Junction diode: Structure, Principle of operation, various types of Diode, Solar cell.

UNIT II **9 Hrs.**

Rectifiers and Transistors: Half wave and full wave rectifiers, capacitive filter, Zener voltage regulator. Bipolar Junction Transistors: Structure, Principle of operation, and its CB, CC, CE configuration.

UNIT III **8 Hrs.**

Basic Electrical Parameter Measuring Instruments: Voltmeters & Ammeter, Wattmeter, Energy meter, Basics of CRO (analog & digital).

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BTEC102	BEC	Fundamentals of Electronics Engineering	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT IV **8 Hrs.**

Number System: Introduction to binary, octal, decimal & hexadecimal systems, representation of negative numbers, 1's, 2's, 9's, 10's complement and their arithmetic. Introduction, Definitions, Principle of Duality, Basic Theorems, Applications of Boolean Algebra, Boolean Functions, Complement of Boolean Function. Logic Gates (Symbol, Truth Table, Logic Diagram): And, OR, NOT, NAND, NOR, XOR, XNOR. Universal Gates: NAND Gate and NOR Gate implementation.

UNIT V **9 Hrs.**

Signals: Introduction, Representation of Discrete-time Signals: Graphical Representation, Functional Representation, Tabular Representation, and Sequence Representation. Elementary Signals: Unit Step Function, Unit Ramp Function, Unit Parabolic Function, Unit Impulse Function, Sinusoidal Signal, Real Exponential Signal, Complex Exponential Signal, Rectangular Pulse Function, Triangular Pulse Function and their energy and power calculation.

Text Books:

1. Boylested, R. L. and Nashelsky, L., "Electronic Devices and Circuit Theory", 11th edition, Pearson Education, 2013.
2. Bell, D. A., "Electronic Devices and Circuits", 5th edition, Oxford University Press, 2008.
3. M. Morris Mano and Michael D. Ciletti, "Digital Design", 5th edition,Pearson Education, 2013
4. A Anand Kumar, "Signals and Systems", 3rd edition, PHI, 2013.

References:

1. Sedra and Smith, "Microelectronic Circuits" ,Fourth Edition, Oxford University Press, 2010.
2. Ashok Ambardar, " Analog and Digital Signal Processing", Second Edition,Brooks/Cole Publising Company.
3. A. Anand Kumar, "Fundamentals of Digital Circuits", Fourth Edition, PHI.
4. A.K Sawhney, "A Course on Electrical and Electronics Measurement and Measuring Instruments" Dhanpat Rai pub, 2015.

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List of Experiments.

1. Understanding the working of Laboratory Instruments (Oscilloscope, Function Generator, Digital Multimeter, DC Power Supply)
2. Interpreting the characteristics of Passive Circuit Elements (R, L, C)
3. Interpreting the Time & Frequency Response of RC and RL Circuits.
4. Analyzing V-I curve for P-N Junction Diodes.
5. Analyzing V-I curve for Zener Diode.
6. Analyzing and demonstrating Zener as a voltage regulator
7. Analyzing Half-Wave and Full-Wave (Center tapped and Bridge) Rectifiers
8. Interpreting the characteristics of Bipolar Junction Transistor (BJT)
9. Verification of Truth Table of various logic gates.
10. Understanding basic Combinatorial Circuits using logic gate Integrated circuits.

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COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCE 101	BCE	Fundamentals of Civil Engineering	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):
The students (A) will be able to identify various Civil Engineering aspects (B) with emphasis on Civil Engineering materials, various surveys, and major structures in Civil Engineering (C) efficiently & effective (D).

Course Outcomes (COs):
The student will be able to understand.

1. Understand identify various building materials.
2. Perform various surveys required to carry Civil Engineering work.
3. Identify various aspects of remote sensing.
4. Get knowledge about various aspects of road and dam.

Syllabus

UNIT I **08 Hrs.**
Building Material: Introduction, types, properties and uses of stones, bricks, cement, lime, mortar, concrete, and timber; Nominal proportion of concrete, preparation of concrete, compaction, and curing.

UNIT II **08 Hrs.**
Construction Element: Elements of building construction, types, and suitability; Introduction to foundations and footings, brick masonry walls, floors, roofs, doors, windows, lintels, staircases.

UNIT III **09 Hrs.**
Surveying: Introduction to surveying instruments, - Auto level, Theodolites and Plane table; Measurement of distances by traversing; Measurement of elevations by rise & fall and height of instrument method; Reciprocal levelling.

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COURSE CODE	CATE-GORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCE 101	BCE	Fundamentals of Civil Engineering	60	20	20	30	20	3	0	2	4

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UNIT IV **08 Hrs.**

Contour and Contouring: Introduction to contours; Methods of contouring; Measurement of areas, volumes; Application of measurements in quantity computation

UNIT V **09 Hrs.**

Advance Surveying Methods- Introduction to Electronic distance measurement (EDM); Introduction of remote sensing and its applications.
Earthquake Engineering General concepts of earthquake and earthquake resistant structures.

Textbooks:

1. Ramamrutam & R. Narayanan; Basic Civil Engineering, Dhanpat Rai Publishing Company Private Limited-New Delhi.
2. S.C. Rangwala; Building Construction, Charotar Publishing House Pvt. Ltd.
3. B.C. Punmia; Surveying – Volume – I, Laxmi Publications.

Reference Books:

1. S.K. Duggal; Building Materials, New Age Publishers
2. Gopi; Global Positioning System Principles and application, McGraw Hill Education.
3. General Concepts of Earthquake Engineering, NICEE Publication.

List of Practical's:

1. Determination of fineness of cement by dry sieving.
2. Determination of consistency of standard cement paste
3. Determination of setting time of standard cement paste
4. Determination of compressive strength of cement.
5. Determination of water absorption and compressive strength of brick.
6. Sieve analysis of coarse and fine aggregates.
7. Measurement of distance by ranging and chaining.
8. Traverse surveying with prismatic compass
9. Levelling using Auto level.

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Choice Based Credit System (CBCS) in the Light of NEP-2020
B.Tech. in Electrical Engineering
(Common to EE/EX/EE (Tata Power))
(2021-2025)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEE103	SEC	Electrical Workshop	0	0	0	50	50	0	0	6	3

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Course Educational Objectives (CEOs):

1. The objective of this course is to familiarize the students with commonly used components, accessories and measuring equipment in Electrical installations.
2. The course also provides hands on experience in setting up of simple wiring circuits

Course Outcomes (COs):

After the successful completion of this course students will be able to

1. Understand different Electrical components.
2. Understand different wiring practices.
3. Understand different Earthing Practices.
4. Understand different Lighting System.

Syllabus

1. Study of various electrical components. — 2 Hrs.
   a) Domestic.
   b) Industrial.

2. Study of different wiring practices. — 6 Hrs.
   a) Domestic.
   b) Industrial.

3. Study of earthing practices. — 2 Hrs.
   a) Domestic.
   b) Industrial

4. Study of various lighting systems. — 8 Hrs.
   a) fluorescent lamp
   b) HPMV lamp
   c) SV lamp

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BTEE103	**SEC**	**Electrical Workshop**	0	0	0	50	50	0	0	6	3

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d) Metal Halide lamp
e) Halogen lamp
f) Igniters various lamps
g) Compare Fluorescent lamps

5. Study of Electrical Motor starter — 7 Hrs.
   a) DOL
   b) Semi-automatic star delta
   c) Fully automatic star delta
   d) Slip ring motor starter
   e) Auto-transformer motor starter
   f) DC motor starter

6. Study of motor protection system — 5 Hrs.
   a) Thermal overload relay
   b) Single phasing preventor
   c) Static protection relay against over heating

7. Study — 4 Hrs.
   a) ELCB
   b) MCB
   c) Fuses

References:

1. S.L.Uppal Electrical, estimating and costing.
2. J.B.Gupta Electrical estimating and costing and other reference books (National Electric codes)

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BTCS207	BEC	COMPUTER PROGRAMMING-II	0	0	0	30	20	0	0	2	1

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Course Objectives:

1. To understand Object oriented concepts.
2. To understand programming using object oriented techniques.
3. To understand the use of various system libraries.
4. To have the knowledge of important topics and principles of software development.
5. To write a computer program & to solve specified problems.
6. To use the Java SDK environment to create, debug and run simple Java programs.
7. To study event driven Graphical User Interface(GUI)programming

Course Outcomes:

1. Students should be able to explain the object oriented concepts.
2. Students should be able to write programs using object-based programming techniques including classes, objects and inheritance.
3. Able to use of various system libraries.
4. Be aware of the important topics and principles of software development.
5. Have the ability to write a computer program to solve specified problems.
6. Be able to use the JavaSDK environment to create, debug and run simple Java programs.
7. Introduce event driven Graphical User Interface(GUI) programming

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UNIT-I

Java Fundamentals: Features of Java,OOPS Concepts Java virtual machine, Byte code interpretationDatatypes,variable,arrays,expressions,operators,andcontrolstructures,Objects,Introduction toClassInstance members and member functions, constructors, constructor overloading, Static Method, Static classes ,Inner classes.

UNIT-II

Introduction to Java classes and objects: Java features: Java syntax, data types, data type conversions, control statements, operators and their precedence. Introduction to Class: Instance members and member functions. Inner Classes, String Handling, Wrapper classes

UNIT-III

Inheritance, Polymorphism and Collection: Class relationships: Inheritance and its types, Merit and Demerits. Association, Association inheritance, Polymorphism: Dynamic method dispatch, Runtime polymorphism, Abstract classes, Interface sand packages, Collections.

UNIT-IV

Exception Handling and Multithreading: Exceptions: Need for exceptions, Exception hierarchy:CheckedUncheckedexceptions,Try,catch,finally,Throw,throws,creatingexceptions.Multithreading:ThreadLifecycle,Multihreading advantages and issues, Simple thread program, Priorities and scheduling, Thread Synchronization.

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UNIT-V

Java I/O, Applets, Event Handling, and Database Connectivity: Basic concept of streams I/O stream &reader-writer classes. File handling. Applet and its Life Cycle, Basic GUI elements, Event Delegation Model and event handling Swing components: Applet, JButton, JFrame, etc. Sample swing Programs JDBC architecture establishing connectivity and working with connection inter face working with statements, Creating and executing SQLstatements, working with Result Set.

Text Books:

1. Java- Head First 2nd edition Kathy Sierra , Bert Bates.
2. Programming with Java A Primer, E. Balaguruswamy Tata McGraw Hill Companies.
3. Java Programming John P. Flynt Thomson 2nd.

Refrences:

1. Java Programming Language Ken Arnold Pearson.
2. The complete reference JAVA2, Hervertschildt. TMH.
3. Big Java, Cay Horstmann 2nd edition, Wiley India Edition.
4. Java – Balaguruswamy.

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Practical List :

1. InstallationofJ2SDK
2. Write a program to show Scope of Variables
3. Write a program to show Concept of CLASS in JAVA
4. Write a program to show Type Casting in JAVA
5. Write a program to show How Exception Handling is in JAVA
6. Write a Program to show Inheritance
7. Write a program to show Polymorphism
8. Write a program to show Access Specifiers (Public,Private,Protected)in JAVA
9. Write a program to show use and Advantages of CONTRUCTOR.
10. Write a program to show Interfacing between two classes
11. Write a program to Add a Class to a Package
12. Write a program to show Life Cycle of a Thread
13. Write a program to demonstrate AWT.
14. Write a program to Hide a Class
15. Write a Program to show Data Base Connectivity Using JAVA
16. Write a Program to show "HELLOJAVA" in Explore using Applet
17. Write a Program to show Connectivity using JDBC
18. Write a program to demonstrate multithreading using Java.
19. Write a program to demonstrate applet lifecycle.
20. Write a program to demonstrate concept of servlet.

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