SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
DTMA 201	BS	**APPLIED MATHEMATICS II**	60	20	20	0	0	3	1	0	4

Course Objective

To introduce the students with the Fundamentals of the Advanced Engineering Mathematics.

Course Outcomes

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

1. *apply the techniques of finding limit, continuity and differentiability of any function with conclusions.*
2. *understand the applications of the matrices and the determinants.*
3. *know the fundamentals of the partial derivatives and the 3D geometry.*
4. *study the properties of the integral calculus used in the field of the engineering.*
5. *understand the concepts and the solution of the differential equations.*

Course Content:

Unit 1

Function, Limit, Continuity & Differentiability: Function, Definitions of variables, constants, open & closed intervals. Definition & types of functions – Simple Examples, Limits, Concept & definition of Limit. Standard limits of algebraic, trigonometric, exponential and logarithmic functions. Evaluation of limits. Continuity, Definition and simple problems of continuity. **Derivative:** Definition of Derivatives, notations. Derivative of standard functions. Rules for differentiation in case of sum, difference, product and quotient of functions. Derivative of composite functions (Chain rule). Derivatives of inverse trigonometric functions. Derivatives of implicit functions. Logarithmic derivatives. Derivatives of parametric functions. Derivative of one function with respect to another function, Second order derivatives. Applications of Derivatives. Geometric meaning of derivative. Rate measurement, Maxima & Minima (one variable)

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Unit 2

Matrices & Determinats: Define matrix and its representation state its order. State types of matrices with examples. Perform Addition, subtraction and multiplication of a matrix with a scalar and multiplication of two matrices (upto third order only). Transpose, Adjoint and Inverse of a matrix upto third order. Solution of simultaneous equations by matrix method (linear equations in two and three unknowns). Problems on above. **Determinats:** Define determinant (second and third order). Minor, CO-factor, Study properties of determinants. Cramer's Rule: (solutions of simultaneous equations of two and three unknown).

Unit 3

Partial Differentiation & Analytical Geometry In Three Dimensions: Functions of several variables. Partial derivatives up to three independent variables, Maxima & Minima, Euler's Theorem on homogenous function for two variables. **Analytical Geometry In Three Dimensions:** Co-ordinates of a point in rectangular co-ordinate system, Distance formula, Division formula, Dcs & Drs of a line, the formula for angle between two lines with given Drs, conditions of perpendicularity and parallelism. State equation of a plane, Find equation of a plane in different forms (i) General form Ax+By+Cz+D=0, where A,B,C are Drs of the normal to the plane, (ii) Intercept form (X/a+Y/b+Z/c=1), (iii) Normal form, Angle between two planes, Perpendicular distance from a point to a plane

Unit 4

Integral Calculus: Integration as inverse process of differentiation. Indefinite and Definite Integral, Integrals of standard functions, Methods of Integration (i) Integration by Decomposition of Integrand, (ii) Integration by Substitution, (iii) Integration by parts, Methods of Integration by partial fraction. Definite Integrals, Properties of Definite Integrals. Area bounded by the curve y=f(x), x=a, x= b and x -axis and the area bounded by the curve x=f(y), y=c, y= d and y - axis.

Unit 5

Differential Equation: Differential equation, Order and degree of a differential equation, Formation of first order first degree differential equation. Solution of first order and first degree differential equation by the following methods (i) separation of variables (ii) Linear (iii) Exact.

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Text Books:

1. A. Sarkar, Mathematics (First Semester), Naba Prakashani
2. G.P. Samanta, A Text Book of Diploma Engineering Mathematics, Volume-1, Learning Press
3. Dr. S. Bose & S. Saha, A Complete Text Book of Mathematics, Lakhsmi Prakasan

Reference Books:

1. H.S. Hall & S.R. Knight, Higher Algebra Book Palace, New Delhi
2. S.L. Loney, Trigonometry S. Chand & Co.
3. H.K. Dass Engineering Mathematics S. Chand & Co.
4. T.M. Apostol Calculus, Volume-1, John Wiley & Sons
5. B.K. Pal, K.Das, Engineering Mathematics, Volume-1, U.N. Dhar & Sons
6. B.C. Das & B.N. Mukherjee, Differential Calculus U.N. Dhar & Sons
7. Kar, Engineering Mathematics, Tata McGraw- Hill
8. Singh, Engineering Mathematics Tata McGraw- Hill

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Shri Vaishnav Institute of Science
Name of Program: Diploma (All Streams)
(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*				
DTCH101	**Diploma**	**Engineering Chemistry**	60	20	20	30	20	2	1	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):

To impart a sound knowledge on the principles of chemistry involving the different application-oriented topics required for all diploma engineering branches.

1. To understand the boiler related problems and treatment of hard water for industries and power plants.
2. To acquire the knowledge about the properties of engineering materials, lubricants and fuels.
3. To understand the electrochemical reactions and significance of corrosion control to protect the structure.
4. To acquaint the students with practical knowledge of the basic concepts of chemistry.

Course Outcomes (COs):

Students will:

1. Understand the properties of water and the importance of its treatment for portable and industrial purposes.
2. They will understand the basic properties of engineering materials, lubricants and fuels
3. To make the students understand the principles and electrochemical reactions involved in corrosion and methods to control corrosion.
4. They can predict the potential applications of chemistry and practical utility to become a good engineer.

Syllabus

Unit-I Water: Characteristics and Treatment

Sources, Impurities, Hardness & its units, Industrial water characteristics, softening of water by various methods (Exrernal & Internal treatment), Boiler trouble causes, effects & remedies, Characteristics of municipal water & its treatment.

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Name of Program: Diploma (All Streams)
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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*				
DTCH101	Diploma	Engineering Chemistry	60	20	20	30	20	2	1	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.

Unit-II Lubricants

Introduction, Mechanism of lubrication, Classification of lubricants, Properties and Testing of lubricating oils.

Unit-III Fuels

Introduction, Definition and classification of fuels, Characteristics of a good fuel, Calorific value, Determination of calorific value by Bomb calorimeter, Proximate and Ultimate analysis of coal and their significance, Carbonization, Cracking of higher Hydrocarbons and its advantages, Knocking, Cetane number, Octane Number.

Unit-IV Electrochemistry and Corrosion

Arrhenius theory of electrolytic dissociation, Transport number, Kohlrausch's law, Electrochemical cells.

Introduction and economic aspects of corrosion, Dry or Chemical Corrosion, Wet or Electrochemical Corrosion, Prevention methods of corrosion.

Unit-V Engineering Materials

Engineering materials and their classification: Refractories, Cement, Polymers. Properties and applications.

References

1. Engg. Chemistry- Rath cengage learning.
2. Applied Chemistry – Theory and Practice, O.P. Viramani, A.K. Narula, New Age Pub. Chemistry for Environmental Engineering – Sawyer, McCarty and Parkin –McGraw Hill, International.
3. Basic Lubrication theory – Alistair Cameron

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Shri Vaishnav Institute of Science
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(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*				
DTCH101	Diploma	Engineering Chemistry	60	20	20	30	20	2	1	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.

4. Engineering chemistry- Dr. Jyoti Mitna
5. Engineering chemistry- Dr. Sunita Ratan
6. Applied Chemistry – S.M. Khopkar
7. Introduction of polymer science- G.S. Mishra

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Choice Based Credit System (CBCS) in Light of NEP-2020
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COURSE CODE	CAT-EGORY	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*				
DTMT202	DCC	Basic Electronics Engineering	60	20	20	30	20	2	1	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):

1. The capability to use abstractions to analyse and design simple electronic circuits.
2. To introduce the fundamentals of electrical and electronic instruments
3. An understanding of how devices such as semiconductor diodes, rectifiers, and bi-polar junction transistors are working and how they are used in the design of useful circuits.
4. An understanding of basic Electronics Engineering.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge and skills.

The students will be able to

1. Develop the capability to analyse and design simple circuits.
2. To identify, formulate, and solve the fundamentals of electrical and electronic instruments.
3. Demonstrate various types of introduce various storage and display devices.
4. Learn how to develop and employ circuit models for elementary electronic components, e.g., resistors, sources, inductors, capacitors, diodes and transistors.

Syllabus

Unit I **8 Hrs.**

Importance of Basic Electronics in our society, Active and Passive Electrical and Electronics components, and their use in basic Electrical & Electronics Circuits. Testing and working of Basic Components used in Electronics Circuits and Bread Board.

Unit-II **7 Hrs.**

Classification of Materials, Energy band Principle, Semiconductors, Types of Semiconductor (P-Type, N Type), P-N junction Theory and Types of Diode, Transistors.

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COURSE CODE	CAT-EGORY	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*				
DTMT202	DCC	Basic Electronics Engineering	60	20	20	30	20	2	1	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.

Unit III **7 Hrs.**

Basic Instruments, Electrical Measurement, Measurement of voltage , current , power & energy, voltmeters & ammeter , wattmeter , energy meter, Electronics Instrument ,multimeter, CRO (analog & digital), An overview of voltage regulator.

Unit IV **8 Hrs.**

Magnetic disk and tape – Recorders, digital plotters and printers, CRT display, digital CRO, LED, LCD & dot matrix display, Loudspeaker, Microphone, Audio and Radio Techniques.

Unit V **8 Hrs.**

Sensors & Transducers, Classification of Transducers, Selection of transducers. Resistive, capacitive & Inductive transducers. Piezoelectric, Optical and Digital transducers, Block Diagram of Generalized Measurement System, Smart sensors.

Text Books:

1. R.S.Sedha, " A text Book of Applied Electronics". S.Chand Publication 2014.
2. H.S. Kalsi, '"Electronic Instrumentation", Tata McGraw Hill, II Edition 2004.
3. D.V.S. Moorthy, "Transducers and Instrumentation", Prentice Hall of India Pvt Ltd, 2007.

References :

1. A.K. Sawhney, "A Course in Electronic Measurements and Instrumentation", Dhanpat Rai Publication 2015

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COURSE CODE	CAT-EGORY	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*				
DTMT202	DCC	Basic Electronics Engineering	60	20	20	30	20	2	1	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.

List of Experiments:

1. To Study and Demonstrate of Basic Instruments in Lab.
2. To Design Basic Electronic Circuits using Bread Board.
3. To Study of CRO and perform component testing using CRO.
4. To Study and Perform to Plot V-I Characteristics of P-N Junction Diode.
5. To Study and perform V-I Characteristics of Zener Diode.
6. To Study and perform LVDT (Linear Variable Differential Transformer) characteristics.
7. To Study of function generator with its application.
8. To Demonstrate and Calibrate Measuring Instruments.
9. To Measure Various Electrical Parameter with Multimeter.
10. To Study and Perform with Strain Gauge.

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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*				
DTCS201	ODC	Computer Application-II	-	-	-	30	20	-	-	2	1

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 Objectives:

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 solves specified problems.

Course Outcomes:

1. Explain & implement the Object Oriented Programming concepts.
2. Explain packages and interfaces using Java program.
3. Implement Exception Handling in Java.
4. Design graphical user interface and Event Handling in Java.
5. Develop and deploy Applet in Java.

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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*				
DTCS201	ODC	Computer Application-II	-	-	-	30	20	-	-	2	1

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.

Syllabus

Unit - I

Basics of Java: Java - What, Where and Why? History and Features of Java , Difference between JDK,JRE and JVM ,Variable and Data Type, operators, Naming Convention.

Unit-II

OOPS Concepts : Advantage of OOPs, Object and Class, Method Overloading, Constructor, static variable, method and block , this keyword, Inheritance (IS-A), Aggregation and Composition(HAS-A), Method Overriding, super keyword, final keyword, Polymorphism, Abstract class and Interface, Package and Access Modifiers, Encapsulation.

Unit-III

String Handling : String ,Immutable String , String Comparison , String Concatenation , Substring , Methods of String class, String Buffer class , toString method.

Unit-IV

Exception Handling: Exceptions: Need for exceptions, Exception hierarchy:Checked Unchecked exceptions,Try, catch ,finally ,Throw, throws,creating exceptions.

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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*				
DTCS201	ODC	Computer Application-II	-	-	-	30	20	-	-	2	1

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-V

Multi threading: Multi threading advantages and issues,Multi threading advantages ,Thread Life cycle, Simple thread program, Priorities and scheduling.

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, Hervert schildt. TMH.
3. Big Java, Cay Horstmann 2nd edition, Wiley India Edition.
4. Java – Balaguruswamy.

List of experiments (Expandable):
Programming assignments may be given to students so that they can better understand the concepts of object oriented programming such as objects, classes, class-relationships, association, aggregation, inheritance, polymorphism etc.

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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*				
DTCS201	ODC	Computer Application-II	-	-	-	30	20	-	-	2	1

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.

1. Installation of J2SDK
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 Write a program to show
5. 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 Write aprogram to show use and Advantages of CONTRUCTOR
9. Write a program to show Interfacing between two classes
10. Write a program to Add a Class to a Package
11. Write a program to show Life Cycle of a Thread
12. Write a program to demonstrate AWT.
13. Write a program to Hide a Class
14. Write a Program to show Data Base Connectivity Using JAVA
15. Write a Program to show "HELLO JAVA" in Explorer using Applet
16. Write a Program to show Connectivity using JDBC
17. Write a program to demonstrate multithreading using Java.

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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*				
DTEI201	DCC	Electronics and Instrumen-tation	60	20	20	0	0	3	0	0	3

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 and instrumentation .
2. To familiarize the working and characteristics of various instrumentation devices.

Course Outcomes(COs):
Students will:
1. Define various Units system.
2. Explain working of various Instrumentation devices.

Syllabus

UNIT I **8 Hrs.**
Unit, dimensions and standards: Scientific notations and metric prefixes. SI electrical units, SI temperature scales, other unit systems, dimension and standards.

UNIT II **9 Hrs.**
PMMC instrument, galvanometer, DC ammeter, DC voltmeter, series ohm meter.

UNIT III **8 Hrs.**
Voltmeters &Ammeter, Wattmeter, Energy meter, Basics of CRO(analog & digital).

UNITIV **8 Hrs.**
Instrument calibration: Comparison method, digital Multimeter as standard instrument, calibration instrument Recorders: X-Y recorders, plotters.

UNIT V **9 Hrs.**
Low resistance measuring instruments AC bridge theory, capacitance bridges, Inductance bridges, Q meter.

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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*				
DTEI201	DCC	Electronics and Instrumentation	60	20	20	0	0	3	0	0	3

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.

Text Books:

1. A.K. Sawhney, "A Course in Electrical and Electronic Measurements", Dhanpat Rai Publication 2015.

References:

1. Oliver and Cage, "Electronic Measurements and Instrumentation", TMH, 2009.
2. Alan S. Morris, "Measurement and Instrumentation Principles", Elsevier (Buterworth Heinmann),2008.

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Vishwavidyalaya, Indore

Chairperson
Faculty of Studies
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Vishwavidyalaya, Indore

Controller of Examination
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore

Joint Registrar
Shri Vaishnav Vidyapeeth
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Shri Vaishnav Institute of Technology and Science
Choice Based Credit System (CBCS) in Light of NEP-2020
Diploma in Electronics and Instrumentation Engineering
(2021-2024)

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*				
DTEI201	DCC	Electronics and Instrumen-tation	60	20	20	0	0	3	0	0	3

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 and instrumentation .
2. To familiarize the working and characteristics of various instrumentation devices.

Course Outcomes(COs):
Students will:
1. Define various Units system.
2. Explain working of various Instrumentation devices.

Syllabus

UNIT I **8 Hrs.**
Unit, dimensions and standards: Scientific notations and metric prefixes. SI electrical units, SI temperature scales, other unit systems, dimension and standards.

UNIT II **9 Hrs.**
PMMC instrument, galvanometer, DC ammeter, DC voltmeter, series ohm meter.

UNIT III **8 Hrs.**
Voltmeters &Ammeter, Wattmeter, Energy meter, Basics of CRO(analog & digital).

UNITIV **8 Hrs.**
Instrument calibration: Comparison method, digital Multimeter as standard instrument, calibration instrument Recorders: X-Y recorders, plotters.

UNIT V **9 Hrs.**
Low resistance measuring instruments AC bridge theory, capacitance bridges, Inductance bridges, Q meter.

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Text Books:

1. A.K. Sawhney, "A Course in Electrical and Electronic Measurements", Dhanpat Rai Publication 2015.

References:

1. Oliver and Cage, "Electronic Measurements and Instrumentation", TMH, 2009.
2. Alan S. Morris, "Measurement and Instrumentation Principles", Elsevier (Buterworth Heinmann),2008.

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DTEE101	BEC	Basic Electrical Engineering	60	20	20	30	20	2	1	2	4

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Course Educational Objectives (CEOs):

1. To impart the basic knowledge about the Electric and Magnetic circuits.
2. To explain the working principle, construction, applications of DC machines, AC machines.

Course Outcomes (COs):

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

1. Understand and analyse basic circuit concepts.
2. Apply knowledge of mathematics to analyse and solve electrical circuit problems.
3. Understand the AC fundamentals.
4. Illustrate basic knowledge about the Electric and Magnetic circuits.
5. Distinguish the working Principles of various Electrical Machines.

Syllabus

UNIT I **8 Hrs.**

Basic Terminology and their concepts: Current, EMF, potential difference (Voltage), resistance, resistivity their units conductors & insulators, semiconductors. Electrical power, energy, and their units (SI), Heating effect of electric current and its practical examples. Relationship between electrical, mechanical, and thermal SI units of work, power and energy.

UNIT II **8 Hrs.**

D.C. Circuits: Ohm's law, Resistance – Specific Resistance, Temperature coefficient of Resistance, Resistance in series, parallel and series - parallel combinations, Kirchhoff's laws. Simple numerical problems based on Kirchhoff's laws.

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UNIT III **9 Hrs.**

Electromagnetism: Concept of magnetic flux, flux density, magnetic field intensity ,permeability and their units. Magnetic circuits, concept of reluctance and mmf. Analogy between electric and magnetic circuits. Elementary ideas about hysteresis loss. Electro Magnetic Induction, Dynamically and statically induced E.M.F, Lenz's Law & Fleming's right-hand rule -Self and mutual inductance.

UNIT IV **9 Hrs.**

A.C Circuits:- Instantaneous value, maximum (peak) value, cycle, frequency, alternating current and voltage. Difference between AC and DC. Average and RMS value of alternating voltage and current. Importance of RMS value. Simple problems. Concept of phase, phase difference and phasor representation of alternating voltage and current. A.C. through pure resistance, inductance, capacitance, phasor diagram and power absorbed. Apparent power, reactive power and active power, power factor, its importance and simple problems.

UNIT V **9 Hrs.**

Basic Concepts of Electrical Machines: Constructional details of Transformer, DC Machine, Induction motor and Synchronous machines, Working principle and operation of Transformer, 3-Phase Induction motor, DC machines and Synchronous machines.

Textbooks:

1. Basic Electrical Engineering, V.N Mittle & Arvind Mittal, TMH, Second Edition.
2. Basic Electrical engineering, D.P Kothari & I.J Nagrath, TMH, Second Edition.

References:

1. B. L. Theraja, "Electrical Technology", Vol.1, S. Chand Publication, New Delhi
2. E. Hughes, 'Electrical and Electronics Technology", Pearson, 2010.
3. L. S. Bobrow, 'Fundamentals of Electrical Engineering', Oxford University Press.

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List of Experiments:

1. Verification of KCL and KVL for DC circuits.
2. Measurement of current, power and power factor of incandescent lamp, fluorescent lamp, and LED lamp.
3. Measurement of resistance and inductance of a choke coil using 3 voltmeter methods.
4. Two way and three-way control of lamp and formation of truth table.
5. Measurement of earth resistance.
6. Study of effect of open and short circuit in simple circuits.
7. Demonstration of fuse and MCB separately by creating a fault.
8. Demonstration of cut-out sections of electrical machines (DC machines, Induction machines and synchronous machines).
9. Understanding AC and DC supply. Use of tester and test lamp to ascertain the healthy status of mains.

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