Shri Vaishnav VidyapeethVishwavidyalaya, Indore

Diploma in (Electronics and Instrumentation)

SUBJECT CODE	CATEGORY	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
ML301	Compulsory	**Environment and Energy Studies**	60	20	20	0	0	4	0	0	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST Mid Sem Test.

CourseObjectives: The students will be able to:

1. To understand sources of information required for addressing environmental challenges
2. To identify a suite of contemporary tools and techniques in environmental informatics
3. To apply literacy, numeracy and critical thinking skills to environmental problem-solving

Course Outcomes: The students should be able to:

1. Apply the principles of ecology and environmental issues that apply to air, land and water issues on a global scale.
2. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
3. Demonstrate ecology knowledge of a complex relationship between predators, prey, and the plant community.

Syllabus

Unit I

Environmental Pollution and Control Technologies: Environmental Pollution & Control: Classification of pollution, Air Pollution: Primary and secondary pollutants, Automobile and industrial pollution, Ambient air quality standards. Water pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid Waste management composition and characteristics of e - Waste and its management. Pollution control technologies: Wastewater Treatment methods: Primary, Secondary and Tertiary.

Unit II

Natural Resources: Classification of Resources: Living and Non - Living resources, water

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resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problem, Mineral resources: use and exploitation, environmental effects of extracting and using mineral resouces, Land resources: Forest resources, Energy resources: growing energy needs, renewable energy source, case studies..

Unit III

Ecosystems: Definition, Scope and Importance ecosystem. Classification, Structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Energy flow in the ecosystem, Biogeochemical cycles, Bioaccumulation, ecosystem value, devices and carrying capacity, Field visits.

Unit IV

Biodiversity and its Conservation: Introduction - Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a megadiversity nation - Hot-sports of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, manwildlife conflicts; Conservation of biodiversity: In-situ and Exsitu conservation. National biodiversity act.

Unit V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio- economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan(EMP)

Suggested Readings:

1. Agarwal, K.C.,(latest edition).**Environmental Biology**, Bikaner :Nidi Pub. Ltd.,
2. Brunner R.C.(latest edition) **Hazardous Waste Incineration**, McGraw Hill Inc.
3. Clank R.S. .,(latest edition. **Marine Pollution**, Clanderson Press Oxford (TB).
4. **Environmental Encyclopedia**, Jaico Pub. Mumbai,
5. De A.K(latest edition) **Environmental Chemistry**, Wiley Wastern Ltd.
6. ErachBharucha(2005).**Environmental Studies for Undergraduate Courses** by for University Grants Commission.
7. R. Rajagopalan(2006).**Environmental Studies**. Oxford University Press.
8. M. AnjiReddy(2006).**Textbook of Environmental Sciences and Technology**. BS Publication.
9. Richard T. Wright(2008).**Enviromental Science: towards a sustainable future** PHL Learning Private Ltd. New Delhi.
10. Gilbert M. Masters and Wendell P. Ela .(2008).**Environmental Engineering and science**. PHI Learning Pvt Ltd.

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11. Daniel B. Botkin& Edwards A. Keller(2008).**Environmental Science** Wiley INDIA edition.
12. AnubhaKaushik(2009).**EnviromentalStudies**. New age international publishers.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTEI301		MEASUREMENT & INSTRUMENTATION	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. To introduce the basic functional elements of instrumentation
2. To introduce the fundamentals of electrical and electronic instruments
3. To educate on the comparison between various measurement techniques
4. To introduce various storage and display devices
5. To introduce various transducers and the data acquisition system

Course Outcomes (COs):

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

The students will be able to

1. To apply knowledge of measurement system.
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. Demonstrate various types oftransducers and the data acquisition system.

Syllabus

Unit-I

Introduction to measurement: Definition, application and types of measurement System,Accuracy, Precision, sensitivity, Resolution. Functional elements of an instrument – Static and dynamic characteristics – Errors in measurement –Statistical evaluation of measurement data – Standards and calibration.

Unit-II

ELECTRICAL AND ELECTRONICS INSTRUMENTS:

Construction and operation of moving coil, moving iron,Theory and Operation of D'arsonval.

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Principle and types of analog and digital voltmeters, ammeters, Determination of B-H curve and measurements of iron loss – Instrument transformers – Instruments for measurement of frequency and phase.

Unit-III

COMPARISON METHODS OF MEASUREMENTS

D.C & A.C potentiometers, D.C & A.C bridges, transformer ratio bridges, self-balancing bridges. Interference & screening – Multiple earth and earth loops – Electrostatic and electromagnetic interference – Grounding techniques.

Unit-IV

STORAGE AND DISPLAY DEVICES

Magnetic disk and tape – Recorders, digital plotters and printers, CRT display, digital CRO, LED, LCD & dot matrix display – Data Loggers.

Unit-V

TRANSDUCERS AND DATA ACQUISITION SYSTEMS

Classification of transducers – Selection of transducers – Resistive, capacitive & inductive transducers – Piezoelectric, Hall effect, optical and digital transducers – Elements of data acquisition system – A/D, D/A converters – Smart sensors.

Text Books:

1. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw Hill, II Edition 2004.
2. D.V.S. Moorthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd, 2007.

References :

1. A.J. Bouwens, 'Digital Instrumentation', Tata McGraw Hill, 1997.
2. Martin Reissland, 'Electrical Measurements', New Age International (P) Ltd., Delhi, 2001.
3. Alan. S. Morris, Principles of Measurements and Instrumentation, 2nd Edition, Prentice Halln of India,

List of Experiments:

1. Study of CRO and perform component testinng using CRO.
2. Study of phase & frequency using Lissajous pattern with help of CRO.
3. Study and Perform Strain using staing gauge.
4. To study and perform LVDT (Linear Variable Differential Transformer) characteristics.
5. Study of function generator with its application.
6. To study and find out the balance condition for the Maxwell's bridge.
7. To study and find out the balance condition for the Schering bridge.
8. To study and find out the balance condition for the Hay's Bridge.
9. To study and find out the balance condition for the Wein's bridge.
10. To study and find out the balance condition for the Anderson's Bridge.

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SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTEI302		Digital Electronics	60	20	20	30	20	3	1	2	5

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 Will Be Able to

1. To explain and illustrate the concepts of digital
2. To have problem solving techniques for various Digital circuits.
3. To analyze the operation of sequential circuits

Course Outcomes (COs):

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

The students will be able to

1. develop the understanding of the Digital systems
2. To develop the research work, about the design methods.
3. Awareness of latest technologies and developments.
4. Implement various methods used to design the digital circuit for future application.

Syllabus

Unit-I

Number Systems: Decimal, binary, octal, hexadecimal number system and conversion, binary weighted codes, error detecting and correcting codes. Signed numbers, 1s and 2s complement codes, Binary arithmetic. Boolean algebra: Binary logic functions, Boolean laws, truth tables, associative and distributive properties, DeMorgans theorems, realization of switching functions using logic gates.

Unit-II

Combinational Logic: Switching equations, canonical logic forms, sum of product & product of sums, Karnaugh maps, two, three and four variable Karnaugh maps, simplification of expressions, Quine-McCluskey minimization technique, mixed logic combinational circuits, multiple output functions.

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Analysis & design of Combinational Logic: Introduction to combinational circuits, code conversions, decoder, encoder, priority encoder, multiplexers as function generators, binary adder, substractor, BCD adder, Binary comparator, arithmetic logic units

Unit-III

Sequential Logic: Sequential circuits, flip-flops, clocked and edge triggered flipflops, timing specifications, asynchronous and synchronous counters counter design with state equations, Registers, serial in serial out shift registers, timing considerations.

Unit-IV

Programmable Logic: Programmable logic devices, programmable read only memory, programmable logic arrays and programmable array logic, Design using PLA, field programmable gate a arrays.

Introduction to various semiconductor memories.

Unit-V

Digital integrated circuits: Logic levels, propagation delay time, power dissipation fan-out and fan-in, noise margin, logic families and their characteristics TTL, LSTTL CMOS and ECL integrated circuits and their performance comparison, open collector and tristate gates and buffers.

Introduction to A/D and D/A converters. Various types of Analog Digital & Digital to Analog converters.

References

1. M. Morris Mano, "Digital Design", 4th Edition, Prentice Hall of India Pvt. Ltd., 2008 / Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.. Mano; "Digital Logic & Computer Design"; PHI.
2. R.J. Tocci, "Digital Systems Principles & Applications".
3. Donald P.Leach and Albert Paul Malvino, "Digital Principles and Applications", 6th Edition, TMH, 2006
4. S Salivahanan,"Digital Circuits And Design"
5. John F.Wakerly, "Digital Design", Fourth Edition, Pearson/PHI, 2008
6. John.M Yarbrough, "Digital Logic Applications and Design", Thomson Learning, 2006.
7. Charles H.Roth. "Fundamentals of Logic Design", 6th Edition, Thomson Learning, 2013.

List of Experiments.

1. Getting familiar with various digital integrated circuits of different logic families. Study of data sheet of these circuits and see how to test these circuits using Digital IC Tester.
2. Configure diodes and transistor as logic gates and Digital ICs for verification of truth table of logic gates.
3. Configuring NAND and NOR logic gates as universal gates.
4. Verification & Implementation of Adders and Subtractors.

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5. Study and configurations of Encoder and Decoder circuits.
6. Study and configurations of multiplexer and demultiplexer circuits.
7. . Study and configure of various digital circuits such as code converters& parity generator.
8. Study and configure of flip-flop, registers and counters.

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SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment*				
DTEE101		**Basic Electrical 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):
To introduce the students with the

1. Component and type of components.
2. Material used for the type of component.
3. Construction and the working principle of the component.

Course Outcomes (COs):
After the successful completion of this course students will be able to

1. Identify various types of components.
2. Use multi meter for measuring various quantities like voltage(dc & ac), current, resistance.
3. Assemble and test components on breadboard.
4. Solder one simple circuit on a general purpose PCB.

Syllabus
Unit I
RESISTORS: Basic concepts. Ohm's Law. Fixed and Variable type.
Fixed: Carbon composition, carbon film, metal film, Ceramic & Vitreous Enamel wire-wound types.
Variable: Rheostat, Carbon track and wire-wound potentiometers (Linear & Non-Linear), Preset resistors.
Their construction, power rating, tolerance (accuracy) temperature coefficient, and typical applications.
E6, E12 & E24 series of resistors. Colour Code of Standard Resistors.

Unit II
CAPACITORS: Fixed and Variable type.
Fixed: Ceramic, Mica, Polyester and Electrolytic
Variable: Air Gang and Trimmer.
Their construction, voltage rating & typical applications. Colour Coding of capacitors.

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Unit III

INDUCTORS: Construction & application of air core, iron core, ferrite core, inductor coils(winding) used in Motors, Generators, Transformers, Tube-light chokes, D.C. power supply Filter chokes, loudspeakers and ignition system of vehicles.

Unit IV

CABLES/WIRES: Types: flexible, hook-up, coaxial and fiber optic. Multi-core Power and Control cables.
Their construction and applications.

Unit V

SWITCHES: Types: Slide, Toggle, Push to ON, Push to OFF, Rocker, Rotary & Reed switches. Their construction & applications.
RELAYS: Construction, rating & working principle of general purpose relay, Reed relay.

Text Book: - Electronic Circuits Handbook, 3rd Edition by Michael H Tooley. (BPB Publications).
Reference Books:-

1. Basic Electronics and Linear Circuits, 4th Edition by N Bhargava, D C Kulshreshtha & S C Gupta. (Tata McGraw – Hill Publishing Company Limited)
2. Electronic Components & Materials, 2nd Edition by S M Dhir, (Tata McGraw - Hill Publishing Company Limited).
3. Electronic Components and Materials, 2nd Edition by Grover & Jamwal (Dhanpat Rai & Sons).

List of Laboratory Experiments:-

Drawing of symbols/conventions of various Electrical & Electronic components used in Engineering.

1. To identify the value, tolerance of resistors and capacitors by colour code.
2. To measure the value of resistor/s using multimeter.
3. To test rheostat, linear potentiometer, logarithmic potentiometer, preset variable resistors.
4. Testing of LDR on multimeter.
5. Testing of Germanium, Silicon PN diodes on multimeter.
6. Use of breadboard & testing of different colour LED's, 7 segments LED Display on breadboard.
7. Testing of switches by measuring their contact resistance on multimeter.
8. Wiring and soldering of one circuit on a general purpose PCB.
9. Wiring and testing of AC 230V, 50 Hz extension supply board.
10. observe motors, generators, transformers and identify theInductor coils (windings) used therein.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	Th	T	P	CREDITS
DTCS201		Computer Application-II	0	0	0	30	20	0	0	4	2

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.

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.

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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.

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.

Installation of J2SDK

1. Write a program to show Scope of Variables
2. Write a program to show Concept of CLASS in JAVA
3. Write a program to show Type Casting in JAVA Write a program to show
4. How Exception Handling is in JAVA
5. Write a Program to show Inheritance
6. Write a program to show Polymorphism
7. Write a program to show Access Specifiers (Public, Private, Protected) in JAVA Write a program to show use and Advantages of CONTRUCTOR
8. Write a program to show Interfacing between two classes
9. Write a program to Add a Class to a Package
10. Write a program to show Life Cycle of a Thread
11. Write a program to demonstrate AWT.
12. Write a program to Hide a Class

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13. Write a Program to show Data Base Connectivity Using JAVA
14. Write a Program to show "HELLO JAVA " in Explorer using Applet
15. Write a Program to show Connectivity using JDBC
16. Write a program to demonstrate multithreading using Java.

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTEI304		Electronics Workshop-1	0	0	0	60	40	0	0	4	2

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
Q/A – Quiz/Assignment/Attendance, MST Mid Sem Test.

Course Objectives: -

1. To be familiar with PCB design and various processes involved.
2. To provide in depth knowledge of PCB fabrication.
3. To provide the knowledge in assembling and testing of the PCB based electronic circuits.

Course Outcomes:-

Students will be able to:

1. Apply the knowledge of engineering to design and conduct experiments using PCB design software.
2. Identify, formulate, and solve engineering problems related to PCB design and generate manufacturing files.
3. Design and simulate various PCB circuits using industry standard PCB design software tools.
4. Identify, formulate, and solve engineering problems associated with assembly and testing of electronic circuits.
5. Design and simulate various electronic PCB's required for prototyping and testing using software tools and testing equipments.

List of Experiments:

1. Familiarization/Identification of all analog ICs and digital ICs with specification (Functionality, type, size, package, symbol, cost etc).
2. Introduction to OrCAD schematic capture tool.
3. Introduction to Industry standard PCB design software tools like Eagle, Power PCB and TINA packages.
4. Analysis of conception level of Specifying Parts, Packages and Pin Names, Libraries and checking foot prints of the components.

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5. Analysis of Partlist, Netlist, Making Netlist Files, Placing Parts, Routing Traces.
6. To perform Modifying Traces, Mounting Holes, Adding Text, PCB Layout, DRC, and Pattern Transfer.
7. To simulate simple electronic circuit, Schematic to layout transfer, Layout Printing.
8. To Compute Etching, Cleaning, Drying and Drilling of PCB.
9. Identification of components and its location on the PCB, soldering of active and passive components, testing the assembled circuit for correct functionality.
10. Develop one mini project using all above process.

Text Books:

1. Electronic Devices, Thomas L. Floyd, Pearson (9th Edition), 9-Jan-2011.
2. Electronic Devices and Circuits, David A. Bell, Oxford Press (5th Edition) 30- April-2008.

References:

1 Printed Circuit Boards: Design, Fabrication, Assembly and Testing R.S. Khandpur Tata McGraw-Hill Education, 24-Feb-2005.
2 Printed Circuits Handbook Clyde Coombs McGraw Hill Professional, 22-May-2007.

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