SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
DTMA 301	BS	**APPLIED MATHEMATICS III**	60	20	20	0	0	3	1	0	4

Course Objective

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

Course Outcomes

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

1. *understand the techniques of Integration.*
2. *understand the concepts of the Fourier series.*
3. *understand the concepts of the Fourier Transforms.*
4. *understand the concepts of Laplace Transforms.*

Course Content:

Unit 1

Partial Fractions: Definition of Partial Fractions, Proper and Improper Fraction, Method of Resolving Into Partial Fractions:

Integral Calculus: Evaluation of Integrals by use of Partial Fraction. Evaluation of Integrals of the type $\int \frac{1}{ax^2+bx+c} dx$, $\int \frac{1}{\sqrt{ax^2+bx+c}} dx$, $\int \frac{px+q}{ax^2+bx+c} dx$.

Unit 2

Integral Calculus: General Rule of Integration by Parts $\int u(x)v(x)dx$. Reduction formulae for $\int \sin^n x \, dx, \int \cos^n x \, dx$ and evaluation of $\int_0^{\pi/2} \sin^n x \, dx$ and $\int_0^{\pi/2} \cos^n x \, dx$. Reduction formulae for $\int \sin^n x \cos^m x \, dx$ and evaluation of $\int_0^{\pi/2} \sin^n x \cos^m x \, dx$. Integration of $\int e^{ax} \sin bx \, dx$ and $\int e^{ax} \cos bx \, dx$.

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Unit 3

Laplace Transforms: Introduction to Laplace Transforms, Transforms of Elementary Functions, Properties of Laplace Transforms, Simple Problems.

Unit 4

Fourier Series: Introduction to Fourier Series, Periodic Function, Euler's Formula, Fourier Series for Even and Odd Functions, Half-Range Fourier Series and Simple Problems.
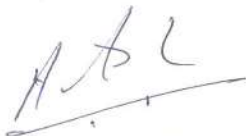
Unit 5

Fourier Transforms: Introductions to Fourier Transforms, Properties of Fourier Transforms, Simple Problems.

Text Books:

1. B.K. Paul, Diploma Engineering Mathematics (Vol-1), U.N. Dhar & Sons.
2. A. Sarkar, Mathematics, Naba Prakashani.
3. G.P. Samanta, A Text Book of Diploma Engineering Mathematics, Volume-1, Learning Press.
4. Dr. S. Bose & S. Saha, A Complete Text Book of Mathematics, Lakhsmi Prakasan.

Reference Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
2. H.K. Dass, Engineering Mathematics, S. Chand & Co.
3. B.K. Pal, K.Das, Engineering Mathematics, Volume-1, U.N. Dhar & Sons.
4. Kar, Engineering Mathematics, Tata McGraw- Hill.
5. Singh, Engineering Mathematics, Tata McGraw- Hill.

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ML-301 ENVIRONMENT AND ENERGY STUDIES

SUBJECT CODE	CATEGORY	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	CREDITS
ML-301	Compulsory	Environment and Energy Studies	60	20	20	0	0	4	0	0	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practicals 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 Objectives :
1. Understand sources of information required for addressing environmental challenges.
2. Identify a suite of contemporary tools and techniques in environmental informatics.
3. Apply literacy, numeracy and critical thinking skills to environmental problem-solving.
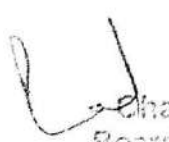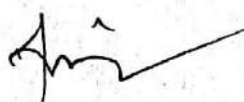
Course Outcomes
1. Apply the principles of ecology and environmental issues that apply to air, land and water issues on a global scale.
2. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
3. Demonstrate ecology knowledge of a complex relationship between predators, prey, and the plant community.
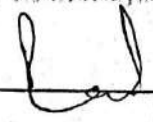
Unit I: Environmental Pollution and Control Technologies - Environmental Pollution & Control: Classification of pollution, Air Pollution: Primary and secondary pollutants. Automobile and industrial pollution. Ambient air quality standards. Water pollution: Sources and types, Impacts of modern agriculture, 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 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 resources, Land resources: Forest resources, Energy resources:

5

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, man wild life conflicts; Conservation of biodiversity: In-situ and Ex-situ 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)

Recommended Readings:

1. Agarwal, K.C. (2001). *Environmental Biology*. Bikaner: Nidi Pub. Ltd.
2. Brunner, R.C. (1993). *Hazardous Waste Incineration*. New Delhi: McGraw Hill Inc.
3. Clank, R.S. (2001). *Marine Pollution*. New York: Oxford University Press.
4. De, A.K. (2001).*Environmental Chemistry*. New Delhi: Wiley Western Ltd.
5. Bharucha , Erach (2005). *Environmental Studies for Undergraduate Courses*. New Delhi: University Grants Commission.
6. Rajagopalan, R. (2006). *Environmental Studies*. New York: Oxford University Press.
7. AnjiReddy, M. (2006).*Textbook of Environmental Sciences and Technology*. BS Publication.
8. Wright, Richard T. (2008). *Environmental Science: towards a sustainable future* .New Delhi: PHL Learning Private Ltd.
9. Gilbert M. Masters and Wendell P. Ela .(2008).*Environmental Engineering and science*. University Kindom:PHI Learning Pvt Ltd.
10. Botkin ,Daniel B. & Edwards A. Keller(2008).*Environmental Science*. New Delhi: Wiley INDIA edition.
11. Kaushik ,Anubha (2009).*Environmental Studies*. New Delhi: New age international publishers.

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Diploma in (Electronics and Instrumentation)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME									
			THEORY			PRACTICAL						
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	Th	T	P	CREDITS
DTEI401		Instrumentation and Process Control	60	20	20	30	20	2	1	2	4

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

Course Educational Objectives (CEOs):

Student should understand and analyze process control & Instrumentation engineering problems.

Course Outcomes (COs):

After successful completion of the course students should be able to:
1. Describe dynamics of various processes.
2. Learn and analyze the effect of various control actions.
3. Impart knowledge on the final control elements.
4. Know evaluation criteria and tuning techniques of controllers.
5. Understand and explain the concept of ladder logics on PLC.

Unit-I

Fundamental & Importance of Instrumentation, types of instruments, selection of instruments, performance of instruments, error in measurement, calibration & standard, Calibration of Instruments: Methods & analysis, Introduction to Transducer & types, Process Instrumentation , indicating & recording Instruments.

Unit-II

Basic concept and objectives of process control, types of control & their application. Concept of automatic control & its classification, Degree of freedom, Classification of variables, Process characteristics, Process lag, load disturbance and its effects - Self regulating, interacting and non-interacting process.

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Unit-III
Control Modes: Definition, Characteristics and comparison of on-off, proportional, integral, Derivative,

Unit-IV
Actuators: Hydraulic, Pneumatic actuators, Solenoid, E-P converters, control valves, Types, Functions, Quick opening, Linear and equal percentage valve, valve application and selection, Control valve sizing.

Unit-V
Introduction to advanced control system like Cascade, Feed forward, Ratio, Selective, Override, Split range and Auctioneering control, Introduction to PLC and its basic ladder logic.

TEXT BOOK
1. C.D. Johnson, "Process control Instrumentation Technology "Prentice Hall Inc., 2007.
2. Bella G. Liptak,"Process control and Optimization", Instrument Engineers Handbook, volume 2,CRC Press and ISA,2005.

REFERENCES
1. Coughanowr, D.R., "Process system analysis and control", McGraw-Hill International, Edition 2004.
2. D.P. Eckman,"Automatic Process controls "John Willey, 7th Edition, and newYork1990.
3. D.M Consedine," Process Instruments and control Handbook", Second Edition, McGraw, 1999.
4. Peter Harriott, "Process Control", Tata McGraw Hill, New Delhi, 1985.
5. Shinskey, "Process Control Systems", 4th Edition, McGraw Hill, Singapore, 1996.

List of Experiments
1. Experimental study of PID controller response on a level loop.
2. Controlling of Temperature of water by continuous controllers (P, I, D, PI, PD, PI D).
3. Designing of continuous electronics controllers, (P, I, D, PI, PD, PI D).
4. Study of Electro - Pneumatic Trainer kit and Pneumatic control valves.
5. Study of P to I converter and it's Interfacing to electro-pneumatic kit.
6. Study of I to P converter and it's Interfacing to electro-pneumatic kit.
7. Study of PLC and ladder diagram programming.
8. Controlling of Bottling plant through PLC.
9. Controlling of Water level through PLC.
10. Implementation of traffic light control through PLC.
11. Problem solving in PLC.

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SUBJECT CODE	Category	SUBJECT NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	Th	T	P	CREDITS
DTEI402		Microprocessors 8085 and Interfacing	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 8085 architecture and programming in assembly language.
2. To introduce basic concepts of interfacing memory and peripheral devices to a microprocessor.
3. To introduce serial and parallel bus standards

Course Outcomes (COs):

After successful completion of the course students should be able to:
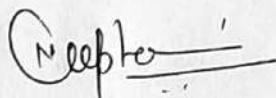
1. Understand the architecture of 8085 8-bit Microprocessor.
2. Describe the importance and function of each pin 8085 Microprocessor.
3. Write, Debug and Simulate assembly language program.
4. Interface Memory, Input/output with 8085 Microprocessor.
5. Summarize the functionality of various peripheral chips. .

Syllabus

Unit-I
Introduction To 8-bit Microprocessor

History of Microprocessor, 8085 Microprocessor architecture, buses, register, flags. 8085 pin configuration & function of each pin. Fetch, Decode and execute operations. Op-code Fetch, execute cycle, T state, Machine cycle. Memory and I/O read and write cycles WAIT state, interrupt timing diagram

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Unit-II

Intel 8085 Microprocessor Instruction Set

Intel 8085 Microprocessor Instruction Set, Addressing modes of 8085. Data transfer, Arithmetic, Logical, Rotate, Branch and machine control instructions.

Unit-III

Interfacing of Memory Chips & Input / Output Chips

Memory mapped I/o and I/O mapped I/O. Address decoding, interfacing of memory chips with 8085. Interfacing of input/output chips with 8085

Unit-IV

Assembly Language Programming

Development of 8085 assembly language programs: time delays. Concept of stack and Instruction related to stack. 8085 interrupts, RST, RIM, SIM instructions. Subroutines and conditional call instruction

Unit-V

Peripherals IC and Applications

Block diagram, Pin description and Interfacing of 8255(PPI) with 8085 Microprocessor.Interfacing of keyboard, display, ADC and DAC to 8255.Block diagram, Pin description and Interfacing of 8253(PIT) with 8085 Microprocessor.Brief description and application of 8259 10 20 PIC, 8251 USART and 8237 DMA Controller.

Text Books

1. Microprocessor Architecture, Programming, and Applications with the 8085 –Ramesh S. Gaonkar Pub: Penram International.

References

1. 8085 Microprocessor And its Applications, By A. NagoorKani, Third Edition,TMH Education Pvt. Ltd.

List of Experiments

1. Write 8085 assembly language program for addition of two 8-bit numbers.
2. Write 8085 assembly language program for subtraction of two 8-bit numbers.
3. Write 8085 assembly language program for multiplication of two 8-bit numbers.
4. Write 8085 assembly language program for division of two 8-bit numbers.
5. Write 8085 assembly language program for one's complement of an 8-bit numbers
6. Write 8085 assembly language program to find factorial of number.
7. Write 8085 assembly language program to find largest number in an arrey.
8. Write 8085 assembly language program to generate square wave and triangular wave.
9. Write 8085 assembly language program to interface 8279 programmable keyboard display controller to 8085 microprocessor.
10. Write 8085 assembly language programto interface 8253 programmable interval timer and verify the operation in six different modes.

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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*				
DTEI403		Electronics devices and Circuits	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 enable the student to be familiar with the structure of basic electronic devices and exposed to the operation and applications of electronic devices.

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 demonstrate the operation of BJT.
2. To demonstrate the various biasing technique of BJT.
3. To explain the working of UJT.
4. To analyze the working of amplifier oscillator.

Syllabus

Unit-I

BJT BIASING
The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Thermal Runaway, Thermal Stability, Analysis of a Transistor Amplifier Circuit using h - Parameters.

Unit-II

Small Signal analysis: Small signal Amplifier, Amplifier Bandwidth, Hybrid model, analysis of transistor amplifier using h-parameter, Multistage Amplifier: Cascading amplifier, Boot-strapping ·Technique, Darlington amplifier and cas-code amplifier, Coupling methods in multistage amplifier, Low and high frequency response, Hybrid π model, Current Mirror circuits.

Unit-III
Uni-junction Transistor (UJT): UJT - Principle of operation, characteristics, UJT relaxation oscillator, PNPN Diode and its characteristics,

Unit-IV
FEEDBACK AMPLIFIERS AND OSCILLATORS
Advantages of negative feedback – voltage / current, series , Shunt feedback –positive feedback – Condition for oscillations, phase shift – Wien bridge, Hartley, Colpitts and Crystal oscillators.

Unit-V
AMPLIFIERS :

Differential amplifiers: CM and DM , Introduction to Power Amplifier, Their types and efficiency, Introduction to Operational Amplifier.

current, series / shunt feedback – oscillators – LC, RC, crystal

Text Books:
1. *Integrated Electronics – J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.*
2. *Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.*

References :

1. *Electronic Devices and Circuits - K. Lal Kishore, 2 Ed., 2005, BSP.*
2. *Electronic Devices and Circuits – Anil K. Maini, Varsha Agarwal, 1 Ed., 2009, Wiley India Pvt. Ltd.*
3. *Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 Ed., 2008, TMH.*

4. *Electronic Devices and Circuits – B. P. Singh, Rekha Singh. Pearson, 2 Ed, 2013.*

List of experiments.
1. Study of Transistor Amplifier and its characteristics.
2. Study of Transistor Amplifier (Common base mode).
3. Study of Transistor Amplifier (Common Collector mode).
4. Study of Transistor Amplifier (Common Emitter mode).

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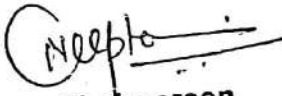Shri Vaishnav Vidyapeeth Vishwavidyalaya
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5. Study of Transistor Biasing Methods.
6. Study of Thermal Stability of Transistor.
7. Study of FET Amplifier and its characteristics.
8. Study of oscillator..
9. Study UJT Characteristics.
10. Study of Operational Amplifier

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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*				
DTEI404		Electronics Workshop-1	0	0	0	30	20	0	0	2	1

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.
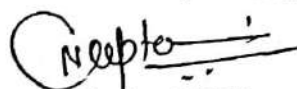3. To provide the knowledge in assembling and testing of the PCB based electronic circuits.

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.
5. Analysis of Partlist, Netlist, Making Netlist Files, Placing Parts, Routing Traces.

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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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Diploma [Electronics and Instrumentation]

SUBJECT CODE	CAEGORY	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				
DTEI405		Software Lab	0	0	0	30	20	0	0	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.

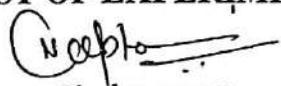## Course Educational Objectives (CEOs):

1. To familiarize the student with introducing and exploring LABVIEW software.
2. To enable the student on how to approach for solving Engineering problems using simulation tools.
3. To prepare the students to use LABVIEW in their project works.
4. To provide a foundation in use of this software for real time applications.

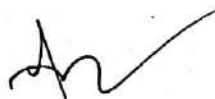## Course Outcomes (Cos)

The students will be able to

1. Express programming & simulation for engineering problems.
2. Find importance of this software for Lab Experimentation.
3. Articulate importance of software's in research by simulation work.
4. In-depth knowledge of providing virtual instruments on Labview Environment.

LIST OF EXPERIMENTS

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