



Lokmanya Tilak Jankalyan Shikshan Sanstha's

PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR

(An Autonomous Institute affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)



SCHEME OF EXAMINATION w.e.f. 2023-24 onwards

IV Semester B. Tech. Electrical Engineering (CBCS)

Sr. No.	Course Code	Course Category	BoS / Deptt	Course Name	Contact Hours				Marks				Total Marks	ESE Duration
					L	T	P	Credits	Theory		Practical			
									CE	ESE	CE	ESE		
1	24UEL401T	PCC	EE	Electrical Machines	3	0	0	3	40	60	-	-	100	3
2	24UEL401P	PCC	EE	Electrical Machines Lab.	0	0	2	1	-	-	25	25	50	-
3	24UEL402T	PCC	EE	Devices and Circuits	3	0	0	3	40	60	-	-	100	3
4	24UEL402P	PCC	EE	Devices and Circuits Lab.	0	0	2	1	-	-	25	25	50	-
5	24UXX4XXT	MDM		MDM-II	2	0	0	2	20	30	-	-	50	2
6	24UEL4XXT	OE		Open Elective-II	2	0	0	2	20	30	-	-	50	2
7	24UEL403P	VSEC	EE	Electrical Workshop	0	0	4	2	-	-	25	25	100	-
8	24UBS407T	AEC	ASH	Professional Communication	2	0	0	2	20	30	-	-	50	2
9	24UBS408T	EEM	ASH	Entrepreneurship Development & Startup	2	0	0	2	20	30	-	-	50	2
10	24UBS410T	VEC	ASH	Environmental Science	2	0	0	2	20	30	-	-	50	2
				Total	16	0	8	20	180	270	75	75	600	-

Open Elective-II		MDM-II		
Course Code	Course	Course Code	MDM Stream	Course
24UOE439T	1. Sensors and Transducers	24UCT410T	SOFTWARE DEVELOPMENT	Web Technology
24UOE440T	2. Network Theory and Machines	24UME408T	THERMAL POWER	Engineering Thermodynamic
		24UIT404T	DATA ANALYTICS	Introduction to Statistics with Probability
		24UET407T	ELECTRONIC SYSTEM DESIGN	Electronics Communication System



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Course Title: Electrical Machines
Course Code: 24UEL401T
Teaching Scheme: L – T – P
3 – 0 – 0

Semester: IV
Course Category: PCC
Total Credits: 03

Prerequisites: Nil

Course Objectives: To make the students aware and understand:

1. Basic Principle of Transfer of Electrical Power, Operation and Construction of Single phase Transformer with Phasor diagram.
2. Three Phase Transformer with Phasor diagram and Connections.
3. Construction, and Principle of D.C. Machines.
4. Construction, and Principle of Three Phase Induction Motor
5. Construction, Principle and Applications of Single Phase Induction Motor.
6. Construction and, Principle of Three Phase Synchronous Generator.

Course Outcomes:

After the completion of this course, the students shall be able to:

1. Determine Equivalent Circuit parameter, Efficiency and Regulation of Single Phase Transformer
2. Draw the Phasor as per groups and connections of Three Phase Transformer
3. Analyze different characteristics of D. C. Machines and Speed Control of D.C. Motor.
4. Explain starting and Speed control methods of Three Phase Induction Motor and Analyze the characteristics at different Value of Slip.
5. Describe various types of Single Phase Induction Motors.
6. Determine Voltage Regulation of Three Phase Synchronous Generator.

Course Content:

UNIT I

[8 Hours]

Single Phase Transformer: Phasor Diagram Under Different Load Conditions, Losses, Equivalent Circuit, Open Circuit and Short Circuit Test, Voltage Regulation, Efficiency, Condition of Maximum Efficiency, All Day Efficiency, Polarity Test. Single phase Auto - Transformer, Working, Merits and Demerits.

UNIT II

[6 Hours]

Three Phase Transformer: Principle and Operation, Open Circuit and Short Circuit Test, Connection and Phasor diagram of vector Groups, Scott connection. Open Delta connection, Conditions of Parallel Operation.

UNIT III

[6 Hours]

D.C. Machines: Basic Principle and Operation of D.C. Motor and D.C. Generator, Emf Equation and Torque equation, Types of D.C. Machines, Characteristics of Generator (OCC), Characteristics and Speed Control of D.C. Shunt and D.C. Series Motor, Losses and Efficiency of D.C. Motor. Armature Reaction and commutation in D. C. Machines.

UNIT IV

[8 Hours]



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Three Phase Induction Motor: Principle, Production of Torque, Torque Equation and Condition of Maximum and Starting Torque, Losses and Efficiency, Torque-Slip Characteristics, No Load Test and Blocked Rotor Test. Starting and Speed control methods of Three Phase Induction Motor.

UNIT V

[6 Hours]

Single Phase Induction Motors: Principle and Operation, Double Field Revolving Theory. Principle and Working of Shaded Pole Induction Motor, Split Phase Induction Motor and Capacitor Start, Capacitor Run Motor. Applications.

UNIT VI

[8 Hours]

Three Phase Synchronous Generator : Introduction, Constructional features of Salient Pole and Cylindrical Pole Rotor Machines, Introduction to Armature Winding and Field Winding, Winding Factors and EMF Equation, Armature Reaction, Phasor Diagram Under Load Condition, Synchronous Impedance Method to determine Voltage Regulation.

Text Books:

1. I. J. Nagrath, D.P. Kothari, "Electrical Machines," Tata McGraw- Hill Publishing Company Ltd
2. P.S. Bhimbra, "Electrical Machinery", Khanna Publishers.
3. P.K. Mukherjee, S. Chakravorty, "Electrical Machines", Dhanpat Rai Publications.
4. D C Kulshreshtha, "Basic Electrical Engineering," The McGraw Hill Higher Education Private Limited, New Delhi
5. Ashfaq Hussain, "Electrical Machines," Dhanpat Rai Publications.

Reference Books:

1. M.G.Say, " Performance and Design of A.C. Machines," CBS Publishers and Distributors Pvt. Ltd.
2. A.F. Fitzgerald, Charles Kingdey, Jr. Stephan D. Umans, "Electrical Machinery", Fifth Edition in SI Units, McGraw Hill Book Company.
3. D.P. Kothari, B.S.Umre, "Laboratory Manual for Electrical Machines," Second Edition , I.K. International Publishing House Pvt.Ltd., New Delhi.
4. S.G.Tarnekar, P.P. Kharbanda, S.B.Bodkhe, S.D. Naik , " Laboratory Courses in Electrical Engineering," S. Chand & Company Ltd., New Delhi.



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Course Title: Electrical Machines Lab.
Course Code: 24UEL401P
Teaching Scheme: L – T – P
0 – 0 – 2

Semester: IV
Course Category: PCC
Total Credits: 01

List of Experiments:

- 1 To perform open circuit (o.c.) & short circuit (s.c.) test on 3- phase Transformer
- 2 To perform open circuit (o.c.) & short circuit (s.c.) test on 1- phase Transformer
- 3 Speed control of d.c. shunt motor by – Varying field current and Varying armature voltage
- 4 Polarity marking on 1-phase transformer
- 5 Speed control of 3-phase slip - ring Induction Motor by rotor resistance method.
- 6 To perform load test on d.c. shunt Motor
- 7 To perform load test on d.c. shunt Generator
- 8 To draw magnetization characteristics of d.c. shunt generator
9. No load & Blocked rotor test on 3-phase Induction motor
10. To perform load test on 3-Ph Induction Motor
11. To study three phase to two phase conversation (scott connection).
- 12 To plot the 'v' & inverted 'v' curves of a Synchronous motor
- 13 To find regulation of 3-phase Alternator by open circuit (o.c.) & short circuit (s.c.)test
- 14 No load & Blocked rotor test on 1-phase Induction motor

Innovative Experiments:

1. Study of A.C.Series Motor
2. To Perform V- I characteristics of Universal Motor
3. To perform back to back test on 1-phase Transformer
4. To find regulation of 3-phase Alternator by Potier method
5. To plot the 'v' & inverted 'v' curves of a Synchronous motor
6. To study of BLDC Motor
7. To study the synchronization of an Alternator - With infinite bus-
A) By dark lamp method. Or B) By bright lamp method



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Course Title: Devices and Circuits
Course Code: 24UEL402T
Teaching Scheme: L – T – P
3 – 0 – 0

Semester: IV
Course Category: PCC
Total Credits: 03

Prerequisites: Nil

Course Objectives:

1. To provide basic knowledge and applications of diodes, transistors and MOSFETs.
2. To provide basic knowledge and applications of logic gates and logic families.
3. To provide basic understanding of Analog to digital and digital to analog converters

Course Outcomes:

After the completion of this course, the students shall be able to:

1. Design and Analyze diode circuits.
2. Understand the characteristics and use of a transistor as amplifiers.
3. Analyze and utilize OP-AMPS and linear ICs.
4. Design and implement combinational digital circuits
5. Design and implement sequential logic circuits
6. Apply the process of Analog to Digital and Digital to Analog conversion and classify memories.

Course Content:

UNIT I

[6 Hours]

Semiconductor Diodes and Circuits: Review of basic diodes, Tunnel diode, schottky diode, varactor diode and their characteristics and applications. Zener Diode as voltage regulators, Practical Applications of diode circuits. JFET, MOSFET, UJT – structure, operation and V-I characteristics. Introduction to power diodes and its characteristics.

UNIT II

[8 Hours]

Transistors and Power Amplifiers: Introduction to operating points, BJT Biasing, Fixed biased configuration, Emitter-bias configuration, Voltage divider bias configuration, collector feedback configuration, Emitter follower configuration, Design operations, current mirror circuits, constant current source circuits, Practical applications. DC and AC analysis.

Power Amplifiers: Introduction, feedback Amplifier, Class A amplifier, Transformer-Coupled Class A amplifier, Class B amplifier operation, Class B amplifier circuits, Push Pull amplifier. Amplifier distortion, Class C and Class D amplifier. Introduction to Differential amplifier.

UNIT III

[8 Hours]

Op-Amp and Linear ICs: Introduction to op-amp, Inverting and non-inverting amplifier, integrator, active filter, voltage regulator, oscillators (Wein bridge and phase shift). Analog to Digital Conversion. Hysteresis Comparator, Zero Crossing Detector, Square-wave and triangular-wave generators. Precision rectifier.

Study of linear ICs: LM723, LM741, LM555, LM 78XX.



UNIT IV

[6 Hours]

Combinational Digital Circuits: Representation for logic functions, K-map representation (up to 4 variables), and simplification of logic functions using K-map, minimization of logical functions. Don't care conditions, Multiplexer, De-Multiplexer/Decoders, use in combinational logic design, Adders, Subtractors, Arithmetic logic unit (ALU), digital comparator, code converters, priority encoders, decoders/drivers for display devices.

UNIT V

[8 Hours]

Sequential circuits and systems : A 1-bit memory, the circuit properties of Bi-stable latch, the clocked SR flip flop, J- K flip flop, T and D types flip-flops, excitation table of flip flop, conversion of flip flops, applications of flip flops, shift registers, applications of shift registers, serial to parallel converter, parallel to serial converter, ring counter, sequence generator, ripple(Asynchronous) counters, synchronous counters, counters design using flip flops, special counter IC's, asynchronous sequential counters, applications of counters.

UNIT VI

[6 Hours]

A/D and D/A Converters: Digital to analog converters - weighted resistor/converter R-2R ladder D/A converter, specifications for D/A converters, examples of D/A converter ICs, sample and hold circuit. Analog to digital converters - quantization and encoding, parallel comparator. Semiconductor memories- Semiconductor Memory - Types, Working and Applications

Text Books:

1. Millman and Halkias, "Electronic Devices and Circuits", McGraw Hill
2. Millman and Halkias, "Integrated Electronics", McGraw Hill
3. J. V. Wait, L. P. Huelsman and G. A. Korn, "Introduction to Operational Amplifier theory and applications", McGraw Hill U. S., 1992
4. R. Gaikwad, "Operational Amplifiers and applications"
5. Linear ICs Manual I, II, III, National Semiconductors
6. R. P. Jain, "Modern Digital Electronics", McGraw Hill Education, 2009.
7. M. M. Mano, "Digital logic and Computer design", Pearson Education India, 2016.
8. H.Taub, "Digital Integrated Electronics" McGraw Hill
9. A. Kumar, "Fundamentals of Digital Circuits", Prentice Hall India, 2016.
10. Herbert Taub, Donald LSchilling "Digital Integrated Electronics", McGraw Hill, 1977

Reference Books:

1. J. Millman and A. Grabel, "Microelectronics", McGraw Hill Education, 1988
2. P. Horowitz and W. Hill, "The Art of Electronics", Cambridge University Press, 1989.
3. P. R. Gray, R. G. Meyer and S. Lewis, "Analysis and Design of Analog Integrated Circuits", John Wiley & Sons, 2001



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Course Title: Devices and Circuits lab.

Course Code : 24UEL402T

Teaching Scheme: L – T – P
0 – 0 – 2

Semester: IV

Course Category: PCC

Total Credits: 01

List of Experiments:

- 1 To study and plot V-I Characteristics of Silicon diode
- 2 To study and plot characteristics of Zener diode
- 3 To study Zener diode as a voltage regulator. A) When V_{in} is fixed. b) When V_{in} is variable
- 4 To study the operation of Class A and B Power amplifier.
- 5 To study the operation of differential amplifier.
- 6 To study and verify truth table of half adder, full adder
- 7 To study and verify truth table of half subtractor, full subtractor
- 8 To study and verify truth table of different types of flip flops
9. To design and implement counters using shift registers - Ring Counter and Johnson Counter
10. To set up and test 7-segment static display system to display numbers 0 to 9
11. To study operation of Multiplexer & Demultiplexer

Innovative Experiments:

1. Study and experimental verification of MOSFET
2. To study design of Arithmetic Logic Unit (<http://vlabs.iitkgp.ernet.in/dec/exp10/index.html>)
3. To study logic functions using decoders (<http://vlabs.iitkgp.ernet.in/dec/exp5/index.html>)
4. To study characteristics of BJT in common emitter configuration (Virtual Laboratory)
5. To study characteristics of BJT in common base configuration (Virtual Laboratory)
6. To study BJT in common emitter amplifier. (Virtual Laboratory)



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Course Title: OE-II Sensors and Transducers
Course Code: 24UOE440T
Teaching Scheme: L – T – P
2 – 0 – 0

Semester: IV
Course Category: OE
Total Credits: 2

Prerequisites: Nil

Course Objectives: Students will be able to –

1. Introduce students to the principle of various Transducers, their construction, applications and principles of operation, standards and units of measurements.
2. Explain various measurements techniques for industrial applications based on sensors and transducers.

Course Outcomes:

After the completion of this course, the students shall be able to:

1. Basic of transducers
2. Illustrate measurement techniques for displacement, acceleration and torque.
3. Summarize various temperature, humidity and vibration measurement techniques
4. Select a suitable instrument for measuring pressure, flow and vacuum

Course Content:

UNIT I

[7 Hours]

Instrumentation System: Definition of sensor and transducer, classification of transducers, performance characteristics, selection criteria, transducer specification, roll of sensors in industry.

UNIT II

[7 Hours]

Displacement, Force & Torque Measurement:

Linear Displacement: Resistive potentiometer, capacitive displacement transducer, LVDT, Hall Effect sensor. Rotary Displacement- Tachometer, rotary encoder, stroboscope. Force: Basic methods of force methods, Strain gauge. Torque: Inductive torque transducers, digital method of torsion transducer.

UNIT III

[7 Hours]

Temperature, Humidity and Vibration Measurement

Classification of Temperature sensors, selection criteria of temperature sensors. Bimetallic Strip, Thermistor- Principle, types (NTC, PTC), construction & working, testing & applications. Thermocouples– Principle, Terminology (Thermo electric, See beck, Peltier effect) and characteristics, cold junction compensation methods. Pyrometers: Principle, construction & working of total radiation pyrometer and optical pyrometer, applications.

Humidity and Vibration Measurement- pH : construction & working of pH sensor. Humidity: Hygrometer (Hair, wire & electrolysis). Vibration: acceleration pick up, proximity probes.

UNIT IV

[7 Hours]

Flow, Pressure and Level Measurement: Selection criteria of flow sensors. Head Type Flow Meter- Orifice, venturi, pitot tube. Variable Area Type Flow Meter: Rota-meter Open Channel: Electro Magnetic, Ultrasonic, anemometers.

Selection criteria of pressure sensors. Primary Pressure Sensors: Elastic elements types - bourdon,



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diaphragm, bellows, Non elastic: Manometer. Secondary/ Electrical Pressure sensors: LVDT, photoelectric. Low Pressure- Mc-Leod gauge, pirani gauge, ionization gauge. Level Measurement - Selection criteria for level sensors. capacitive, conductivity, radiation level sensor, Ultrasonic level Detector.

Text Books:

1. D. Patranabis "Sensors and Transducers", PHI Learning Private Limited, Delhi, Second Edition, 2003,.
2. A.K. Sawhney, "A Course in Electrical & Electronics Measurement and Instrumentation", Dhanpat Rai & Sons, 2015

Reference book:

1. Handbook of Modern Sensors: Physics, Designs, and Applications by Jacob Fraden.



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Course Title: OE-II Network Theory and Machines
Course Code : 24UOE440T
Teaching Scheme: L – T – P
2 – 0 – 0

Semester: IV
Course Category: OE
Total Credits: 2

Prerequisites: Nil

Course Objectives:

To provide a fundamental understanding of electrical network theory and its applications.
To introduce students to various electrical machines and their operating principles.
To develop skills in analyzing and designing electrical networks and machines.

Course Outcomes:

After the completion of this course, the students shall be able to:

1. Apply the concept of Node and Mesh analysis to ac circuits and analyze the Network theorems.
2. Analyze and determine Fundamentals of A.C circuits.
3. Apply and analyze the working of DC machines.
4. Apply and analyze the working of AC machines.

Content:

UNIT I

[6 Hours]

Basic circuit elements and Kirchhoff's laws, Network theorems (Thevenin, Norton, Superposition, etc.), Mesh and nodal analysis techniques, Transient and steady-state analysis of networks

UNIT II

[8 Hours]

Network Functions and Resonance
Network functions (impedance, admittance, transfer functions), Resonance in AC circuits (series and parallel resonance), Coupled circuits and Transformers: Principles of operation and construction, Equivalent circuit and phasor diagrams. Voltage regulation and efficiency calculations

UNIT III

[6 Hours]

Introduction to Electrical Machines
Principles of electromechanical energy conversion, Constructional details and operating characteristics of machines.
DC Machines
Principles of operation and construction, Types of DC machines (generators, motors), Armature reaction and commutation, Characteristics and applications,

UNIT IV

[8 Hours]

Induction Machines- Principles of operation and construction, Torque-speed characteristics and applications,
Synchronous Machines- Principles of operation and construction, Applications in power generation
Special Machines
Single-phase induction motors, Stepper motors, Brushless DC motors, Applications in industrial automation



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Text Books

1. Electrical Circuits by A.Chakrabarthy- Dhanapat Raj and Sons.
2. Electrical Circuits by Joseph Edminister- Schaum series
3. Electrical Technology vol.-II, B.L Theraja.
4. Engineering Circuit analysis By William Hayt and JackE,kemmerly-TMH.



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Course Title: Electrical Workshop
Course Code: 24UEL404P
Teaching Scheme: L – T – P
0 – 0 – 4

Semester: IV
Course Category: VSEC
Total Credits: 02

List of Experiments:

- 1 To study the different electrical symbols used in power plants, and design the substation layout electrical drawing.
- 2 To design the single-phase transformer of small VA rating
- 3 To design a circuit for starting a induction motor using different switch gear components
- 4 To perform the Megger test or insulation test on the motor, and power cable
- 5 To study the cut section of a single-phase induction motor
- 6 To study the cut section of DC motor
- 7 To study the operation of a tong tester or clamp meter
- 8 To control lamps by two separate switches (house wiring).
9. To control one lamp by two 2-way switches.
10. To study the different logic gates using electrical switches
11. To study the different functions of electronic hardware timers
- 12 To Design LED light.
- 13 To study the cut section of the power cables and control cables
- 14 To study the operation of the LCR meter
- 15 To study soldering- de-soldering techniques
- 16 To Design and fabricate Half – Wave and Full wave rectifier
- 17 To study circuit and working of a Home Inverter
- 18 To study function generator & Power Supply and perform measurements.
- 19 To measure the resistance to earth by using an earth tester.

Innovative Experiments:

1. Visit to Electrical Park of Electrical Department, PCE, Nagpur
2. Visit to substation PCE, Nagpur
3. Visit to solar Power plant, PCE, Nagpur



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Course Title: Professional Communication
Course Code: 24UBS407T
Teaching Scheme: L – T – P
2 – 0 – 0

Semester IV
Course Category: HSSM-AEC
Total Credits: 2

Pre-requisites: Basic knowledge of spoken and written English

Course Objectives: The objectives of the course are:

1. To enhance speaking skills of the learners.
2. To encourage learners to write effectively.
3. To prepare learners for their job placement.

Course Outcomes: On completion of the course, students will be able to-

1. Construct correct sentences for spoken and written English.
2. Develop writing and speaking skills.
3. Demonstrate writing skills at work place.
4. Prepare themselves for job placement.

Course Content:

UNIT I

[8 Hours]

Grammar for Spoken English: Tense, Active and Passive Voice, Negative, Interrogative and Negative-interrogative sentences, use of modal auxiliary verbs.

UNIT II

[7 Hours]

Writing and Speaking skills: Paragraph writing, Precis Writing, Research papers writing, workplace communication (at shop, restaurant, bank, airport, office etc.), Public speaking.

UNIT III

[9 Hours]

Professional writing skills: Business letters, email, minutes of meeting, notices, blog writing, virtual message drafting, one page report writing.

UNIT IV

[6 Hours]

Job placement techniques: Job application letter, Resume writing, Group discussion, types of interview, interview techniques, telephonic interview etiquettes.

Activities:

1. Video making on practicing Grammar and Public speaking.
2. Reinforcement exercises on Group Discussion and Interview.
3. Role play for communication at work places.

Reference books:

1. Technical Communication by Meenakshi Raman and Sangeeta Sharma, OUP
2. Public Speaking and Influencing Men in Business by Dale Carnegie
3. Professional Communication Skills by Bhatia and Sheikh, S. Chand Publications
4. Communication Skills by Sanjeev Kumar and Pushpalata, OUP
5. Functional English for Technical Students by Dr. Pratibha Mahato and Dr. Dora Thompson, Himalaya Publishing House.
6. Communication Skills by Lalita Bisen, Bhumika Agrawal, N.Thejo Kalyani, Himalaya Publishing House



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Course Title: Entrepreneurship Development & Startups

Course Code : 24UBS408T

Teaching Scheme: L – T – P

2 – 0 – 0

Semester: IV

Course Category: HSSM-Eco

Total Credits: 2

Prerequisites : Basic knowledge of business and finance.

Course Objectives: The objectives of the course are:

1. To create awareness among learners about entrepreneurship development and that of start up.
2. To motivate the learners to convert their ideas and creativity into business.
3. To encourage learners to develop out of the box thinking and problem solving skills that benefit society.

Course Outcomes: On completion of the course, students will be able to-

1. Acquire basics of entrepreneurship development
2. Identify various types of startups.
3. Analyze the concept of ideation
4. Develop knowledge of start-up funding.

Course Content:

UNIT I

[8 Hours]

Concept of entrepreneurship, characteristics of an Entrepreneur, types of Entrepreneurship, Functions of Entrepreneurs, Women entrepreneurship in India, Problems and challenges of women entrepreneurs, Government's support system to develop women entrepreneurship.

UNIT II

[7 Hours]

Concept of startup, Features of start-up, challenges and benefits of startups, Types of startups: Scalable startup, small business startup, lifestyle startup, buyable startup, social startup, big business startup, causes of startup failure, Startup ecosystem.

UNIT III

[8 Hours]

Concept of ideation, ideation process, idea incubation, design thinking approach, ideation techniques: Brain-storming, Worst Idea, Mind Mapping, sketching, Analogies, SCAMPER, success factors for ideation.

UNIT IV

[7 Hours]

Funding for startups: Private equity fund, angel funding, venture funding, bootstrapping, crowd funding, Seed funding, government grants and subsidies.

Activities:

1. Guest lecture and its report submission by individual student.
2. Industrial Visit to a start-up and its report submission by individual student.

Reference books:

1. Entrepreneurial Development By, S. S. Khanka S. Chand & Co. Ltd. New Delhi, 1999.
2. Small- Scale Industries and Entrepreneurship, By, Dr. Vasant Desai, Himalaya Publication.



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3. The startup checklist by David. S. Rose, Wiley publications, 2016.
4. Trajectory: Start up: Ideation to Product/Market Fit by Dave Parker, Matt Holt Books
5. Funding Your Startup By Dhruv Nath, Penguin Books India PVT Limited, 2020



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Course Title: Environmental Science

Course Code : 24UBS410T

Teaching Scheme: L – T – P

2 – 0 – 0

Semester: IV

Course Category: HSSM-VEC

Total Credits: 2

Prerequisites: Students are expected to know the fundamental principles of theoretical and experimental Basic Science of HSC level.

Course Objectives:

- A systematic study of human interaction with the environment in the interests of solving complex problems.
- Study of physical and biological characters of the environment , also the social and cultural factors along with the impact of man on environment.
- Bring together the principles of various disciplines of Sciences, to solve contemporary environmental problems.

Course Outcomes:

1. Understand the Multidisciplinary nature of environmental science and gain in-depth knowledge of natural processes that sustain life and govern economy.
2. Develop critical thinking for shaping strategies (scientific, social, economic and legal) for environmental protection and conservation of biodiversity, social equity and sustainable development.
3. Acquire values and attitudes towards understanding complex environmental-economic-social challenges, and participating actively in solving current environmental problems and preventing the future ones.
4. Adopt sustainability as a practice in life, society and industry and know their roles and ethics, as citizens, and consumers in a complex, interconnected world.

Course Content:

UNIT I

[6 Hours]

Environment as a multidisciplinary subject and Natural resources

Environment: Definition, Scope, basic terms, importance, need for public awareness. concept of sustainable development.

Natural resources and associated problems. Forest, water, mineral, food and land resources. Role of individuals in conservation of natural resources. Equitable use of resources for sustainable lifestyle. Environmental Application of remote sensing and GIS. Relevant case studies, laws and Legislations.

UNIT II

[8 Hours]

Ecosystem and Biodiversity

Ecosystem: Concept, Structure and Functions, Energy Flow, Food Chain, Food web, and Ecological Pyramids; Grassland and pond Ecosystem. Ecological succession.

Biodiversity: Introduction, definition, Types (genetic, species & ecosystem). value of biodiversity, Biodiversity at Global, National and local Levels. Hot spots of biodiversity; Threats to biodiversity; conservation, In-situ and Ex-situ conservation; Relevant case studies, laws and Legislations.



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UNIT III

[8-Hours]

Environmental Pollution, hazards, Disaster management & EIA:

Pollution: Definition, causes, effects and control measures of Water, Air, solid, noise and nuclear pollution.

Environmental hazards & Disaster management: Definition, and types of mitigation. Preparedness and awareness.

Environmental impact assessment (EIA); scope, importance and need. Role of IT in environment. Environmental Auditing; Relevant case studies, laws and Legislations.

UNIT IV

[8- Hours]

Social Issues and Environment, Environmental conventions

Population explosion, Urban problems related to energy, resettlement and rehabilitation of people, their problems and concerns, family welfare programme, human health, women and child welfare; environmental ethics & consumerism. Mass tourism and environment. Sustainable tourism. Stockholm convention, Kyoto Protocol, Montreal Protocol, COP (Conference of Parties), Ramsar Convention, Rio Summit, Convention on Biological Diversity; National Green Tribunal; Relevant case studies, laws and Legislations.

Textbooks:

- 1.Environmenta Studies: ISBN: 8188458-77-5
- 2.Environmenta StudiesISBN-978-81-317-2118-6

Reference books:

- 1.Environmenta Studies Univ. Sci. PressISBN-978-81-318-0641-8
- 2.Environmenta Studie: ISBN: 8188458-77-5