

**DGCT AUTONOMOUS REGULATION - 2024
IV SEMESTER**

24TMA401	PROBABILITY AND STOCHASTIC PROCESSES	L	T	P	C
		3	1	0	4

COURSE OBJECTIVES:

- To provide necessary basic concepts in probability and random processes for applications such as random signals, linear systems in communication engineering.
- To provide necessary basics in probability that are relevant in applications such as random signals, linear systems in communication engineering.
- To understand the basic concepts of probability, one and two dimensional random.
- Variables and to introduce some standard distributions applicable to engineering which can describe real life phenomenon.

UNIT - I PROBABILITY AND RANDOM VARIABLES 9+3

Probability – Axioms of probability – Conditional probability – Baye's theorem - Discrete random variables – Continuous random variables – Binomial, Poisson, Exponential and Normal distributions.

UNIT - II TWO - DIMENSIONAL RANDOM VARIABLES 9+3

Joint distributions – Marginal and conditional distributions – Covariance – Correlation – Central limit theorem (Statement only) – Problems based on Central limit theorem for independent and identically distributed random variables.

UNIT - III RANDOM PROCESSES 9+3

Classification – Stationary process – Wide sense stationary process – Markov process - Poisson process - Discrete parameter Markov chain – Chapman Kolmogorov equations (Statement only) – Problems based on steady state distribution of the chain – Nature of the states of Markov Chain.

UNIT - IV CORRELATION AND SPECTRAL DENSITIES 9+3

Auto correlation functions – Cross correlation functions – Properties – Power spectral density – Cross spectral density – Properties.


UNIT - V LINEAR SYSTEMS WITH RANDOM INPUTS 9+3

Linear time invariant system – System transfer function – Linear systems with random inputs – Auto correlation and Cross correlation functions of input and output.

Total Periods : 60**COURSE OUTCOMES:**

At the end of the course, the students will be able to

- CO1.** Apply the concept of random processes in engineering disciplines
- CO2.** Understand the fundamental concepts of probability with a thorough knowledge of standard distributions that can describe certain real-life phenomenon.
- CO3.** Understand the basic concepts of one and two dimensional random variables and apply them to model engineering problems.
- CO4.** Understand the fundamental concepts of correlation and spectral densities.


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C05. Able to analyze the response of random inputs to linear time invariant systems.

TEXT BOOKS:

1. Ibe.O.C., "Fundamentals of Applied Probability and Random Processes", Elsevier, 1st Indian
2. Peebles. P.Z., "Probability, Random Variables and Random Signal Principles", Tata Mc Graw Hill, 4th Edition, New Delhi, 2002.


REFERENCE BOOKS:

1. Yates. R.D. and Goodman. D.J., "Probability and Stochastic Processes", 2nd Edition, Wiley India Pvt. Ltd., Bangalore, 2012.
2. Stark. H., and Woods. J.W., "Probability and Random Processes with Applications to Signal Processing", 3rd Edition, Pearson Education, Asia, 2002.
3. Miller. S.L. and Childers. D.G., "Probability and Random Processes with Applications to Signal Processing and Communications", Academic Press, 2004.
4. Hwei Hsu, "Schaum's Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata Mc Graw Hill Edition, New Delhi, 2004.
5. Cooper. G.R., Mc Gillem. C.D., "Probabilistic Methods of Signal and System Analysis", 3rd Indian Edition, Oxford University Press, New Delhi, 2012.

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	3	-	-	-	-	-	-	3	-	-	2	-	-
C02	3	3	-	-	-	-	-	-	3	-	-	2	-	-
C03	3	3	-	-	-	-	-	-	3	-	-	2	-	-
C04	3	3	-	-	-	-	-	-	3	-	-	2	-	-
C05	3	3	-	-	-	-	-	-	3	-	-	2	-	-
Avg	3	3	-	-	-	-	-	-	3	-	-	2	-	-

1-low, 2-medium, 3-high, '-'-no correlation


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**DGCT AUTONOMOUS REGULATION - 2024
IV SEMESTER**

24TEC401	ELECTRO MAGNETIC FIELDS	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES :

- To understand and apply the laws and theorem for calculating and solving problems on static Electric field.
- To understand and apply the laws for calculating and solving problems on static magnetic field.
- To relate Electromagnetic Magnetic Field in materials.
- To relate the EM wave propagation in lossless and in lossy media.
- To understand the principles and applications of Electromagnetic fields

UNIT - I STATIC ELECTRIC FIELDS 9

Coordinate Systems – Gradient, Divergence, Curl - Divergence theorem, Stoke's theorem - Coulomb's Law and Applications – Electric Field Intensity in line, Surface and Volume – Gauss Law and Applications – Electric potential.

UNIT - II STATIC MAGNETIC FIELDS 9


Biot-Savart Law – Magnetic Field intensity due to a finite and infinite wire carrying a current I – Ampere's circuital law and simple applications – Magnetic flux density – Lorentz force equation – Force on a wire carrying a current placed in a magnetic field – Torque on a loop carrying a current – Magnetic moment – Magnetic vector potential.

UNIT - III STATIC ELECTRIC AND MAGNETIC FIELDS IN MATERIALS 9

Electrostatics in Materials: Polarization in dielectric materials, Boundary conditions for electric field, Poisson's and Laplace's equation – Application of Laplace's equation in calculating the parallel and series capacitance. Magneto statics in Materials: Magnetization and Permeability – Magnetic boundary conditions, Electric current - Current density - Continuity equation for current. Inductance -Mutual inductance -Energy density in magnetic fields.

UNIT - IV TIME VARYING FIELDS AND MAXWELL'S EQUATIONS 9

Maxwell's equations in integral form and differential form, Poynting Vector and the flow of power - Poynting theorem - Wave equations for conducting and non-conducting media -Uniform plane waves in perfect dielectrics, conductors, and free space -Total Internal Reflection- Skin effect – Brewster angle


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UNIT – V APPLICATIONS OF ELECTROMAGNETIC WAVES

9

Radio frequency Communications, Medical Imaging, Microwave heating, Induction heating, Electromagnetic Sensing, Navigation Systems, Electromagnetic Compatibility – regulation and Standards.

Total Periods : 45

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1:** Apply the basic laws to determine electric field intensity and potential for point, line, and surface charge distributions.
- CO2:** Apply Biot-Savart's Law and Ampere's circuital law to determine Magnetic field Intensity.
- CO3:** Investigate the behavior of electromagnetic fields in materials.
- CO4:** Apply the Maxwell's equations in wave propagation.
- CO5:** Understand the real time applications of electromagnetic.

TEXT BOOKS :

1. David K.Cheng, "Field and Wave Electromagnetics", 2nd Edition, Pearson Education, 2014.
2. M.N.O. Sadiku and S.V. Kulkarni, Principles of Electromagnetics, 6th ed., Oxford (Asian Edition), 2015.

REFERENCE BOOKS:


1. E.C.Jordan & K.G. Balmain, "Electromagnetic Waves and Radiating Systems", 2nd Edition, Pearson Education, 2015.
2. W H. Hayt Jr & J A Buck, "Engineering Electromagnetics", 9th Edition, TATA McGraw-Hill, 2020.
3. Branislav Notaros, Electromagnetics, 1st edition, Pearson, 2010.
4. Narayana Rao, N, "Elements of Engineering Electromagnetics", 6th Edition, Pearson Education, 2004.
5. Samuel Y. Liao, "Engineering Applications of Electromagnetic Theory", West Publishing Co., 1988.


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CO's- PO's& PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1	-	2	1	-	-	1	-	2	-	-
CO2	2	2	3	3	2	2	2	-	-	1	1	2	-	-
CO3	2	2	3	2	2	2	1	-	-	1	1	2	-	-
CO4	2	2	2	2	2	2	1	-	-	2	2	1	-	-
CO5	3	2	1	1	2	1	1	-	-	1	2	-	-	-
Avg	2	2	2	2	1.6	2	1	-	-	1	1	1.4	-	-

1-low,2-medium,3-high,'-'-no correlation


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**DGCT AUTONOMOUS REGULATION – 2024
IV SEMESTER**

24TEC402	LINEAR INTEGRATED CIRCUITS	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

- To introduce the basic building blocks of linear integrated circuits.
- To learn the linear and non-linear applications of operational amplifiers.
- To introduce the theory and applications of analog multipliers and PLL.
- To learn the theory of ADC and DAC.
- To introduce the concepts of waveform generation and introduce some special function ICs.

UNIT - I BASICS OF OPERATIONAL AMPLIFIERS **9**

Current mirror and current sources, Current sources as active loads, Voltage sources, Voltage References, BJT Differential amplifier with active loads, Basic information about op-amps – Ideal Operational Amplifier - General operational amplifier stages -and internal circuit diagrams of IC 741, DC and AC performance characteristics, slew rate, Open and closed loop configurations

UNIT - II APPLICATIONS OF OPERATIONAL AMPLIFIERS **9**

Sign Changer, Scale Changer, Phase Shift Circuits, Voltage Follower, V-to-I and I-to-V converters, adder, subtractor, Instrumentation amplifier, Integrator, Differentiator, Logarithmic amplifier, Antilogarithmic amplifier, Comparators, Schmitt trigger, Precision rectifier, peak detector, clipper and clamper, Low-pass, high-pass and band-pass Butterworth filters.

UNIT - III ANALOG MULTIPLIER AND PLL **9**

Analog Multiplier using Emitter Coupled Transistor Pair - Gilbert Multiplier cell - Variable transconductance technique, analog multiplier ICs and their applications, Operation of the basic PLL, Closed loop analysis, Voltage controlled oscillator, Monolithic PLL IC 565, application of PLL for AM detection, FM detection, FSK modulation and demodulation and Frequency synthesizing and clock synchronization

UNIT - IV ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERTERS **9**

Analog and Digital Data Conversions, D/A converter – specifications - weighted resistor type, R-2R Ladder type, Voltage Mode and Current-Mode R - 2R Ladder types - switches for D/A converters, high speed sample-and-hold circuits, A/D Converters – specifications - Flash type - Successive Approximation type - Single Slope type – Dual Slope type - A/D Converter using Voltage-to-Time Conversion - Over-sampling A/D Converters, Sigma – Delta converters.


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UNIT – V WAVEFORM GENERATORS AND SPECIAL FUNCTION ICs**9**

Sine-wave generators, Multivibrators and Triangular wave generator, Saw-tooth wave generator, ICL8038 function generator, Timer IC 555, IC Voltage regulators – Three terminal fixed and adjustable voltage regulators - IC 723 general purpose regulator - Monolithic switching regulator, Low Drop – Out(LDO) Regulators - Switched capacitor filter IC MF10, Frequency to Voltage and Voltage to Frequency converters, Audio Power amplifier, Video Amplifier, Isolation Amplifier, Optocouplers and fibre optic IC.

Total Periods : 45**COURSE OUTCOMES:**

At the end of the course, the students will be able to

- CO1.** Design linear and nonlinear applications of OP – AMPS.
- CO2.** Design applications using analog multiplier and PLL
- CO3.** Design ADC and DAC using OP – AMPS
- CO4.** Generate waveforms using OP – AMP Circuits
- CO5.** Analyze special function ICs

TEXT BOOKS:

- Roy Choudhry, Shail Jain, "Linear Integrated Circuits", New Age International Pvt. Ltd., 2018, Fifth Edition.
- Sergio Franco, "Design with Operational Amplifiers and Analog Integrated Circuits", 4th Edition, Tata Mc Graw-Hill, 2016


REFERENCE BOOKS:

- Ramakant A. Gayakwad, "OP-AMP and Linear ICs", 4th Edition, Prentice Hall / Pearson Education, 2015
- Robert F. Coughlin, Frederick F. Driscoll, "Operational Amplifiers and Linear Integrated Circuits", Sixth Edition, PHI, 2001.
- S. Salivahanan & V.S. Kanchana Bhaskaran, "Linear Integrated Circuits", TMH, 2nd Edition, 4th Reprint, 2016.

CO's-PO's& PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	2	-	-	-	-	-	-	-	-	-
CO2	3	3	3	3	2	-	-	-	-	-	-	-	-	-
CO3	3	2	2	3	2	-	-	-	-	-	-	-	-	-
CO4	3	3	3	2	1	-	-	-	-	-	-	-	-	-
CO5	3	3	3	2	2	-	-	-	-	-	-	-	-	-
Avg	3	3	3	3	2	-	-	-	-	-	-	-	-	-

1-low, 2-medium, 3-high, '-' - no correlation


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**DGCT AUTONOMOUS REGULATION - 2024
IV SEMESTER**

24TCH401	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY	L	T	P	C
		2	0	0	2

COURSE OBJECTIVES:

- To introduce the basic concepts of environment, ecosystems and bio diversity and emphasize on the biodiversity of India and its conservation.
- To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and natural disasters
- To facilitate the understanding of global and Indian scenario of renewable and non-renewable resources, causes of their degradation and measures to preserve them
- To familiarize the concept of sustainable development goals and appreciate the interdependence of economic and social aspects of sustainability, recognize and analyse climate changes, concept of carbon credit and the challenges of environmental management
- To inculcate and embrace sustainability practices and develop a broader understanding on green materials, energy cycles and analyses the role of sustainable urbanization.

UNIT - I ENVIRONMENT AND BIODIVERSITY 6

Definition, scope and importance of environment – need for public awareness. Eco-system and Energy flow– ecological succession. Types of biodiversity: genetic, species and ecosystem diversity– values of biodiversity, India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ.

UNIT - II ENVIRONMENTAL POLLUTION 6

Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid, Hazardous and E-Waste management. Case studies on Occupational Health and Safety Management system (OHSMS). Environmental protection acts – air, water and soil.

UNIT - III RENEWABLE SOURCES OF ENERGY 6

Energy management and conservation, New Energy Sources: Need of new sources. Different types new energy sources. Applications of- Hydrogen energy, Ocean energy resources (OTE), Tidal energy, Concept, origin and power plants of geothermal energy.

UNIT - IV SUSTAINABILITY AND MANAGEMENT 6

Sustainable Development, GDP, Sustainability- concept, needs and challenges-economic, social aspects of sustainability from unsustainability. Sustainable Development Goals-targets, indicators and intervention areas Climate change- Global, Regional and local environmental issues and possible solutions-case studies. Concept of Carbon Credit, Carbon Footprint. Environmental management in industry-A case study.

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UNIT - V SUSTAINABILITY PRACTICES

6

Zero waste and R concept, Circular economy, ISO 14000 Series, Material Life cycle assessment, Environmental Impact Assessment. Sustainable habitat: Green buildings, Green materials, Energy efficiency, Sustainable transports. Sustainable energy: Non-conventional Sources, Energy Cycles, carbon cycle, emission and sequestration, Green Engineering: Sustainable urbanization- Socioeconomically and technological change.

Total Periods : 30

COURSE OUTCOMES:

At the end of the course, learners will be able to


- CO1.** To recognize and understand the functions of environment, ecosystems and bio diversity and their conservation.
- CO2.** To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.
- CO3.** To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
- CO4.** To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.
- CO5.** To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.

TEXT BOOKS:

1. Anubha Kaushik and C. P. Kaushik's "Perspectives in Environmental Studies", 6th Edition, New Age International Publishers, 2018.
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2016.

REFERENCE BOOKS:


1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media. 38 . edition 2010.
2. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2007.
3. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, Third Edition, 2015.
4. Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" OrientBlackswan Pvt. Ltd. 2013.


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CO's-PO's& PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	2	1	-	-	-	2	3	-	-	-	-	2	-	-
C02	3	2	-	-	-	3	3	-	-	-	-	2	-	-
C03	3	-	1	-	-	2	2	-	-	-	-	2	-	-
C04	3	2	1	1	-	2	2	-	-	-	-	2	-	-
C05	3	2	1	-	-	2	2	-	-	-	-	1	-	-
Avg	2.8	1.8	1	1	-	2.2	2.4	-	-	-	-	1.8	-	-

1-low,2-medium,3-high,'-'no correlation


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**DGCT AUTONOMOUS REGULATION – 2024
IV SEMESTER**

24TEC403	PRINCIPLES OF COMMUNICATION SYSTEMS	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES :

- Able to design generation and detection of AM, DSB, SSB and VSB signals.
- Able to understand the concepts in Angle modulation for the design of communication systems.
- Learn the concepts of random process and various types of noise.
- Evaluate the performance of the communication system in presence of noise.
- Analyze pulse modulation and sampling techniques.

UNIT - I AMPLITUDE MODULATION 9

Review of signals and systems, Amplitude Modulation: Introduction, Principle of Amplitude Modulation, Modulation, DSB-SC, VSB Modulation, AM Generation, AM Transmitters and receivers – TRF, Superheterodyne Receiver, Hilbert Transform, Pre-envelope and complex envelope.

UNIT - II ANGLE MODULATION 9

Phase and Frequency Modulation: Narrow Band FM, Wide Band FM, Transmission bandwidth of FM Signals Phase and frequency Modulation, FM Modulators-Reactance modulator, Varactor diode, Armstrong method, FM transmitters – Cross by, PLL, Indirect FM transmitter, FM Receiver-FM Demodulators discriminators-Balanced slope detector, Foster Seeley discriminator, Ratio detector, PLL.

UNIT - III RANDOM PROCESS AND NOISE CHARACTERIZATION 9

Review of probability and random process, Noise sources and its types, Performance measures for noise in AM and FM, Receiver for AM signal, Noise performance analysis of FM systems, FM Noise suppression-Pre-emphasis and De-emphasis in FM.

UNIT - IV SAMPLING AND QUANTIZATION 9

Low pass sampling- Aliasing - Signal reconstruction-Quantization –Uniform and non-uniform quantization-Logarithmic companding.

UNIT - V INFORMATION THEORY 9

Discrete Memoryless source, Information, Entropy, Mutual Information – Discrete Memoryless channels – Binary Symmetric Channel, Channel Capacity – Hartley –Shannon law –Source coding theorem – Shannon – Fano & Huffman codes.

Total Periods : 45

COURSE OUTCOMES:

At the end of the course, students will be able to

- CO1:** Able to design generation and detection of AM, DSB, SSB and VSB signals.
- CO2:** Able to understand the concepts in Angle modulation for the design of communication systems.
- CO3:** Learn the concepts of random process and various types of noise.
- CO4:** Understand the sampling and quantization method
- CO5:** Determine the error in digital code.


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Patt, Salem - 636 303.

TEXT BOOKS:

1. Communication Systems, Simon Haykins & Moher, 5th Edition, John Willey, India Pvt Ltd, 2010, ISBN 978-81-265-2151-7.


REFERENCE BOOKS:

1. Modern Digital and Analog Communication Systems, B. P. Lathi, Oxford University Press., 4th edition.
2. An Introduction to Analog and Digital Communication, Simon Haykins, John Wiley India Pvt. Ltd., 2008, ISBN 978-81-265-3653-5.
3. Principles of Communication Systems, H.Taub & D.L.Schilling, TMH, 2011.
4. Communication Systems, Harold P.E, Stern Samy and A.Mahmond, Pearson Edition, 2004.
5. Communication Systems: Analog and Digital, R.P.Singh and S.Sapre: TMH 2nd edition, 2007.

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	3	3	1	-	-	-	1	-	1	-	-	-	1
C02	3	3	3	2	-	-	-	1	-	-	-	-	-	2
C03	3	3	2	1	-	-	-	1	-	-	-	-	-	1
C04	3	3	2	1	-	-	-	1	-	-	-	-	-	-
C05	3	3	2	2	-	-	-	1	-	1	-	-	-	-
Avg	3	3	2.5	1.5	-	-	-	1	-	0.5	-	-	-	1

1-low, 2-medium, 3-high, '-'-no correlation


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**DGCT AUTONOMOUS REGULATION – 2024
IV SEMESTER**

24TEC404	MICROPROCESSORS AND MICROCONTROLLERS	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

- To study the Addressing modes & instruction set of 8085 & 8086
- To introduce commonly used Peripheral Interfacing of 8051 Microcontroller
- Develop skills in simple program writing in assembly languages
- To study and understand elements of ARM Cortex
- To study and understand the basics of embedded system

UNIT - I 16 - BIT MICROPROCESSOR 9

8086 Architecture, Instruction set and programming, Addressing modes, Interrupts Timing diagrams, Memory and I/O interfacing, Minimum and Maximum mode configurations.

UNIT - II 8051 MICROCONTROLLERS AND ITS PERIPHERAL INTERFACING 9

8051 Architecture, Instruction Set, Data Processing - Stack, Arithmetic, Logical; Branching - Unconditional and Conditional Peripheral Interfacing: Standard Interfaces - RS232, SPI and I2C, Interfacing of Sensors: DAC, ADC, PWM and LCD Interfacing, Sensor with Signal Conditioning Interface.

UNIT - III 8051 SPECIAL PURPOSE REGISTERS AND PROGRAMMING 9

Special Function Register - Interfacing of Memory Devices - Timer Programming - Serial Data Transfer - UART. I/O Ports and Port Expansion - Programming on Interrupts. Assembly Language Programs, C Language Programs Using SFR.

UNIT - IV INTRODUCTION TO ARM MICROCONTROLLERS 9

Functional Blocks of ARM, Processor Modes, Registers, Pipeline, advantages and Features, Applications of ARM microcontroller, Difference between RISC & CISC.

UNIT - V EMBEDDED SYSTEMS 9


Components of Embedded System, Classification, Architecture, functionality, Processors, Embedded system design process, Basic Structure of an Embedded C Program Real time Embedded system.

Total Periods : 45

COURSE OUTCOMES:

At the end of the course, students will be able to

- CO1.** Ability to write assembly language program for 8 and 16 bit microprocessor.
- CO2.** Ability to design and implement interfacing of peripheral with microcontroller.
- CO3.** Ability to analyze, design and simulate microcontroller based systems.
- CO4.** Ability to analyze, design and simulate microcontroller based systems used for control and Monitoring.
- CO5.** Ability to understand basics of Embedded System.


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TEXT BOOKS:

1. Ramesh S. Gaonkar, "Microprocessor Architecture Programming and Application", Pen ram International (P)ltd., Mumbai, 6th Edition, 2013.
2. Muhammad Ali Mazidi & Janice Gilli Mazidi, "The 8051 Micro Controller and Embedded Systems", Pearson Education, Second Edition 2011.
3. K.V Shibu, "Introduction to Embedded System", 2nd Edition 2016.
4. Wayne Wolf, "Principles of Embedded Computing System Design", 2nd Edition 2018.

REFERENCE BOOKS:

1. Douglas V. Hall, "Micro-processors & Interfacing", Tata McGraw Hill 3rd Edition, 2017
2. Krishna Kant, "Micro-processors & Micro-controllers", Prentice Hall of India, 2007
3. Kenneth Ayala, "The 8051 Microcontroller", Thomson, 3rd Edition 2004
4. Mike Predko, "8051 Micro-controllers", McGraw Hill, 2009.
5. Steve Furber, "ARM System-on-Chip Architecture", 2nd Edition 2016.

CO's-PO's & PSO's MAPPING

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C01	2	1	2	3	-	-	-	1	-	-	-	2	1	-
C02	2	1	2	3	-	-	-	1	-	-	-	2	1	-
C03	2	1	2	3	-	-	-	1	-	-	-	2	1	-
C04	2	1	2	3	-	-	-	1	-	-	-	2	1	-
C05	2	1	2	3	-	-	-	1	-	-	-	2	3	-
Avg	2	1	2	3	-	-	-	1	-	-	-	2	1	-

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**DGCT AUTONOMOUS REGULATION - 2024
IV SEMESTER**

24S001	EMPLOYABILITY SKILLS - I	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES:

- To solve basic math problems like time, speed, work, and percentages.
- To improve communication, teamwork, and time management skills.
- To write programs to solve problems using coding and algorithms.
- To prepare for placements with better technical and soft skills.

MODULE - I APTITUDE - I 10

Number Systems – LCM & HCF – Work & Wages – Time, Distance and Speed – Pipes and Cisterns – Trains, Boats and Streams – Averages and Percentages – Allegations and Mixtures – Profit and Loss

MODULE - II SOFT SKILLS - I 10

Goal Setting - Motivation - Problem Solving - Cognitive Skills - Personal Qualities - Ethics - Effective Communication - Interpersonal Skills - Teamwork - Time Management - Positivity - Role Play - Emotional Maturity - Emotional Health.

MODULE - III PROBLEM SOLVING -I 10

Mathematical - Bit Manipulation - Design Pattern - - Counting - Arrays - Matrix - Searching - Sorting - Strings - Stack - Queue - Pointer - Series - Online Preparation - Leetcode - Codechef - Hackerrank - Geeks for geek.

Total Periods :30

COURSE OUTCOMES:

At the end of the course, students will be able to:

- CO1: Develop students' ability to solve quantitative problems for placement tests.
CO2: Enhance soft skills like communication, teamwork, and time management for professional growth.
CO3: Build problem-solving skills using programming and algorithms.
CO4: Prepare students for technical assessments and interviews in campus placements.

TEXT BOOKS:

1. R.S. Aggarwal, "Quantitative Aptitude for Competitive Examinations", S. Chand Publishing, 2001
2. Stephen R. Covey, "The 7 Habits of Highly Effective People", Free Press (Simon & Schuster), 1989

REFERENCE BOOKS:

1. <https://www.geeksforgeeks.org/>
2. <https://leetcode.com/>
3. <https://www.hackerrank.com/>


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CO's-PO's& PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PS01	PS02
C01	-	1	3	-	-	-	-	-	1	-	-	-	-	-
C02	-	-	2	-	-	-	-	-	1	-	-	-	-	-
C03	-	1	3	-	-	-	-	-	1	1	-	-	-	-
C04	-	1	3	-	-	-	-	-	1	1	-	-	-	-
Avg	-	1	3	-	-	-	-	-	1	1	-	-	-	-

1-low, 2-medium, 3-high, '-'-no correlation


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**DGCT AUTONOMOUS REGULATION - 2024
IV SEMESTER**

24LEC401	LINEAR INTEGRATED CIRCUITS LABORATORY	L	T	P	C
		0	0	3	1.5

COURSE OBJECTIVES:

- To understand the basics of linear integrated circuits and available ICs.
- To understand the characteristics of the operational amplifier.
- To apply operational amplifiers in linear and nonlinear applications.
- To acquire the basic knowledge of special function IC.
- To use SPICE software for circuit design.

List of Experiments:

Part I – Hardware Experiments

1. Design and testing of Inverting, Non-Inverting, Differential amplifiers.
2. Design and testing of Integrator and Differentiator.
3. Design and testing of Comparators and Schmitt Trigger using op-amp.
4. Design and testing of Phase shift and Wien bridge oscillators using op-amp
5. Frequency response analysis of active low-pass, High-pass and band-pass filters.
6. Design and testing of Astable and monostable multivibrators using NE555 Timer.
7. Design and testing of PLL characteristics and its use as Frequency Multiplier, Clock synchronization
8. Design and testing of R-2R Ladder Type D- A Converter using Op-amp.
9. Design and testing of DC power supply using LM317 and LM723.
10. Design and testing of Low dropout voltage regulators.

Part II – Software Experiments (PSPICE)

1. Design and testing of Instrumentation amplifier
2. Design and testing of active low-pass, high-pass and band-pass filters using op-amp
3. Design and testing of Astable and monostable multivibrators using Timer.
4. Design and testing of Comparators and Schmitt Trigger using op-amp.
5. Design and testing of Voltage Controlled Oscillator

Total Periods : 45

COURSE OUTCOMES:

At the end of the course, students will be able to


- C01. Design amplifiers, oscillators, multivibrators and D-A converters using operational amplifiers.
- C02. Design filters using op-amp and performs an experiment on frequency response.
- C03. Analyze the working of PLL and describe its application as a frequency multiplier.
- C04. Design DC power supply using ICs.
- C05. Analyze the performance of amplifiers, filters, multivibrators using SPICE.


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CO's- PO's& PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3	2	3	2	2	-	-	-	-	-	-	-	-	2
C02	3	2	3	2	2	-	-	-	-	-	-	-	-	-
C03	3	3	3	2	2	-	-	-	-	-	-	-	-	2
C04	3	2	3	3	1	-	-	-	-	-	-	-	-	1
C05	3	3	3	2	2	-	-	-	-	-	-	-	-	-
Avg	3	3	3	3	2	-	-	-	-	-	-	-	-	-

1-low, 2-medium, 3-high, '-'-no correlation


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**DGCT AUTONOMOUS REGULATION – 2024
IV SEMESTER**

24PEC401

MICRO PROJECT

L	T	P	C
0	0	3	1.5

COURSE OBJECTIVES:

- To acquaint the process of identifying the needs and converting it into the problem
- To familiarize themselves with the process of applying basic engineering fundamentals to attempt solutions to the problems.
- To develop analytical thinking and professional skills to prepare mini project.
- To demonstrate the developed project and its outcome to the evaluators
- To inculcate the process of self-learning.

GENERAL GUIDELINES FOR MICRO PROJECT :


The students in a group of 4 to 5 works on a topic approved by the head of the department and prepare a comprehensive micro project report after completing the work to the satisfaction. The progress of the project is evaluated based on a minimum of two reviews. The review committee may be constituted by the Head of the Department. A micro project report is required at the end of the semester. The micro project work is evaluated based on oral presentation and the micro project report by internal examiners constituted by the Head of the Department

Total Periods : 45

COURSE OUTCOMES:

At the end of the course, students will be able to


- CO1.** Identify problems based on societal /research needs.
- CO2.** Design solutions or system components or processes that meet the specified needs.
- CO3.** Develop interpersonal skills to work as a member of a group.
- CO4.** Showcase technical proficiency and the ability to translate ideas into tangible solutions.
- CO5.** Demonstrate the ability to engage in self-learning by identifying challenges and formulating effective methodologies to solve them..


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CO's - PO's& PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO1	PSO2
CO1	3	3	3	3	3	2	3	-	2	2	2	3	2	2
CO2	3	3	3	3	3	-	-	-	2	-	2	3	2	3
CO3	3	3	3	3	2	1	-	-	3	-	2	3	3	2
CO4	2	3	3	3	3	2	-	2	3	2	2	3	2	2
CO5	2	-	-	-	3	-	-	2	2	3	2	3	2	2
Avg	2	3	3	3	3	2	3	2	2	3	2	3	3	3

1-low, 2-medium, 3-high, '-'-no correlation


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24XGE001

INDUCTION PROGRAMME

L	T	P	C
0	0	0	0

This is a mandatory 2 week programme to be conducted as soon as the students enter the institution. Normal classes start only after the induction program is over.

The induction programme has been introduced by AICTE with the following objective:

"Engineering colleges were established to train graduates well in the branch/department of admission, have a holistic outlook, and have a desire to work for national needs and beyond. The graduating student must have knowledge and skills in the area of his/her study. However, he/she must also have broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he/she would understand and fulfill his/her responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed."

"One will have to work closely with the newly joined students in making them feel comfortable, allow them to explore their academic interests and activities, reduce competition and make them work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and build character."

Hence, the purpose of this programme is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

(i) Physical Activity

This would involve a daily routine of physical activity with games and sports, yoga, gardening, etc.

(ii) Creative Arts

Every student would choose one skill related to the arts whether visual arts or performing arts. Examples are painting, sculpture, pottery, music, dance etc. The student would pursue it everyday for the duration of the program. These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, grow into engineering design later.

(iii) Universal Human Values

This is the anchoring activity of the Induction Programme. It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, take decisions with courage, be aware of relationships with colleagues and supporting stay in the hostel and department, be sensitive to others, etc. A module in Universal Human Values provides the base. Methodology of teaching this content is extremely important. It must not be through do's and don'ts, but get students to explore and think by engaging them in a dialogue. It is best taught through group

discussions and real life activities rather than lecturing.

Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It would be effective that the faculty mentor assigned is also the faculty advisor for the student for the full duration of the UG programme.

(iv) Literary Activity

Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

(v) Proficiency Modules

This would address some lacunas that students might have, for example, English, computer familiarity etc.

(vii) Lectures by Eminent People

Motivational lectures by eminent people from all walks of life should be arranged to give the students exposure to people who are socially active or in public life.

(viii) Visits to Local Area

A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the under privileged.

(ix) Familiarization to Dept./Branch & Innovations

They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.


(x) Department Specific Activities

About a week can be spent in introducing activities (games, quizzes, social interactions, small experiments, design thinking etc.) that are relevant to the particular branch of Engineering / Technology / Architecture that can serve as a motivation and kindle interest in building things (become a maker) in that particular field. This can be conducted in the form of a workshop. For example, CSE and IT students may be introduced to activities that kindle computational thinking, and get them to build simple games. ECE students may be introduced to building simple circuits as an extension of their knowledge in Science, and so on. Students may be asked to build stuff using their knowledge of science

Induction Programme is totally an activity based programme and therefore there shall be no tests / assessments during this programme

REFERENCE BOOK:

Guide to induction program from AICTE


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DGCT AUTONOMOUS REGULATION - 2024

24XGE002	INDIAN CONSTITUTION	L	T	P	C
		3	0	0	0
UNIT - I					9
	1. Constitutional Development Since 1909 to 1947				
	2. Making of the Constitution.				
	3. Constituent Assembly				
UNIT - II					9
	1. Fundamental Rights				
	2. Fundamental Duties				
	3. Directive Principles of State Policy				
UNIT - III					9
	1. President				
	2. Parliament				
	3. Supreme Court				
UNIT - IV					9
	1. Governor				
	2. State Legislature				
	3. High Court				
UNIT - V					9
	1. Secularism				
	2. Social Justice				
	3. Minority Safeguards				

Total Periods : 45

REFERENCE BOOKS:

1. Basu. D.D.: Introduction to Indian Constitution ; Prentice Hall; New Delhi.
2. Kapur. A.C: Indian Government and Political System; S.Chand and Company Ltd., New Delhi.
3. Johari J.C.: Indian Politics, Vishal Publications Ltd, New Delhi
4. Agarwal R.C: Indian Political System; S.Chand & Co., New Delhi


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DGCT AUTONOMOUS REGULATION – 2024

24XGE003	DESIGN THINKING	L	T	P	C
		3	0	0	0

COURSE OBJECTIVES

The objective of this Course is to provide the new ways of creative thinking and Learn the innovation cycle of Design Thinking process for developing innovative products which useful for a student in preparing for an engineering career.

UNIT - I AN INSIGHT TO LEARNING

Understanding the Learning Process, Kolb's Learning Styles, Assessing and Interpreting

UNIT - II REMEMBERING MEMORY

Understanding the Memory process, Problems in retention, Memory enhancement techniques

UNIT - III EMOTIONS: EXPERIENCE & EXPRESSION

Understanding Emotions: Experience & Expression, Assessing Empathy, Application with Peers

UNIT - IV BASICS OF DESIGN THINKING

Definition of Design Thinking, Need for Design Thinking, Objective of Design Thinking, Concepts & Brainstorming, Stages of Design Thinking Process (explain with examples) – Empathize, Define, Ideate, Prototype, Test

UNIT - V BEING INGENIOUS & FIXING PROBLEM

Understanding Creative thinking process, Understanding Problem Solving, Testing Creative Problem Solving

UNIT - VI PROCESS OF PRODUCT DESIGN

Process of Engineering Product Design, Design Thinking Approach, Stages of Product Design, Examples of best product designs and functions, Assignment – Engineering Product Design

UNIT - VII PROTOTYPING & TESTING

What is Prototype? Why Prototype? Rapid Prototype Development process, Testing, Sample Example, Test Group Marketing

UNIT - VIII CELEBRATING THE DIFFERENCE

Understanding Individual differences & Uniqueness, Group Discussion and Activities to encourage the understanding, acceptance and appreciation of Individual differences

UNIT - IX DESIGN THINKING & CUSTOMER CENTRICITY

Practical Examples of Customer Challenges, Use of Design Thinking to Enhance Customer Experience, Parameters of Product experience, Alignment of Customer Expectations with Product Design


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UNIT X FEEDBACK, RE-DESIGN & RE-CREATE

Feedback loop, Focus on User Experience, Address "ergonomic challenges, User focused design, rapid prototyping & testing, final product, Final Presentation – "Solving Practical Engineering Problem through Innovative Product Design & Creative Solution".

Total Periods 45


COURSE OUTCOMES:

At the end of the course students should be able to:

- C01:** Compare and classify the various learning styles and memory techniques and Apply them in their engineering education
- C02:** Analyze emotional experience and Inspect emotional expressions to better understand users while designing innovative products
- C03:** Develop new ways of creative thinking and Learn the innovation cycle of Design Thinking process for
- C04:** Propose real-time innovative engineering product designs and Choose appropriate frameworks, strategies, techniques during prototype development
- C05:** Perceive individual differences and its impact on everyday decisions and further Create a better customer experience

TEXT/REFERENCE BOOKS:

1. E Balaguruswamy (2022), Developing Thinking Skills (The way to Success), Khanna Book Publishing Company.


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24XGE004	INTRODUCTION TO WOMEN AND GENDER STUDIES	L	T	P	C
		3	0	0	0
UNIT - I	CONCEPTS				9
	Sex vs. Gender, masculinity, femininity, socialization, patriarchy, public/ private, essentialism, binaryism, power, hegemony, hierarchy, stereotype, gender roles, gender relation, deconstruction, resistance, sexual division of labour				
UNIT - II	FEMINIST THEORY				9
	Liberal, Marxist, Socialist, Radical, Psychoanalytic, postmodernist, ecofeminist.				
UNIT - III	WOMEN'S MOVEMENTS: GLOBAL, NATIONAL AND LOCAL				9
	Rise of Feminism in Europe and America. Women's Movement in India				
UNIT - IV	GENDER AND LANGUAGE				9
	Linguistic Forms and Gender. Gender and narratives.				
UNIT - V	GENDER AND REPRESENTATION				9
	Advertising and popular visual media. Gender and Representation in Alternative Media. Gender and social media				

Total Periods : 45

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24XGE005	ELEMENTS OF LITERATURE	L	T	P	C
		3	0	0	0

COURSE OBJECTIVES:

- To make the students aware about the finer sensibilities of human existence through an art form. The students will learn to appreciate different forms of literature as suitable modes of expressing human experience.

UNIT - I Introduction To Elements Of Literature 9

Relevance of literature

- Enhances Reading, thinking, discussing and writing skills.
- Develops finer sensibility for better human relationship.
- Increases understanding of the problem of humanity without bias.
- Providing space to reconcile and get a cathartic effect

Elements Of Fiction

- Fiction, fact and literary truth.
- Fictional modes and patterns.
- Plot character and perspective.

Elements Of Poetry

- Emotions and imaginations.
- Figurative language.
- (Simile, metaphor, conceit, symbol, pun and irony).
- Personification and animation.
- Rhetoric and trend.


Elements of drama

- Drama as representational art.
- Content mode and elements.
- Theatrical performance.
- Drama as narration, mediation and persuasion.
- Features of tragedy, comedy and satire.

UNIT - II READINGS 9

- An Introduction to the Study of English Literature, W.H. Hudson, Atlantic, 2007.
- An Introduction to Literary Studies, Mario Klarer, Routledge, 2013.
- The Experience of Poetry, Graham Mode, Open college of Arts with Open Univ Press, 1991.
- The Elements of Fiction: A Survey, Ulf Wolf (ed), Wolfstuff, 2114.
- The Elements of Drama, J.L.Styan, Literary Licensing, 2011.

3.1 Textbook: 3.2 *Reference Books:: To be decided by the teacher and student, on the basis of individual student so as to enable him or her to write the term paper


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UNIT - IV OTHER SESSION

9

4.1*Tutorials:

4.2*Laboratory:

4.3*Project: The students will write a term paper to show their understanding of a particular piece of literature

UNIT - V ASSESSMENT

9

5.1 HA:

5.2 Quizzes-HA:

5.3 Periodical Examination: one

5.4 Project/Lab: one (under the guidance of the teachers the students will take a volume of poetry, fiction or drama and write a term paper to show their understanding of it in a given context; sociological, psychological, historical, autobiographical etc.

5.5 Final Exam

Total Periods : 45

COURSE OUTCOME

Students will be able to understand the relevance of literature in human life and appreciate its aspects in developing finer sensibilities.


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DGCT AUTONOMOUS REGULATION – 2024

24XGE006

FILM APPRECIATION

L	T	P	C
3	0	0	0

COURSE OBJECTIVES:

In this course on film appreciation, the students will be introduced broadly to the development of film as an art and entertainment form. It will also discuss the language of cinema as it evolved over a century. The students will be taught as to how to read a film and appreciate the various nuances of a film as a text. The students will be guided to study film joyfully.

Theme - A	THE COMPONENT OF FILMS	9
A-1:	The material and equipment	
A-2:	The story, screenplay and script	
A-3:	The actors, crew members, and the director	
A-4:	The process of film making... structure of a film	
Theme - B:	EVOLUTION OF FILM LANGUAGE	9
B-1:	Film language, form, movement etc.	
B-2:	Early cinema... silent film (Particularly French)	
B-3:	The emergence of feature films: Birth of a Nation	
B-4:	Talkies	
Theme - C	FILM THEORIES AND CRITICISM/APPRECIATION	9
C-1:	Realist theory; Auteurists	
C-2:	Psychoanalytic, Ideological, Feminists	
C-3:	How to read films?	
C-4:	Film Criticism / Appreciation	
Theme - D	DEVELOPMENT OF FILMS	9
D-1:	Representative Soviet films	
D-2:	Representative Japanese films	
D-3:	Representative Italian films	
D-4:	Representative Hollywood film and the studio system	
Theme - E	INDIAN FILMS	9
E-1:	The early era	
E-2:	The important films made by the directors	
E-3:	The regional films	
E-4:	The documentaries in India	

Total Periods : 45**READING:**

A Reader containing important articles on films will be prepared and given to the students. The students must read them and present in the class and have discussion on these.

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24XGE007	DISASTER RISK REDUCTION AND MANAGEMENT	L	T	P	C
		3	0	0	0

COURSE OBJECTIVES:

- To impart knowledge on concepts related to disaster, disaster risk reduction, disaster
- To acquaint with the skills for planning and organizing disaster response

UNIT-I HAZARDS, VULNERABILITY AND DISASTER RISKS 9

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Types of Disasters: Natural, Human induced, Climate change induced –Earthquake, Landslide, Flood, Drought, Fire etc – Technological disasters- Structural collapse, Industrial accidents, oil spills -Causes, Impacts including social, Economic, political, environmental, health, psychosocial, etc.- Disaster vulnerability profile of India and Tamil Nadu - Global trends in disasters: urban disasters, pandemics, Complex emergencies, - - , Inter relations between Disasters and Sustainable development Goals.

UNIT-II DISASTER RISK REDUCTION (DRR) 9

Sendai Framework for Disaster Risk Reduction, Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community Based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions / Urban Local Bodies (PRIs/ULBs), States, Centre, and other stakeholders- Early Warning System – Advisories from Appropriate Agencies.- Relevance of indigenous Knowledge, appropriate technology and Local resources.

UNIT-III DISASTER MANAGEMENT 9

Components of Disaster Management – Preparedness of rescue and relief, mitigation, rehabilitation and reconstruction- Disaster Risk Management and post disaster management – Compensation and Insurance- Disaster Management Act (2005) and Policy - Other related policies, plans, programmers and legislation - Institutional Processes and Framework at State and Central Level- (NDMA –SDMA-DDMA-NRDF- Civic Volunteers)

UNIT-IV TOOLS AND TECHNOLOGY FOR DISASTER MANAGEMENT 9

Early warning systems -Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment. - Elements of Climate Resilient Development –Standard operation Procedure for disaster response – Financial planning for disaster Management.



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UNIT-V DISASTER MANAGEMENT: CASE STUDIES

9

Discussion on selected case studies to analyse the potential impacts and actions in the contest of disasters-Landslide Hazard Zonation: Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.- Field work-Mock drill -


Total Periods : 45

TEXT BOOKS:

1. Taimpo (2016), Disaster Management and Preparedness, CRC Publications
2. Singh R (2017), Disaster Management Guidelines for earthquakes, Landslides, Avalanches and tsunami, Horizon Press Publications
3. Singhal J.P. "Disaster Management", Laxmi Publications, 2010. ISBN-10: 9380386427 ISBN-13: 978-9380386423
4. Tushar Bhattacharya, "Disaster Science and Management", McGraw Hill India Education Pvt. Ltd., 2012. ISBN-10: 1259007367, ISBN-13: 978-1259007361]

REFERENCE BOOKS:

1. Govt. of India: Disaster Management Act, Government of India, New Delhi, 2005.
2. Government of India, National Disaster Management Policy, 2009.
3. Shaw R (2016), Community based Disaster risk reduction, Oxford University Press


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24XGE008	WELL-BEING WITH TRADITIONAL PRACTICES-YOGA, AYURVEDA AND SIDDHA	L	T	P	C
		3	0	0	0

COURSE OBJECTIVES:

- To enjoy life happily with fun filled new style activities that help to maintain health also
- To adapt a few lifestyle changes that will prevent many health disorders
- To be cool and handbill every emotion very smoothly in every walk of life
- To learn to eat cost effective but healthy foods that are rich in essential nutrients
- To develop immunity naturally that will improve resistance against many health disorders

UNIT-1 HEALTH AND ITS IMPORTANCE 9

Health: Definition - Importance of maintaining health - More importance on prevention than treatment Ten types of health one has to maintain - Physical health - Mental health - Social health - Financial health - Emotional health - Spiritual health - Intellectual health - Relationship health - Environmental health - Occupational/Professional health.

Present health status - The life expectancy-present status - mortality rate - dreadful diseases - Non-communicable diseases (NCDs) the leading cause of death - 60% - heart disease - cancer - diabetes - chronic pulmonary diseases - risk factors - tobacco - alcohol - unhealthy diet - lack of physical activities

Types of diseases and disorders - Lifestyle disorders - Obesity - Diabetes - Cardiovascular diseases - Cancer - Strokes - COPD - Arthritis - Mental health issues. Causes of the above diseases / disorders - Importance of prevention of illness - Takes care of health - Improves quality of life - Reduces absenteeism - Increase satisfaction - Saves time

Simple lifestyle modifications to maintain health - Healthy Eating habits (Balanced diet according to age) Physical Activities (Stretching exercise, aerobics, resisting exercise) - Maintaining BMI-Importance and actions to be taken.

UNIT-II DIET 9

Role of diet in maintaining health - energy one needs to keep active throughout the day - nutrients one needs for growth and repair - helps one to stay strong and healthy - helps to prevent diet-related illness, such as some cancers - keeps active and - helps one to maintain a healthy weight - helps to reduce risk of developing lifestyle disorders like diabetes - arthritis - hypertension - PCOD - infertility - ADHD - sleeplessness -helps to reduce the risk of heart diseases - keeps the teeth and bones strong.

Balanced Diet and its 7 Components - Carbohydrates - Proteins - Fats - Vitamins - Minerals - Fibre and Water.

Food additives and their merits & demerits - Effects of food additives - Types of food additives - Food additives and processed foods - Food additives and their reactions

Definition of BMI and maintaining it with diet

Importance - Consequences of not maintaining BMI - different steps to maintain optimal BM

Common cooking mistakes

Different cooking methods, merits and demerits of each method

UNIT-III ROLE OF AYURVEDA & SIDDHA SYSTEMS IN MAINTAINING HEALTH 9

AYUSH systems and their role in maintaining health - preventive aspect of AYUSH - AYUSH as a soft therapy.

Secrets of traditional healthy living - Traditional Diet and Nutrition - Regimen of Personal and Social Hygiene - Daily routine (Dinacharya) - Seasonal regimens (Ritucharya) - basic sanitation and healthy living environment - Sadvritta (good conduct) - for conducive social life.

Principles of Siddha & Ayurveda systems - Macrocosm and Microcosm theory - Panchekarana Theory / (Five Element Theory) 96 fundamental Principles - Uyir Thathukkal (Tri-Dosha Theory) - Udal Thathukkal

Prevention of illness with our traditional system of medicine Primary Prevention - To decrease the number of new cases of a disorder or illness - Health promotion/education, and - Specific protective measures - Secondary Prevention - To lower the rate of established cases of a disorder or illness in the population (prevalence) - Tertiary Prevention - To decrease the amount of disability associated with an existing disorder

UNIT-IV MENTAL WELLNESS 9

Emotional health - Definition and types - Three key elements: the subjective experience - the physiological response - the behavioral response - Importance of maintaining emotional health - Role of emotions in daily life - Short term and long term effects of emotional disturbances - Leading a healthy life with emotions - Practices for emotional health - Recognize how thoughts influence emotions - Cultivate positive thoughts - Practice self-compassion - Expressing a full range of emotions.

Stress management - Stress definition - Stress in daily life - How stress affects one's life - Identifying the cause of stress - Symptoms of stress - Managing stress (habits, tools, training, professional help) - Complications of stress mismanagement.

Sleep - Sleep and its importance for mental wellness - Sleep and digestion.

Immunity - Types and importance - Ways to develop immunity

UNIT-V YOGA 9

Definition and importance of yoga - Types of yoga - How to Choose the Right Kind for individuals according to their age - The Eight Limbs of Yoga - Simple yogasanas for cure and prevention of health disorders - What yoga can bring to our life

Total Periods : 45

COURSE OUTCOMES:

At the end of the course students should be able

CO1: Learn the importance of different components of health

CO2: Gain confidence to lead a healthy life

CO3: Learn new techniques to prevent lifestyle health disorders

CO4: Understand the importance of diet and workouts in maintaining health



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TEXT BOOKS:

1. Nutrition and Dietetics - Ashley Martin, Published by White Word Publications, New York, NY 10001, USA
2. Yoga for Beginners_ 35 Simple Yoga Poses to Calm Your Mind and Strengthen Your Body, by Cory Martin, Copyright © 2015 by Althea Press, Berkeley, California

REFERENCE BOOKS:

1. WHAT WE KNOW ABOUT EMOTIONAL INTELLIGENCE How It Affects Learning, Work, Relationships, and Our Mental Health, by Moshe Zeidner, Gerald Matthews, and Richard D. Roberts
2. A Bradford Book, The MIT Press, Cambridge, Massachusetts, London, England The Mindful Self-Compassion Workbook, Kristin Neff, Ph.D Christopher Germer, Ph.D, Published by The Guilford Press A Division of Guilford Publications, Inc.370 Seventh Avenue, Suite 1200, New York, NY 10001



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DGCT AUTONOMOUS REGULATION – 2024

24XGE009	HISTORY OF SCIENCE AND TECHNOLOGY IN INDIA	L	T	P	C
		3	0	0	0

UNIT-1 CONCEPTS AND PERSPECTIVES 9

Meaning of History Objectivity, Determinism, Relativism, Causation, Generalization in History; Moral judgment in history Extent of subjectivity, contrast with physical sciences, interpretation and speculation, causation verses evidence, concept of historical inevitability, Historical Positivism. Science and Technology-Meaning, Scope and Importance, Interaction of science, technology & society, Sources of history on science and technology in India.

UNIT-II HISTORIOGRAPHY OF SCIENCE AND TECHNOLOGY IN INDIA 9

Introduction to the works of D.D. Kosambi, Dharmapal, Debiprasad Chattopadhyay, Rehman, S. Irfan Habib, Deepak Kumar, Dhruv Raina, and others.

UNIT-III SCIENCE AND TECHNOLOGY IN ANCIENT INDIA 9

Technology in pre-historic period
Beginning of agriculture and its impact on technology
Science and Technology during Vedic and Later Vedic times
Science and technology from 1st century AD to C-1200.

UNIT-IV SCIENCE AND TECHNOLOGY IN MEDIEVAL INDIA 9

Legacy of technology in Medieval India, Interactions with Arabs Development in medical knowledge, interaction between Unani and Ayurveda and alchemy Astronomy and Mathematics: interaction with Arabic Sciences Science and Technology on the eve of British conquest


UNIT-V SCIENCE AND TECHNOLOGY IN COLONIAL INDIA 9

Science and the Empire
Indian response to Western Science
Growth of techno-scientific institutions

UNIT-VI SCIENCE AND TECHNOLOGY IN A POST-INDEPENDENT INDIA 9

Science, Technology and Development discourse
Shaping of the Science and Technology Policy
Developments in the field of Science and Technology
Science and technology in globalizing India
Social implications of new technologies like the Information Technology and Biotechnology

Total Periods : 45


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24XGE010	POLITICAL AND ECONOMIC THOUGHT FOR A HUMANE SOCIETY	L	T	P	C
		3	0	0	0

COURSE OBJECTIVES:

This course will begin with a short overview of human needs and desires and how different political-economic systems try to fulfill them. In the process, we will end with a critique of different systems and their implementations in the past, with possible future directions.

COURSE TOPICS :

Considerations for humane society, holistic thought, human being's desires, harmony in self, harmony in relationships, society, and nature, societal systems. (9 lectures, 1 hour each)

(Refs: A Nagaraj, M K Gandhi, JC Kumarappa)

Capitalism – Free markets, demand-supply, perfect competition, laissez-faire, monopolies, imperialism. Liberal democracy. (5 lectures)

(Refs: Adam smith, J S Mill)

Fascism and totalitarianism. World war I and II. Cold war. (2 lectures)

Communism – Mode of production, theory of labour, surplus value, class struggle, dialectical materialism, historical materialism, Russian and Chinese models.

(Refs: Marx, Lenin, Mao, M N Roy) (5 lectures)

Welfare state. Relation with human desires. Empowered human beings, satisfaction. (3 lectures)

Gandhian thought. Swaraj, Decentralized economy & polity, Community. Control over one's lives. Relationship with nature. (6 lectures)

(Refs: M K Gandhi, Schumacher, Kumarappa)

Essential elements of Indian civilization. (3 lectures)

(Refs: Pt Sundarlal, R C Mazumdar, Dharampal) Technology as driver of society, Role of education in shaping of society. Future directions. (4 lectures)

(Refs: Nandkishore Acharya, David Dixon, Levis Mumford)

Conclusion (2 lectures)

Preferred Textbooks: See Reference Books

Reference Books: Authors mentioned along with topics above. Detailed reading list will be provided.

GRADING:

Mid sem	30
End sem	20
Home Assign	10
Term paper	40

Total Periods : 45

COURSE OUTCOMES:

The students will get an understanding of how societies are shaped by philosophy, political and economic system, how they relate to fulfilling human goals & desires with some case studies of how different attempts have been made in the past and how they have fared.


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24XGE011	STATE, NATION BUILDING AND POLITICS IN INDIA	L	T	P	C
		3	0	0	0

COURSE OBJECTIVES:

The objective of the course is to provide an understanding of the state, how it works through its main organs, primacy of politics and political process, the concept of sovereignty and its changing contours in a globalized world. In the light of this, an attempt will be made to acquaint the students with the main development and legacies of national movement and constitutional development in India, reasons for adopting a Parliamentary-federal system, the broad philosophy of the Constitution of India and the changing nature of Indian Political System. Challenges/ problems and issues concerning national integration and nation-building will also be discussed in the contemporary context with the aim of developing a future vision for a better India.

TOPICS:

Understanding the need and role of State and politics.
 Development of Nation-State, sovereignty, sovereignty in a globalized world.
 Organs of State – Executive, Legislature, Judiciary. Separation of powers, forms of government unitary-federal, Presidential-Parliamentary,
 The idea of India.
 1857 and the national awakening.
 1885 Indian National Congress and development of national movement – its legacies.
 Constitution making and the Constitution of India.
 Goals, objective and philosophy.
 Why a federal system?
 National integration and nation-building.
 Challenges of nation-building – State against democracy (Kothari)
 New social movements.
 The changing nature of Indian Political System, the future scenario.
 What can we do?
 What can we do?

Total Periods:45**COURSE OUTCOMES**

It is expected that this course will make students aware of the theoretical aspect of the state, its organs, its operationalization aspect, the background and philosophy behind the founding of the present political system, broad streams and challenges of national integration and nation-building in India. It will equip the students with the real understanding of our political system/ process in correct perspective and make them sit up and think for devising ways for better participation in the system with a view to making the governance and delivery system better for the common man who is often left unheard and unattended in our democratic setup besides generating a lot of dissatisfaction and difficulties for the system.

SUGGESTED READING:

1. Sunil Khilnani, The Idea of India. Penguin India Ltd., New Delhi.
2. Madhav Khosla, The Indian Constitution, Oxford University Press. New Delhi, 2012.
3. Brij Kishore Sharma, Introduction to the Indian Constitution, PHI, New Delhi, latest edition.
4. Sumantra Bose, Transforming India: Challenges to the World's Largest Democracy, Picador India, 2013.
5. Atul Kohli, Democracy and Discontent: India's Growing Crisis of Governability, Cambridge University Press, Cambridge, U. K., 1991.
6. M. P. Singh and Rekha Saxena, Indian Politics: Contemporary Issues and Concerns, PHI, New Delhi, 2008, latest edition.
7. Rajni Kothari, Rethinking Democracy, Orient Longman, New Delhi, 2005.



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2WXGE012	INDUSTRIAL SAFETY	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

- To Understand the Introduction and basic Terminologies safety.
- To enable the students to learn about the Important Statutory Regulations and standards.
- To enable students to Conduct and participate the various Safety activities in the Industry.
- To have knowledge about Workplace Exposures and Hazards.
- To assess the various Hazards and consequences through various Risk Assessment Techniques

UNIT – I SAFETY TERMINOLOGIES 9

Hazard-Types of Hazard- Risk-Hierarchy of Hazards Control Measures-Lead indicators- lag Indicators-Flammability- Toxicity Time-weighted Average (TWA) - Threshold Limit Value (TLV) - Short Term Exposure Limit (STEL)- Immediately dangerous to life or health (IDLH)- acute and chronic Effects- Routes of Chemical Entry-Personnel Protective Equipment- Health and Safety Policy-Material Safety Data Sheet MSDS

UNIT II STANDARDS AND REGULATIONS 9

Indian Factories Act-1948- Health- Safety- Hazardous materials and Welfare- ISO 45001:2018 occupational health and safety (OH&S) - Occupational Safety and Health Audit IS14489:1998- Hazard Identification and Risk Analysis- code of practice IS 15656:2006.

UNIT III SAFETY ACTIVITIES 9

Toolbox Talk- Role of safety Committee- Responsibilities of Safety Officers and Safety Representatives- Safety Training and Safety Incentives- Mock Drills- On-site Emergency Action Plan- Off-site Emergency Action Plan- Safety poster and Display- Human Error Assessment.


UNIT IV WORKPLACE HEALTH AND SAFETY 9

Noise hazard- Particulate matter- musculoskeletal disorder improper sitting posture and lifting Ergonomics RULE & REBA- Unsafe act & Unsafe Condition- Electrical Hazards- Crane Safety-Toxic gas Release.

UNIT V HAZARD IDENTIFICATION TECHNIQUES 9

Job Safety Analysis-Preliminary Hazard Analysis-Failure mode and Effects Analysis- Hazard and Operability- Fault Tree Analysis- Event Tree Analysis Qualitative and Quantitative Risk Assessment Checklist Analysis- Root cause analysis- What-If Analysis- and Hazard Identification and Risk Assessment.

Total Periods : 45


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COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1:** Understand the basic concept of safety.
- CO2:** Obtain knowledge of Statutory Regulations and standards.
- CO3:** Know about the safety Activities of the Working Place.
- CO4:** Analyze on the impact of Occupational Exposures and their Remedies
- CO5:** Obtain knowledge of Risk Assessment Techniques.

TEXT BOOKS:

- 1.R.K. Jain and Prof. Sunil S. Rao Industrial Safety, Health and Environment Management Systems KHANNA PUBLISHER
- 2. L. M. Deshmukh Industrial Safety Management: Hazard Identification and Risk Control McGraw-Hill Education

REFERENCES BOOKS:

- 1. Frank Lees (2012) 'Lees' Loss Prevention in Process Industries. Butterworth-Heinemann publications, UK, 4th Edition
- 2. John Ridley & John Channing (2008) Safety at Work: Routledge, 7th Edition.
- 3. Dan Petersen (2003) Techniques of Safety Management: A System Approach.
- 4. Alan Waring. (1996). Safety management system: Chapman & Hall, England
- 5. Society of Safety Engineers, USA

ONLINE RESOURCES:

- 1. ISO 45001:2018 occupational health and safety (OH&S) International Organization for
- 2. Standardization <https://www.iso.org/standard/63787.html>
- 3. Indian Standard code of practice on occupational safety and health audit
- 4. <https://law.resource.org/pub/in/bis/S02/is.14489.1998.pdf>
- 5. Indian Standard code of practice on Hazard Identification and Risk Analysis IS 15656:2006
- 6. <https://law.resource.org/pub/in/bis/S02/is.15656.2006.pdf>


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