



Integral University, Lucknow

Effective from Session: 2023-24

Course Code	ME101	Title of the Course	Basic Mechanical Engineering	L	T	P	C
Year	I	Semester	II	3	1	0	4
Pre-Requisite	NONE	Co-requisite	NONE				
Course Objectives	1. Be able to have the basic concepts of thermal sciences and temperature measurement on the basis of Zeroth law of thermodynamics. 2. To understand and apply first and second law of thermodynamics to various processes and real systems. 3. Be able to model the problem using free-body diagrams and reach to solution by using equilibrium equations. 4. To impart knowledge of structural analysis for safe design. 5. Be able to test different mechanical properties of engineering materials.						

Course Outcomes	
CO1	Explain basic concepts of thermal sciences and temperature measurement on the basis of zeroth law of thermodynamics.
CO2	Understand and apply first and second law of thermodynamics to various processes and real systems.
CO3	Model the problem using free-body diagrams and reach to solution by using equilibrium equations.
CO4	To perform structural analysis for safe design.
CO5	Knowledge of different mechanical properties of engineering materials and its testing.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Fundamental Concepts for modelling of thermal systems	Role of thermodynamics in different fields of engineering, thermodynamics system, surrounding and universe, macroscopic & microscopic point of view, concept of continuum, thermodynamic equilibrium, property, state, path, process, Energy and its form, temperature and its measurement, Zeroth law of thermodynamics.	8	CO1
2	First law & Second law of thermodynamics as a tool for analysing thermal systems	First law of thermodynamics and its application for non flow processes, Flow processes and control volume, Flow work, Steady flow energy equation, Mechanical work in a steady flow process. Essence of second law of thermodynamics, Thermal reservoir, heat engines, COP of heat pump and refrigerator and its introduction to industrial applications. Statements of second law, Carnot cycle, Clausius inequality and its applications.	8	CO2
3	Introduction to engineering mechanics and its application	Role of engineering mechanics in different fields of engineering, Laws of motion, Transfer of force to parallel position, Resultant of planer force system. Free Body diagrams, equilibrium and its equation, Coulomb's law of friction, Equilibrium of bodies involving dry friction.	8	CO3
4	Structure analysis for safe design	Beams: Introduction, its types and uses in engineering application, concept of shear force and bending moment, Shear and bending moment diagram for statically determinate beams. Simple Stress and strain: Introduction, Normal & shear stress- strain for unidirectional loading, pure bending of beam and its applications.	8	CO4
5	Mechanical properties and testing of engineering materials	Introduction to engineering materials & their applications, Mechanical properties of engineering materials. Mechanical Testing: Tensile and compressive test, stress-strain diagrams for ductile and brittle materials bending test, hardness testing and impact test.	8	CO5

Reference Books:

Van Wylen G.J. & Sonnlog R.E. Fundamentals of Classical Thermodynamics, John Wiley & Sons, Inc. NY.

Wark Wenneth: Thermodynamics (2nd edition) Mc Graw Hill Book Co. NY.

Holman, J.P.: Thermodynamics, Mc Graw Hill Book Co. NY.

Shames I.H., Engineering Mechanics, P.H.I.

D.S. Kumar, Mechanical Engineering, S.K. Katarial & Sons.

Bhavi Katti S.S., Engineering Mechanics, New Age Pub.

P.K. Bharti: Engineering Mechanics, Kataria and Sons.

W. D. Callister, 2006, "Materials Science and Engineering-An Introduction", 6th Edition, Wiley India

e-Learning Source:

https://www.youtube.com/watch?v=Dy2UeVCSRYs&list=PL2_EvjPqHc10CTN7cHiM5xB2qD7BHUr77

<https://www.youtube.com/watch?v=DzyIEz3dKXQ&t=1s>

https://www.youtube.com/watch?v=A-3W1EbQ13k&list=PLvqSpQzTE6M_MEUdn1izTMB2vZgP1NLfs

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)														
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1		2						3	3	2	2
CO2	3	3	3	2		3						3	3	3	2
CO3	3	3	3	2		3						3	3	2	1
CO4	3	2	2	2		3						3	3	2	1
CO5	3	3	2	1		3						3	3	2	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

<div>Name & Sign of Program Coordinator</div>	<div>Sign & Seal of HoD</div>
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Effective from Session: 2024-25							
Course Code	LN132	Title of the Course	Communication Skills: Theory and Practices	L	T	P	C
Year	I st	Semester	I/I	3	0	1	4
Pre-Requisite	10+2	Co-requisite	Graduation				
Course Objectives	<ul style="list-style-type: none"> The course aims to educate the students in the artistry and utility of the English language for professional purposes by studying language. The key component of the various types of professional communication is communication in English, which is now a global language. The Department of Languages caters to the needs of the students aspiring for training, expertise, and excellence in professional communication with a marked emphasis on English for Specific/Special Purposes (ESP). 						

Course Outcomes	
CO1	Students will be introduced to the basic understanding of communication and Professional Communication. Knowledge of Professional, cultural, and cross-cultural communication will be imparted. The meaning and process of communication, verbal and nonverbal communication will be focused. A basic understanding of questions will be provided. They will also learn & practice how to introduce themselves in a professional setting & how to manage speaking anxiety.
CO2	Students will develop an understanding of the concept and theory of Lingua Franca ELF, Its Importance and its use as a means of communication between populations speaking vernaculars that are not mutually intelligible. Students will develop an understanding of IPA symbols and improve pronunciation through practice
CO3	Basic tools of communication and improvement in communicative competence. Oral Communication techniques through situational conversations.
CO4	Understanding the structural and functional grammar and basic structure of language. Students will also develop the ability for group discussion and debate.
CO5	Enhancement of writing skills in English i.e., writing applications, reports, and various types of letters. Preparing PowerPoint Presentations and practicing for oral presentations to develop competency-based professional skills.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Professional Communication	Professional Communication: It's Meaning and Importance, Essentials of Effective Communication, Barriers to Effective Communication. (Theory)	6	CO 1
		Lab-1 Introduction (SWOT Analysis) Framing Questions (Yes/No Questions, Why-Questions, Question tags, Rhetorical Questions)	2	
2	Oral Communication Skills (Speaking Skills)	English as Lingua Franca: From Theory to Practice Importance of Spoken English Status of Spoken English in India (Theory)	6	CO 2
		Lab-2 International Phonetic Alphabets (IPA) Symbols Spelling and Pronunciation (Practical)	2	
3	Basic Vocabulary	Euphemism, One-word Substitution, Synonyms, Antonyms, Homophones, Idioms and Phrases, Common Mistakes, Confusable Words and Expressions, Portmanteau Words, Foreign Words and Expressions. (Theory)	6	CO 3
		Lab-3 Oral Communication Practice: - Asking for and giving information Congratulating people on their success Expressing condolences Apologizing and forgiving (Practical)	2	
4	Basic Grammar	Articles, Prepositions, Tenses, Concord, (Subject-Verb agreement), Modal Auxiliaries, Verbs: its Kinds and uses, Degrees of Comparison, Punctuation. (Theory)	6	CO 4

		Lab-4 Oral Practice: Group Discussion (Based on Topic and Case Study) Debate (Topic Based) (Practical)	2	
5	Basic Composition	Report Writing: What is report? Kinds and Objectives of reports, writing reports, Business Letter writing; Introduction to Business Letters, Layout of Business letters, Letters of Enquiry/Complaint Proposal writing. (Theory)	6	CO 5
		Lab-5 Oral Presentation through PPT (Topic based) (Practical)	2	

Reference Books:

1. Gerson, Sharon J. *Technical Writing: Process and Product* (5th edition). Prentice Hall, 2005.
2. K. Floyd, *Interpersonal Communication: The Whole Story*. McGraw Hill, 2009.
3. Greenbaum, Sidney and Nelson Gerald, *An Introduction to English Grammar*. Routledge, 2009.
4. Swan, Michael, *Practical English Usage*. OUP, 2005.
5. Murphy, Raymond. *English Grammar in Use*. Cambridge University Press, 2019.
6. Kumar, Sanjay and Pushp Lata., *Communication Skills*. Oxford University Press, Oxford 2011.
7. Raman, Meenakshi, and Sangeeta Sharma. *Technical Communication: Principles and Practice*. Second Edition, Oxford University Press, 2012.
8. Gerson, Sharon J. *Technical Communication: Process and Product* (9th edition). Longman Pub., 2016.

e-Learning Source:

1. <http://www.uptunotes.com/notes-professional-communication-unit-i-nas->
2. <https://www.docsity.com/en/subjects/professional-communication/>
3. <https://lecturenotes.in/download/note/22690-note-for-communication-skills-for-profession...>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO- PSO CO	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO 2	PSO 3	PSO4	PSO5
CO 1	1	1	1	2	1	2	1	3	3	3	3	2	3	2	2	1	-
CO 2	1	1	1	1	1	3	1	3	3	3	3	3	1	1	1	1	-
CO 3	1	1	2	2	1	3	2	3	3	3	2	2	1	1	1	1	-
CO 4	1	1	1	2	1	2	2	3	2	3	2	1	1	1	1	1	-
CO 5	1	1	1	2	3	3	2	3	3	3	2	3	1	3	2	3	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD
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SEMESTER – I

1. Name of the Department: Mathematics																
2. Course Name		Mathematics-I for Computer Science & Engineering								L		T		P		
3. Course Code		MT149								3		1		0		
4. Type of Course (use tick mark)										Core ()		DE ()		FC (v)		
5. Pre-requisite (if any)		10+2 with Mathematics			6. Frequency (use tick marks)		Even ()			Odd (v)		Either Sem ()		Every Sem ()		
7. Total Number of Lectures, Tutorials, Practical's																
Lectures = 30					Tutorials = 10					Practical = Nil						
8. COURSE OBJECTIVES: The course is aimed to develop the skills in mathematics which is necessary for grooming them into successful engineering graduate. The topics introduced will serve as basic tools for specialized studies in science field.																
9. COURSE OUTCOMES (CO):																
After the successful course completion, learners will develop following attributes:																
COURSE OUTCOME (CO)		ATTRIBUTES														
CO1		Able to calculate rank of matrix, characteristic equation & characteristic roots & use the applicability of Caylay Hamilton Theorem to find inverse of matrix which is very important in many engineering application.														
CO2		To develop ability to find out the various properties of a matrices and linear transformation over a vector spaces.														
CO3		Develops ability to solve Jacobian, error and approximation and Extrema of the function.														
CO4		Learn the evaluation policy of some special function like gamma & Beta function. & their relation which is helpful to evaluate some definite integral arising in various branch of Engineering.														
CO5		Able to determine vector differentiation and integration.														
10. Unit wise detailed content																
Unit-1		Number of lectures			08											
Introduction, Different types of matrices, Algebraic operations, Elementary row and column transformations, Rank of matrix, Linear dependence, Consistency of linear system of equations, Characteristic equation, Cayley-Hamilton theorem, Eigen values and Eigen vectors.																
Unit-2		Number of lectures			08											
Vector space, subspace, examples, linear span, basis, dimension, extension of a basis of a subspace, intersection and sum of two subspace, examples. Linear transformation, kernel and range of a linear map , rank-nullity theorem, row and column spaces																
Unit-3		Number of lectures			08											
n^{th} derivative, Leibnitz theorem, Partial differentiation, Euler's theorem, curve tracing, change of variables , expansion of function of several variables..																
Unit-4		Number of lectures			08											
Jacobian, Approximation of errors, Extrema of functions of several variables, Lagrange's method of multipliers (simple applications).																
Unit-5		Number of lectures			08											
Double and triple integrals, Change of order of integration, change of variables, Gamma and Beta functions, Applications to area and volume, Dirichlet's integral and its applications.																
11. CO-PO mapping																
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	2	-	1	3	2	3	2	3	3	3	2
CO2	3	3	2	3	2	2	-	1	2	2	3	2	3	3	2	2
CO3	2	2	3	2	2	1	-	1	1	1	2	2	2	2	1	1
CO4	2	2	3	1	1	1	-	1	1	1	2	2	2	1	1	1
CO5	2	2	1	1	2	1	-	1	1	2	1	2	2	2	2	1
3 Strong contribution, 2 Average contribution , 1 Low contribution																
12. Brief description of self-learning / E-learning component																
1. https://nptel.ac.in/courses/122104018/ 2. https://nptel.ac.in/courses/111104092/ 3. https://nptel.ac.in/courses/111107108/ 4. https://archive.nptel.ac.in/courses/111/105/111105122/																
13. Books recommended:																
1. A Text Book of Matrices, S. Chand & Co. New Delhi 2. Calculus and Analytical Geometry, Narosa Publishing House, New Delhi 3. Higher Engineering Mathematics, Khanna, Publishers, Pvt. Ltd 4. Advanced Engineering Mathematics, Khanna Publication 5. Introduction to Engineering Mathematics-I, S.Chand & Company, New Delhi																



Integral University, Lucknow

Effective from Session:2024-25							
Course Code	EE103	Title of the Course	Basic Electrical Engg	L	T	P	C
Year	I	Semester	I / II	3	0	2	4
Pre-Requisite	None	Co-requisite	None				
Course Objectives	<ul style="list-style-type: none"> • Knowledge and concept of D.C Circuit Analysis and Network Theorems Circuit. • Use of Steady State Analysis of Single-Phase AC Circuits AC fundamentals. • Knowledge and concept of Three Phase AC Circuits Three phase system and measuring devices. • Basic concepts of Power System and Transformer • Study of Electromechanical energy conversion devices: AC/ DC Machines. 						

Course Outcomes	
CO1	Know about the concept of D.C Circuit Analysis and Network Theorems Circuit.
CO2	Steady State Analysis of Single Phase AC Circuits AC fundamentals.
CO3	Know about concept of Three Phase AC Circuits Three phase system and measuring devices
CO4	Layout of Power System and transformer
CO5	Know about Electromechanical energy conversion devices: AC/ DC Machines

THEORY				
Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	D.C. Circuit Concept and its Analysis	Circuit concepts: Active and passive elements, linear and nonlinear network, unilateral and bilateral elements, Series and Parallel connections, Ohms law, Kirchhoff's Law: loop and nodal methods of analysis. Network theorems: Superposition theorem, Thevenin's theorem, Maximum Power Transfer theorem	8	CO1
2	Domestic/ Single Phase A.C. Circuits and its Analysis	AC fundamentals: Average and effective value of Sinusoidal waveform , form factor and peak factor, Concept of phasor, Analysis of R, L and C Circuits, power factor, Apparent, active and reactive powers, causes and problems of low power factor, resonance in series RLC circuit.	8	CO2
3	Commercial/ Industrial Three Phase A.C. Circuits and its measurement	Three phase system: Its necessity and advantages, meaning of phase sequence, star and delta connections, balanced supply, line and phase voltage/current relationship. Measuring Instruments: Types of instruments: construction and working principle of PMMC, MI type instruments, Electrodynamometer type wattmeter.	8	CO3
4	Transformer and its concept in Household/ Commercial application	Magnetic circuit: Concepts, analogy between electric and magnetic circuit. Single Phase Transformer: Principle of operation, construction, emf equation, losses and efficiency.	8	CO4
5	House Hold/ Industry oriented Electrical Machines	UNIT-5: House Hold / Industry oriented Electrical Machines DC Machines: Construction, Types, Principle of operation and application. Single Phase Induction Motor: Principle of operation and application. Three Phase Induction Motor: Principle of operation and application. Three Phase Synchronous Machines: Principle of operation and application.	8	CO5

PRACTICAL				
S. No.	List of Experiments		Contact Hrs.	Mapped CO
1	Verification of Thevenin's Theorem.		2	1
2	Verification of Superposition Theorem.		2	1
3	Verification of Maximum Power Transfer Theorem.		2	1
4	To study V-I characteristics of diode.		2	2
5	To study the input & output characteristics of BJT in CE configuration.		2	2
6	To study the full wave rectifier circuit with & without filter and determine the ripple factor.		2	2
7	To study the phenomenon of resonance in series RLC circuit.		2	3
8	Determination of losses in single phase transformer by OCT and SCT.		2	3
9	To calibrate a single-phase induction type energy meter.		2	4
10	To study the running and reversing of a three phase SCIM.		2	4

11	Study of OP Amp based inverting and non-inverting amplifier	2	2
Reference Books:			
1. V.Deltoro, “Principle of Electrical Engg.” PHI, 2009..			
2. M.A Mallick, Dr. I. Ashraf, “Fundamental of Electrical Engg,” CBS Publishers, 2010.			
3. A. Hussain, “Basic Electrical Engg” Dhanpat Rai & sons, 2007			
4. I J Nagrath, “Basic Electrical Engg” ,TMH, 2010.			

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
PO- PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO																
CO1	3	3	2	1	1	3						3	3	3	2	3
CO2	3	3	3	2	1	1						2	3	2	2	3
CO3	3	2	1	1	2	2	3					3	2	2	2	3
CO4	3	2	2	2	3	3						2	3	2	2	3
CO5	3	1	1	1	1	2	1					2	3	2	2	3

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation



Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	EC101	Title of the Course	Basic Electronics	L	T	P	C
Year	I	Semester	I	3	0	0	3
Pre-Requisite		Co-requisite					
Course Objectives	<ul style="list-style-type: none">Understand the basics of semiconductors, including how current flows and how various types of diodes work.Analyze the characteristics and biasing techniques of Bipolar Junction Transistors (BJTs) and Field Effect Transistors (FETs).Design and implement basic circuits using operational amplifiers (op-amps) for various functionalities like inverting, integrating, and differentiating signals.Grasp the concepts of number systems, logic gates, and Boolean algebra, and learn how to simplify logic functions using Karnaugh maps.Explore different types of sensors and transducers, understand the working principles of basic motors, and learn about common consumer electronics and their applications.						

Course Outcomes	
CO1	Understand and analyze the behavior of semiconductor materials and basic electronic devices like diodes and transistors.
CO2	Design and build circuits using operational amplifiers for various applications.
CO3	Apply Boolean algebra and logic gates to simplify digital circuits.
CO4	Comprehend the working principles of various sensors, transducers, and basic motors for robotics.
CO5	Demonstrate a basic understanding of common consumer electronics and their functionalities.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Semiconductor & Devices	Current Conduction in Semiconductors, Electrons and holes, PN junction diode, working and its characteristic, Halfwave and full wave rectifiers, LED. BJT characteristics and circuits: Transistor, configuration and characteristics, transistor biasing.	8	CO1
2	Field Effect Transistors	JFET: Working and its characteristics, MOSFET: Working of Enhancement and depletion type, Biasing of FET. Implementation of Basic functions through circuits (Using Operational Amplifier) Op-Amp & its application: Inverting, Non-inverting, integrator, differentiator, Summer.	8	CO2
3	Number System & Logic gates	Number system, Conversion, 2's and 10's, 1's Compliments, 9's Compliments Addition and Subtraction, Boolean algebra, Logic gates, Minimization of logical function using Karnaugh map.	8	CO3
4	Sensors & Transducers	Types and Application of Sensors & Transducers, Pressure sensor, IR sensors, PiezoElectric transducers. Basics of Motors: Working principle of Servo Motors, Stepper Motors.	8	CO4
5	Consumer Electronics	Working of TV, Remote, Microwave Oven, Washing Machine, Electronic Security systems. Application of Digital Multimeter	8	CO5

Books recommended:

Text Books:

1. Bolyested & Nashekey: Electronic Devices and Circuit Theory, PHI.
2. J. S. Katre, Electronics Engineering, Tech-Max Publication.
3. B.R. Gupta, V. Singhal, Consumer Electronics, S.K. Kataria & Sons.
4. S. H. Saeed, Automatic Control System, S.K. Kataria & Sons.

Reference Book:

Milliman & Halkias: Integrated Electronics, McGraw- Hill

e-Learning Source:

- https://www.youtube.com/watch?v=4_nGFY7zgDM
- https://www.youtube.com/results?search_query=diode+characteristics
- <https://nptel.ac.in/courses/117108140>
- <https://nptel.ac.in/courses/108102156>

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	1	3			2							3	2		
CO2	3	2	3										3		3	3
CO3	3	3	3	2	2			1					3	2		
CO4	3	3	2			2						1	3		3	3
CO5	3	2	2	1	1			1				1	3	2		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2025-26 (NEP for admitted batch 2025-26 onwards)

Course Code	CS125	Title of the Course	Digital Workforce Skills	L	T	P	C
Year	I	Semester	I	0	0	2	1
Pre-Requisite	None	Co-requisite	None				
Course Objectives	This study explores emerging digital workforce technologies, data-driven insights, and analytics, with case studies on current industry applications.						

Course Outcomes

CO1	Students must be able to understand the building blocks of Software Digital Workforce Skills.
CO2	Students must be able to articulate the emerging technologies that should embrace a mindset.
CO3	Students must be able to understand the specialized aspects of Ad Hoc analysis and Advance analysis with the help of different real-time case studies.
CO4	Students must be able to represent the analytical aspects of cloud, analytics, and artificial intelligence.
CO5	Students must be knowing the recent research trends related to unlocking hidden values in unstructured data and content inside an image.

S. No.	List of Experiments	Contact Hrs.	Mapped CO
1	To explore datasets by asking relevant questions and creating visualizations using Python and data slots.	2	1
2	To apply Exploratory Data Analysis (EDA) techniques using Python and Pandas and automate data processing tasks.	2	1
3	To deploy a basic cloud application while exploring cloud IDEs, security features, and layout/design choices.	2	2
4	To implement user permissions, access control, and identity management systems for secure cloud application deployment.	2	2
5	To configure roles, relationships, and security settings, managing administrative, user, and staff rights effectively.	2	3
6	To explore and implement Watson Assistant for building conversational AI applications.	2	3
7	To develop a Speech-to-Text model using Python and AI APIs for real-time speech recognition.	2	4
8	To integrate sentiment analysis and emotion detection into a chatbot to enhance user interactions.	2	4
9	To utilize Natural Language Understanding and Knowledge Studio for advanced language processing and model training.	2	5
10	To apply Tone Analyzer and Personality Insights to analyze and respond to user emotions and traits.	2	5

e-Learning Source:

<https://integral.skillsnetwork.site/>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1		1	2		1				1	2	3	2	2	
CO2			1		2	2			2	3	3		3	3
CO3		2			2	3		1			2	1		
CO4	2		2			3		3	3		1	2		
CO5	2	3	3		3				3		2	1	2	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation



B.Tech (All Branches)

Attributes & SDGs Common for all branches/Disciplines

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
ES102	Concept of Environmental Studies					√			SDGs 6,13,14,& 15

Effective from Session:

Enclave from session.							
Course Code	ES102	Title of the Course	Concept of Environmental Studies	L	T	P	C
Year	I	Semester	I/II	2	1	0	3
Pre-Requisite	10+2	Co-requisite					
Course Objectives	The objectives of environmental studies are Creating awareness about environmental problems among people and imparting basic knowledge about the environment and its allied problems. The importance of environmental science and environmental studies cannot be disputed. The need for sustainable development is a key to the future of mankind. Continuing problems of pollution, loss of forest, solid waste disposal, degradation of the environment, issues like economic productivity and national security, Global warming, the depletion of the ozone layer and loss of biodiversity have made everyone aware of environmental issues						
Course Outcomes							
CO1	Students will be able to understand about relationship between Humans and Environment						
CO2	Understand about Ecosystem, Biodiversity and Conservation						
CO3	Identifying environmental pollution, its impact on humans, ecosystems and control measures through latest technologies						
CO4	Analyze and apply knowledge for understanding complex environmental- economic-social challenges, and active participation in solving current environmental problems and preventing the future ones						
CO5	Evaluate the Environmental crisis and can propose effective environmental management						
Unit No.	Title of the Unit	Content of Unit			Contact Hrs.	Mapped CO	
1	Unit I. Humans and the Environment	The man-environment interaction: Humans as hunter-gatherers; Mastery of fire; Origin of agriculture; Emergence of city-states; Great ancient civilizations and the environment; Middle Ages and Renaissance; Industrial revolution and its impact on the environment; Population growth and natural resource exploitation; Global environmental change. The emergence of environmentalism: Anthropocentric and eco-centric perspectives (Major thinkers)			06	CO1	
2	Unit II. Natural Resources, Ecosystem and Biodiversity	Overview of natural resources: Definition, Classification and types of natural resources; Status and challenges. Biodiversity as a natural resource; Levels and types of biodiversity; Biodiversity in India and the world; Biodiversity hotspots. Major ecosystem types in India and their basic characteristics; Ecosystem services- classification and their significance. Threats to biodiversity and ecosystems, Major conservation policies: in-situ and ex-situ conservation approaches.			10	CO2	
3	Unit III. Environmental Pollution and International Treaties	Understanding pollution: Production processes and generation of wastes; Assimilative capacity of the environment; Definition of pollution; Point sources and non-point sources of pollution. Air pollution: Sources; Primary and secondary pollutants; Indoor air pollution; National Ambient Air Quality Standards. Technology to mitigate air pollution Water pollution: Sources; River, lake, and marine pollution, groundwater pollution; Water quality parameters and standards; Technology to mitigate water pollution Soil pollution and solid waste; Solid and hazardous waste; Technology to mitigate waste pollution Noise pollution: Definition; Unit of measurement of noise pollution; Sources of noise pollution; Noise standards; Technology to mitigate noise pollution Thermal and Radioactive pollution: Sources, impacts and Technology to mitigate pollution			10	CO3	
4	Unit IV. Climate Change: Impacts, Adaptation and Mitigation	Observed impacts of climate change on ocean and land systems; Sea level rise, changes in marine and coastal ecosystems; Impacts on forests and natural ecosystems; Impacts on animal species, agriculture, health, urban infrastructure, Indigenous knowledge for adaptation to climate change. Major International Environmental Agreements: CBD; Cartagena Protocol on Biosafety; Nagoya Protocol on Access and Benefit-sharing; CITES; Ramsar Convention; UNCCD; Vienna Convention for the Protection of the Ozone Layer; Montreal Protocol and the Kigali Amendment; Basel Convention; Stockholm Convention; Minamata Convention; UNFCCC; Kyoto Protocol; Paris Agreement; India's status as a party to major convention. Major Indian Environmental Legislations, Industry-specific environmental standards; Waste management rules; National Green Tribunal; Some landmark Supreme Court judgments			10	CO4	
5	Case Studies and Field Work	<ul style="list-style-type: none">• Discussion on one national and one international case study related to the environment and sustainable development.• Field visits to identify local/regional environmental issues, make observations including data collection and prepare a brief report.• Documentation of campus biodiversity.• Campus environmental management activities such as solid waste disposal, water management, and sewage treatment.• Model Making			09	CO5	

Reference Books:

- 1) Agarwal, K.C. 2001 Environmental; Biology, Nidi Pub. Ltd. Bikaner.
- 2) Bharucha Erach, The Biodiversity of India, Mapin Pub. Pvt. Ltd., Ahmedabad-380, India.
- 3) Brunner R.C. 1989. Hazardous waste incineration, Mc Graw Hill
- 4) Clark R.S. Marine Pollution, Clanderson Press Oxford (TB)

e-Learning Source:

<https://byjus.com/biology/difference-between-environment-and-eCOsystem>.



<https://www.youtube.com/watch?v=dRPl4TB8w7k>

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4		
CO1	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-		
CO2	-	-	1	-	-	-	3	-	1	-	-	-	-	-	1	1		
CO3	-	-	2	-	-	-	3	-	1	-	-	-	-	-	1	1		
CO4	-	-	2	-	-	-	2	-	1	-	-	-	-	-	1	1		
CO5	-	-	1	-	-	-	2	-	1	-	-	-	-	-	1	1		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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SYLLABUS
SEMESTER – II

1. Name of the Department: Mathematics & Statistics																
2. Course Name		Mathematics-II for Computer Science & Engineering			L	T	P									
3. Course Code		MT150			3	1	0									
4. Type of Course (use tick mark)					Core ()	DE ()	FC (v)									
5. Pre-requisite (if any)		10+2 with Mathematics	6. Frequency (use tick marks)		Even (v)	Odd ()	Either Sem ()	Every Sem ()								
7. Total Number of Lectures, Tutorials, Practical's																
Lectures = 30			Tutorials = 10		Practical = Nil											
8. COURSE OBJECTIVES: The course is aimed to develop the skills in mathematics which is necessary for grooming them into successful engineering graduate. The topics introduced will serve as basic tools for specialized studies in science field.																
9. COURSE OUTCOMES (CO): After the successful course completion, learners will develop following attributes:																
COURSE OUTCOME (CO)		ATTRIBUTES														
CO1		Students will understand the methods to solve first and higher order linear equations differential equations of certain types and interpret the solutions														
CO2		To use shift theorems to compute the Laplace transform, inverse Laplace transform and the solutions of second order, linear equations with constant coefficients.														
CO3		Students will be able to determine given function in terms of sine and cosine terms in Fourier series.														
CO4		Students will gain an understanding of probability and its applications. They will also learn different kind of probability distributions. They will understand the concept of correlation and regressions.														
CO5		Students will be able to apply method of least squares to find the curve of best fit for the given data.														
10. Unit wise detailed content																
Unit-1		Number of lectures	08													
Linear differential equations of first order, Linear differential equations of higher order with constant coefficients, Complementary functions and particular integrals, Solution of second order differential equations by changing dependent and independent variables, Method of variation of parameters, Applications to engineering problems (without derivation) .																
Unit-2		Number of lectures	08													
Laplace transform of different types of functions, Laplace transform of derivatives and integrals, Unit step function, Laplace transform of periodic functions, Inverse Laplace transform, Convolution theorem, Applications to solve simple linear differential equations.																
Unit-3		Number of lectures	08													
Periodic functions, Trigonometric series , Fourier series of period 2π , Euler's formulae, Even and odd functions, Functions having arbitrary period, Change of interval, Half range sine and cosine series., Fourier transform, Fourier cosine and sine transforms.																
Unit-4		Number of lectures	08													
Correlation and Regression Analysis, Definition of Probability: Classical and Axiomatic, Conditional Probability, Baye's theorem, Binomial Distribution, Poisson distribution and Normal Distribution.																
Unit-5		Number of lectures	08													
Method of least squares, Curve fitting of straight line and parabola, solution of cubic and biquadratic equations.																
11. CO-PO mapping																
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	-	-	-	-	-	-	-	2	-	-	-	1
CO2	3	3	3	1	-	-	-	-	-	-	-	2	-	-	-	1
CO3	3	3	3	1	-	-	-	-	-	-	-	2	-	-	-	1
CO4	2	2	2	1	-	-	-	-	-	-	-	2	-	-	-	1
CO5	1	1	1	1	-	-	-	-	-	-	-	1	-	-	-	-
3 Strong contribution, 2 Average contribution , 1 Low contribution																
12. Brief description of self-learning / E-learning component																
1. https://nptel.ac.in/courses/111106100/ 2. https://nptel.ac.in/courses/111105123/ 3. https://courses.maths.ox.ac.uk/node/view_material/1720 4. https://nptel.ac.in/courses/111103021/ 5. https://www.youtube.com/watch?v=QuAiA1jaee0																
13. Books recommended:																
1. Advanced Engineering Mathematics, Wiley Eastern Ltd. 2. Advanced Engineering Mathematics, Khanna Publication. 3. Higher Engineering Mathematics, Khanna Publication. 4. Advanced Engineering Mathematics, CBS Publication. 5. Introduction to Engineering Mathematics-I, S.Chand & Company. New Delhi																



Integral University, Lucknow

Effective from Session: 2024-25							
Course Code	PY101	Title of the Course	Physics	L	T	P	C
Year	First	Semester	First	3	0	2	4
Pre-Requisite	10+2 with Physics and Mathematics	Co-requisite	None				
Course Objectives	The purpose of this undergraduate course is to impart basic knowledge of fundamental concept of physics which is necessary for a strong engineering knowledge base and to support this knowledge through its various experiments.						

Theory

Course Outcomes

CO1	To realize that apparently different ideas of Optics such as Interference and Diffraction have interrelationship between them.
CO2	To grow in ideas of different aspect of light and develop connection between daily life applications and science
CO3	To grow in developing connection between philosophy and science and realize that seemingly different ideas such as Relativity and Mechanics have interrelationship between them.
CO4	To grow in developing the connection between philosophy and science and realize that seemingly different ideas such as Compton Effect and Quantum Theory have interrelationship between them.
CO5	To grow in developing connection between daily life utility and material science and to evaluate that how totally different manifestation of Modern Science leads to new technology.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Wave Optics	Interference: Methods of formation of coherent sources, theory of interference fringes, fringe width, Fresnel's Biprism, thin film interference, Newton's ring and its application in determination of wavelength of light. Diffraction: Theory of Fraunhofer's diffraction at single slit, Intensity distribution curve, (No derivation), Introduction to the grating grating equation and its application in determination of wavelength of light, Resolving Power of Optical Instruments and Rayleigh's criterion of resolution.	8	1
2	Optical Activity and Modern Optics	Polarization: Production of plane polarized light by reflection, Double refraction, Nicol prism, Optical activity, specific rotation, polarimeter (Laurentz and Biquartz) and its application in determination of specific rotation. Optical Fiber: Principle of fiber optics, numerical aperture. LASER: Main components of laser, Einstein's coefficients, He-Ne laser, Nd-YAG laser and their applications.	8	2
3	Relativistic Mechanics	Brief Introduction to the Michelson-Morley Experiment (Negative results and their explanation), Galilean Transformation Equations, Lorentz Transformation Equations and their consequences (Length Contraction, Time Dilation and Velocity Addition Theorem), Energy-Mass Relation, Relativistic Kinetic Energy.	8	3
4	Quantum Physics	Compton Effect, de-Broglie Hypothesis, Heisenberg's uncertainty principle (no derivation) and its applications (non-existence of electron in nucleus), Wave function and its physical admissibility, orthogonality of wavefunctions, normalization of wave functions, Schrodinger's equation (Time dependent and Time independent) and its application (particle in one dimensional potential box).	8	4
5	Physics of Materials	Magnetic Properties: Magnetization, Origin of magnetic moment, Langevin's theory for diamagnetic material, Phenomena of hysteresis and its applications. Superconductors: Temperature dependence of resistivity in superconducting materials, Effect of magnetic field (Meissner effect), Temperature dependence of critical field, Type I and Type II superconductors, Nano-Materials: Basic Principle of Nanoscience and Technology, Structure, Properties and uses of Fullerene and Carbon Nanotubes, Applications of Nanotechnology	8	5

Reference Books:

1. Fundamentals of Optics by Jenkins and White.
2. Optical Fiber Communication by Gerd Keiser.
3. Concepts of Modern Physics by Arthur Beiser.
4. Introduction to Special Theory of Relativity by Robert Resnick.
5. Quantum Physics by Eisberg.
6. Introduction to Nanotechnology by Poole Owens, Wiley India.
7. Solid State Physics by S.O. Pillai, New Age Publications

e-Learning Source:

1. <https://nptel.ac.in/courses/115/101/115101011/>
2. <https://nptel.ac.in/courses/115/107/115107095/>
3. <https://nptel.ac.in/courses/113/106/113106093/>
4. <https://nptel.ac.in/courses/115/101/115101107/>

PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1					1											2
CO2			1		2							2				2
CO3	1															2
CO4				3								2				2
CO5	2			2	2							2				2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Practicals

Course Outcomes	
CO1	To demonstrate how interference takes place by division of amplitude and by division of wavefront.
CO2	To demonstrate the practical applications of polarization phenomenon in finding the specific rotation, TIR in refractive index calculation.
CO3	To demonstrate the practical application of Fraunhofer diffraction in wavelength determination and application of Carey Foster's bridge in resistivity determination.
CO4	To demonstrate the magnetic and heating effect of current in finding the magnetic field and Stefan's constant.
CO5	To demonstrate how to calculate the energy band gap of a semiconductor material and viscosity of a liquid.

Experiment No.	Title of the Experiment	Aim of the Experiment (*Offline)	Contact Hrs.	Mapped CO
1	Newton's Ring	To determine the wave length of monochromatic light by Newton's ring.	4	CO1
2	Fresnel's Biprism	To determine the wave length of monochromatic light with the help of Fresnel's Biprism.	4	CO1
3	Refractive Index	To determine the refractive index of a liquid using laser.	4	CO2
4	Polarimeter	To determine the specific rotation of cane sugar solution using Half Shade polarimeter.	4	CO2
5	Diffraction Grating	To determine the wavelength of prominent spectral lines by plane diffraction grating.	4	CO3
6	Carey Foster's Bridge	To determine the resistance per unit length of Carey Foster's bridge wire and (i) to prepare one ohm coil (ii) to determine the specific resistance of given wire.	4	CO3
7	Variation of Magnetic Field	Plot the graph showing variation of magnetic field with distance along the axis of a circular current carrying coil and then to determine the radius of the coil from it.	4	CO4
8	Stefan's Law	To verify Stefan's law by electrical method.	4	CO4
9	Energy Band Gap	To determine the energy band gap of a semiconductor using a PN junction diode.	4	CO5
10	Viscosity of water	To determine the coefficient of viscosity of water by Poiseuille's method.	4	CO5

Reference Books:

1. Practical Physics. by R. K. Shukla, New Age International Private Limited; Third edition.
2. B.Sc. Practical Physics by Harnam Singh and Hemne, S. Chand and Company.
3. B. Sc. Practical Physics by CL Arora, S Chand and Company
4. Practical Physics by Kumar P.R.S., Prentice Hall India Learning Private Limited
5. Engineering Physics Practical by S.K. Gupta, Krishna Prakashan

e-Learning Source:

1. <https://youtu.be/fWhgguWc8rk>
2. <https://youtu.be/Bf0Tg-fNWjQ>
3. https://youtu.be/dDp_Insp_p0
4. <https://youtu.be/N0lxwqANsd4>
5. <https://youtu.be/G8Rqd2HNhuk>
6. <https://youtu.be/7Mq4isproEE>
7. <https://youtu.be/G8Rqd2HNhuk>
8. <https://youtu.be/NtfbmAw62Hw>

PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO																
CO1					1											2
CO2			1		2							2				2
CO3	1															2
CO4				3								2				2
CO5	2			2	2							2				2

Name & Sign of Program Coordinator	Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2025-26 (NEP)							
Course Code	CS101	Title of the Course	Computer Programming	L	T	P	C
Year	I	Semester	II	3	0	2	4
Pre-Requisite	None	Co-requisite	None				
Course Objectives	<ul style="list-style-type: none"> To give knowledge of computers, networks, algorithms & flowcharts. To provide fundamental concepts of programming language 'C'. To show the use of functions and pointers to different problems. To study the implementation of arrays, matrices and strings. To give concepts of user defined datatypes, structure & union 						

Course Outcomes	
CO1	Understanding basic concepts of computer, networks and formulation of algorithmic solutions to problems.
CO2	Understanding of programming concepts of C language and their implementation.
CO3	Analyze and develop programs on pointers and functions.
CO4	Acquire the knowledge and develop programs on different operations on arrays, matrices & strings.
CO5	Implementation of programs on structure, union & dynamic memory allocation.

THEORY				
Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to Computers	Generation of computers, Characteristic and classifications of computers. Components of Computer: CPU, Various I/O Devices, Memory & its types, (Memory Hierarchy, Storage Media), Computer Software and their types, Operating System. Computer Networks & Communication: LAN, MAN, WAN, Network Topologies, Modes of Data Communication. Introduction to Internet and its Safeguard: Internet Addresses, Domain Name System, URL, Web Browsers Search Engines, Firewalls, Anti-Virus, Translators. Algorithm and flowchart: Algorithm and flow chart characteristics, Sketching Flowcharts of various problems.	9	1
2	Introduction to C	Standard I/O in 'C', 'C' Fundamental, C Character set, Constants, Variables, Keywords and Identifiers, Data types, Declaration. Operators and Expressions, Conditional statements (If, If-else), Nesting of if- else statement, switch statement, The? operator, goto statement. Decision making and Looping (While, Do-While, for), Break and Continue statements, Case Control Structures (Switch), C programs based on above concepts.	8	2
3	Pointers & Functions	Declaration and initialization of pointers, accessing the address of the variable, accessing the variable through the pointer, chain of pointers, pointers operators, pointer arithmetic Introduction to Functions: Need of "C" function, User Defined and Library Functions, Prototype of Function, Call by Value; Call by Reference; Nesting of Functions, Recursion. Pointers with function, C program based on above concept.	9	3
4	Array	Concept of One Dimensional and Multi-Dimensional arrays, Declaration, Operations: insert, delete, search, traverse, and merge, matrix operations, Sorting: Bubble sort, merge sort, insertion sort. Character array and strings: declaring and initializing strings variable, reading and writing a character, reading and writing strings from terminal, Arithmetic operations on characters, string handling functions. Application of pointers, and function on array, C program based on above concept.	10	4
5	Structures	Defining Structure, Declaration of Structure Variable, Accessing Structure members, copying and comparing structure variable, operation on individual member, nesting of structures, Array of structures. Application of pointers and function on Structures. Union Defining Union Declaration of Union, difference between structure and Union, Introduction of Static and Dynamic memory allocation- The process of Dynamic memory allocation, C program based on above concept.	8	5
PRACTICAL				
S. No.	List of Experiments		Contact Hrs.	Mapped CO
1	Write a Program to print sum and multiply of two numbers.		2	1
2	WAP that calculates the Simple Interest and Compound Interest. The Principal, Amount, Rate of Interest and Time are entered through the keyboard.		2	1
3	Write a Program to enter the temperature in Celsius(c) then count it into Fahrenheit.		2	1
4	Write a Program to swap the number taking the help of third variable.		2	1
5	Write a Program to convert Decimal to Binary in C.		2	1
6	Write a Program to find the greater number enter by user.		2	2
7	Write a Program to check a year is leap year not.		2	2
8	Write a Program to print number is even or odd.		2	2
9	Write a C program to design calculator with basic operations using Switch case.		2	2
10	Write a Program to print the no is positive or negative.		2	2
11	Write a C program to print Fibonacci Series without using Recursion and using Recursion.		2	3

12	WAP to find a Factorial in C.	2	3
13	Write a Program to enter any no and check whether the given no is palindrome or not.	2	3
14	Write a Program to enter any no. and check whether the given no. is Armstrong or not.	2	3
15	Write a Program to Print Pattern * * * * * * * * * *	2	3
16	Write a Program to Print Pattern 1 2 3 4 1 2 3 1 2 1	2	3
17	Write a C program to form Pascal Triangle using numbers.	2	3
18	Write a program to find in C to design the report card of 5 subject according to the following condition if the totalpercentage are. ≥35 and <45 III Div ≥45 and <60 II Div ≥60 I Div If any students score <35 in any of the subject display fail	2	3
19	Write a Program to create 2-D array or order M*N and insert the element and display it.	2	4
20	Write a Program to find the addition of two matrix of order M*N.	2	4
21	Write a Program to find the Transpose of the matrix.	2	4
22	WAP to find Reverse of an Array using Functions in C.	2	4
23	Write a Program to swap two number using function pointers.	2	5
24	WAP to demonstrate Student Record System in C.	2	5

Reference Books:

1. Foundation of Information Technology by 'D.S. Yadav' - New age International
2. Programming in 'C' by 'E Balagurusamy'. -TMH Publication.
3. Let us 'C' by 'Yashwant Kanitkar'-BPB Publication.
4. The C Programming Essentials by Dey- Pearson Publication.

e-Learning Source:

https://onlinecourses.nptel.ac.in/noc22_cs40/preview
<https://archive.nptel.ac.in/courses/106/104/106104128/>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)														
PO- PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO														
CO1	2	2	1	2							2	3	1	1
CO2	3	3	1	1							2	3	2	1
CO3	3	3	3	2							2	3	2	2
CO4	3	3	2	2	1						2	3	3	2
CO5	3	3	2	2	1						1	3	3	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation



Integral University, Lucknow

Effective from Session: 2025-26 (NEP for admitted batch 2025-26 onwards)							
Course Code	CS126	Title of the Course	Changing Business with Data Insights (Watson Analytics)	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	None	Co-requisite	None				
Course Objectives	The goal is to learn business insights using IBM Cognos, focusing on visualization, Watson Analytics features like filtering and reporting, and data preparation for industry applications.						

Course Outcomes	
CO1	Student must be able to understand the building blocks of IBM Cognos.
CO2	Student must be able to articulate the advance dashboarding using IBM Cognos for business trends.
CO3	Student must be able to understand the specialized aspects of Watson Analytics with the help of customize reports, chart and focusing on filters and sorting data.
CO4	Student must be able to represent the analytical aspects of Watson Analytics using IBM Cognos for better business decisions.
CO5	Student must be know the recent research trends related to building queries, data aggregation and data preparation for decision making.

S. No.	List of Experiments	Contact Hrs.	Mapped CO
1	To explore IBM Cognos Dashboards by uploading data, creating and modifying dashboards, managing widgets, and exporting the final dashboard.	2	1
2	To create and customize visualizations in a dashboard, incorporating drill-through capabilities, multilingual support, and conditional formatting.	2	2
3	To work with data sources, apply various visualization types, and configure features like zoom, data highlighting, and auto-refresh in IBM Cognos Dashboards.	2	2
4	To enhance dashboards by adding multimedia elements, creating interactive widgets, and setting up drill-through definitions for deeper data insights.	2	2
5	To apply and manage filters in visualizations, use filter widgets, and employ data selection techniques for effective data presentation.	2	3
6	To sort, highlight, and filter data across visualizations, and learn how to manage filters within tabs and widgets in IBM Cognos Dashboards.	2	3
7	To apply sorting techniques, create column calculations, and enhance visual storytelling through dynamic animations and slide transitions in IBM Cognos Dashboards	2	4
8	To format visualizations effectively, customize legends and colors, and create engaging business presentations using IBM Cognos Analytics Dashboards and Stories.	2	4
9	To improve visualization performance by changing axis labels, applying data aggregation techniques, and adjusting object properties in IBM Cognos Dashboards.	2	5
10	To enhance dashboard efficiency by enabling data caching, editing column headings, and customizing label orientations and data point connections.	2	5

Reference Books:	
1.	IBM Cognos 10 Report Studio Cookbook by Ahmed Lashin.
2.	IBM Cognos Business Intelligence v10: The Complete Guide (IBM Press) 1st Edition, Kindle Edition
3.	IBM Cognos TM1 The Official Guide.
4.	IBM Cognos Business Intelligence v10: The Complete Guide (IBM Press) 1st Edition, Kindle Edition
5.	IBM Cognos TM1 The Official Guide.
6.	IBM Cognos Business Intelligence
e-Learning Source:	
https://integral.skillsnetwork.site/	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)														
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1		2				3	3	2	1		2	1		2
CO2	3	2						3		2				2
CO3	3		3	2				3	3	3	2	2		3

C04	2	2	3	2	3		2	2		3	3			
C05	2	2	3		2			2		3	3	3		1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Effective from Session:2024-25							
Course Code	HM101	Title of the Course	RASHTRA GAURAV	L	T	P	C
Year	I	Semester	I	2	0	0	2
Pre-Requisite	Intermediate (Any Stream)	Co-requisite	None				
Course Objectives	The objective of the course on "Rashtra Gaurav" is to explore and critically analyze the multifaceted dimensions of national pride and glory, as depicted in the paper. Participants will delve into the historical, cultural, social, and political aspects that contribute to the concept of "Rashtra Gaurav" (National Pride) in the context of the specific themes and perspectives presented in the paper. Through in-depth discussions, readings, and interactive sessions, participants will gain a comprehensive understanding of the factors that shape and define a nation's sense of pride, and how these factors influence individual and collective identities. The course aims to foster a nuanced appreciation for the significance of "Rashtra Gaurav" in contemporary society, encouraging participants to critically evaluate its implications and applications within diverse global contexts.						

Course Outcomes	
CO1	To understand the basics of Indian Society and culture.
CO2	To understand the literature, science and astrology.
CO3	To understand Indian heritage.
CO4	To examine the philosophical and spiritual developments in India.
CO5	To evaluate the contributions of Major National Characters and Personalities.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Indian Society & Culture	<ul style="list-style-type: none"> Unity in Diversity: Cultural & Religious Harmony Indian Diaspora Ancient Indian Civilization. National and International Awards & Awardees 	05	01
2	Literature, Science, Astrology	<ul style="list-style-type: none"> Indian Epics: Ramayan & Mahabharata Prominent litterateur: Shudrak, Kalidas, Amir Khusru, Kautilya's Arthashastra Panini's Ashtadhyayi 	05	02
3	Indian Heritage	<ul style="list-style-type: none"> Cultural Heritage in India: Buddhist Monuments at Sanchi, Ajanta & Ellora Caves, Khajuraho, Taj Mahal Tourist Places in India: Red Fort, Ambar Palace, Kaziranga National Park 	04	03
4	Philosophical and Spiritual Developments	<ul style="list-style-type: none"> Sufism & Bhakti Movement: Bulleh Shah, Data Ganj Baksh, Khwaja Moinuddin Chishti, and Nizamuddin Auliya. Tulsidas, Surdas, Meera, Nanak & Kabir Jainism: Mahavir's Biography and Education Buddhism: The life of Buddha, Contributions of Buddhism to India's Culture 	05	04
5	Major National Characters And Personalities	<ul style="list-style-type: none"> Ashoka the Great and His Dhamma Raja Ram Mohan Roy & Brahmo Samaj Swami Vivekanand and his philosophies Mahatma Gandhi: Role of Gandhi in Indian National Movement Dr. Bhimrao Ambedkar: A Chief architect of the Indian Constitution 	06	05

Reference Books:
Jawaharlal Nehru - "The Discovery of India"
B.R. Ambedkar - "Annihilation of Caste"
Ramachandra Guha - "India After Gandhi: The History of the World's Largest Democracy"
Mahatma Gandhi – "My Experiment with Truth"
S C Dubey- "Indian Society"
Nadeem Hasnain – "Indian Society and Culture"
G Shah- "Social Movements in India"

Course Articulation Matrix: (Mapping of COs with POs and PSOs)										
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	1	3	3	2	2	3	2	1	2
CO2	3	2	2	3	1	2	3	1	2	1
CO3	1	2	2	2	2	3	2	3	3	2
CO4	1	3	2	3	2	3	2	3	1	3
CO5	2	3	1	2	2	3	1	3	2	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign and seal of HoD
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