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 Fraunhoffer'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 CO	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 Fraunhoffer 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 CO	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

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

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	• 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**

			Hrs	CO
		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: Principals 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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	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**

SYLLABUS
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 (√)
5. Pre-requisite (if any)	10+2 with Mathematics	**6.**	**Frequency (use tick marks)** Even ()	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	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	PS01	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	• 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.

PO-PSO / CO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
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	● 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

PO-PSO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
	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**

Integral University, Lucknow

Effective from Session: 2024-25							
Course Code	CS131	**Title of the Course**	Web Design Lab	**L**	**T**	**P**	**C**
Year	I	**Semester**	I	0	0	2	1
Pre-Requisite	None	**Co-requisite**	None				
Course Objectives	The objectives of this course uses of various front-end tools. They can understand and create applications on their own. Demonstrate and design of web site can be carried out.						

Course Outcomes	
CO1	Develop front end website architecture.
CO2	Basics of HTML and CSS.
CO3	Work Alongside graphic designers for web design features.
CO4	Apply acquired knowledge and skills to build a web project.
CO5	Handle various aspects of full web development, ensuring they can build robust and scalable websites.

Experiment No.	Name of Experiment	Contact Hrs.	Mapped CO
1	Write an HTML code to display your education details in a tabular format.	2	1
2	Write an HTML code to create a Home page having three links: About Us, Our Services and Contact Us. Create separate web pages for the three links.	2	1
3	Write an HTML code to illustrate the usage of the following: Ordered List, Unordered List and Definition List	2	2
4	Write a HTML program to design a form which should allow to enter your personal data (Hint: make use of text field, password field, e-mail, lists, radio buttons, checkboxes, submit button)	2	2
5	Write HTML Code to demonstrate the use of Anchor Tag for the Following: - • Creating a web link that opens in a new window. • Reference within the same html document. • Making an image a hyperlink to display second image.	2	3
6	Write an HTML code to create a frameset having header, navigation, and content sections.	2	3
7	Write an HTML code to demonstrate the usage of inline, internal, and external CSS.	2	4
8	Create a web page to demonstrate the usage of following CSS properties: • List properties • Border Properties • Positioning Properties • CSS Lists	2	4
9	Create a web page to demonstrate the usage of following CSS properties: • CSS Tables • CSS Menu Design • CSS Image Gallery	2	5
10	Introduction to GitHub and Version Control Tools • Git • Concurrent Versions System (CVS) • Apache Subversion (SVN) • Mercurial	2	5
e-Learning Source:			
Udemy			

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	3	3	1	3		3	1	1		1	1	1	3		3
CO2	2	2	3	3	1		2	2	1		1	2	2	2	1	
CO3	1	1	1	2	3			2	2		2	1		3	1	2
CO4	2	2	1	2	2		2	1	3		3		2	1	1	1
CO5	1	2	1	3	1	3	1		2	3	2	1	1	2	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	0
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	• Unity in Diversity: Cultural & Religious Harmony • Indian Diaspora • Ancient Indian Civilization. • National and International Awards & Awardees	05	01
2	Literature, Science, Astrology	• Indian Epics: Ramayan & Mahabharata • Prominent litterateur: Shudrak, Kalidas, Amir Khusru, • Kautilya's Arthashastra • Panini's Ashtadhyayi	05	02
3	Indian Heritage	• 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	• 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	• 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	P05	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

Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	EC102	**Title of the Course**	Switching theory and logic design	**L**	**T**	**P**	**C**
Year	I	**Semester**	II	3	1	2	5
Pre-Requisite		**Co-requisite**					
Course Objectives		● To understand the concepts of digital electronics and their applications. To provide a conversion in mathematical form. Can identify type of complements, can apply 1's and 2's complements. ● To learn the Boolean Expression, K- Map method. To understand the basic concepts of various combinational circuits including gates, adders, subtractor, multiplexers. ● To learn the analysis of various sequential circuits, flip flops, counters and various shift registers. ● To understand the concept and design of synchronous/asynchronous sequential logic. ● To understand the concepts of various logic devices programming logic array, programming array logic PROM and various memories.					

Course Outcomes	
CO1	Students shall be able to understand fundamental concepts of digital systems and binary numbers and converting numbers between different bases.
CO2	Students shall be able to understand logic of universal gates to build simple digital circuits and analyze Boolean expressions using fundamental postulates and theorems.
CO3	Students shall be able to implement Boolean functions using Karnaugh Maps for simplification.
CO4	Given concept students shall be able to understand and analyze the structure and function of combinational and sequential circuits.
CO5	Given a AND and OR array, student shall be able to analyze the characteristics of different types of memory.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Binary System**	Introduction of Digital Computers and Digital Systems, Binary numbers, Base Conversion, Conversion of numbers, Binary, Decimal, Hexadecimal, Octal, Binary Code: BCD, Excess-3, Gray Code	8	CO1
2	**Binary Logic and Boolean Algebra**	Basic Logic Gates: AND, OR, NOT, Universal Gates: NAND, NOR, Combinational Gates: X-OR, X-NOR gates, Fundamental Postulates of Boolean Algebra, Basic theorems of Boolean algebra, De-Morgan's Theorems.	8	CO2
3	**Boolean Function Implementation**	Need for simplification, K–Map method, 2-Variable K-map, 3-Variable K – Map, K-Map using Don't care condition.	8	CO3
4	**Combinational Logic**	Combinational circuits, Analysis procedure, design procedure, Binary adder-subtractor, Decimal adder, Binary multiplier. Multiplexer & Demultiplexer. Sequential Logic: Latches, Flip Flops, Synchronous/Asynchronous Counter, Register	8	CO4
5	**Memory**	Introduction of logic families: TTL, DTL & CMOS. Memory: ROM: PROM, EROM, RAM SRAM, DRAM PLD: PLA, PAL, and FPGA	8	CO5

Books recommended:

Text Books:
1. "Digital Design", M. Morris Mano and M. D. Ciletti, 5th Edition, Pearson Education

Reference Book:

1. "Fundamentals of Logic Design", Charles H. Roth, Jr., 5th Edition, Brooks/Cole, a division of Thomson, 2004.

2. "Digital Principles and Application", D P Leach, A P Malvino and Goutam Saha, 7th Edition, TMH.

3.	" Digital Fundamentals", Thomas L. Floyd, 11th Edition by Pearson.

e-Learning Source:

https://www.youtube.com/watch?v=HcH0khFGwS8

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

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

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Department of Computer Science and Engineering (Programme B.Tech)

Effective from Session:							
Course Code	ES101	Title of the Course	Environmental Studies	L	T	P	C
Year	I	Semester	I	2	1	0	3
Pre-Requisite	10+2	Co-requisite					
Course Objectives		To study about the Environment and the Ecosystem. To study about the Natural Resources. To study about Biodiversity and Conservation. To study Environmental pollution, its policies and practices. To study Human Population and Environmental Ethics.					

Course Outcomes	
CO1	Gain knowledge about environment and ecosystem
CO2	Students will learn about natural resource, its importance and environmental impacts of human activities on natural resource.
CO3	Gain knowledge about the conservation of biodiversity and its importance.
CO4	Aware students about problems of environmental pollution, its impact on human and ecosystem and control measures.
CO5	Students will learn about increase in population growth and its impact on environment.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to Environment and Ecosystem	Environment, its components and segments, Multidisciplinary nature of Environmental studies, Concept of Sustainability and sustainable development, Environmental movements, Ecosystem, Structure & Function, Energy flow in the Ecosystem, Ecological Pyramids and Ecological Succession.	8	CO1
2	Natural Resources	Renewable and non- renewable, Soil erosion and desertification, Deforestation, Water: Use and over exploitation, Impacts of large Dams, Case studies	8	CO2
3	Biodiversity and Conservation	Levels of biological diversity, Hot spots of biodiversity, India as a Mega Diversity Nation, Endangered and endemic species of India, Threats to Biodiversity, Conservation of Biodiversity, Ecosystem and biodiversity services.	8	CO3
4	Environmental Pollution, Policies and Practices	Environmental pollution, Solid waste management, Ill effects of fireworks, Climate change, Ozone layer depletion, acid rain and impacts on human communities and Environment, Environmental Laws: Environment Protection Act, Wildlife protection Act, Forest conservation Act, Convention on Biological Diversity (CBD), Tribal rights, Human wildlife conflicts.	8	CO4
5	Human Population and the Environment	Human population growth: Impacts on environment, human health and welfare, Resettlement and rehabilitation of project affected persons, Environmental ethics, Environmental communication and public awareness, case studies.	8	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., Ahemdabad-380, India.

3) Brunner R.C. 1989. Hazardous waste incineration, Mc Graw Hill

4) Clark R.S. Marine Pollution, Clanderon Press Oxford (TB)

5) Cunningham W.P.2001.Cooper, T.H. Gorhani, E & Hepworth, Environmental encyclopedia, Jaicob Publication House, Mumbai.

6) De. A.K. Environmental chemistry Willey Eastern Limited.

7) Glick, H.P.1993 water in crisis, Pacific Institute for studies in dev, Environment & security, Stockholm Env, Institute, Oxford Univ, Press 473 p.

8) Hawkins R .E. Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay.

9) Heywood, V.H. & Watson, R. T.1995.Global biodiversity Assessment.Cambridge Univ. Press 1140 p.

10) Jadhave, H. and Bhosale, V. M. 1995 Environmental protection and laws, Himalaya pub, house, Delhi.284 p.

11) Mckinnery, M.L. and School, R. M.1996 Environmental science systems and solutions, web enhanced edition 639 p.   12) Mhaskar A.K. Matter Hazardous, Techno Science Pub (TM)

13) Miller T.G. Jr, Environmental Ecology, W. B. Saunders Co.USA,574 p. 16

14) Odum, E.P.1997.Fundamental chemistry, Goel Pub House Meerut.

15) Survey of the Environment, The Hindu (M).

16) Sharma B.K.2001.Environmental Chemistry, Goel Pub.House Meerut

e-Learning Source:

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

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

https://www.youtube.com/watch?v=3fbEVytyJCk

https://www.vedantu.com/biology/conservation-of-biodiversity

https://youmatter.world/en/definition/soil-erosion-degradation-definition/

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

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		3		1							
CO2				1			3		1							
CO3			1	1			3		1							2
CO4			1			2	3		1			1				2
CO5	1		1	1		1	3	3	1			1				2

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

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 (√)	
5. Pre-requisite (if any)	10+2 with Mathematics	**6. Frequency (use tick marks)**	Even (√)	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	Solve first order linear equations and higher order differential equation 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	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	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. Transform of derivatives, convolution theorem, 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	2	2	2	1	2	2	-	1	2	2	2	2	2	2	3	2
CO2	3	3	2	2	2	3	-	1	2	2	3	2	3	3	3	3
CO3	3	3	2	2	2	3	-	1	2	2	3	2	3	3	3	2
CO4	2	2	2	1	2	2	-	1	2	2	2	2	2	3	3	2
CO5	1	1	2	1	1	2	-	1	1	2	1	1	1	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/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	ME101	**Title of the Course**	Basic Mechanical Engineering & Workshop	**L**	**T**	**P**	**C**	
Year	I	**Semester**	I / II	3	0	2	4	
Course Objectives	To impart knowledge to the students of basic thermodynamics process and laws along with mechanics of materials, their properties and fabrication techniques							

Course Outcomes	
CO1	Understand the 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 in various processes and systems
CO3	Will be able to model the problem using free-body diagrams and reach to solution by using equilibrium equations
CO4	Will be able to perform structural analysis for safe design and fabrication techniques
CO5	Will be able to understand mechanical properties of engineering materials, their testing and different operations performed in workshop to make components
CO6	Learn to perform operations on lathe machine shop, fitting shop, carpentry shop
CO7	Learn to perform operations on sheet metal shop, smithy shop, welding shop

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 it's measurement, Zeroth law of thermodynamics.	08	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.	08	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.	08	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.	08	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 test and impact test.	08	CO5

Practical				
S. No.	Name of shop	List of experiments	Contact Hrs.	Mapped CO
1	**Machine shop**	To study and sketch a lathe machine To perform facing, plain turning, step turning, taper turning & chamfering operations	4	CO6
2	**Fitting shop**	To perform step cutting, filing, drilling & tapping To make a 90° v-groove fitting on mild steel flat	4	CO6
3	**Carpentry shop**	To make a mortise and tenon joint To make a corner lap joint	4	CO6
4	**Smithy shop**	To make a square punch from mild steel round rod To make a pipe hook from a mild steel round rod	4	CO7
5	**Welding shop**	To weld the two given plates & make a lap joint (by arc welding) To weld the two given plates & make a butt joint (by arc welding)	4	CO7
6	**Sheet metal**	To perform different fabrication operations in sheet metal shop	4	CO7

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
◆ Kumar D.S, Mechanical Engineering, S.K. Katarial & Sons
◆ Bhavi Katti S.S., Engineering Mechanics, New Age Pub
◆ Bharti P.K: Engineering Mechanics, Kataria and Sons

- ◆ Callister W. D., 2006, "Materials Science and Engineering-An Introduction", 6th Edition, Wiley India
- ◆ Khurmi R.S, Workshop Technology, S.Chand Publication

e-Learning Source:
https://www.youtube.com/watch?v=Dy2UeVCSRYs&list=PL2_EyjPqHc10CTN7cHiM5xB2qD7BHUry7
https://www.youtube.com/watch?v=DzyIEz3dKXQ&t=1s
https://www.youtube.com/watch?v=A-3W1EbQ13k&list=PLyqSpQzTE6M_MEUdn1izTMB2yZgP1NLfs
https://www.vlab.co.in/

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
CO6	3	1		2		2			2			3	3	3	3
CO7	3	1		2		2			2			3	3	3	3

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

Integral University, Lucknow

Effective from Session:2024-25							
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	• 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 Pattern1 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.

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

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

Integral University, Lucknow

Effective from Session: 2015-16									
Course Code	ME103	**Title of the Course**	ENGINEERING GRAPHICS			**L**	**T**	**P**	**C**
Year	**I**	**Semester**	I			0	0	2	1
Pre-Requisite	None	**Co-requisite**	None						
Course Objectives	• Main objective is to teach the fundamentals of Engineering Graphics. • This course enhances visualization skill and imagination power. • To understand techniques of drawings for various fields of engineering • To improve their technical communication skill in the form of communicative drawings.								

Course Outcomes	
CO1	Describe the fundamentals of engineering drawing, use of geometrical instruments and drawing steps
CO2	To understand the concept of projection and acquire visualization skills, draw the projection of points, lines and planes.
CO3	Classify solids and projection of solids at different positions
CO4	To get the exact sectioned view of solids and development of their surfaces.
CO5	To draw isometric projection and perspective views of an object.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Lettering and geometrical constructions	Describe the fundamentals of engineering drawing, use of geometrical instruments and layout for initial drawing.	2	CO1
2	Orthographic projections of points	Describe the fundamentals orthographic projections and use of geometrical instruments and layout for initial drawing.	2	CO2
3	Projections of lines	Describe the fundamentals of projections of lines and use of geometrical instruments and procedure for the drawing.	2	CO2
4	Projections of solids	Describe the fundamentals of projections of solids and use of geometrical instruments and procedure for the drawing.	2	CO3
5	Sectioning of solids	Describe the fundamentals of sectioning of solids and use of geometrical instruments and procedure for the drawing.	2	CO4, CO3
6	Isometric Projections	Describe the fundamentals of Isometric projections and use of geometrical instruments and procedure for the drawing.	2	CO5
7	Production drawing	Describe the fundamentals of production drawing.	2	CO1, CO2

Reference Books:

Engineering graphics by Pradeep Jain

Engineering graphics by Krunal Patel

e-Learning Source:

https://www.youtube.com/watch?v=p62LPzFqGQw&list=PLp6ek2hDcoNCjoRLQ4rjpCozisCACBxKA

https://www.youtube.com/watch?v=VrU73IwRyc4&list=PLLy_2iUCG87Bw9XPfEF3r3EW5UlAOv8iz

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								1	2		3	3		3
CO2	3	2	2						1	2		3	3		3
CO3	3	2	2						1	2		3	3		3
CO4	3	2	2						1	2		3	3		3
CO5	3	2	2						1	2		3	3		3

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

Name & Sign of Program Coordinator	**Sign & Seal of HoD**