Integral University, Lucknow

Effective from Session: 2024-25							
Course Code	DMA-201	**Title of the Course**	APPLIED MATHEMATICS-II	**L**	**T**	**P**	**C**
Year	I[ST]	**Semester**	II[nd]	**03**	**01**	**00**	**-**
Pre-Requisite	DMA-201	**Co-requisite**	NA				
Course Objectives	To know the basic concepts of Mathematics with their Applications in Engineering.						

Course Outcomes	
CO1	Definite and Indefinite integral knowledge makes students wide in solving problems related to big summations and areas related problems.
CO2	Applications of Integration will lead students to get a good knowledge of finding areas, volume etc.
CO3	Some different rules like Newton-Cote's Quadrature formula, Trapezoidal rule, Simpson's 1/3rd rule and 3/8th rule, Students will be able to solve big Integral problems in a very easy pattern.
CO4	2D Coordinate Geometry has application in the field of construction. The sketch of a building is a pure geometry. It is also used for finding the distance between places and in geography also it has many applications. It is also used in Astrophysics to find the distance between planets
CO5	Three dimensional geometry is used in various fields like in computer graphics, biotechnology and medical sciences and in different projects also.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	i). Integral Calculus-I ii). Indefinite Integral	**Integral Calculus – I:** Definition of Integration (anti-derivative), Integration of standard functions. Rule of integration (Integration of sum, difference and Scalar multiplication). **Indefinite Integral:** Integration by substitution, Integration by parts, Integration by partial fraction.	07	1
2	i). Integral Calculus-II ii). Application of Integral Calculus	**Integral Calculus - II:** **Definite Integral:** Definition of definite integral, properties and evaluation of definite integral. **Application of Integral Calculus:** Finding areas bounded by sample curves.	08	2
3	i). Numerical Integral & Error	**Numerical Integration & Error:** Introduction, Newton-Cote's Quadrature formula, Trapezoidal rule, Simpson's 1/3rd rule and 3/8th rule. Concept of error for simple function.	08	3
4	i). Coordinate Geometry (2Dimention)	**Coordinate Geometry (2-Dimension):** Circle, Equation of circle in standard form. Centre - Radius form, Diameter form, Two intercept form.	08	4
5	i). Coordinate Geometry (3-Dimention)	**Co-ordinate Geometry (3 Dimension):** Straight lines and planes in space, Distance between two points in space, direction cosine and direction ratios, Finding equation of a straight line (without proof).	09	5

References Books:

1. Applied Mathematics: Kailash Sinha, Meerut publication.
2. Applied Mathematics: P. K. Gupta, Asian Publication.
3. Applied Mathematics: H. R. Loothara, Bharat Bharti Publication.
4. Mathematics for Polytechnic: S.P. Deshpande, Pune Vidyarthi Griha.

e-Learning Source:

https://www.youtube.com/watch?v=syLIPtxjN0E&list=PLn78sdsv0QoXBxWmyGp5SQdg-F_AlyB05&pp=iAQB

https://www.youtube.com/watch?v=rBNQ0r7CN2c&list=PLn78sdsv0QoXUdre4aCAobj3cxACkNeLL&pp=iAQB

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	3	--	1	--	--	2	-	1	1
CO2	1	3	1	1	2	--	--	2	1	2	-
CO3	--	1	--	2	3	--	--	3	--	2	1
CO4	2	2	2	1	--	--	--	-	2	1	3
CO5	2	1	1	--	1	--	--	-	1	-	2

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

Name & Sign of Program Coordinator	Sign & Seal of HoD

Effective from Session: 2010							
Course Code	DPH-201	**Title of the Course**	Applied Physics-II	**L**	**T**	**P**	**C**
Year	I	**Semester**	I	**3**	**1**	**0**	
Pre-Requisite	None	**Co-requisite**	None				
Course Objectives	To equip learners with the foundational concepts of units, dimensions, dimensional analysis, measurement accuracy, and vector operations, enabling them to analyze physical equations, perform unit conversions, estimate errors, and apply vector algebra in solving scientific and engineering problems.						

Course Outcomes	
CO1	Student learn to analysis to effect of building acoustic condition.
CO2	Student learn about application of ultrasound in various field like SONAR, medical and research work and sound signal etc.
CO3	The student learns to introduce and overview of optical fiber and process of transmission of signal and application of various field.
CO4	Student learns to investigate broken telegraph wire with the help of post office box.
CO5	Student learn to simplify the complicated circuit by using Kirchhoff's law.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
Unit-1	**Application of Sound Waves**	**Acoustics**: Standing waves, Closed and Open organ pipes, Resonance, End correction. Definition of pitch, loudness, quality and intensity of sound waves. Echo and reverberation and reverberation time. Sabine's formula, Control of reverberation time (problems on reverberation time). Acoustics of buildings, defects and remedy. **Ultrasonics:** Generation, Magnetostriction, Piezoelectric effect, Application in new technology	6	CO-1
Unit-2	**Fiber Optics**	Quantum nature of light, Coherence (Spatial and temporal), Duality of wave and particle, Concept of Interference, Biprism, Fraunhoffer single slit diffraction, grating, Resolving and dispersive power, Elementary concept of polarization. Critical angle, Total internal reflection, Principle of fiber optics, Optical fiber, Pulse dispersion in step-index fibers, Graded index fiber, Single mode fiber, Optical sensor	8	CO-2
Unit-3	**D.C. Circuits, Dielectrics**	Principle of Wheat Stone bridge and application of this principle in measurement of resistance (Meter bridge and Post Office Box); potentiometer, Kirchhoff's Law and their simple application. Principle of Carey-Foster's bridge. Electric potential, potential energy, Energy of a charged capacitor. Charging and discharging of capacitors. Electric dipole; effect of electric field on dielectrics, polarization. Magnetic Fields & Materials: Dia, Para and Ferro-magnetism, Ferrites, Hysteresis, Hysteresis curve of a ferro magnetic materials and their uses, Basic idea of super conductivity.	8	CO-3
Unit-4	**Semiconductor Physics, Nuclear Physics**	classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semiconductors, Electrons and holes as charge carriers in semiconductors, Effect of temperature in conduction in semiconductors, P-type and N-type semiconductors, P-N junction formation, barrier voltage, Forward and reverse biasing of a junction diode. Continuous and characteristics of X-rays, Properties & applications of X-rays. Radioactivity, Nuclear stability, Radioactive emission, radiation hazards, nuclear fission and fusion, nuclear reactors and their application, Mass-energy relation, atomic mass unit, Mass defect and binding energy.	10	CO-4
Unit-5	**Lasers and its Applications, Non-conventional energy resources**	Absorption and Emission of energy by atom, Spontaneous and Stimulated Emission, Population inversion. Main components of laser and types of lasers, Ruby Laser, He-Ne laser and their applications. Wind energy: Introduction, scope and significance, measurement of wind velocity by anemometer, general principle of wind mill, Indian wind energy program. Solar energy: Solar radiation and potentiality of solar radiation in India, unit of solar radiation. Bio fuel and Gobar gas plants Uses of solar energy: Solar Cooker, solar water heater, solar photo-voltaic cells, solar energy collector, Modern applications in technology.	8	CO-5

References Books:

1. Nootan Physics: Kumar & Mittal
2. Applied Physics: P.K. Gupta.
3. Pradeep Fundamental: Gogia & Gomber.
4. Applied Physics: P.S. Kushwaha.

e-Learning Source:

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2											1	2				
CO2	2										1	1	2				
CO3	2				2	1						2	2				2
CO4	1				2		3						1				2
CO5	2	2										1	2	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:							
Course Code	DCH-201	**Title of the Course**	Applied Chemistry	**L**	**T**	**P**	**C**
Year	I	**Semester**	II	**3**	**1**	**0**	**0**
Pre-Requisite	None	**Co-requisite**	None				
Course Objectives	1. To understand all the chemical reactions, principle and theory related to topics 2. To provide examples and unsolved problems as much as possible 3. To provide example related to industrial as well as domestic proposes						

Course Outcomes	
CO1	To acquire the foundational knowledge needed to understand the properties, combustion behaviors, and potential impacts of different fuels.
CO2	To understand the all, disperse systems used in pharmaceutical and other paint industry.
CO3	To provide knowledge about the nature of compounds and nature of bonds of organic compound as well as the possibility of chemical reaction.
CO4	To provide the fundamental understanding needed to design and optimize industrial Process
CO5	To understand the vital material which is used in a range of application across various industries. Understand manufacturing process to create sustainable material.

Unit No.	**Title of the Unit**		**Contact Hrs.**	**Mapped CO**
Unit-1	**Fuels**	Definition, its classification, high and low calorific value. Determination of calorific value of solid and liquid fuels by Bomb calorimeter. Liquid fuel- Petroleum and its refining, distillates of petroleum (Kerosene oil, Diesel and Petrol), Benzol and power alcohol. Knocking, Anti-knocking agents, Octane number and Cetane number. Cracking and its type, Gasoline from hydrogenation of coal (Bergius process and Fischer Tropsch's process) Gaseous Fuel- Coal gas, Oil gas, Water gas, Producer gas, Biogas, LPG and CNG. Numerical problems based on topics.	10	1
Unit-2	**Colloidal State of Matter Lubricants**	Concept of colloidal and its types, different system of colloids, dispersed phase and dispersion medium. Methods of preparation of colloidal solutions, Dialysis and electrodialysis. Properties of colloidal solution with special reference to absorption, Brownian movement, Tyndal effect, Electrophoresis and Coagulation. Relative stability of hydrophilic and hydrophobic colloids. Protection and protective colloids. Emulsion, types, preparation, properties and uses. Application of colloids chemistry in different industries.	06	2
Unit-3	**Hydrocarbons**	Definition, classification, necessity and various kinds of lubricants. Function and mechanism of action of lubricants and examples. Properties of lubricants, importance of additive compounds in lubricants, Synthetic lubricants and cutting fluids. Industrial application, its function in bearing.	10	3
Unit-4	**Organic Reactions and Mechanism:**	A. Classification and IUPAC nomenclature of organic compounds homologous series (Functional Groups). B. Preparation, properties and uses of Ethane, Ethene, Ethyne (Acetylene), Benzene and Toluene. Fundamental aspects- A. Electrophiles and nucleophiles, Reaction intermediates, Free radicals, Carbocation, Carbanion. B. Inductive effect, Mesomeric effect, Electrometric effect. Mechanism- A. Mechanism of addition reaction (Markovnikov's Rule, Cyanohydrin and Peroxide effect). B. Mechanism of substitution reactions; (Nucleophilic) hydrolysis of alkyl halide, electrophilic substitution halogenations, Sulphonation, Nitration and Friedel- Craft reaction. C. Mechanism of Elimination reaction- Dehydration of primary alcohol, Dehydrohalogenation of primary alkyl halide.	07	4
Unit-5	**Polymers and Synthetic Materials**	Polymers and their classification. Average degree of polymerization, Average molecular weight, Free radical polymerisation (Mechanism). Thermosetting and thermoplastic A. Addition polymers and their industrial applications- Polythene, Polystyrene, PVA, PVC, PAN, PMMA, Buna-S, Buna-N, Teflon. B. Condensation polymers and their industrial applications- Nylon 6, Nylon 6,6, Bakelite, Melamine formaldehyde, Urea formaldehyde, Terylene or Dacron, Polyurethanes. General concept of Bio polymers, Biodegradable polymers and Inorganic polymers (Silicon). Synthetic Materials- A. Introduction- Fats and Oils B. Saponification of fats and oils, Manufacturing of soap C. Synthetic detergents, types of detergents and its	07	5

		manufacturing. Explosives: TNT, RDX and Dynamite, Paint and Varnish.		

References Books:

1. Applied Chemistry: R. S. Katiyar and J. P. Chaudhary
2. Applied Chemistry: Rakesh Kapoor
3. Principles of general and inorganic chemistry: O. P. Tandon
4. Engineering Chemistry: S. Chandra
5. Applied Chemistry: M. Gupta

e-Learning Source:

https://drive.google.com/file/d/176P2RihIzLCSWmWqeMf5W1ja5uYcqRXn/view?usp=drive_link
https://drive.google.com/file/d/1HkrXSpQw7_Y5FZPf8iq0T92DRyuGrms3/view?usp=drive_link
https://drive.google.com/file/d/1lsZHgt7nlIdB0iReCbTaP53JZjgzjOZ3/view?usp=drive_link
https://drive.google.com/file/d/176OiA-haF34K1Bzg_xA2PwSXkwGb-FMD/view?usp=drive_link

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	03	-	01	-	-	-	01				
CO2	03	-	-	-	-	-	-				
CO3	03	-	01	-	-	-	02				
CO4	03	01	02	-	-	-	02				
CO5	03	-	-	-	-	-	02				

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

Dr. Rida Sagheer **Name & Sign of Program Coordinator**	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2024-25							
Course Code	DEE-201	**Title of the Course**	BASIC ELECTRICAL ENGINEERING-I	**L**	**T**	**P**	**C**
Year	First	**Semester**	Second	**3**	**1**	**2**	**-**
Pre-Requisite		**Co-requisite**					
Course Objectives	1. Concept of electromagnetic induction laws which is required for electrical engineering 2. Classification of different types of capacitors and Battery.						

Course Outcomes	
CO1	Conceptualize the fundamental of current, voltage and power and would be able to utilize in electrical heating and mechanical work
CO2	Characterization of material on the basis of their conductivity and permeability for the use in the field electrical and electronic engineering.
CO3	Develop the concept of electromagnetic induction laws which is required for electrical engineering
CO4	Battery maintenance, care and grouping of cell to get required Ah.
CO5	Classification of different types of capacitors. And to know influence dielectric as well series parallel combination on capacitance value.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
Unit-I	Introduction of Electrical Engineering	Basic Terminology and their concepts of Current, EMF, potential difference (Voltage), resistance, resistivity, their units, conductors & insulators, Insulation resistance of a cable. Effect of temperature on the resistance of conductors, semiconductors (C, Si, Ge) and insulators physical explanation, temperature coefficient of resistance. Electrical power, energy and their units (SI), Heating effect of electric current and its practical examples. Relationship between electrical, mechanical and thermal SI units of work, power and energy, Electrical Safety and precautions.	8	1
Unit-II	Material Classification,	Material Classification, conducting, insulating, Semi Conducting materials with reference to their atomic Structure. Classification of magnetic materials, Ferro Magnetism, domains, permeability, hysteresis loop, Coercive Force & residual magnetism & magnetic saturation, Semi Conductor & Special purpose material, N-type & P-type Materials, application of semi conductor materials, Materials used in transistor & I.C.	8	2
Unit-III	Electromagnetic Induction	Electromagnetic Induction: Faraday's laws of electromagnetic induction. Lenz's law, simple problem. Dynamically induced emf. Self induced emf, inductance, its role in electrical circuits. Simple problems. Mutually induced emf, mutual inductance, its role in electrical circuits. Simple problems. Energy stored in magnetic circuit. Rise and decay of current in inductors. Force on a current carrying conductor placed in a magnetic field and its applications. Elementary idea about eddy current loss.	8	3
Unit-IV	Batteries	Batteries Construction, chemical changes during charging and discharging of lead acid cells. Indications of a fully charged battery. Capacity and efficiency of lead acid cell / battery. Charging of 6 V, 12 V. Commercial batteries. Grouping of cells. Care and batteries maintenance of commercial batteries. Problems/defects in lead acid batteries. Concept of Nickel-Iron and Nickel Cadmium Batteries. Concept of solid sealed maintenance free batteries (SMF batteries), Oxygen recombination principle.	8	4
Unit-V	Capacitors	Capacitors: Concept of capacitor, types of capacity of parallel plate capacitor, Composite capacitor and effect of physical parameters. Energy stored in a capacitor, dielectric and its influence on capacitance of a capacitor, dielectric constant dielectric breakdown and dielectric strength. Dielectric loss. Series and parallel combination of capacitors. Capacitance of multi-plate capacitors. Variable capacitors. Charging and discharging of capacitors. Simple problem on capacitors.	8	5

References Books:

1. Fundamental of Electrical Engg. – Ashfaq Husain
2. Electrical Technology Volume-I – B.L. Thereja

e-Learning Source:

https://nptel.ac.in/

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1		3	2		1	1	1						2	
CO2		2	2		1				2				2	
CO3		2	2	3	2		2	2	1	2			3	
CO4		2	2			2		2	2	1			2	
CO5		2	3				2		2	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	DEC-202	**Title of the Course**	Electronics Component and Devices-II	**L**	**T**	**P**	**C**
Year	II	**Semester**	IV	**3**	**1**	**0**	
Pre-Requisite		**Co-requisite**					
Course Objectives	After undergoing the subject, the students will be able to Understand transistor & their significance, understand and describe type of FET, compare different types of transistor.						

Course Outcomes	
CO1	Characterize Input and Output performance of different configuration of BJT
CO2	Bias the transistor differently and select operation point.
CO3	Calculate the voltage & current gain of single stage amplifier
CO4	Characterize the FET and MOSFET.
CO5	Characterize MOS and its application.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	TRANSISTOR BIASING AND STABILIZATION	1.Different transistor biasing circuit for fixing the operation points, of temperature on operation point. Need and method for stabilization of operation point. Effect of fixing operation point in cut – off or saturation region on performance of amplifier. 2.Calculation of operation point for different biasing circuits, use of thevenin's theorem in analysing potential divider biasing circuit. 3.Simple design problems on potential divider biasing circuit.	8	1
2	SINGLE STAGE TRANSISTOR AMPLIFIER	1.Analysis of Single Stage CE, BE, and CC amplifier. 2.Single stage CE amplifier circuits with proper biasing component 3.AC load line and its use in: (a) Calculation of current and voltage gain of a single stage amplifier circuit. (b) Explanation of phase reversal of the output voltage with respect to input voltage	8	2
3	FIELD EFFECT TRANSISTOR	1. Construction, operation, characteristics and Biasing of Junction FET . 2. Analysis of Single Stage CS, CG and CD amplifiers. (Only brief idea)	8	3
4	MOSFET	1.Constructions, operation, Characteristics and Biasing of MOSFET in both depletion and enhancement modes. 2.Analysis of single stage CS, CG and CD amplifiers (Only Brief Idea) 1. Construction, operation and characteristics of CMOS in both depletion and enhancement modes 2. Use of CMOS as Inverter, Different application of CMOS 3. Comparison of JEET, MOSFET and Bipolar transistor.	8	4
5	INTEGRATED ELECTRONICS	1.Introduction to IC and its importance in modern electronics, types of IC's some examples of popular IC's (74& 40 series i.e. 741,714,555,810,4046etc.) 2. Fabrication of transistor by planer process. A typical fabrication process for Ics (brief explanation) 3. Difference between SSI , MSI. LSI.VLSI.	8	5

References Books:

Principles of Electronics – V.K.Mehta

Fundamental of Electrical Engg- Ashfaq Husain

Bhargava,kulshereshtha & Gupta –"Basic Electronics & Linear Circuits " – Tata Mcgraw -hill

e-Learning Source:

http://swayam.gov.in

http://spoken-tutorial.orgs

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1											
CO2											
CO3											
CO4											
CO5											

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

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

Integral University, Lucknow

Effective from Session: 2010-11							
Course Code	DPC-201	**Title of the Course**	PROFESSIONAL COMMUNICATION	**L**	**T**	**P**	**C**
Year	FIRST	**Semester**	FIRST/ SECOND		**T**		
Pre-Requisite		**Co-requisite**					
Course Objectives	Enhance Verbal Communication Skills Master Written Communication Cultivate Interpersonal Skills Develop Professional Etiquette Utilize Communication Technologies						

Course Outcomes	
CO1	Introduction of the concept of communication, types skills, modern tools, etc...
CO2	The CO of this unit is to make inquiry about people, product, price etc. with the expansion of business operations of a business, importance of business letter is also increasing. To take right decisions: Taking right decisions require accurate information.
CO3	The CO of this unit is to control sentence-level error (grammar, punctuation, and spelling). Its outcome is to employ techniques of active reading, critical reading, and informal reading response for inquiry, learning, and thinking.
CO4	Learning objectives focus on student performance. Action verbs that are specific, such as list, describe report, compare, demonstrate, and analyze, should state the behaviors students will be expected to perform in Hindi
CO5	The conclusion of this subject is to increase the student's English communication skills by Improving fluency through regular practice and speaking drills. Understanding of basic grammar structures like nouns, verbs and adjectives through class reading and speaking tasks.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Communication in English	Concept of communication, importance of effective communication, types of communication, formal and informal, verbal and nonverbal, spoken and written, Techniques of communication, Listening and reading, writing and speaking, Barriers to communication- Modern tools of communication Fax, e-mail, Telephone, telegram, etc., Techniques for clear, concise, correct and coherent writing, Difference between technical writing and general writing.	8	CO-1
2	Letters	Kinds of letters: Official, demi-official, unofficial, enquiry letter, quotation, tender and order giving letters. Application for a job, Resume, complaint letter and adjustment letter. Report writing, Note making and minutes writing.	8	CO-2
3	Grammar	Transformation of sentences, synthesis, Preposition, Articles, Idioms and Phrases, One word substitution, Abbreviations. Tenses, Active and Passive voice. Composition on narrative, descriptive, imaginative, argumentative, discussion and factual topics.	8	CO-3
4	Spoken English	Phonemes (Speech sound), Consonant sounds, vowels sounds and diphthongs, Phonetic transcription, IPA, word stress and Intonation. Development of comprehension and knowledge of English through the study of text material and language exercises based on the prescribed text book of English.	8	CO-4
5	Letter writing in Hindi	Kinds of letters: Official, demi-official, unofficial, enquiry letter, quotation, tender and order giving letters, Application for a job.	8	CO-5

References Books:

Dr. R.P. Chauhan, Asian Publishers, Muzaffarnagar

S.V. Singh & M. S. Verma: Bharat Bharat Prakashan, Meerut.

R. Thakur & M. Singh, Meerut Publication.

e-Learning Source:

https://www.bbau.ac.in/Docs/FoundationCourse/TM/AECC105/Lecture%20Types%20&%20Modes%20of%20Communication.pdf

https://www.uou.ac.in/sites/default/files/slm/BHMAECC-II.pdf

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2									
CO2	2	2									
CO3	1	1									
CO4	2	2									
CO5	3	3									

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

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

Integral University, Lucknow

Effective from Session:							
Course Code	DCH-251	**Title of the Course**	Applied Chemistry Lab	**L**	**T**	**P**	**C**
Year	1st	**Semester**	2nd	**0**	**0**	**2**	**0**
Pre-Requisite	None	**Co-requisite**	None				
Course Objectives	1. To understand all the chemical reactions, principle and analysis of chemicals 2. To examine the unknown chemical compounds and unsolved problems as much as possible 3. To analyse the water related to industrial as well as domestic proposes						

Course Outcomes	
CO1	The process of qualitative analysis by applying knowledge of acidic basic nature of chemical properties and ions that sharpens the laboratory skills.
CO2	The careful analysis of substances to ensure the correct compounds are used or safely disposed of during manufacturing process.
CO3	Fundamental concepts of electrochemistry, including oxidation-reduction (redox) reactions, electrolytes, electrodes, and electrochemical cells.
CO4	To identify the components in a mixture, whether it's for designing manufacturing processes, dealing with wastewater treatment, or working with catalysts and chemical reactions.
CO5	Identify the chemical, and biological parameters of water quality, including turbidity, pH, temporary and permanent hardness. Understand modern water purification technologies like reverse osmosis (RO), ultrafiltration (UF), ion exchange, and membrane filtration, and their applications in industrial and municipal water treatment.

Unit No.	**Experiment No**		**Contact Hrs.**	**Mapped CO**
	Experiment 1	Analysis of acid and basic radical of inorganic mixture No1	2	1
	Experiment2	Analysis of acid and basic radical of inorganic mixture No2	2	1
	Experiment3	Analysis of acid and basic radical of inorganic mixture No3	2	2
	Experiment4	Analysis of acid and basic radical of inorganic mixture No4	2	2
	Experiment5	Determination of chloride content by Mohr's method in supplied water	2	3
	Experiment6	Testing of total hardness of water sample by EDTA titration method in terms of CaCO3	2	3
	Experiment7	Analysis of temporary hardness in water sample through O'Hener's method	2	4
	Experiment8	Dissolve oxygen analysis in water sample	2	5
	Experiment9	Analysis of strength of HCl solution through NaOH solution by using pH meter	2	5

References Books:

1. Applied Chemistry: R. S. Katiyar and J. P. Chaudhary
2. Applied Chemistry: Rakesh Kapoor

https://drive.google.com/file/d/1K_tMkEUCeiEuWuTuUHf2fYrn0ASKdFvl/view?usp=drive_link
https://drive.google.com/file/d/16AxAY-ykhA-nhABsMQGPe7W3sI6g6HMT/view?usp=drive_link
https://drive.google.com/file/d/10huj7rhxLNrJxjXELMmmgimUVBu-X_mC/view?usp=drive_link
https://drive.google.com/file/d/1YE5zh9X_ZNKZgb01vyPjn15P8QlaedWY/view?usp=drive_link
https://drive.google.com/file/d/1X-zvmfiPgJ_LvbxI7X5ciwJBXHvhadHI/view?usp=drive_link

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	03	-	01	-	-	-	01				
CO2	03	-	-	-	-	-	-				
CO3	03	-	01	-	-	-	02				
CO4	03	01	02	-	-	-	02				
CO5	03	-	-	-	-	-	02				

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

Dr. Rida Sagheer **Name & Sign of Program Coordinator**	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session:							
Course Code	DEC-252	**Title of the Course**	Electronic Components & Devices Lab	**L**	**T**	**P**	**C**
Year	I	**Semester**	II	**0**	**0**	**2**	
Pre-Requisite	-	**Co-requisite**	-				
Course Objectives	After completing the lab student will be to tell the value of the resistor ,operate the CRO and Multimter.						

Course Outcomes	
CO1	Should identify passive and active components and different popular IC's.
CO2	Understand the working of rectifiers and filters
CO3	Understand the work of amplifiers and their characteristics.
CO4	Understand the work of oscillators and their application.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Experiment-1	To identify the values of resistors with the help of colour codes and compare them with values measured with multi-meter.	2	1
2	Experiment-2	To plot the static forward and reverse characteristics of a p-n junction diode.	2	2
3	Experiment-3	To measure amplitude of a sinusoidal signal with the help of CRO. Compare this amplitude with the value measured by multimeter.	2	1
4	Experiment-4	To measure frequency of a sinusoidal signal with the help of CRO. Compare this frequency with that obtained from function generator dial.	2	1
5	Experiment-5	To identify the symbols of various electronic components.	2	1
6	Experiment-6	To plot the input and output waveforms of Half wave rectifier on CRO.	2	2
7	Experiment-7	To plot the input and output waveforms of Full wave rectifier on CRO.	2	2
8	Experiment-8	Simulate the half wave, full wave and bridge rectifier using the simulation tools like PSPICE/ Multisim/OrCAD/Tina.	2	3
9	Experiment-9	To plot the Input and output characteristics of CE Transistor configuration and find its input & output resistance.	2	3
10	Experiment-10	Construct and plot the drain characteristics of JFET and find its pinch off voltage.	2	3

References Books:

e-Learning Source:

1. www.vlab.co.in

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-		-	-	
CO3	3	-	-	-	-	-	-	-	-	-	

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

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

Integral University, Lucknow

Effective from Session: 2016-17							
Course Code	DCS-151/DCS-251	**Title of the Course**	Computer Application Lab	**L**	**T**	**P**	**C**
Year	1st	**Semester**	1st / 2nd	**1**		**2**	
Pre-Requisite		**Co-requisite**					
Course Objectives	To develop basic knowledge and understanding of Computers and C programming language.						

Course Outcomes	
CO1	Students become familiar with the basic fundamentals and concepts of Computer
CO2	Practical knowledge of the MS Office package, viz. MS Word, MS Excel and MS PowerPoint.
CO3	Students are trained with the basic concepts of the C programming language
CO4	Students will be able to develop logics which will help them to create basic programs and applications in C.
CO5	The course is designed to provide complete knowledge of C language.

Practical No.	List of Practicals	Contact Hrs.	Mapped CO
1	Introduction of computer types, generation, Application, characteristic & Memory.	03	CO1
2	Introduction and practice of Ms-Office package (Ms-Word, Ms- Excel, Ms- Power point & Ms-Access).	03	CO2
3	Introduction & Practice of Internet and e-mail.	03	CO2
4	Programming of 'C'- History, character set, variables, and keywords, token data types input and output function.	03	CO3
5	Introduction of Decision control statement- if, if- else, nester if statement and switch case.	03	CO3
6	Programming practice of if, if – else, nested if statement and switch case.	03	CO4
7	Loops- while loop, do- while loop, for loop, break and continuous statements.	03	CO4
8	Programming practice of while loop do- while loop, for loop, break and continuous statements.	03	CO-4
9	Array Declaration, initialization of one and two dimensional array.	03	CO-5
10	Programming practice on array.	03	CO-5

References Books:

1.Computer fundamental- Sinha & Sinha

2.Computer Basics & 'C'- V. Rajaraman

3.Office 2007 -Ruthosky, Seguim, Ruthosky

4.Programming in ANSI- E Balagurusamy

e-Learning Source:

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	1	3	2										1		
CO2	1	2	2							1			1		
CO3				1						2				2	
CO4				2						3				2	
CO5				2						3	2			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: 2010-11							
Course Code	DPC251	**Title of the Course**	Professional Communication	**L**	**T**	**P**	**C**
Year	FIRST	**Semester**	FIRST/ SECOND				
Pre-Requisite		**Co-requisite**					
Course Objectives	Develop Effective Verbal and Non-Verbal Communication Skills Enhance Written Communication Abilities Foster Active Listening and Interpersonal Skills Master Communication Tools and Technology Understand and Adapt to Diverse Communication Styles						

Course Outcomes	
CO1	Introduction of International Phonetic Alphabet and Pronunciation practice.
CO2	From a psychological perspective, objective and outcome of self-description in formal communication situations means that you are focusing attention on you and your behavior, which allows you to evaluate what you see based on the standards and expectations that you have developed throughout your life.
CO3	The CO of this unit is breeding fresh ideas and taking inputs from a particular group of students... Identify a solution to a specific problem or issue. Selecting candidates after their written test for hiring in a company.
CO4	The key objectives outcomes that underline a good presentation often include the following: To establish credibility with your audience. To communicate information clearly to your audience. To persuade and/or influence your audience. The CO of this unit is to establish credibility with your audience. To communicate information clearly to your audience. To persuade and/or influence your audience.
CO5	The CO of this unit is to differentiate between views and facts, to formulate and delineate useful questions, to choose and apply suitable research methods, to look critically at acquired information and to doubt information that has been offered

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Introduction to speech sounds	Introduction to speech sounds through (IPA) International Phonetic Alphabet. - Pronunciation practice emphasizing the articulation of vocal sounds & Word stress. - Pronunciation Practice emphasizing the words with spelling pronunciation Mismatch.	4	1
2	Techniques of giving focused self-description	Techniques of giving focused self-description in formal communication Situations. - Practice in describing objects.	4	2
3	The basics of group discussion	The basics of group discussion. - Common pitfalls in group discussion. - Techniques for making a claim & supporting it in group discussion. - Techniques for offering polite but firm counter arguments. - Participating in a Debate.	4	3
4	The essentials of Seminar Presentation	The essentials of Seminar Presentation. - Techniques for preparing a Seminar Presentation. - Mock Interview: Preparation, unfolding of personality and expressing Ideas effectively. - Role Play/General Conversation, Making polite enquiries at Railway station, Post Office and other Public Places.	4	4
5	Project	Project: At the beginning of the Semester each student in the class will be given topics for one informative & one persuasive speech to be delivered by him/her towards the end of the semester. The students will research for, organize and finalize the speeches under the guidance of the subject teacher. For each speech, the student will submit a one-page written outline.	4	5

References Books:

Grant Taylor: English Conversation Practice (T.M.H.) 2. Grathe King: Colloqnial English Routledge London

Grant Taylor : English Conversation Practice (T.M.H.) 2. Grathe King: Colloqnial English Routledge London

e-Learning Source:

https://siayainstitute.ac.ke/wp-content/uploads/2021/05/COMM-SKILLS-NOTES.pdf

https://mrcet.com/downloads/MBA/Professional%20Communication%20Skills.pdf
https://www.scribd.com/document/389612555/COMMUNICATION-SKILLS-SELF-STUDY-NOTES-1-pdf

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1									
CO2	2	1									
CO3	2	1									
CO4	1	2									
CO5	1	1									

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

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