Integral University, Lucknow
University Polytechnic
Study and Evaluation Scheme

Program: Diploma in Architecture

Semester- II

S. No.	Course code	Course Title	Type of Paper	L	T	P/ST	CT	TA	Total	ESE	Sub. Total	Credit	Total Credits	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics
THEORIES																				
1	DMA-201	Applied Mathematics-II	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y		Y				
2	DPH-201	Applied Physics (B)	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y	Y	Y		Y		
3	DCH-201	Applied Chemistry (B)	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y	Y	Y		Y		
4	DAR-201	Technical Drawing-II	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y	Y	Y		Y		
5	DAR-202	Fundamentals of Architecture	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y	Y	Y		Y		
6	DPC-201	Professional Communication	Core	03	01	00	40	20	60	40	100	3:1:0	4	Y	Y	Y			Y	Y
1	DPH-251	Applied Physics Lab	Core	00	00	02	40	20	60	40	100	0:0:1	1	Y	Y	Y		Y		
2	DCAD-251	Basic Computer-Aided Design Lab	Core	00	00	02	40	20	60	40	100	0:0:1	1	Y	Y	Y				Y
3	DWS-251	Workshop Practice	Core	00	00	03	40	20	60	40	100	0:0:1	1	Y	Y	Y		Y		
4	DPC-251	Professional Communication Lab	Core	00	00	02	40	20	60	40	100	0:0:1	1	Y	Y	Y			Y	Y
5	GP-251	General Proficiency		–	–	–	–	–	60	–	60								Y	Y
Total				18	06	08	**400**	200	660	400	1060		28							

Effective from Session: 2024-25							
Course Code	DMA-201	**Title of the Course**	APPLIED MATHEMATICS-II	**L**	**T**	**P**	**C**
Year	IST	**Semester**	IInd	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**

APPLIED PHYSICS(B)
(DPH-201)
[Common to All Engineering Courses]

L T P
3 1 0

UNIT-I   6
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).Accoustics of buildings, defects and remedy.

Ultrasonics,

Generation, Magnetostriction, Piezoelectric effect, Application in new technology

UNIT-II   8
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.

Fibre Optics :

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

UNIT-III
D.C. Circuits :

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,

Dielectrics :

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.

UNIT-IV   10
Semiconductor Physics :

classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semi conductors, 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.

Production of X-rays types of X-rays spectra :

Continuous and characteristics of X-rays,Properties & applications of X-rays.

Nuclear Physics :

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.

UNIT-V   **8**

Lasers and its Applications :

Absorption and Emission of energy by atom, Spontaneous and Stimulated Emission, Population inversion. Main components of laser and types of laser,Ruby Laser, He-Ne laser and their applications.

Non-conventional energy resources.

Wind energy : Introduction, scope and significance,measurement of wind velocity by anemometer, general principle of wind mill, Indian wind energy programme.

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.   **5**

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

DCH-201	Applied Chemistry (B)				
Pre-requisite	Co-Requisite	L	T	P	C
None	None	03	01	00	--
Objective	To know the basic concept of Chemistry and their Applications in Engineering				
UNIT I	**Fuels:**				07
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.					
UNIT II	**Colloidal State of Matter and Lubricants:**				08
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. 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.					
UNIT III	**Hydrocarbons:**				08

	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.	
UNIT IV	**Organic Reactions and Mechanism:**	08

Fundamental aspects-

    A. Electrophiles and nucleophiles, Reaction intermediates, Free radicals, Carbocation, Carbanion.

    B. Inductive effect, Mesomeric effect, Electromeric effect.

Mechanism-

    A. Mechanism of addition reaction (Markonicove's Rule, Cyanohydrin and Peroxide effect).

    B. Mechanism of substitution reactions; (Nucleophillic) hydrolysis of alkyl halide, electrophillic substitution halogenations, Sulphonation, Nitration and Friedel- Craft reaction.

    C. Mechanism of Elimination reaction- Dehydration of primary alcohol, Dehydrohalogenation of primary alkyl halide.

UNIT V	**Polymers and Synthetic Materials:**	09

Polymers-

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 manufacturing. Explosives: TNT, RDX and Dynamite Paint and Varnish.	
Reference books:	6. Applied Chemistry: R. S. Katiyar and J. P. Chaudhary 7. Applied Chemistry: Rakesh Kapoor 8. Principles of general and inorganic chemistry: O. P. Tandon 9. Engineering Chemistry: S. Chandra 10. Applied Chemistry: M. Gupta	

TECHNICAL DRAWING-II
(DAR-201)

L T P
3 1 0

UNIT-I

  (a) Basis of perspective, cone of vision, central visual ray, picture plane, line of sight through picture plane, spectator.

  (b) Reality and appearance.

  (c) Principal aides of perspective, vanishing points, eye level.

  (d) Study of cube, sphere, cylinder, prism etc. And their one point & two point perspective.

8

UNIT-II

Plane & elevation of a two room single storied building. Sections of a two room single storied building.

8

UNIT-III

Working drawing of a three bed room double storyed flat roofed residential building. Stair case
 a. Details of dog legged stairs (Wodden & RCC).
b. Plans of remaining type of stairs

8

UNIT-IV

Use and care of modern drawing appliances with emphases on stencils, drawing table template fero & ammonia printing machine.

8

UNIT-V

Different presentation drawing techniques, symbols used in architectural drawings. **8**

References :

"Civil Engineering Drawing" – Gurucharan Singh

FUNDAMENTAL OF ARCHITECTURE

(DAR-202)

L T P

3 1 0

UNIT I

Principles of Architecture

General background, evolution of architecture, definition of architecture and interior design, factors effecting architecture and interior design. **8**

UNIT II

Aesthetics in interiors, role of accessories, furniture and fittings. Plumbing & electrical fittings **8**

UNIT III

ARCHITECTURAL COMPOSITION

Anthropometrics diagram, procedure of functional planning, objective of functional planning, methods of determination of various rooms sizes. **8**

UNIT IV

ELEMENTS OF ARCHITECTURAL COMPOSITION

1.Point 2. Lines 3. Figures 4. Forms 5. Scale 6. Proportion 7. Unity 8. Focus 9. Balance 10. Monotony 11. Rhythm 12. Contrast 13. Harmony **8**

UNIT V

ELEMENTS OF ARCHITECTURAL COMPOSITION

14. Character 15. Style 16. Materials and structure 17. Textures 18. Ornamentation 19.Role of color, light and shade in interiors and architecture 20. Truth. **8**

References :

1. A Visual Dictonary : Frantis & D K Singh
2. Form, Space& Order : Frantis & D K Singh

PROFESSIONAL COMMUNICATION
(DPC-101)
[Common to All Engineering Courses]

L T P
3 1 0

UNIT-I
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, writting 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. **5 UNIT-II**

Letters :
Kinds of letters: Official, demi-offical, 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. **5**

UNIT-III
Grammar : **8**
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.

UNIT-IV
Spoken English:
Phonemes(Speech sound),Consonant sounds, vowels sounds and dipthongs, 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. **10**

UNIT-V.
Letter writing in Hindi:
Kinds of letters: Official, demi-offical, unofficial, enquiry letter, quotation, tender and order giving letters, Application for a job. **5**

References :
1.   Dr. R.P. Chauhan, : Asian Publishers, Muzaffarnagar.
2.   S.V. Singh & M. S. Verma : Bharat Bharat Prakashan, Meerut.
3.   R. Thakur & M . Singh, Meerut Publication.

APPLIED PHYSICS LAB
(DPH-151/DPH-251)

L T P
0 0 2

Note: Any ten experiments are to be performed.

1. Determination of 'g' using simple pendulum.
2. To find the surface Tension of water by the method of capillary rise.
3. To determine the frequency of A.C. mains by using a sonometer and a horse shoe magnet.
4. To determine the value of modulus of rigidity of given material of a wire by statical method using Barton's apparatus.
5. Determination of coefficient of viscosity of water by capillary flow (Poiseuilles method).
6. To determine the height of a tower by Sextant.
7. To determine the moment of Inertia of a flywheel.
8. Determination of velocity of sound by resonance tube.
9. Determination of resistivity of a given wire by Post Office Box.
10. By using Potentiometer, determination of
    (i) E_1/E_2
    (ii) Internal resistance of givn cell.
11. Determination of coefficient of friction on a horizontal plane.
12. Determination of viscosity coefficient of a lubricant by Stoke's law.
13. Determination of Spring Constant.
14. Verification of Kirchoff's laws.
15. To draw the characteristics of a p-n junction diode.

BASIC COMPUTER AIDED DESIGN LAB

(DCAD-151)

L T P
0 0 2

1. To study of Auto CAD software.

2. Study And Sketch of drafting setting.

3. Study and sketch of Dimensional setting.

4. To draw geometrical figure using drawing commands.

5. To modify a geometrical figure using editing comment.

6. To draw orthographic view of a geometrical figure.

7. To Draw isometric view of a geometrical figure.

8. To Draw top front and side view of an isometric figure.

9. To draw sectional view of a soild object.

10. To do practical on page set up & scaling of drawing.

WORKSHOP PRACTICE
(DWS-151)

L T P
0 0 3

1. **Machine Shop**
   a.   Study of tools and operations
   b.   Plane turning
   c.   Step turning
   d.   Taper turning
   e.   Threading
   f.   Single point cutting tool grinding

2. **Fitting Bench Working Shop**
   a.   Study of tools and operations
   b.   Simple exercises involding filing work
   c.   Making perfect male-female joint
   d.   Simple exercises involving drilling/tapping/dieing

3. **Black Smithy Shop**
   a.   Study of tools and operations
   b.   Simple exercises based on black smithy operations such as
        Upsetting/drawingdown, punching, bending, fullering and swaging

4. **Welding Shop**
   a.   Study of tools and operations
   b.   Simple butt Joint
   c.   Lap Joint
   d.   Oxy acetylence welding

5. **Sheet Metal Shop**
   a.   Study of tools and operations
   b.   Making funnel complete with soldering
   c.   Fabrication of tool box, tray, electrical panel box etc.

6. **Carpentry Shop**
   a.   Study of tools and operation and carpentry Joints.
   b.   Simple exercise using jack plain
   c.   To prepare half lap corner, joint, mortise and tennon joints.
   d.   Simple exercise on woodworking lathe.

7. **Foundry**
   a.   Making a mould using single piece pattern
   b.   Making a mould using two piece pattern
   c.   Making a mould using a pattern with core print
   d.   Making Pouring and Making an Aluminium Casting

PROFESSIONAL COMMUNICATION LAB
(DPC-251)

L T P
0 0 2

UNIT-I

Introduction to speech sounds through (IPA) International Phonetic Alphabet.

- Pronounciation practice emphasizing the articulation of vocal   sounds & Word stress.
- Pronounciation Practice emphasizing the words with spelling
pronounciation Mismatch.

UNIT-II

- Techniques of giving focused self description in formal communication Situations.
- Practice in describing objects.

UNIT-III

- 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.

UNIT-IV

- 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.

UNIT-V

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.

Software:

- Learn to Speak English (BPB MultiMedia)
- A talking Dictionary.
- CD's of Professional Communication.

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