Course Curriculum

2nd semester

UNIVERSITY POLYTECHNIC

DAS-201: ENGLISHCOMMUNICATION -II

Credits: 04   **Semester II**

Module No.	Contents	Teaching Hours (Approx.)

I	**Grammar and Usage**:
	    Parts of Speech
	    Sentence Structure: Subject; Verb and Object
	    Articles: 'a', 'an' and 'the'
	    Tenses
	Study of Text: "The Renunciation" by Rabindranath Tagore (From the prescribed text)
	 "The Gift of the Magi" by O' Henry (From the prescribed text)
		14

II	**Reading skills:** Unseen comprehension **Vocabulary:** Phrasal Verbs, One-Word Substitutions **Study of Text**: "The Heritage of India" by A.L. Basham (From the prescribed text) "Water" by C.V. Raman (From the prescribed text)	10
III	**Writing skills:** Notice writing Story writing using given clues Official communication: Applications, Resume', Complaint letters, E-mail, **Study of Text:** "A Bookish Topic" by R.K. Narayan (From the prescribed text) **Developing Oral communication skills** 2.1 Offers/Responding to Offers 2.2 Requests/Responding to Requests 2.3 Congratulating 2.4 Expressing Sympathy and Condolences 2.5 Expressing Disappointments 2.6 Apologizing, Forgiving 2.7 Complaining 2.8 Warning 2.9 Asking for and Giving Information 2.10 Giving Instructions 2.11 Getting and Giving Permission 2.12 Asking For and Giving Opinions **(Note: The above content is for oral practice. It should not be included in theory examination)**	12

BOOKS PRESCRIBED:

- *An Anthology of English Essays*, Ed. R.P.Singh, Oxford University Press, New Delhi.
- *Current English Grammar & Usage with Composition,* R.P. Sinha, Oxford University Press, NewDelhi.

BOOKS RECOMMENDED FOR STUDY:

- *Communicating Effectively in English, Book-I* by RevathiSrinivas, Abhishek Publications, Chandigarh.
- *High School English Grammar and Composition* by Wren & Martin, S. Chand & Company Ltd., Delhi.
- *Communication Techniques and Skills* by R.K.Chadha, DhanpatRai Publications, New Delhi.
- *Intermediate English Grammar* by Raymond, Murphy, Cambridge University Press, New Delhi.
- *Living English Structure* by W. Allen, Pearson Education, New Delhi.
- *Oxford English Hindi Dictionary* by R.N. Sahai&S.Kumar, Oxford University Press, New Delhi.

DAS-202: APPLIED MATHEMATICS - II

Credits: 04   Semester II

Module No.	Content	Teaching Hours (Approx.)
I	**Differential Calculus**: Definition of function, concept of limits, standard limits. $\underset{x \to a}{Lt.}\ (x^n - a^n)/(x - a)$, $\underset{x \to 0}{Lt.}\ \sin x / x$, $\underset{x \to 0}{Lt.}\ (a^x - 1) / x$ etc. Differentiation by definition of x^n, sin x, cos x, tan x, e^x, $\log_a x$ only. Differentiation of sum, product, quotient of functions, differentiation of function of a function. Differentiation of inverse trigonometric, logarithmic and exponential functions, successive differentiation (upto III order)	12
II	**Integral Calculus**: Integration as inverse operation of differentiation, simple standard integrals and related problems, simple integration by substitution, by parts and by partial fractions (for linear problems only), Evaluation of definite integrals(simple problems), Definite integral as a limit of the sum.	12
III	**Applications of Calculus in Engineering:** Equation of tangent and normal to a curve(for explicit functions only) – simple problems only. Velocity and acceleration, approximation of errors., maxima and minima, numerical integration by Simpson's rules	12

Reference Books/ Text Books / Cases:

* Gupta P.(2012), Comprehensive Mathematics XII, Laxmi Publications, Delhi
* Grewal B. S. Elementary Engineering Mathematics, Khanna Publishers, New Delhi
* Sharma R.D., Applied Mathematics, Dhanpat Rai Publications, Delhi

DAS-203: APPLIED PHYSICS – II

Credits: 04   Semester II

Module No.	Content	Teaching Hours
Unit-I	Coulombs law, electric potential and electric potential due to point charge, electric potential difference, Electric field, electric field intensity, electric lines of force, electric flux Gauss's Law, Applications of Gauss law in finding electric field of point charge, straight charged conductor, plane charged sheet and between two plane parallel charged sheets using Gauss law, Capacitance types of capacitors, capacitance of parallel plate capacitor, series and parallel combination of capacitors, Dielectric and its effect on capacitance, Concept of Ohm's law and its applications, concept of resistance, conductance, specific resistance, effect of temperature on resistance, co-efficient of resistance, series and parallel combination of resistors, Kirchhoff's laws, Wheatstone bridge principle and its applications (Meter bridge, post office Box), Heating effect of current and concept of electric power, energy and their units.	
Unit-II	Alternating current phase and phase difference, Behaviour of resistance, capacitance and inductance in A.C. Circuits, A.C. Circuits containing R-L, R-C & L-R-C in series, Power in A.C. circuits and power factor, Magnetic field and its units, magnetic intensity, magnetic lines of force, magnetic flux, Right hand thumb rule, magnetic lines of force due to straight conductor, circular coil and solenoid, Force on a charge, moving in a uniform magnetic field (Lorentz force). Force on a current carrying straight conductor. Torque on a current carrying rectangular coil, Moving coil galvanometer conductor, its principle, construction and working, conversion of a galvanometer into ammeter and voltmeter, Electromagnetic induction, Faradays Laws, Lenz's Law, Ampere's circuital law.	12
Unit-III	Formation of energy bands, insulators, intrinsic and extrinsic semiconductors, p-n junction diode and its characteristics (in forward and reverse bias), Diode as rectifier – half wave and full wave rectifier, pnp and npn– transistors and their uses in electronic circuits, Fibre optics: introduction to optical fiber materials, types, light propagation.	12

Reference Books

- Applied Physics, Vol. II, TTTI Publications, Tata McGraw Hill, Delhi
- Concepts in Physics by HC Verma, Vol. II, Bharti Bhawan Ltd. New Delhi
- A Text Book of Optics, Subramanian and Brij Lal, S Chand & Co., New Delhi
- Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
- Basic Electronics and Linear Circuits by NN Bhargava et al Tata Mc Graw Hill Publishers, New Delhi
- Principles of Electronics by SK Sahdev, Dhanpat Rai and Co, New Delhi
- Engineering Physics by Vanchna Singh and Sheeetal Kumar, Cengage Learning India Pvt. Ltd. Patparganj, Delhi

TEXT BOOKS:

- Applied Physics Vol.II by T.R.Narula and Suman Chaudhary, North Publications, Jalandhar
- Nutan Physics by Kumar & Mittal

DAS-204: APPLIED CHEMISTRY-II

Credits: 4   **Semester-II**

Module No.	Contents	Teaching Hours
I	**Water treatment:** Hardness of water, types of hardness, units of hardness. Boiler feed water. Softening of hard water by Calgon process and reverse osmosis method. **Fuel:** Definition, classification, calorific value (HCV & LCV). Petroleum and its distillation products, knocking, antiknock compounds, octane number and cetane number. Biogas. **Lubricants:** Definition, classification, properties of lubricants, flash point and fire point, saponification value, acid value, oiliness, emulsification, cloud & pour point and its applications	8
II	**Organic chemistry:** Classification of organic compounds on the basis of functional groups. IUPAC nomenclature of simple organic compounds containing one functional group only, homolytic fission, heterolytic fission, purification of organic compounds by distillation, fractional distillation, steam distillation, vacuum distillation and thin layer chromatography (TLC). **Glass and cement:** General introduction to glass and cement. Manufacturing process of glass and cement.	8
III	**Polymers:** Definition, classification, preparation and uses of polyethene, polystyrene, PVC, Teflon, Nylon66, Natural rubber, vulcanization of rubber. **Corrosion:** Introduction, Types of corrosion, wet theory of corrosion and prevention of corrosion. **Miscellaneous materials:** Paints and varnishes- Definition, classification and Application. Soap and detergents- Definition, classification and uses.	8

DCS 201: FUNDAMENTAL OF COMPUTERS

Credits: 04   **Semester II**

Module No.	Content	Teaching Hours
I	**Fundamentals of Computer concepts** Impact of computer in society: Computer application in office, book publishing, data analysis, accounting, investment, inventory control, graphics, air and railway ticket reservation, robotics, military, banks, Insurance financial transactions and many more. Generations of computer, block diagram of a computer, CPU, memory, data – numeric data, alpha numeric data, processing of data. Computers for information storage, information seeking, information processing and information transmission, computer organization, computer hardware and software; primary and secondary memory: RAM, ROM, PROM etc. Input devices; keyboard, mouse, scanner, output devices; VDU and Printer (Impact and non-Impact printers), Plotter etc. Primary and Secondary Storage (Auxiliary Storage), Secondary storage; magnetic disks – tracks and sectors, optical disk (CD, CD-RW and DVD Memory) System software, application software, operating systems, advantages of software and application packages. Introduction to Operating Systems such as MS-DOS and Windows, difference between DOS and Windows.	8
II	**Introduction to MS-Office** *Introduction to WORD package* Starting Word Document; Typing and Editing text, Copying and Moving, Typing Special Characters (Symbols); Some common features: Changing the case of text, Moving & copying text with drag and drop, Justifying text, inserting bulleted and numbered lists, Arranging and moving between open documents; Finding and replacing, formatting; Using the spell checker, Checking grammar, mail merging *Concepts of POWER POINT* How to make an effective presentation, Physical aspects of presentation; A Presentation Graphics package; Creating a presentation: creating a Title slide, Creating a Graph, Creating Tables, Make Organization Chart, To Save and close presentation; Working with Tools: Create, Edit, Move, Delete, Resize, Format text object, Working with Graphics tools; Slide show	8
III	**Introduction to Computer Network** Network Goals, Devices, Topologies, Cables and connectors, Addressing, Antivirus **Introduction to INTERNET** What is INTERNET, intranet, client-server architecture, various file formats, Application of INTERNET: E-mail, WWW, Study of various search engine using LYNX, LOGIN PROCEDURE, Study of INTERNET EXPLORER, Creating mailing account, Surfing using WORLD WIDE WEB information relating to employment, education, alumni, social networking.	8

DME 252: ENGINEERING DRAWING-II

Credits: 02   **Semester II**

DETAILED CONTENTS

Module No.	Content	Teaching Hours
I	**Detail and Assembly Drawing (2 sheets)** 1.1 Principle and utility of detail and assembly drawings 1.2 Wooden joints i.e. corner mortice and tenon joint, Tee halving joint, Mitre faced corner joint, Tee bridle joint, Crossed wooden joint, Cogged joint, Dovetail joint, Through Mortice and Tenon joint, furniture drawing - freehand and with the help of drawing instruments.	04
II	**Screw threads and threaded fasteners (8 sheets)** 2.1 Thread Terms and Nomenclature 2.1.1 Types of threads-External and Internal threads, Right and Left hand threads (Actual and Conventional representation), single and multiple start threads. 2.1.2 Different Forms of screw threads-V threads (B.S.W threads, B.A thread, American National and Metric thread), Square threads (square, Acme, Buttress and Knuckle thread) 2.2 Nuts and Bolts 2.2.1 Different views of hexagonal and square nuts and hexagonal headed bolt 2.2.2 Assembly of Hexagonal headed bolt and Hexagonal nut with washer. 2.2.3 Assembly of square headed bolt with hexagonal and with washer. 2.3 Locking Devices 2.3.1 Different types of locking devices-Lock nut, castle nut, split pin nut, locking plate, slotted nut and spring washer. 2.3.2 Foundations bolts-Rag bolt, Lewis bolt, curved bolt and eye bolt. 2.4 Drawing of various types of machine screw, set screw, studs and washers	16
III	**Keys and Cotters (3 sheets)** 3.1 Various types of keys and cotters and their practical application and preparation of drawing of various keys and cotters showing keys and cotters in position 3.2 Various types of joints (3 sheets) - Spigot and socket joint - Gib and cotter joint - Knuckle joint	06
IV	**Rivets and Riveted Joints (4 sheets)** 4.1 Types of general purpose-rivets heads (4 Sheets) 4.2 Caulking and fullering of riveted joints 4.3 Types of riveted joints (i) Lap joint-Single riveted, double riveted (chain and zig-zag type) (ii) Single riveted, Single cover plate butt joint (chain type) (iii) Single riveted, double cover plate butt joint (chain type) (iv) Double riveted, double cover plate butt joint(chain and zig-zag type)	08
V	**Couplings (2 sheets)** 5.1 Flange coupling (Protected and non-protected), muff coupling and half-lap muff coupling	04

VI	**Symbols and Conventions (2 sheets)** 6.1 Civil engineering sanitary fitting symbols 6.2 Electrical fitting symbols for domestic interior installations	04
VII	**AUTO CAD (for practical and viva-voce only)** 7.1 Concept of AutoCAD, Tool bars in AutoCAD, coordinate system, snap, grid, and ortho mode 7.2 Drawing commands – point, line, arc, circle, ellipse 7.3 Editing commands – scale, erase, copy, stretch, lengthen and Explode	06

Note: Minimum 20 drawing sheets will be prepared by the students.

INSTRUCTIONAL STRATEGY

Teacher should show model or realia of the component/part whose drawing is to be made. Emphasis should be given on cleanliness, dimensioning and layout of sheet. Focus should be on proper selection of drawing instrument and its proper use.

References:

1. Engineering Drawing by KK Dhiman, Ishan Publications, Ambala, Haryana
2. Elementary Engineering Drawing (in first angle projection) by ND Bhatt, Charotar Publishing House, Anand, Gujarat
3. A Text Book of Engineering Drawing by Surjit Singh published by Dhanpat Rai and Co., Delhi
4. Engineering Drawing by PS Gill published by SK Kataria and Sons, Delhi
5. Engineering Drawing by RB Gupta published by Satya Prakashan, New Delhi
6. Engineering Drawing by NS Kumar published by King India Publication, New Delhi

DAS-251 : APPLIED PHYSICS LAB

LIST OF EXPERIMENTS

Semester-II

Credits: 2

Module No.	Contents	Teaching Hours
1.	To Verify Ohm's law	
2.	To Verify law of resistance in series.	
3.	To verify law of resistance in parallel.	
4.	To Convert a Galvanometer of known resistance into an Ammeter of given range.	
5.	To Convert a Galvanometer of known resistance into a voltmeter of given range.	
6.	To determine the resistivity (Specific resistance) of the given wire with the help of post office box.	24
7.	To draw characteristic curve of a P-N junction diode.	
8.	To compare the emf's of two primary cells using potentiometer.	
9.	To Verify of Kirchhoff's Laws	
10.	To determine the internal resistance of a given primary ceii using ammeter & voltmeter.	
11.	To determine the internal resistance of a given primary cell using potentiometer.	

DCS 251: FUNDAMENTAL OF COMPUTER LAB

Semester II

Credits: 02   **LIST OF PRACTICALS**

Module No.	Contents

I	**Microsoft Excel**
	a) Starting Excel (Spread Sheet Processing)
	    open worksheet, enter, edit data, formulae to calculate values, format data, create chart, printing chart, save worksheet, switching between different spread sheets
	b) Menu commands
	    Create, format charts, organize, manage data, solving
	    problem by analyzing data, creating graphs
	c) Work books
	    ▪ Managing workbooks (create, open, close, save, rename), working in work books
	    ▪ Editing a worksheet: copying, moving cells, pasting, inserting, deleting cells, rows, columns, find and replace text, numbers of cells, formatting worksheet
	d) Creating a chart
	    ▪ Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
	    ▪ Using a list to organize data, sorting and filtering data in list
	e) Formulas
	    ▪ Addition, subtraction, division, multiplication, percentage and auto sum

II	**Microsoft Access**
	a) Brief overview of Databases and Database Applications
	b) Starting Microsoft Access
	c) Creating and Viewing Tables
	    • Creating a Table Using the Design View
	    • Exercise: Creating a Table
	    • Viewing and Adding Data to a Table
	    • Exercise: Adding Data to a Table
	    • Creating Relationships Between tables
	d) Creating and Running Queries
	    • Single Table Queries
	    • Exercise: Single Table Queries
	    • Multiple Table Queries
	    • Exercise: Multiple Table Queries
	e) Creating and Running Data Entry Forms
	    • Creating a Single Table Form using the Wizard
	    • Exercise: Creating a Single Table Form
	    • Review of Creating and Running a Data Entry Form
	f) Creating and Running Reports
	    • Creating a Single Table Report using the wizard
	    • Exercise: Creating a Single Table Report
	    • Review of Creating and Running a Report

DME 253: WORKSHOP PRACTICE-II

Credits: 02   **Semester II**

DETAILED CONTENTS

Module No.	Content
I	**Carpentry Shop-II** 1.1 Introduction to joints, their relative advantages and uses. Job I Preparation of dovetail joint and glued joint. Job II Preparation of mitre joint Job III Preparation of a lengthening Joint Job IV Preparation of at least one utility job with and without lamination. 1.2 Demonstration of job showing use of rip saw, bow saw and tenon saw, method of sharpening various saws. 1.3 Demonstration of job on band saw and circular saw, chain and chisel, universal wood working machine, Saw re-sharpening machine, saw brazing unit. 1.4 Importance and need of polishing wooden items. Introduction to polishing materials. Job V Polishing on wooden items.
II	**Plumbing Shop** 2.1 Introduction to various types of threads (internal and external)- single start, multi-start, left hand and right hand threads. 2.2 Description and demonstration of various types of drills, taps and dies Selection of dies for threading, selection of drills, taps and reamers for tapping operations. Job I Making internal and external threads on a job by tapping and dieing operations (manually) 2.3 Precautions while drilling soft metals, e.g. copper, brass, aluminum etc. Job II Drilling practice on soft metals such as aluminum, brass and copper Job III Preparation of a job by filing on non-ferrous

III	**Welding Shop – II** 3.1 Introduction to gas welding, spot welding and seam welding and welding techniques. Adjustments of different types of flames in gas welding, demonstration and precautions about handling welding equipment. Job I — Practice in handling gas welding equipment (Low pressure and High pressure) and welding and tacking practice on simple jobs. 3.2 Common welding joints generally made by gas welding. Job II — Preparation of butt joint by gas welding. Job III — Preparation of small cot frame from conduit pipe by gas welding. Job IV — Preparation of square pyramid from MS rods by welding (type of welding to be decided by students themselves). Job V — Exercise of preparing a job on spot/seam welding machine. 3.3 Demonstration and use of TIG and MIG welding equipment	
IV	**Electric Shop – II** 4.1 Importance of three-phase wiring and its effectiveness. Demonstration of three-phase wiring with the help of a demonstrating panel. Job I — Laying out 3-phase wiring for an electric motor or any other 3-phase machine. Job II — Connecting single-phase energy meter and testing it. Reading and working out the power consumption and the cost of energy. Job III — Checking continuity of connection (with tester and series lamp) location of faults with a multimeter and their rectification in simple machines and/or other electric circuits fitted with earthing. Job IV — Finding fault in simple electric machine and its rectification 4.2 Demonstration of dismantling, servicing and reassembling a table fan/ceiling fan/air cooler/mixer/electric iron, electric heater, geyser, electric oven, air conditioner etc. Job V — Testing single phase/three phase electrical motor by using voltmeters, ammeter, clip-on meter, tachometer etc. Job VI Reversing the direction of rotation of a motor.	

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	1. Concept of AutoCAD, Tool bars in AutoCAD, coordinate system, snap, grid, and ortho mode 2. Drawing commands – point, line, arc, circle, ellipse 3. Editing commands – scale, erase, copy, stretch, lengthen and Explode	

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6. Engineering Drawing by NS Kumar published by King India Publication, New Delhi