

ELEMENTS AND DEVICES OF COMPUTING TECHNOLOGY

BEG170CO

Year: I

Semester: I

Teaching Schedule Hours/week			Examination Scheme				Internal Assessments		Total Marks	Remarks		
			Final				Theory Marks				Practical Marks	
			Theory		Practical		Theory Marks				Practical Marks	
L	T	P	Duration	Marks	Duration	Marks						
3	1	2	3	80			20	25	125			

Objectives: To provide the basic concept of computer system and its application

1. Types of Computer 3 hrs

- 1.1 Operation: Analog and Digital
- 1.2 Uses: General purpose and Specific purpose
- 1.3 Capacity: Mainframe, mini, personal and super computer

2. Basic Architecture 4hrs

- 2.1. Building blocks of a PC
- 2.2. CPU
- 2.3. RAM, DRAM, SDRAM, ROM, EPROM
- 2.4. Input/output

3. Operating System 4hrs

- 3.1. Definition
- 3.2. Functions of operating system
- 3.3. Types of OS: DOS, Windows, Mac OS, Unix, Linux, OS/2

4. Programming Language and Compiler 7hrs

- 4.1 Introduction to programming language
- 4.2 Assembler, interpreter and compiler
- 4.3 Program Design, Programming tools
- 4.4 Program Structure, Programming algorithm
- 4.5 Program Specification

5. Software Applications 6hrs

- 5.1 Word Processor
- 5.2 Spreadsheet
- 5.3 Database 5.4 Graphics
- 5.5 Engineering applications
- 5.6 Customized Packages

6. Computers Peripherals 8hrs

- 6.1 Printer/Plotter

- 6.2 Scanner, Digital Camera, Digitizer
- 6.3 Sound system
- 6.4 Storage Devices: magnetic, optical, Zip drive

7. Network and Internet 8hrs

- 7.1 Peer to peer and dedicated server types
- 7.2 Topologies: Bus, Ring, Star
- 7.3 Network Cabling: 10BaseT, 10Base5, 100BaseT, Hub, Terminator, Coaxial, UTP, Fiber
- 7.4 Modem, Repeaters, Bridges, Routers, Radio link
- 7.5 Networking Operating System: Novell Net Ware, Windows
- 7.6 Introduction to Client-Server Model

8. Computers in Business 5hrs

- 8.1 Importance of computers in modern business
- 8.2 Business Information System
- 8.3 Introduction to e-commerce
- 8.4 Cyber Laws: Computer Crime, information privacy and Security

**Computer Programming
BEG175CO**

Year: I

Semester: I

Teaching Schedule Hours/week			Examination Scheme				Total Marks	Remarks		
			Final		Internal Assessments					
			Theory	Practical	Theory Marks	Practical Marks				
L	T	P	Duration	Marks	Duration	Marks				
3	1	3	3	80			20	50	150	

Objective: To provide the fundamental concept of programming

- 1 Problem Solving Using Computers** **2hrs**
 - 1.1 problems Analysis
 - 1.2 Algorithm Development & Flowcharting
 - 1.3 Coding
 - 1.4 Compilation & Executing
 - 1.5 Debugging & Testing
 - 1.6 Program Documentation
- 2 Introduction to C** **2hrs**
 - 2.1 Historical Development of C
 - 2.2 Importance of C
 - 2.3 Basic Structure of C program
 - 2.4 Executing a C program
- 3 C Fundamentals** **3hrs**
 - 3.1 Character Set
 - 3.2 Identifiers & Keywords
 - 3.3 Data Types
 - 3.4 Constants, Variables
 - 3.5 Declarations
 - 3.6 Escape Sequences
 - 3.7 Preprocessors Directives
 - 3.8 Typedef statement
 - 3.9 Symbolic Constants
- 4 Operators & Expression** **1hr**
 - 4.1 Operators:
 - 4.2 Arithmetic, Relational, Logical, Assignment, Unary, conditional, operators Bit wise
 - 4.3 Precedence & Associativity
- 5 Input and Output** **2hrs**
 - 5.1 Types of I/O
 - 5.2 Reading & Writing data
 - 5.3 Formatted I/O
- 6 Control Statements** **6 hrs**

- 6.1 Loops: For, While, Do-while
- 6.2 Decisions: if, if-else, Nested if...else.
- 6.3 Statements: switch, break, continue, goto
- 6.4 exit() function

7 Functions 6 hrs

- 7.1 Advantages of using Function
- 7.2 User Defined & Library, Functions
- 7.3 Function prototypes, Definition & return statement
- 7.4 Call by Value & Call by reference
- 7.5 Concept of Local, Global & Static variables
- 7.6 Recursive Function

8 Arrays and Strings 6 hrs

- 8.1 Introduction
- 8.2 Single and Multi-dimension arrays
- 8.3 Processing array
- 8.4 Passing arrays to Functions
- 8.5 Arrays of Strings
- 8.6 String Handling Functions

9 Pointers 5 hrs

- 9.1 Fundamentals
- 9.2 Pointer Declarations
- 9.3 Passing Pointers to functions
- 9.4 Relationship between Arrays & pointers
- 9.5 Dynamic Memory Allocation

10 Structures and Unions 6 hrs

- 10.1 Defining a Structure, Arrays of structures, Structures within Structure
- 10.2 Processing a Structure
- 10.3 Structures & pointers
- 10.4 Passing Structures Functions
- 10.5 Union & its importance

11 Data Files 3 hrs

- 11.1 Opening & Closing a Data File
- 11.2 Creating a Data File
- 11.3 Processing a Data File

12 Graphics 3 hrs

- 12.1 Initialization
- 12.2 Graphical mode
- 12.3 Simple programs using built-in graphical functions

MATHEMATICS-I

BEG101SH

Year: I

Semester: I

Teaching Schedule Hours/week			Examination Scheme				Internal Assessments		Total Marks	Remarks
			Final				Theory Marks	Practical Marks		
			Theory		Practical					
L	T	P	Duration	Marks	Duration	Marks				
3	3	-	3	80	-	-	20	-	100	

Objectives: The basic objective of the course is to provide a sound knowledge of calculus and other related topics.

1. Limit and continuity of a function:..... 3hrs

Limit of a function with examples, infinity as a limit, continuity of a function with their Properties

2. Derivatives: 5hrs

Derivatives of explicit, implicit, parametric equations, Derivative of hyperbolic and inverse hyperbolic functions, Higher order derivative and Leibnitz's Theorem, Partial derivatives of a function of two and three variables, and total differential coefficients.

3. Application of derivatives: 10Hrs

Extrema of function of two and three variables, Mean value theorems Taylor and Maclauring's infinite series, indeterminate forms and L'Hospital rule Tangent and Normal, Curvature, Asymptotes, Curve Tracing (Cartesian, Parametric and Polar)

4. Integration: 8Hrs

Basic integration formulae, Integration method, Standard integrals, Definite integral and its properties Definite integral as a limit of a sum, Fundamental Theorem of integral calculus, Improper integrals, Reduction formula for integrals Beta and Gamma functions

5. Application of integral Calculus 7Hrs

Determination of area, length and volumes, Surface area of solid of revolution Double integrals of Cartesian curves.

6. Plane Analytic Geometry: 6Hrs

Translation and rotation of axes, Circles, Parabola, Ellipse, Hyperbola

7. Vector Algebra: 7Hrs

Vector Components, Types of vectors, Vector addition and subtraction, Direction cosines, Space coordinates (Cartesian, cylindrical and spherical) and equations relating to these co-ordinates. Scalar and vector product of two vectors, Product of Three vectors, Product of Four vectors, Vector equation of lines and planes

PHYSICS

BEG103SH

Year: I

Semester: II

Teaching Schedule Hours/week			Examination Scheme				Internal Assessments		Total Marks	Remarks
			Final				Theory Marks	Practical Marks		
			Theory		Practical					
L	T	P	Duration	Marks	Duration	Marks				
4	1	2	3	80	3	25	20	-	125	

Course objective: To provide the concept and knowledge of physics with the emphasis of present day application. The background of physics corresponding to proficiency certificate level /+2 science is assumed.

Course Details:

- 1. Simple Harmonic Motion. (4 Hrs)**
 - 1.1 Introduction ,Hook's law ,elastic restoring; force equations of S H M (2 hrs)
 - 1.2 Examples of S H M; suspended mass spring system pendulum (bar pendulum) (1 hrs)
 - 1.3 Angular harmonic motion: "Torsonal pendulum" (1 hrs)

- 2.0 Waves in elastic media (5 Hrs)**
 - 2.1 Introduction to waves, types of wave; travelling wave, mechanical wave, speed of travelling wave in a stretched string,waves and particles. (2 hrs)
 - 2.2 Energy and power in travelling waves, Intensity in wave motion. (1 hrs)
 - 2.3 Reflection of waves, Principle of superposition, interference of waves. (1 hrs)
 - 2.4 Standing waves and resonance (1 hrs)

- 3. Acoustics (7 Hrs)**
 - 3.1 Soundwaves,Sound propogation in gases, liquids and solids, pressure variation due to waves. (1.5 hrs)
 - 3.2 Attenuation, reflection and refraction (0.5 hrs)
 - 3.3 Beat phenomena and Doppler's effect. (1.5 hrs)
 - 3.4 Energy considerations, intensity level and loudness. (1 hrs)
 - 3.5 Ultrasound and its uses, production of ultrasound (Introduction) distances measurement, imaging, signaling, cleaning, and neating. (2.5 hrs)

- 4. Electrostatic (7 Hrs)**
 - 4.1 Electric charge, Interaction between electric charges. (0.5hrs)
 - 4.2 Electric field, lines of force, calculation of electric field due to dipole and quadrupole, electric flux (1 hrs)
 - 4.3 Gauss Law, Application of Gauss Law to spherical, linear and planer symmetric distribution of charges. (2 hrs)
 - 4.4 Electric potential, potential difference, potential due to a point charge, potential gradient (0.5 hrs)
 - 4.5 Potential due, to dipole and quadruple, electrostatic. potential energy. (0.5 hrs)

- 4.6 Capacitors; parallel plate capacitor, spherical capacitor, permittivity, conductors and dielectric in electric field, E and D fields, energy stored in electric field and energy density (2 hrs)
- 4.7 Electrostatic induction, lightning conductors, industrial uses and Hazards (0.5hrs)
- 5. Direct Current (5 Hrs)**
- 5.1 Current flow in solids, liquids and gases. Ohm's law, Resistance in series and parallel. (0.5 hrs)
- 5.2 Current and current density, atomic view of resistivity, effect of temperature on resistance. (1 hrs)
- 5.3 Semiconductors: intrinsic and extrinsic semiconductor, Introduction of P N Junction, NPN& PNP transistor (2 Hrs)
- 5.4 Energy loss, heat production, verification of joule's law. (1 hr)
- 5.5 Kirchhoff's law. (0.5 hr)
- 6.0 Magnetism and magnetic fields. (10 Hrs)**
- 6.1 Sources of magnetic fields: current and permanent magnets, earth's magnetic field, lines of magnetic field and permeability. (1 hr)
- 6.2 Biot and Savart's law and its application to long straight conductor carrying current, Amperes theorem and its application to long straight conductor carrying current and solenoid carrying current. (2 hrs)
- 6.3 Magnetic scalar potential and potential gradient (1 hr)
- 6.4 Force on conductor in magnetic fields, force per unit length between parallel conductors carrying current. (1 hr)
- 6.5 Faraday's law of electromagnetic induction, flux linkage, Lenz's law, self induction, Calculation of the coefficient of self induction for solenoid (2 hrs)
- 6.6 LR circuit, Energy stored in magnetic field, Energy density of magnetic field. (1 hr)
- 6.7 Magnetic properties of matter, Domain Theory, Ferromagnetism. saturation and Hysteresis (2 hrs)
- 7. Electromagnetic Oscillations (4 hrs)**
- 7.1. LC oscillation, analogy to SHM
- 7.2 Electromagnetic oscillation (quantitative) forced oscillation and resonance, induced magnetic field. (2 hrs)
- 7.3. Displacement current and its applications. (1 hr)
- 8 Electro magnetic waves (4 Hrs)**
- 8 .1 Maxwell's equation -Differential and Integral form (2hrs)
- 8.2 Application of Maxwell's equation, wave equations in free space and medium (1hr)
- 8.3 Speed of electromagnetic wave, Energy electromagnetic wave, Poynting vector (1 hr)
- 9. Optics**
- 9.1 Geometrical Optics (6 hrs)**

- 9.1.1 Nature and source of light, different theories of light, different types of sources. (1 hrs)
- 9.1.2 Review of optics of mirror and lenses, reflection and refraction both in plane and spherical surfaces, refraction through prism (1 hrs)
- 9.1.3 combination of lenses in contact and at a separation, cardinal points, Achromatic combination of two lenses, separated by distance (1 hrs)
- 9.1.4 Monochromatic aberration of lenses. Spherical aberration, astigmatism, coma, Curvature of field and distortion, causes and their minimization (1 hrs)
- 9.1.5 Fibre optics: Introduction to optical fibre, Types of optical fibres, Uses in communication. (1 hrs)
- 9.1.6 Lasers: Principal of the generation of laser light, Uses of Laser. (1 hrs)

9.2 Physical optics (8 Hrs)

- 9.2.1 Interference: Interference of light waves. Young's experiment, coherent sources, path difference and phase difference, condition for constructive and destructive interference, interference in thin films and wedge shape, Newton's ring and determination of wave length, blooming of lenses (3 hrs)
- 9.2.2 Diffraction: Introduction of Fresnel's and Fraunhofer diffraction for a single and double slits and multiple slits. Diffraction grating, intensity variation in order, wave length measurement by diffraction gratings. (2 hrs)
- 9.2.3 Polarization: Introduction, Polarization by reflection, Malu's law, double refraction, Nicol prism, plane, circular, elliptical polarization of light waves, Optical activity, polarimeter (2 hrs)
- 9.2.4 Use of light, distance measurement, signal transmission, optical stress analysis, spectrometric analysis of gases. (1 hrs)

Laboratory: (Minimum 9 Experiments)

1. Physical pendulum, Torsional pendulum
2. Resonance tube
3. Newton's Ring, Diffraction grating, prism
4. Carryfoster bridge, Low resistance, resistivity, LC circuits.
5. Polarimeter, Junction transistor

Reference Books:

1. Physics by Resnick, Haliday 2nd/ 4th Edition"
2. Concept of Modern Engineering Physics by A. S. Vasudeva
3. Optics by Subhrmanyam and Brij Lal
4. Plactical Physics by C. L. Arora.

COMMUNICATIVE ENGLISH
BEG105SH

Year: I

Semester: I

Teaching Schedule Hours/week			Examination Scheme				Internal Assessments		Total Marks	Remarks
			Final							
			Theory		Practical		Theory Marks	Practical Marks		
L	T	P	Duration	Marks	Duration	Marks				
3	1	-	3	80	-	-	20	-	100	

Course Description:

This course is designed for the students of B.E. level: first year first semester of Purbanchal University who have completed either Diploma level in Engineering or I. Sc. or +2 from any institution recognize by this university. It attends to develop and strength in students: basic and communicative skills in the English language with emphasis on speaking, reading and writing

Course objectives:

This course intends to develop:

- Skills needed for group discussion, meeting conduction and technical talk.
- Intensive and extensive reading skills in technical non-technical reading materials.
- Skills in writing description, official letters and letters of application, proposal and formal technical reports.

Course in detail:

Unit 1: Oral Communication

(12 Hrs)

- A. Fundamental of Effective speaking: posture, gesture, expression voice, eye contact, space distancing etc.
- B. Group Discussion on objects of general and technical interest
- C. Meeting
 - a. Notice preparation
 - b. Agenda Preparation
 - c. Minutes Preparation
 - d. Meeting conduction
 - e. Writing Minutes
- D. Technical talk /writing and presenting a seminar paper
 - a. Writing complete manuscript for technical
 - b. Presenting technical talk based on manuscript

Unit 2: Reading: Intensive and Extensive

(16Hrs)

- A. Intensive Reading:
 - a. How to tackle reading materials
 - b. practicing on contextual grammar
- i) Preposition ii) Voice (Active Passive) iii) Tense based Practice

- c. Reading Technique
 - i) Skinning ii) Scanning iii) Note Making iv) Summary Writing v) 4 levels
- B. Extensive Reading
 - a. How to tackle extensive reading materials
 - b. Practicing Extensive Reading
- C. Reading
 - i. The mother of A Traitor, by maxim Gorky.
 - ii. 'A Tale' by B.P .Koirala,
 - iii. Who Was To Blame, by Anton Chekhov.
 - iv. Marriages is A private Affair, by Chinua Achebe.
 - v. 'Keeping Errors At Bay'- By Butraned Russel"

Unit 3: Writing

(17Hrs)

- A. Fundamental of effective writing. Unity, coherences, conciseness, clarify.
- B. Description writing, Mechanical, electrical or electronic objectives, tables graphs, charts, landscape, technical process
- C. Letters
 - a. Official letters
 - i. Standard letter format.
 - ii. Writing letters for asking and giving instruction, letters of request, apology and explanation, complaint and order
 - b. Letter of Application
 - i. Standard format
 - ii. Preparing Bio-data and resume.
 - iii. Writing letters of application.
- D. Proposal Writing
 - a. Format for technical proposals.
 - b. Writing technical proposals.
- E. Technical Report Writing
 - a. Format for technical reports
 - b. Writing technical reports
- F. a. Memo Writing
 - b. Instructions - User's Manual

Prescribed Book:

1. English for Engineers and Technologist
2. Orient Longman, Anna University Channel 1990(reading and language focus all and oral and writing as mentioned in the syllabus)

Reference Books:

1. Adhikari Usha, et, al. Communicative skills in English, Research Training unit, Department of Science and Humanities, Institute of Engineering Pulchok Campus 2002
2. "Technical writing" Sharon"r J. Gerson/Steven M.Gerson-pederson Education
3. Study Skills in English - Michal J.Wallace.
4. A communicative Grammar of English- Leeach, G & savertink, J
5. Oxford English Dictionary.
6. Developing communication skills-Krishna Mohan, Meena Baneifi

Engineering Drawing
BEG145ME

Year: I

Semester: I

Teaching Schedule Hours/week			Examination Scheme				Internal Assessments		Total Marks	Remarks
			Final				Internal Assessments			
			Theory		Practical		Theory Marks	Practical Marks		
L	T	P	Duration	Marks	Duration	Marks				
1	0	3	-	-	3 hrs	40	10	50	100	

Course objectives: To develop the basic understanding and the skills of Engineering graphic technology to the students.

1.0 Instrumental Drawing: Practices & lettering (2 Hrs)

1.1 Equipment and Materials Description of Drawing instruments, ability equipment and drawing materials

1.2 Techniques of instrumental Drawing Pencil sharpening, securing paper, proper use of T- squares, triangles, scales, and dividers and compasses, erasing shields, French curves, inking pens

2.0 Freehand Technical lettering (2 Hrs)

2.1 Lettering strokes, letter proportions, use of Pencil and pens, uniformity and appearance of letters, freehand technique, included and vertical letter and numerals, upper and lower cases Standard English lettering form.

2.2 Sketching and Decision; Value of Sketching as part or design.

2.3 Techniques of Sketching; Pencil hardness paper, squired line densities Techniques for horizontal, Vertical and Ccircular lines.

2.4 Multi view Sketches; Choice of views, adding detail dimensioning, title, notes proporing and competitive size Sketching Pictorial views

3.0 Applied Geometry (5 Hrs)

3.1 Plane Geometrical construction, Bisecting and trisecting lines and angles, Proportional division of lines. Construction of angels, triangles, squares, polygons, ellipses, Parabolas, hyperbolas, involutes, cycloid, spirals helices.

3.2 Solid Geometrical Construction: Classification and pictorial representation of solid regular objects such as;

Prisms: square, cubical, triangular and oblique

Cylinders: right and oblique

Cones: right and oblique

Pyramid: square, triangular, oblique, truncated

4.0 Theory of Projection (4 Hrs)

4.1 Common types of projections – pictorial (Perspectives. Isometric, Oblique) and Orthographic Projection

4.2 System of orthographic projection 1st and 3rd angle projection

5. Multi-view (Orthographic Projection Drawings) (6 Hrs)

5.1 Principal Views; Methods for obtaining orthographic views, Projection of lines, angles and plane surfaces; analysis in three views, Projection of curved lines surfaces.

Object orientation and selection of views for best representation, Full and, hidden lines.

5.2 Orthographic Drawings: Making an orthographic drawing, Visualizing objects from the given views, Interpretation of adjacent area True-length lines, Representation of holes - Conventional Practice

6 Pictorial Projections (6 Hrs)

6.1 Introduction; Characteristics, advantages and disadvantages

6.2 Axonometric Projection; Isometric drawing, Dimetric and trimetric drawing

6.3 Oblique Projection

6.4 Perspective Projection

7.0 Sectional Views (3 Hrs)

7.1 Full Section

7.2 Half Section

7.3 Broken Section

7.4 Specifying Cutting planes for section

7.5 Conventions for hidden lines holes, ribs, poke

8.0 Design and Production Drawings. Machine Drawing (Simple Types Problems) (4 Hrs)

8.1 Introduction; Production of complete design and assemble drawings

8.2 Fundamental Techniques; Size and location dimensional Placement of lines and general procedures Standard dimensioning Practice (SI system)

8.3 Limit Dimensioning Nominal and basic size allowance, tolerance, limits of size clearance fit, interference fit, Basic hole system and shaft systems

8.4 Threads and Standard Machine Assembly Elements Screw threads standards.

Representation and dimensional Fasteners. Type and drawing representation Keys, Collars, joints, springs, bearing

9.0 Assembly & Disassembly drawings of machine components- Machine Drawing (4 Hrs)

9.1 Assembly Drawings; Drawing layout, bill of materials (BOM), drawing numbers

9.2 Disassembly Drawings, Drawing layout. BOM, product structure tree (PST)

10.0 Welding and Riveting (3hrs)

10.1 Representing Joints and Welds for Gas, Arc and Resistance

Welding; Types: Spot, Seam, Flash, Fillet, Back-back. Surface and upset welds.

10.2 Drawing Symbols for welds

10.3 Rivets and Riveted Joints; Types and drawing representation

11.0 Other Engineering Drawing (4 Hrs)

11.1 Electrical and Electronic Diagrams Standards Types of Diagrams; Line diagram, schematics and pictorials Symbols for Components, Printed Circuits, Integrated circuits

11.2 Duplicating and Reproduction of Engineering Drawings Blue prints, Brown Prints and Blue line prints, Duplicate Tracing, Photocopies

- 11.3 Piping, Tubing and Types of Joints
- 11.4 Specification of Threads, Fittings and Valves

12.0 Developments, Intersections and Interpenetration (4 hrs)

Development General Concepts and practical considerations
Developments of a right prism, Cylinder pyramid and cone.

13.0 Computer Software used in Drawings (with lab) (13 Hrs)

- 13.1 An introduction to AutoCAD (Computer Aided Design)
- 13.2 An introduction about drawing tools i.e. ortho, osnop, mirror, trim, erase etc.
- 13.3 Introduction about line and angle drawing, dimensioning and definition of point and location.
- 13.4 Drawing of different geometrical shape i.e. t angle, circle, semi-'circle square etc in two dimensions.
- 13.5 Drawing of different view of a solid object i.e. Top, front and side view in two Dimensions. (The drawing done in previous drawing class is recommended)
- 13.6 Electrical and Electronics Diagrams

LABORATORY

2 Hrs / week, 10 weeks

1. Freehand Technical Lettering and Use of Drawing Instruments
2. Freehand Technical lettering and Use of -Drawing Instruments (cont)
3. Dimensioning
4. Geometrical and Projection Drawing
5. Descriptive Geometry
6. Descriptive geometry (contd.)
7. Projection and Multi-view Drawing
8. Projection and Multi-view Drawing (contd)
9. Isometric and Oblique Drawings
10. Perspective Drawing
11. Machine Drawings; Sizing and dimensioning
12. Threads and Fasteners, Welding, Joining and Piping