PURBANCHAL UNIVERSITY

Biratangar, Nepal

B.E. (Civil Engineering)
Updated Syllabus (2068 Ashad)

Year: I **Semester: II**

S. No.	Course Code	Course Description	Credits	Lecture	Tutorial	Laboratory	Total
1.	BEG102SH	Mathematics - II	3	3	3	0	6
2.	BEG157CI	Applied Mechanics - II (Dynamics)	3	3	3	0	6
3.	BEG147ME	Engineering Drawing - II	2	1	0	3	4
4.	BEG103SH	Physics	3	4	1	2	7
5.	BEG105SH	Communicative English	3	3	1	0	4
6.	BEG149ME	Fundamental of Thermodynamics and Heat	2	2	1	2/2	4
7.	BEG155CI	Building Construction	3	3	1	0	4
		Total	19	19	10	6	35

MATHEMATICS-II

BEG102SH

Year: I **Semester: II**

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	3	-	3	80	-	-	20	-	100	

Objectives: The basic objective of the course is to provide a sound knowledge of vectors, 3-D analytical geometry, Infinite series and ordinary differential equations.

1. **Analytic Geometry of 3-D:** Planes, Straight lines, Standard equation of sphere, cylinder and cone. **(12 Hrs)**

2. **Infinite Series:** Infinite series and sequences, convergence, ratio, root and integral tests, absolute convergence, power series, radius of convergence. **(16 hrs)**

3. **Plane Curves and Polar' Coordinates:** Plane curves, parametric equations, polar Coordinates, in the polar coordinates. **(4hrs)**

4. **Vector Calculus:** Differentiation and Integration of vectors, gradients, divergence and curl. **(8 Hrs)**

5. **Differential Equations:** First order differential equation, variable separation, homogeneous, linear and exact. Second order differential equations, linear equations with constant coefficient, homogeneous equation with constant coefficient, general solutions, initial value problems, non-homogeneous equations, solutions in series, Legendre, Bessel equations. **(15 Hrs)**

Reference Books:

1. Three-dimensional Geometry - Y. R. Sthapit & B. C. Bajracharya.
2. Algebra - G. D. Pant
3. A Text Book of Vector Analysis - M. B. Singh & B. C. Bajracharya.
4. Integral calculus and Differential Equations - G. D. pant & G. s . sth.
5. Calculus and Analytic Geometry - Thomas & Finney, Narosa Publication House, India.
6. Advanced Engineering Mathematics -- E" Kreyszig, 5th Edition, Wiley, New York.

APPLIED MECHANICS - II (DYNAMICS)

BEG157CI

Year: I **Semester: II**

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	3	-	3	80	-	-	20	-	100	

1.0 Introduction to Dynamics

l.l Definition, branches, importance of dynamics **(1 hrs)**

2.0 Rectilinear Motion of Particles **(3 hrs)**

2.1 Position, Velocity and Acceleration
2.2 Determination of particles
2.3 Uniform Rectangular Motion
2.4 Uniformly Accelerated Rectilinear Motion
2.5 Motion of Several Particles
2.6 Graphical Solution of Rectilinear.-Motion Problems

3.0 Curvilinear Motion of Particles **(4 hrs)**

3.1 Position Vector, Velocity and Acceleration Body
3.2 Derivatives of Vector Functions
3.3 Rectangular Components of Velocity and Acceleration
3.4 Motion Relative to a Frame in Translation
3.5 Tangential and Normal Components
3.6 Radial and Transverse Components

4.0 Kinetics of Particles: Newton's Second Law **(6 hrs)**

4.1 Newton's Second law of Motion
4.2 Linear Momentum and Rate of Change
4.3 System of Units
4.4 Equations of Motion and Dynamic Equilibrium
4.5 Angular Momentum and Rate of Change
4.6 Equations of Motion-Radial and Transverse Components
4.7 Motion Due to a Central Force- Conservation of Momentum
4.8 Newton's Law of Gravitation
4.9 Application to Space Mechanics

5.0 Kinetics of Particles: Energy and Momentum method **(6 hrs)**

5.1 Work Done by a Force

5.2 Kinetic Energy of a Particle
5.3 Principles of Work and Energy: Application
5.4 Power and Efficiency
5.5 Potential Energy
5.6 Conservation of Energy
5.7 Principle of Impulse and Momentum
5.8 Impulsive Motion and Impact
5.9 Direct Central Impact
5.10 Oblique Impact

6.0 Systems of Particles (6hrs)

6.1 Newton's Laws and a System of Particles
6.2 Linear and Angular Momentum for a System for parties
6.3 Motion of the Mass Centre
6.4 Conservation of Momentum
6.5 Kinetic Energy of a System of particles
6.6 work Energy Principle; conservation of Energy for a system of particles
6.7 Principle of Impulse and Momentum for a system of parties
6.8 Steady Stream of Particles, System with variables Mass

7.0 Kinematics of Rigid Bodies (7 hrs)

7.1 Introduction
7.2 Translation
7.3 Rotation
7.4 General Plane Motion
7.5 Absolute and Relative Velocity in plane motion
7.6 Instantaneous Centre of Rotation
7.7 Absolute and Relative Frame; Coriolis Acceleration in plane Motion
7.8 Rate of Change of a General Vector with Respect to a Rotating Frame Coriolis Acceleration
7.9 Motion About a Fixed point
7.10 General Motion
7. 11 Three Dimensional Motion of a particles Relative to a Rotating Frame, Coriolis Acceleration

8.0 Plane Motion of Rigid Bodies: Forces, Moments and Accelerations (4 hrs)

8.1 Equations of Motion for a Rigid Body
8.2 Angular Momentum of a Rigid Body in plane Motion
8.3 Plane Motion of a Rigid Body; D'Alembert's principle
8.4 Application of rigid Body motion in the plane
8.5 Constrained Motion in the plane

9.0 Plane Motion of Rigid Bodies: Energy and Momentum Methods (5 hrs)

9.1 Principle of work and Energy for a Rigid Body
9.2 Work done by external forces
9.3 Kinetic Energy for a system

9.4 Conservative and Non-Conservative System
9.5 Work-Energy Applications
9.6 Impulse and Momentum for system of Rigid Bodies
9.7 Conservation of Angular and Linear Momentum
9.8 Impulsive Motion and Eccentric Impact

10.0 Mechanical Vibrations (3 hrs)

10.1 Undamped free vibrations of Particles and Rigid Bodies; simple Harmonic motion ; frequency and Period of Oscillation
10.2 Steady Harmonic Forcing of Undamped system

Tutorials: l2 Assignments and 2 Quizzes.

Text books:- "Engineering Mechanics - statics and Dynamics", Shames, L.H, 3'rd Edition, New Delhi, Prentice Hall of India, 1990.

Reference "Mechanics for Engineers - Statics and Dynamics " F p. Beer and E. R.. Johnston., Jr 4^{th} edition Mr Graw Hill 1937.

ENGINEERING DRAWING -II

BEG147ME

Year: I **Semester: II**

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				
1	-	3	-	-	3	40	10	50	100	

Course Objectives: To develop a good understanding of isometric and orthographic projection drawings, assembly & disassembly drawing of machine components and other basic engineering drawings in civil, electronic, electrical and geographical.

1. Pictorial Projections (12hrs)

1.1 Introduction; Characteristics, advantages and disadvantages
1.2 Axonometric Projection; Isometric drawing, Diametric and trimetric drawing
1.3 Oblique Projection
1.4 Perspective Projection

2.0 Design and Production Drawings- Machine Drawing (16hrs)

2.1 Introduction; Production of complete design and assembly drawings
2.2 Fundamental Techniques; Size and location dimensioning; Placement of lines and general procedures, Standard dimensioning practice (SI system)
2.3 Limit Dimensioning; Nominal and basic size, allowance, tolerance, limits of size, clearance fit, interference fit, Basic hole system and shaft systems
2.4 Threads and Standard Machine, assembly Elements: Screw threads; ISO standards, representation and dimensioning Fasteners; types and drawing presentation keys, Collars, joints, springs, bearings

3.0. Welding and Riveting (6 Hrs)

3.1 Representing Joints and Welds for Gas, Arc and Resistance Welding; Types: Spot, Seam, Flash, Fillet, Back - back, surface and upset welds.
3.2 Drawing Symbols for Welds
3.3 Rivets and Riveted Joints; Types and drawing representation

4.0 Piping Diagrams (4 Hrs)

4.1 Piping, Tubing and Types of Joints
4.2 Specification of Threads, Fittings and Valves
4.3 Standard Piping Symbols
4.4 Piping Drawings and Symbolic Diagrams

5.0 Other Engineering Drawings (10 Hrs)

5.1 Civil Drawings, Steel Construction, Wood Construction, Concrete construction, Masonry and Stone Construction

5.2 Electrical and Electronic Diagrams Standards types of Diagrams, Line diagram, schematics and pictorials Symbols for Components Printed Circuits, integrated Circuits

5.3 Geographical Drawings, Topographical Maps, Cadastral Maps, Engineering Maps

5.4 Graphs, Charts and Nomograms (rectangular Coordinate Graphs, Charts, Nomograms

5.5 Duplicating and Reproduction of Engineering Drawings, Blue prints, Brown Prints and Blue-Line prints, Duplicate Tracings, Photocopies

6.0 Computer Software used and Drawings (12 hrs)

6.1 An introduction to AutoCAD (Computer Aided Design)

LABORATORIES: 3 Hrs/week, l2weeks

1. Isometric and Oblique Drawings
2. Oblique Drawings, Perspective Drawings
3. Machine Drawings; Sizing and dimensioning
4. Machine Drawings; Detail drawings, dimensioning and tolerance
5. Threads and Fasteners
6. Welding, Joining and Piping
7. Structural Drawings
8. Electrical and Electronics Diagrams
9. Topographic and Engineering map, Graphs, Chart and Nomograms and Drawing, Reproduction of Drawings.
10. Machine Drawing by using AutoCAD 2007.
I l. Building Drawing by using AutoCAD 2007.

Reference Books:

l. "Fundamentals of Engineering Drawing ", W.J. Luzadcler, prentice Hall, 8th Edition, 1981
2. "Engineering Drawing and Graphic Technology', T'. E. French, C.J. Vierck and R. J. Foster, Mc Graw Hill, 1981
3. "Technical Drawing", F..E. Giesecke, A. Mitchell, H.C.Spencer and .J.C. Dygdone, Macrnillan, 8th Edition , l986
3. Machine Drawing
4 "Text book of Engineering Drawing", Gurucharan Singh and Iagdishlal
5 Auto CAD 2000", George Omura

PHYSICS

BEG103SH

Year: I **Semester: II**

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				
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) (l hrs)
1.3 Angular harmonic motion: Torsonal pendulum" (l 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. (l 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. (l 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.l Sources of magnetic fields: current and permanent magnets, earth's magnetic field, lines of magnatic 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 radiant (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, pointing vector (l 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 (l hrs)

9.l.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 (lhrs)

9.l.5 Fibre optics: Introduction to optical fibre, Types of optical fibres, Uses in communication. (1 hrs)

9.1.6 Lasers: Principal ofthe generation of laser light, IJses 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 Fraunhoffer 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 Polanzzlion: 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)

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

Reference Books:

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

COMMUNICATIVE ENGLISH

BEG105SH

Year: I **Semester: II**

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	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 l. 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:
l. 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-pedrson 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

FUNDAMENTAL OF THERMODYNAMICS AND HEAT

BEG 249 ME

Year: I **Semester: II**

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				
2	1	2/2	1.5	40	3	25	10	25	75	

Course Objective: To provide the students with a basic understanding and norms of Thermodynamics and Heat Transfer.

1.0 Basic Concepts (2 Hrs)

1.1 The nature of Thermodynamics
1.2 Social value of energy
1.3 Application of energy, balance approach in engineering
1.4 Work and heat transfer

2.0 Energy and Energy Transfer (4 Hrs)

2.1 The meaning of energy and energy transfer , Thermodynamic systems: boundary of closer heterogeneous , homogeneous, isolated
2.2 Thermodynamic equilibrium and quasi -static process
2.3 Thermodynamic properties, state and process
2.4 Energy transfer as heat and work

3.0 Properties of pure Substances (Steam) (3Hrs)

3.1 Pure substances, phase and wet steam (Two phase mixture)
3.2 Thermodynamics properties : Specific Volume, internal energy, enthalpy and specific heats
3.3 Common Process: Throttling Isothermal and Isobaric
3.4 Common diagram for a pure substance: P- V, P-T, T- S,h - S or mollier
3.5 Steam Tables, Quality or Dryness fraction and measurement of steam quality

4.0 First Law of Thermodynamics and its applications:

4.1 Definitions and law of conversation of energy
4.2 Application of the law to a closed system
4.3 Application of the first law of thermodynamics some common process:
4.4. Steady flow Process

4.5 Application of the first law to open system (General energy Equation)
4.6 Energy of an isolated system
4.7 Perpetual Motion Machine of the first kind PMM 1.

5.0 Second Law of Thermodynamics and Entropy (4Hrs)

5.1 Statement of second law: Clausius Kelvin Planck, principle of degradation of energy, principles of increases of entropy
5.2 The principles and properties of Entropy.
5.3 Entropy and disorder, Absolute entropy and Entropy balance in open and closed system.
5.4 Reversible and Irreversible processes.
5.5 Consequences of the second- law and Isentropic process.
5.6 Carnot cycle and its efficiency

6.0 Thermodynamic Power cycles, Refrigerator and Air conditioning (5Hrs)

6.1 Heat engine cycles
6.2 External heat transfer cycles
6.3 Rankine cycles and Modified Rankine Cycle
6.4 Air standard cycles: Air standard ottocycle, Diesel cycle and dual cycle
6.5 Refrigeration, air-conditioning and heat pump cycles
6.6 Psychometric chart and process

7.0 Introduction to Engineering Heat Transfer (4Hrs))

7.1 Basic concepts and modes of heat transfer
7.2 The common laws of heat transfer Fourier's Law, Newton's Law and Stefan - Boltzmann Law
7.3 Conduction: Critical insulation thickness of pipes, R values and electric analogies; Overall coefficient

Laboratories:

Six laboratory exercises will be performed in this course. These are:
(a) Pressure and Temperature measurement
(b) Experiment on compression and expansion of gases
(c) Heat conduction and convection
(d) Operation of refrigeration or heat pump
(e) Performance of small I.C. engine
(f) Experiment on Thermal radiation

Tutorials:

a) Three assignments in each before first and second assessment.
b) Quizzes before first and second assessments.

Recommended Books/ References:

l. "Fundamentals of Engineering Thermodynamics',. Jchn R., Howell & Richard O. Bucckius, McGraw Hill Publishers, 1987

2. "Engineering Thermodynamics",Guirta C. p. and Prakash R., Nemchand & Broj, Roorkee 1991

3 "Engineering Thermodynarnics" Nag P.K., Tata McGraw Hill, New Delhi, Second Edition

4. "Engineering Heat Transfer", Gupta c. p. & prakash R, Nemchand & Broj, Roorkee, 1994

5. "Heat Transfer", J. P. Holman, Mc Grawhill, 1981

6. "Heat Transfer - A Basic Approach", M, lT. ozicik, McGraw Hil1,1985

BUILDING CONSTRUCTION

BEG 155 CI

Year: I **Semester: II**

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	80	-	-	20	-	100	

1. Building Sciences (7 Hrs)

l. l Moisture and its movement through building components
1.2 Condensation and its reasons
1.3 Effects of moisture and condensation on building components and materials
l. 4 The use of vapor barriers and other damp proof courses in building
1.5 Thermal properties of building components and materials
1.6 Thermal insulation and thermal resistance and capacity
1.8 Noise controls and constructional precautions to reduce noise
1.9 Lighting natural and artificial
l. l0 Energy conches design: renewable and non-renewable source of energy, active and passive methods of solar cooling and heating

2.0 Foundations and Basements (4 hrs)

2.1 Some common problems with existing foundations
2.2 Underpinning of foundation of existing building
2.3 Shoring of existing buildings during foundation strengthening
2.4 Retaining properties and waterproofing of basement
2.5 Sealing of cracks in basements

3.0 Roofs (3 hrs)

3 .l single timber roof : their types, comparative advantages and some construction details
3.2 Double and triple roof: situations for their use, their elements and construction details
3.3 Roofs coverings; files, slates, CCT sheets, etc.

4.0 Staircases (2 hrs)

4.1 Elements of staircase
4.2 Types of staircases
4.3 Relationship between rise and tread of a stair

5.0 Doors and windows (3 hrs)

5.1 Doors parts: frame, shutter and their details
5. 2 Windows types and details
5.3 Ventilators types and details

6.0 Joints (4 hrs)

6.1 Types of joints: construction and expansion joints
6. 2 The need for provision of joints
6.3 Treatment and detailing of joints at the roof levels
6.4 Treatment and detailing of joints at the floor levels
6.5 Treatment of joints in external walls

7.0 Temporary Construction (3 hrs)

7.1 Scaffolding : Single and double
7. 2 Formwork for excavation and Trenches
7.3 Formworks for reinforced concrete construction
7.4 Shoring: horizontal, slant and vertical shores

8.0 Cladding and External Finishing (4 hrs)

8.1 Load bearing and non -load bearing cladding
8. 2 Brick facing
8.3 Cladding in stone
8.4 Cladding in concrete panels and their construction details
8.5 Plastering
8.6 Painting and important properties of the paint

9.0 Internal Finishing (2 hrs)

9.1 Non Load bearing partitions : types, functions and methods of connection to the surrounding structure
9.2 Suspended Ceilings : types, functions and methods of construction

10.0 Electrical Services (4 hrs)

10.1 Residential and commercial requirements
10.2 General Principles
10.3 Wiring Systems
10.4 Trunkings, busbars and ducts for electrical distribution
10.5 Safety Precautions

11.0 Water Supply and Drainage Services (5 hrs)

11.1 General Principles
11.2 Mains of water supply: Storage and distribution system
11.3 Hot water supply

11.4 Drainage of sewage and waste
11.5 Rainwater pipes and gutters
11.6 Septic Tanks

12.0 Other miscellaneous services in Buildings (4 hrs)

12.1 Lifts and escalators: general principles and practices
12.2 Ventilation and heating systems: general principles and construction standards
12.3 Telecommunication
12.4 Air conditioning

Tutorials: Six assignments and two quizzes

Textbooks:

1. "Understanding Buildings", Reid. E., MIT Press
2. "Construction Principles, Methods & Materials", Olin, H.B.
3. "Building Construction Illustrated", Ching, F.D.K.