



MOTHERHOOD UNIVERSITY

Roorkee-Dehradun Road, Village Karoundi Post Bhagwanpur, Tehsil-Roorkee, Uttarakhand, India

MOTHERHOOD UNIVERSITY, Roorkee

ENLIGHTENING WORLD

DIPLOMA IN ENGINEERING

(CIVIL ENGINEERING)

II Year/3RD SEMESTER

[Academic Session 2020-2021]





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Sr. No.	Subject Code	Subject Name	Effective Teaching			Credits	Evaluation Scheme		
			L	T	P		Internal Assessment	External Assessment	Total Marks
			Hours/week						
THEORY									
1	MUPCE 301N	Fluid Mechanics	4	-	-	4	25	75	100
2	MUPCE 302N	Applied Mechanics	4	-	-	4	25	75	100
3	MUPCE 303N	Basic Surveying	3	-	-	3	25	75	100
4	MUPCE 304N	Building Materials and Construction	4	-	-	4	25	75	100
5	MUPCE 305N	Building Drawing	2	-	-	2	-	100	100
6	MUPCE 306N	Electrical & Mechanical Engineering Systems	3	-	-	3	25	75	100
PRACTICAL/PROJECT									
7	MUPCE 351N	Fluid Mechanics Lab	-	-	2	1	15	50	65
8	MUPCE 352N	Applied Mechanics Lab	-	-	2	1	10	50	60
9	MUPCE 353N	Basic Surveying Lab	-	-	4	3	25	75	100
10	MUPCE 354N	Building Materials and Construction	-	-	2	1	15	50	65
11	MUPCE 355N	Building Drawing Lab	-	-	2	1	25	-	25
12	MUPCE 356N	Electrical & Mechanical Engineering System Lab	-	-	2	1	10	25	35
13	MUPGP 351N	General Proficiency	-	-	1	1	25	-	25
14	MUPGP 352N	Industrial Exposure (Assessment at University Level)	-	-	1	1	25	-	25
TOTAL			20	-	16	30	275	725	1000



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MUPCE-301N	FLUID MECHANICS	4L:0T:2P	5 Credits
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Course Objectives

The objectives of the course is:

1. To give fundamental knowledge of fluid
2. Principle of buoyancy and stability of a floating body and application of mass.
3. its properties and behavior under various conditions of internal and external flows
4. develop an appreciation for the properties of Newtonian fluids

Course Outcomes

At the end of the Course, Student will be able:		Bloom's Level
CO1	To understand Units of measurement and their conversion	K2
CO2	To understand concept of atmospheric pressure ,pressure and its applications manometers	K2
CO3	To understand types of flow and flow measurement	K2
CO4	To understand flow through pipes	K2
CO5	To understand flow through open channel and will learn about various types of hydraulic pumps	K2

K1 – Remember K2- Understand K3-Apply K4-Analyze K5 – Evaluate K6 – Create



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MUPCE 301N: FLUID MECHANICS

RATIONALE

Subject of Fluid Mechanics is a basic engineering subject and helps in solving fluid flow problems in the field of Civil Engineering. The subject deals with basic concepts and principles in hydrostatics, hydro kinematics and hydrodynamics and their application in solving fluid - mechanics problems.

DETAILED CONTENTS

UNIT 1. Introduction:

Fluids: Real and ideal fluids
Fluid Mechanics, Hydrostatics, Hydrodynamics, Hydraulics

UNIT 2. Properties of Fluids (definition only)

Mass density, specific weight, specific gravity, viscosity, surface tension - Cohesion, adhesion and, capillarity, vapour pressure and compressibility.
Units of measurement and their conversion

UNIT 3. Hydrostatic Pressure:

Pressure, intensity of pressure, pressure head, Pascal's law and its applications.
Total pressure, resultant pressure, and centre of pressure.
Total pressure and centre of pressure on horizontal, vertical and inclined plane
Surfaces of rectangular, triangular, trapezoidal shapes and circular. (No derivation)



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UNIT 4. Measurement of Pressure:

- 4.1 Atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure.
- 4.2 Piezometer, simple manometer and differential manometer, Bourdon gauge and Dead weight pressure gauge.

UNIT 5. Fundamentals of Fluid Flow:

- 5.1 Types of Flow: Steady and unsteady flow, laminar and turbulent flow, Uniform and non-uniform flow
- 5.2 Discharge and continuity equation (flow equation) {No derivation}
- 5.3 Types of hydraulic energy: Potential energy, kinetic energy, pressure energy. Hydraulic gradient line and total energy line
- 5.4 Bernoulli's theorem; statement and description (without proof of theorem) and simple numerical problems.

UNIT 6. Flow Measurements (brief description with simple Numerical problems)

- 6.1 Venturimeter and mouthpiece
- 6.2 Pitot tube
- 6.3 Orifice and Orificemeter
- 6.4 Current meters
- 6.5 Notches and weirs (simple numerical problems)

UNIT 7. Flow through Pipes:

- 7.1 Definition of pipe flow; Reynolds number, laminar and turbulent flow - explained Through Reynolds's experiment
- 7.2 Critical velocity and velocity distributions in a pipe for laminar flow
- 7.3 Head loss in pipe lines due to friction, sudden expansion and sudden contraction,
- 7.4 entrance, exit, obstruction and change of direction (No derivation of formula)
- 7.5 Flow from one reservoir to another through a long pipe of uniform cross section (Simple problems)
Pipes in series and parallel
- 7.6 Water hammer phenomenon and its effects (only definition and description)

UNIT 8. Flow through Open Channels:

- 8.1 Definition of an open channel, uniform flow and non-uniform flow
- 8.2 Discharge through channels using
 - i) Chezy's formula (no derivation)
 - ii) Manning's formula (no derivation)
 - iii) Simple Numerical Problems
- 8.3 Most economical channel sections (no derivation)
 - i) Rectangular



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ii) Trapezoidal

iii) Simple Numerical Problems

8.4 Head loss in open channel due to friction

UNIT 9. Hydraulic Pumps:

9.1 Hydraulic pump, reciprocating pump, centrifugal pumps (No numerical and derivations) (may be demonstrated with the help of working models)

Note: Visit to Hydraulic research station is must to explain the various concepts

PRACTICAL EXERCISES

1. To verify Bernoulli's Theorem
2. To find out venturimeter coefficient
3. To determine coefficient of velocity (C_v), Coefficient of discharge (C_d)
4. contraction (C_c) of an orifice and verify the relation between them
5. To perform Reynolds's experiment
6. To verify loss of head in pipe flow to
 - a. Sudden enlargement
 - b. Sudden contraction
 - c. Sudden bend
7. Demonstration of current Meter and pitot tube
 - a. To determine coefficient of discharge of a rectangular notch/triangular notch

RECOMMENDED BOOKS

1. Jagdish Lal, "Fluid Mechanics and Hydraulics" Delhi Metropolitan Book Co. Pvt Ltd.
2. Modi, PN, and Seth, SM; "Hydraulics and Fluid Mechanics", Standard Publishers Distributors.



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Course

MUPCE-302N	APPLIED MECHANICS	4L:0T:2P	5 Credits
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Objectives

The objectives of the course is:

1. Understand the fundamentals of the theory of kinematics and dynamics
2. Identify the basic relations between distance, time, velocity, and acceleration.
3. an ability to apply knowledge of mathematics, science and engineering
4. an ability to identify, formulate, and solve engineering problems

Course Outcomes

At the end of the Course, Student will be able:		Bloom's Level
CO1	To understand concept and basic definitions of engineering mechanics	K2
CO2	To understand measurement and representation of SI units , types of force system	K2
CO3	To understand concept and principle of moment and its application	K2
CO4	To understand concept and definition of centriod of plain figure	K2
CO5	To understand concept of moment of inertia and will learn about simple machines	K2

K1 – Remember K2- Understand K3-Apply K4-Analyze K5 – Evaluate K6 – Create



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MUPCE 302N: APPLIED MECHANICS

UNIT 1. Introduction

Concept of engineering mechanics definition of mechanics, Statics, dynamics, application of engineering mechanics in practical fields. Definition of Applied Mechanics.

Definition, basic quantities and derived quantities of basic units and derived units Different systems of units (FPS, CGS, MKS and SI) and their conversion from one to another density, force, pressure, work, power, velocity, acceleration
Concept of rigid body, scalar and vector quantities.

Unit 2 Laws of Forces.

2.1 Definition of force, measurement in SI units, its representation, types of force: Point force/concentrated force & Uniformly distributed force, effects of force, characteristics of a force

2.2 Different force systems (coplanar and non-coplanar), principle of transmissibility of forces, law of superposition

2.3 Composition and resolution of coplanar concurrent forces, resultant force, method Of composition of forces, laws of forces, triangle law of forces, polygon law of Forces - graphically, analytically, resolution of forces, resolving a force into two Rectangular components

2.4 Free body diagram

2.5 Equilibrant force and its determination

2.6 Lami's theorem (concept only)

UNIT 3. Moment

3.1 Concept of moment

3.2 Moment of a force and units of moment

3.3 Varignon's theorem (definition only)

3.4 Principle of moment and its applications

(Levers - simple and compound, steelyard, safety valve, reaction at support)

3.5 Parallel forces (like and unlike parallel force),

Calculating their resultant

3.6 Concept of couple, its properties and effects General conditions of

equilibrium of bodies under coplanar forces and beams, fixed support,

roller, support, over hanging, uniformly distributed load, point load, varying

load

3.7 Position of resultant force by moment

UNIT 4 Centre of Gravity

4.1 Concept, definition of centroid of plain figures and centre of gravity of



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symmetrical solid bodies

4.2 Determination of centroid of plain and composite lamina using moment method only, centroid of bodies with removed portion

4.3 Determination of center of gravity of solid bodies - cone, cylinder, hemisphere and sphere; composite bodies and bodies with portion removed

UNIT 5:- Moment of Inertia

Concept of moment of inertia and second moment of area and radius of gyration, theorems of parallel and perpendicular axis, second moment of area of common geometrical sections: rectangle, triangle, circle (without derivations). Second moment of area for L, T and I sections, section modulus.

UNIT 6: Simple Machines

- 1 Definition of effort, velocity ratio, mechanical advantage and efficiency of a machine and their relationship, law of machines
- 2 Definition of ideal machine, reversible and self locking machine
- 3 Effort lost in friction, Load lost in friction, determination of maximum mechanical
- 4 Advantage and maximum efficiency
- 5 System of pulleys (first, second, third system of pulleys), determination of Velocity ratio, mechanical advantage and efficiency
- 6 Working principle and application of wheel and axle, different pulley blocks, simple screw jack, worm and worm wheel, single and double winch crab.
- 7 Expression for their velocity ratio and field of their application



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MUPCE-303N	BASIC SURVEYING	3L:T:4P	6 Credits
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Course Objectives

The objectives of the course is:

1. To learn to work as team, ethics and prepare technical reports of surveying
2. To relate theoretical knowledge of surveying to resolve real field problems
3. To establish horizontal control and vertical control by traversing and triangulation.
4. To prepare topographical map and contour map on an area

Course Outcomes

At the end of the Course, Student will be able:		Bloom's Level
CO1	To understand linear and angular measurement	K2
CO2	To understand purpose and principles of chain surveying	K2
CO3	To understand detection correction and problems on local attraction	K2
CO4	To understand various parts of dumpy level	K2
CO5	To understand use of minor instruments	K2

K1 – Remember K2- Understand K3-Apply K4-Analyze K5 – Evaluate K6 – Create



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MUPCE 303N BASIC SURVEYING

1. Introduction:

- 1.1 Definition & Classifications of Surveys.
- 1.2 Basic principles of surveying
- 1.3 Concept and purpose of surveying, measurements-linear and angular, units of measurements
- 1.4 Instruments used for taking these measurements, classification based on surveying instruments.

2. Chain surveying:

- 2.1 Purpose of chain surveying, principles of chain surveying and its advantages and disadvantages
- 2.2 Obstacles in chain surveying
- 2.3 Direct and indirect ranging offsets and recording of field notes
- 2.4 Errors in chain surveying and their corrections

3. Compass surveying:

- 3.1 Purpose of compass surveying. Use of prismatic compass: Setting and taking observations
- 3.2 Concept of following with simple numerical problems:
 - a) Meridian - Magnetic and true
 - b) Bearing - Magnetic, True and Arbitrary
 - c) Whole circle bearing and reduced bearing
 - d) Fore and back bearing
 - e) Magnetic dip and declination
- 3.3 Local attraction - causes, detection, errors and corrections, problems on local attraction, magnetic declination and calculation of included angles in a compass traverse.

4. Levelling:

- 4.1 Purpose of levelling, concept of a level surface, horizontal surface, vertical surface, datum, reduced level and bench marks
- 4.2 Identification of various parts of Dumpy level and use of Dumpy level, Engineer's level, Auto level: advantages and disadvantages, use of auto level.
- 4.3 Concepts of line of collimation, axis of the bubble tube, axis of the telescope and Vertical axis
- 4.4 Levelling staff: single piece, folding, invar precision staff, telescopic
- 4.5 Temporary adjustment and permanent adjustment of dumpy level by two peg method.
- 4.6 Concept of back sight, foresight, intermediate sight, change point, to determine reduce levels
- 4.7 Level book and reduction of levels by
 - 4.7.1 Height of collimation method and
 - 4.7.2 Rise and fall method
- 4.8 Arithmetic checks, problem on reduction of levels, fly levelling, check levelling and profile levelling (L-section and X-section), errors in levelling, permissible limits, reciprocal levelling. Numerical problems.



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4.9 Computations of Areas of regular figures and irregular figures. Simpson's rule; prismatic formula and graphical method use of plan meter for computation of areas, numerical problems

5. Minor Instruments:-

- 5.1. Introduction and use of minor instruments like Ceylon Ghat Tracer, Clinometers, Pantograph, Abney Level etc.
- 5.2. Use of planimeter for computing areas.

PRACTICAL EXERCISES

I. Chain surveying:

- i a) Ranging a line
 - b) Chaining a line and recording in the field book
 - c) Taking offsets - perpendicular and oblique (with a tape only)
 - d) Setting out right angle with a tape
- ii Chaining of a line involving reciprocal ranging
 - iii) Chaining a line involving obstacles to ranging
 - iv) Chain Survey of a small area.

II. Compass Surveying:

- a) Study of prismatic compass
- b) Setting the compass and taking observations
- c) Measuring angles between the lines meeting at a point

III. Levelling:

- i a) Study of dumpy level and levelling staff
 - b) Temporary adjustments of various levels
 - c) Taking staff readings on different stations from the single setting and finding differences of level between them
- ii To find out difference of level between two distant points by shifting the instrument
 - iii Longitudinal and cross sectioning of a road/railway/canal
 - iv Setting a gradient by dumpy and auto-level

IV Minor instruments:

- (i) Demonstration and use of minor instruments like Ceylon Ghat Tracer, Tangent Clinometers, Pantograph, Abney level etc.
- ii) Use of planimeter for computing areas

RECOMMENDED BOOKS

1. Hussain, SK and Nagraj, MS; "Text Book of Surveying"; New Delhi, S Chand and Co Ltd. New Delhi
2. Deshpande, RS; "A Text Book Surveying and Levelling"; Poona, United Book Corporation, New Delhi
3. Kocher, CL; "A Text Book of Surveying"; Ludhiana, Katson Publishing House, New



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MUPCE-304N	BUILDING MATERIAL AND CONSTRUCTION	4L:0T:2P	5 Credits
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Course Objectives

The objectives of the course is:

1. Understand properties of different building materials.
2. Understand the importance of building components and building services.
3. Understand Masonry, Finishing and Form work standards
4. **Classification and specifications of bricks as per BIS: 1077**

Course Outcomes

At the end of the Course, Student will be able:		Bloom's Level
CO1	To understand geological classification of rocks ,bricks, tiles, and cement	K2
CO2	To understand types of lime as per BIS code properties and specification of structural timber	K2
CO3	To understand purpose and use of paints	K2
CO4	To understand excavation of foundation and classification of walls	K2
CO5	To understand meaning and uses of lintels	K2

K1 – Remember K2- Understand K3-Apply K4-Analyze K5 – Evaluate K6 – Create



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MUPCE 304N BUILDING MATERIAL AND CONSTRUCTION

1. Building Stones:

1.1 Classification of Rocks: (General Review)

- 1.1.1 Geological classification: Igneous, sedimentary and metamorphic rocks
- 1.1.2 Chemical classification; Calcareous, argillaceous and siliceous rocks
- 1.1.3 Physical classification: Unstratified, stratified and foliated rocks
- 1.2 General characteristics of stones – Marble, Kota stone, Granite, Sand, Trap, Basalt stone, Lime stone and Slate
- 1.3 Requirements of good building stones
- 1.4 Identification of common building stones
- 1.5 Various uses of stones in construction
- 1.6 Quarrying of stones by blasting and its effect on environment

2. Bricks and Tiles

- 2.1 Introduction to bricks
- 2.2 Raw materials for brick manufacturing and properties of good brick making earth
- 2.3 Manufacturing of bricks
 - 2.3.1 Preparation of clay (manual/mechanically)
 - 2.3.2 Moulding: hand moulding and machine moulding brick table; drying of bricks, burning of bricks, types of kilns (Bull's Trench Kiln and Hoffman's Kiln), process of burning, size and weight of standard brick; traditional brick, refractory brick, clay-fly ash bricks, sun dried bricks, only line diagram of kilns
- 2.4 Classification and specifications of bricks as per BIS: 1077
- 2.5 Testing of common building bricks as per BIS: 3495
Compressive strength, water absorption – hot and cold water test, efflorescence, Dimensional tolerance, soundness
- 2.6 Tiles
 - 2.6.1 Building tiles; Types of tiles-wall, ceiling, roofing and flooring tiles
 - 2.6.2 Ceramic, terrazzo and PVC tiles, : their properties and uses,
 - 2.6.3 Vitrified tiles, Paver blocks.
- 2.7 Stacking of bricks and tiles at site.

3. Cement:

- 3.1 Introduction, raw materials, flow diagram of manufacturing of cement
- 3.2 Various types of Cements, their uses and testing: Ordinary Portland cement, rapid hardening cement, low heat cement, high alumina cement, blast furnace slag cement, white and coloured cement, Portland pozzolana cement, super sulphate cement, Tests of cement – fineness, soundness, initial and final setting time etc.as per B.I.S. Code.
- 3.3 Properties of cement

4. Lime:

- 4.1 Introduction: Lime as one of the cementing materials
- 4.2 Classification and types of lime as per BIS Code
- 4.3 Calcinations and slaking of lime

5. Timber and Wood Based Products:

- 5.1 Identification and uses of different types of timber: Teak, Deodar, Shisham, Sal, Mango, Kail, Chir, Fir, Hollock, Champ
- 5.2 Market forms of converted timber as per BIS Code
- 5.3 Seasoning of timber: Purpose, methods of seasoning as per BIS Code
- 5.4 Properties of timber and specifications of structural timber
- 5.5 Defects in timber, decay in timber
- 5.6 Preservation of timber and methods of treatment as per BIS
- 5.7 Other wood based products, their brief description of manufacture and uses: laminated board, block board, fibre board, hard board, sun mica, plywood,



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veneers, nu-wood and study of the brand name and cost of the wood based products available in the market, Cement Panel Board, Moulded Door.

6. Paints and Varnishes:

- 6.1 Introduction, purpose and use of paints
- 6.2 Types, ingredients, properties and uses of oil paints, water paints and cement paints
- 6.3 Covering capacity of various paints
- 6.4 Types, properties and uses of varnishes
- 6.5 Trade name of different products.

7. Foundations:

- 7.1 Concept of foundation and its purpose
- 7.2 Types of foundation-shallow and deep
- 7.2.1 Shallow foundation - constructional details of: Spread foundations for walls thumb rules for depth and width of foundation and thickness of concrete block, stepped foundation, masonry pillars and concrete columns
- 7.3 Earthwork
 - 7.3.1 Layout/setting out for surface excavation, cutting and filling
 - 7.3.2 Excavation of foundation, trenches, shoring, timbering and de-watering

8. Walls:

- 8.1 Purpose of walls
- 8.2 Classification of walls - load bearing, non-load bearing, dwarf wall, retaining wall breast walls, partition walls & cavity walls.
- 8.3 partition walls: Constructional details, suitability and uses of brick and wooden partition walls
- 8.4 Mortars:types, selection of mortar and its preparation
- 8.5 Scaffolding,construction details and suitability of mason,s brick layers and tubular scaffolding, shoring,underpinning

9. Masonry:

- 9.1 Brick Masonry: Definition of terms like header, stretcher, queen closer, king closer, frog and quoin, course, bond, facing, backing, hearting, jambs, reveals, soffit, plinth, pillars and pilasters
 - 9.1.1 Bond – meaning and necessity; English, Flemish bond and other types of bonds
 - 9.1.2 Construction of brick walls – methods of laying bricks in walls, precautions observed in the Construction of walls, methods of bonding new brick work with old (toothing,raking,back and Block bonding) Expansion and contraction joints
 - 9.1.3 Importance towards special care during execution on:soaking of bricks, Maintenance of bonds and plumb, filling of horizontal and vertical joints , Masonry work, restriction height of construction on a given day,every fourth Course, earthquake resistance measure ,making of joints to receive finishes
- 9.2 Stone Masonry:
 - 9.2.1 Glossary of terms – natural bed, bedding planes, string course, corbel, cornice, block in course grouting, moulding, templates, corner stone, bond stone, throating, through stone, parapet, coping, pilasters and buttress
 - 9.2.2 Types of stone masonry: Rubble & Ashlars masonry –random and coursed;Ashlarmasonry,principal to be observed in construction of stone masonry walls
 - 9.2.3 Importance towards special care during execution of stone masonry work on



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dressing of stone, size and placing of bond and corner stones, filling joints, proper packing of internal cavities of rubble masonry wall, raking of joints to receive finishes

10. Arches and Lintels:

10.1 Meaning and use of arches and lintels:

10.2 Glossary of terms used in arches and lintels - abutment, pier, arch ring, intrados, soffit, extrados, voussoiers, Springer, springing line, crown, key stone, skew back, span, rise, depth of an arch, haunch, spandril, jambs, bearing, thickness of lintel, effective span

10.3 Arches:

10.3.1 Types of Arches - Semi circular, segmental, elliptical and parabolic, flat inverted and relieving

10.3.2 Stone arches and their construction

10.3.3 Brick arches and their construction

10.4 Lintels

10.4.1 Purpose of lintel

10.4.2 Materials used for lintels

10.4.3 Cast-in-situ and pre-cast lintels

10.4.4 Lintel along with sun-shade or chhajja

11. Doors, Windows and Ventilators:

11.1 Glossary of terms with neat sketches

11.2 Different type of doors- panel door, flush door, flazed

door, rolling shutter, steel door, sliding door, plastic and aluminium doors

11.3 Window – Panel window, glazed windows (fixed and openable) ventilators, sky

11.3

Light window, Louvers shutters, plastic and aluminium windows.

Door and window frames – materials and sections, door closures, hold fasts

12. Damp Proofing and Water Proofing

12.1 Dampness and its ill effects on bricks, plaster, wooden fixtures, sources and causes of dampness, damp proofing materials, damp proofing of : basement, ground floor, plinth and walls, special damp proofing arrangements in bathrooms, WC and kitchen, damp proofing for roofs and window sills.

13. Floors

13.1 Glossary of terms-floor finish, topping, under layer, base course, rubble filling and their purpose

13.2 Types of floor finishes - cast-in-situ, concrete flooring (monolithic, bonded)

Terrazzo tile flooring, stone (marble and kota) flooring, PVC flooring, Terrazzo

Flooring, glazed tiles flooring, Timber flooring, description with sketches. The methods of construction of concrete, terrazzo and timber floors and their BIS specifications

14. Roofs

14.1 Types of roofs, concept of flat, pitched and arched roofs

14.2 Glossary of terms for pitched roofs - batten, eaves, fascia board, gable, hip, lap, purlin, rafter, rag bolt, valley, ridge, rain water gutter, anchoring bolts

15. Stairs

15.1 Glossary of terms: Staircase, winders, landing, stringer, newel, baluster, riser, tread, width of staircase, hand-rail, nosing



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15.2 Planning and layout of staircase: Relations between rise determination of width of stair, landing etc.

15.3 Various types of layout - straight flight, dog legged, open well, quarter turn, half turn (newel and geometrical stairs), bifurcated stair, spiral stair

16. *Surface Finishes

1. Plastering - classification according to use and finishes like plain plaster, grit finish, rough cast, pebble dashed, concrete and stone cladding etc., dubbing, proportion of mortars used for different plasters, techniques of plastering and curing.
2. Pointing - different types of pointing and their methods
3. Painting - preparation of surface, primer coat and application of paints on
 4. wooden, steel and plastered wall surfaces
5. Application of white washing, colour washing and distempering, polishing,
 6. application of cement and plastic paints
 7. Selection of appropriate paints/finishes for interior and exterior surfaces
 8. Importance of preparation of surfaces such as hacking, grooving etc before
 9. application of surface finishes

PRACTICAL EXERCISES:

- i) To determine the crushing strength of bricks
- ii) To determine the water absorption of bricks and efflorescence of bricks
- iii) To determine fineness (by sieve analysis) of cement
- iv) To conduct field test of cement.
 - v) To determine normal consistency of cement
- vi) To determine initial and final setting times of cement
- vii) To determine soundness of cement
- viii) To determine compressive strength of cement
- ix) Demonstration of tools and plants used in building construction.
 - x) To prepare Layout of a building: two rooms building with front verandah
- i) To construct brick bonds (English bond only) in one, one and half and two brick thick: (a) Walls for L, T and cross junction
- ii) Demonstration of following items of work at construction site by:
 - 1-Timbering of excavated trenching
 - 2-Damp proof courses laying
 - 3-Construction of masonry walls
 - 4-Laying of flooring on an already prepared lime concrete base
 - 5-Plastering and pointing exercise
 - 6-Constructing RCC work
 - 7-Pre-construction and post construction termite treatment of building and Woodwork



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RECOMMENDED BOOKS

1. Gupta, Sushil Kumar, Singla, DR, and Juneja BM; "A Text Book of Building Construction"; Ludhiana, Katson Publishing House.
2. Deshpande, RS and Vartak, GV; "A Text Book of Building Construction"; Poona, United Book Corporation.
3. Rangwala, SC: "Building Construction"; Anand, Charotar Book Stall
4. Kulkarni, GJ; "A Text Book of Building Construction"; Ahmedabad Book Depot
5. Arora, SP and Bindra, SP; "A Text Book of Building Construction"; New Delhi DhanptRai and Sons.
6. Sharma,SK and Kaul, BK; "A Text Book of Building Construction"; Delhi, S Chand and Co.
7. Sushil Kumar; "Building Construction"; Standard Publishers Distributors Delhi
8. Moorthy, NKR; "A Text Book of Building Construction"; Poona, Engineering Book Publishing Co.
9. SP – 62 Hand Book of BIS
10. B.I.S. – 6313 Part 1, 2, 3
11. National Building Code
12. Handbook of Civil Engineering by PN Khanna
13. Video films on Damp proofing, water proofing, surface finishes



MOTHERHOOD UNIVERSITY

Roorkee-Dehradun Road, Village Karoundi Post Bhagwanpur, Tehsil-Roorkee, Uttarakhand, India

MUPCE-305N	BUILDING DRAWING	2L:0T:2P	3 Credits
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Course Objectives

The objectives of the course is:

1. Create layout plan, sanction drawings
2. Develop any type of building drawing using CADD software
3. Preparation of a foundation Plan for residential building & framed structures.
4. Preparation of detailed plan and section of a Dog legged Stair case.

Course Outcomes

At the end of the Course, Student will be able:		Bloom's Level
CO1	To understand details of spread footing corner junction walls	K2
CO2	To understand details of drawing elevation sectional plan and sectional side elevation	K2
CO3	To understand drawing using CAD software	K2
CO4	To understand plan and drawing showing details of foundation and roof	K2
CO5	To understand drawing of roof showing heat and thermal insulation provisions	K2

K1 – Remember K2- Understand K3-Apply K4-Analyze K5 – Evaluate K6 – Create



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Roorkee-Dehradun Road, Village Karoundi Post Bhagwanpur, Tehsil-Roorkee, Uttarakhand, India

MUPCE 305N: BUILDING DRAWING

Drawing No. 1:

Details of spread footing foundations, load bearing and non-load bearing wall for given thickness of walls with the help of given data or rule of the thumb, showing offsets, position of DPC. The details of the concrete and brick plinth protection have to be shown in the drawing

Drawing No. 2:

Plans of T and Corner junction of walls of 1 Brick, 1-1/2 Brick and 2 brick thick in English bond

Drawing No. 3:

Detailed drawing of basement, single wooden floor, double wooden floor

Drawing No.4

Elevation, sectional plan and sectional side elevation of flush door, glazed door, panelled door and window, Aluminium door and window with wire gauge shutter. Sketches of various joints of different members.

Drawing No.5

Draw at least one sheet using CAD software

Drawing No. 6:

Drawing plan, elevation of a small building by measurement and foundation detail and sectional elevation.

Drawing No.7

Drawing detailed plan, elevation and section of a two room residential building from a given line plan, showing details of foundations, roof and parapet

Drawing No. 8

Drawings of following floors Cement concrete floors on ground and at first floor

- i) Conglomerate (Concrete Flooring)
- ii) Bonded cement concrete flooring
- iii) Terrazzo flooring
- iv) Ceramic/vitrified tile flooring

Drawing No. 9:

Drawing of flat roof, showing the heat/thermal insulation provisions.

Drawing No.10

Draw at least one sheet using CAD software

NOTE:

- a) All drawings should be as per BIS code and specifications in SI Units
- b) Intensive practice of reading and interpreting building drawings should be given
- c) Some practice should be done to prepare drawings on AutoCAD

RECOMMENDED BOOKS

1. Civil Engineering Drawing by RS Malik, Asia Publishing House
2. Civil Engineering Drawing by V.B.Sikka. Katson Publishing, Ludhiana
3. Civil Engineering Drawing by NS Kumar; IPH, New Delhi
4. Principles of Building Drawing by MG Shah and CM Kale, MacMillan, Delhi
5. Building Construction by Moorthy NRK
6. Civil Engg Drawing by Layal



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7. Zaidi, SKA and Siddiqui, Suhail; Drawing and Design of Residential and



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Roorkee-Dehradun Road, Village Karoundi Post Bhagwanpur, Tehsil-Roorkee, Uttrakhand, India

Course	MUPCE-306N	ELECTRICAL & MECHANICAL ENGINEERING SYSTEMS	3L:0T:2P	4 Credits
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Objectives

The objectives of the course is:

1.

Course Outcomes

At the end of the Course, Student will be able:		Bloom's Level
CO1	To understand belt and gear drive system	K2
CO2	To understand classification and working principles of engines	K2
CO3	To understand types and working of refrigeration system	K2
CO4	To understand classification and working of pumps	K2
CO5	To understand classification and working of turbines	K2

K1 – Remember K2- Understand K3-Apply K4-Analyze K5 – Evaluate K6 – Create



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Roorkee-Dehradun Road, Village Karoundi Post Bhagwanpur, Tehsil-Roorkee, Uttarakhand, India

MUPCE 306N : ELECTRICAL & MECHANICAL ENGINEERING SYSTEMS

UNIT-1: Transmission of Power

1.1 Belt Drives: Types of belts, belt materials, cross and flat belt drives, advantages of V-belt drive. Over flat belt drive.

1.2 Gears Drives: Types of gears (briefly), types of gear trains.

UNIT-2: Internal Combustion Engines

2.1 Classification of IC engines

2.2 Working principles of two stroke and four stroke engines

2.3 Working principles of petrol engine and diesel engines

2.4 Gas turbines (working principle only)

2.5 Using principle of prime motor used in high power single phase and three

Phase generators used in building.

UNIT-3: Refrigeration and Air Conditioning System

3.1 Different types of refrigeration principles and refrigerants

3.2 Working of domestic refrigerator

3.3 Working of Window type AC system

3.4 Working of Split AC System

3.5 Working of Centralized Air Conditioning System

UNIT-4: Hydraulics

4.1 Classification of pumps (reciprocating and centrifugal)

4.2 Working principles of both reciprocating and centrifugal pumps

4.3 Turbine: Working principles of impulse turbine and reaction turbine

PRACTICAL EXERCISES IN MECHANICAL ENGINEERING

1. Demonstration and study of main parts of 4 stroke petrol and diesel engines by actually dismantling them (The idea is to acquaint the students with the most common troubles occurring in the engines)
2. Demonstration and study of main parts of 2 stroke petrol engine by actually dismantling it. (The idea is to acquaint the students with the most common trouble occurring in the engines)
3. Demonstration and study of gas turbines through models
4. Demonstration and study of different hydraulic pumps
5. Demonstration and study of various drives for transmission of powers
6. Models of belts and gears.
7. Demonstration and study of air conditioning system in a building
8. Demonstration and study of domestic refrigerating system
9. Demonstration and study of Prime motor used in three phase generating set