Cochin University of Science and Technology, Kerala B.E./B.Tech EEE Sem 2 syllabus

Basic Civil Engineering

Module I

Engineering Materials: Cement - varieties and grade of cement and their uses. Cement
mortar- Steel- types of steel for reinforcement bars, steel structural sections. Brick- varieties
and strength, tests on bricks.
Aggregates- types & requirements. Concrete- grades of concrete as per IS code, water
cement ratio, workability, mixing, batching, placing, compaction and curing.

Module II

Construction : Components of a building-Foundation- types of foundations- isolated
footing, combined footing, raft, pile & well foundations- Foundation for Machinery
Super structure: Brick masonry, English bond and Flemish bond, Stone masonry-Ashlar
masonry- Rubble masonry. Roofing- Steel trusses, roofing for industrial buildings

Module III

Surveying: Basic Principles of surveying, instruments, methods and measurements- linear
measurements- reconnaissance, selection of survey stations.
Leveling: Leveling instruments, different types, temporary adjustments, reduced level of
point, booking of field notes, and reduction of levels by height of collimation method.

Introduction to Total Station.

Module IV

Site planning and Building Rules-Selection of site-Site plan preparation for buildings-
Kerala Municipal Building Rules prevailing, general provisions regarding site and building requirements-Coverage and Floor Area Ratio-Basic concepts of Intelligent Buildings and Green Buildings Roads- Classification of Rural and urban Roads. Sources of Water - Water Supply-Quality of Water.

References:

1. Chudley, R., Construction Technology, Vol. I to IV, Longman Group, England (2011).
2. Chudley, R. and Greeno, R., Building Construction Handbook, Addison Wesley, Longman
Group, England (1998)
3. Mamlouk, M. S., and Zaniewski, J. P., Materials for Civil and Construction Engineering,
Pearson Publishers (2011)
4.McKay, W. B. and McKay, J. K., Building Construction, Vol. 1 to 4, Pearson India
Education Services.(2013)
5. Rangwala,S.C and Dalal,K.B.,Building Construction, Charotar Publishing House (2017).
6. Kerala Municipal Building Rules (latest revision)

Basic Mechanical Engineering

Module I

Thermodynamics: Thermodynamics systems – open, closed and isolated systems,
equilibrium state of a system, property and state, process, cycle, Zeroth law of
thermodynamics- concept of temperature, temperature scales. First law – internal energy,
enthalpy, work and heat, Different processes (isobaric, isochoric, isothermal, adiabatic and
polytropic processes). Second law – Kelvin-plank and Claussius statements and their
equivalence, Carnot Cycle (Elementary problems only).

Thermodynamic properties of Steam, Steam Generator. Different types of boilers, boiler
mountings and accessories. Formation of steam at constant pressure, working of steam
turbines, compounding of turbines.

Module II

Internal Combustion Engines: Air standard cycles – Otto and Diesel cycles, working of two
stroke and four stroke Petrol and Diesel engines, Carburetted and MPFI engines, fuel pump,
fuel injector, ignition system, cooling system, lubricating system.
Refrigeration & Air-conditioning: Introduction to refrigeration and air -conditioning,
Rating of refrigeration machines, Coefficient of performance, Simple refrigeration vapour
compression cycle (Elementary problems only), Summer and winter air conditioning.

Module III

Hydraulic Turbines & Pumps: Introduction, Classification, Construction details and
working of Pelton Wheel, Francis and Kaplan turbines, Specific speed (Definition and
significance only), Classification of water pumps, working of centrifugal pumps and
reciprocating pumps (Theory of working principles only)
Power plants: Hydro-electric power plants, Thermal power plants, Nuclear power plants,
Diesel power plants, Wind mills, solar energy (Working principles using schematic
representations only)

Module IV

Introduction to Manufacturing Systems: Welding- different types of welding, resistance
welding, arc welding, gas welding, Brazing and soldering, Different welding defects.
Casting- different casting processes, sand casting, casting defects,
Rolling- hot rolling and
cold rolling, two high, three high , cluster rolling mills, wire drawing,

forging, extrusion,
Heat treatment of steel, elementary ideas of annealing, hardening, normalizing, surface
hardening.
Power Transmission Methods and Devices: Introduction to Power transmission, Belt, Rope,
Chain and Gear drive. Length of belt open and crossed. Ratio of belt tensions (Elementary

problems only). Different types of gears (Elementary ideas only). Types and functioning of
clutches.

References

1. Nag, P.K. Engineering thermodynamics. (Fifth Edition). McGraw Hill Education
(India) Pvt. Ltd, New Delhi.(2013).
2. Gill, J.H. Smith Jr. and Ziurys, E.J. Fundamentals of internal combustion engines,
Oxford & IBH, New Delhi.(1959)
3. Stoecker, W. F. Refrigeration and air conditioning. Tata McGraw Hill, New Delhi.
(1980).
4. JagadishLal. Hydraulic machines. Metropolitan Book co, New Delhi.(1994)
5. Raghavan, V. Material science and engineering, Prentice Hall of India, New Delhi.
(2004)
6. Rajendar Singh.Introduction to basic manufacturing processes and workshop
technology, New Age International, New Delhi. (2006).

Engineering Mechanics

Module I

Introduction to Mechanics: Definition and classification of mechanics – rigid body (statics
and dynamics) and deformable body mechanics.
Forces and Force systems: Force and its characteristics, Principles of statics – concept of
resultant and equilibrant, Composition and resolution of forces, force systems.

Coplanar Concurrent force system: Equilibrium of two, three and more than three forces,
Moment of a force, Varignon's theorem of moments, Equations of equilibrium, Friction and
its effects on bodies, Engineering applications.
Coplanar Parallel force System: Two parallel forces, General case of parallel forces in a
plane, Centre of parallel forces, Centre of gravity, Centre of mass, Centroids of curves, areas
and volumes – regular and composite, Pappus's theorems, Equilibrium of distributed forces
in a plane, Applications of the concept of centroid in engineering practice.

Module II

Moment of Inertia: Concept of moment of inertia and second moment of area, Moment of
inertia of regular and composite solids, Second moment of area of regular and irregular
surfaces, Polar moment of inertia / second moment of area, Product of inertia, Principal
moments of inertia and principal axes, Applications of the concepts in engineering practice.
Coplanar non-concurrent force system and Analysis of Plane trusses and frames:
Resultant of a general case of force system in a plane, Equilibrium equations, Concept of load
carrying mechanism in trusses and frames – internal (axial) forces, two force and multi force
members, Analysis of plane trusses by Method of joints and Method of sections, Analysis of
Plane frames by Method of members.

Module III

Principle of virtual work: Concept of virtual work and the principle of virtual work,
Applications in engineering, Equilibrium of ideal systems, Stable and unstable equilibrium.
Introduction to Dynamics: Definitions, Units, Divisions – Kinematics, Kinetics.
Rectilinear translation: Kinematics of rectilinear motion – displacement, velocity,

acceleration, Kinetics – Differential equations of motion, D'Alembert's principle in rectilinear
translation and its applications, Motion of a particle due to a constant force, Motion of a
particle due to a force proportional to displacement – Simple harmonic motion, Momentum and impulse, Work and energy, Conservation of energy, Collision of two bodies – direct
central impact.

Module IV

Curvilinear translation: Kinematics of curvilinear translation – components of
displacement, velocity and acceleration, normal and tangential acceleration, Kinetics –
Differential equations of motion, Motion of a projectile – projection on horizontal and
inclined surfaces, D'Alembert's principle in curvilinear motion and its applications, Moment
of momentum, Work and energy in curvilinear motion.
Rotation of a rigid body: Kinematics of rotation – angular displacement, velocity and
acceleration, RPM, Relations of kinematic parameters of linear and angular motions, Kinetics
– Differential equations of motion of a rigid body rotating about a fixed axis, Rotation under
the action of a constant moment, Rotation proportional to angular displacement – Compound
pendulum, D'Alemberts principle in rotation, Resultant inertia force in rotation, Principle of
angular momentum in rotation, Energy equation for rotating bodies.

References

1. Timoshenko and Young. Engineering mechanics. McGraw Hill Book Company,
Singapore. (1956)
2. Beer, F. P. and Johnston, E. R. Mechanics for engineers (Vol. 1: Statics and Vol.2:
Dynamics). Tata McGraw Hill, New Delhi.(2004).
3. Merriam, H. L. and Kraige, L. G. (2003). Engineering mechanics (Vol. 1: Statics and
Vol.2: Dynamics). John Wiley and Sons, Somerset, N.J.(2003)
4. Hibbeller, R.C. Engineering mechanics. Vol. 1: Statics, Vol. 2:

Dynamics. (Twelfth
edition). Pearson Education Asia Pvt. Ltd., New Delhi.
5. Rajasekaran,S. and Sankarasubramanian,.G. Fundamentals of
engineering mechanics.
(Third edition). Vikas Publishing House Pvt. Ltd., New Delhi.(2010)

Visit www.goseeko.com to access free study material as per your university syllabus