

**VEL TECH MULTI TECH
Dr. RANGARAJAN Dr. SAKUNTHALA
ENGINEERING COLLEGE**

(An ISO 9001: 2008 Certified Institution)

(Owned by 'VEL Shree R. Rangarajan
Dr. Sagunthala Rangarajan Educational Academy)

(Approved by AICTE, New Delhi
and affiliated to Anna University)



WEEKLY SCHEDULE

IV - SEMESTER

2014-2018

4 Year Degree Course in Engineering

CIVIL ENGINEERING

42, Avadi – Alamathi Road,
Chennai – 600062

Telefax – 044-26841061

E-mail: veltech@md3.vsnl.net.in

Web site: www.vel-tech.org

WEEK DETAILS**YEAR 2016**

S.NO	WEEKS	DATE	
		FROM	TO
1.	WEEK 1	18.01.16	23.01.16
2.	WEEK 2	25.01.16	30.01.16
3.	WEEK 3	01.02.16	06.02.16
4.	WEEK 4	08.02.16	13.02.16
5.	WEEK 5	15.02.16	20.02.16
6.	WEEK 6	22.02.16	27.02.16
7.	WEEK 7	29.02.16	05.03.16
8.	WEEK 8	07.03.16	12.03.16
9.	WEEK 9	16.03.16	20.03.16
10.	WEEK 10	22.03.16	26.03.16
11.	WEEK 11	27.03.16	02.04.16
12.	WEEK 12	03.04.16	09.04.16
13.	WEEK 13	11.04.16	16.04.16
14.	WEEK 14	18.04.16	23.04.16
15.	WEEK 15	25.04.16	30.04.16

IV SEMESTER

CONTENTS

S. NO	SUBJECTCODE	SUBJECT NAME
1.	MA6459	Numerical Methods
2	CE6401	Construction Materials
3	CE6402	Strength of Materials
4	CE6403	Applied Hydraulic Engineering
5	CE6404	Surveying II
6	CE6405	Soil Mechanics
7	CE6411	Strength of Materials Laboratory
8	CE6412	Hydraulic Engineering Laboratory
9	CE6413	Survey Practical II

VI SEMESTER

TEST / EXAM SCHEDULE

SL. NO	SUBJECT CODE	SUBJECT NAME	UNIT TEST I	UNIT TEST II	PRE MODEL EXAM	MODEL EXAM
1	MA6459	Numerical Methods	01.02.16	15.02.16	29.02.06	01.04.16
2	CE6401	Construction Materials	02.02.16	16.02.16	01.03.16	04.04.16
3	CE6402	Strength of Materials	03.02.16	17.02.16	02.03.16	06.04.16
4	CE6403	Applied Hydraulic Engineering	04.02.16	18.02.16	03.03.16	08.04.16
5	CE6404	Surveying II	05.02.16	19.02.16	04.03.16	11.04.16
6	CE6405	Soil Mechanics	06.02.15	20.02.16	05.03.16	13.04.16

MA6459 NUMERICAL METHODS

WEEK – - 1&2

UNIT I

solution of equations and eigenvalue problem Solution of algebraic and transcendental equations - Fixed point iteration method – Newton Raphson method- Solution of linear system of equations - Gauss elimination method – Pivoting -Gauss Jordan method – Iterative methods of Gauss Jacobi and Gauss Seidel - Matrix Inversion by Gauss Jordan method - Eigen values of a matrix by Power method

WEEK – 2 UNIT TEST - 1

WEEK – 3

UNIT -2

interpolation and approximation

Interpolation with unequal intervals - Lagrange's interpolation–

WEEK – 4

Newton's divided difference interpolation – Cubic Splines

WEEK - 5

Interpolation with equal intervals - Newton's forward and backward difference formulae

WEEK – 6: UNIT TEST – 1I

WEEK - 7

UNIT- 3

numerical differentiation and integration

Approximation of derivatives using interpolation polynomials - Numerical integration using Trapezoidal, Simpson's 1/3 rule

WEEK – 8

Romberg's method - Two point and three point Gaussian quadrature formulae – Evaluation of double integrals by Trapezoidal and Simpson's 1/3 rules

WEEK – 9: UNIT TEST – 1II

WEEK - 10

UNIT- 4

Single Step methods - Taylor"s series method - Euler"s method - Modified Euler"s method - Fourth order Runge-Kutta method

WEEK – 11

for solving first order equations - Multi step methods - Milne"s and Adams-Bashforth predictor corrector methods for solving first order equations

WEEK – 12: UNIT TEST – 1V

WEEK – 13

UNIT– V

Finite difference methods for solving two-point linear boundary value problems - Finite difference techniques for the solution of two dimensional Laplace"s and Poisson"s equations on rectangular domain

WEEK – 14

– One dimensional heat flow equation by explicit and implicit (Crank Nicholson) methods –One dimensional wave equation by explicit method

WEEK – 15 UNIT TEST – V

WEEK - 16 & WEEK – 17

ICD CLASSES & MODEL EXAM

CE6401 CONSTRUCTION MATERIALS WEEK – 1

WEEK – - 1&2

UNIT - 1

Stones – bricks – concrete blocks

Stone as building material – Criteria for selection – Tests on stones – Deterioration and Preservation of stone work – Bricks – Classification – Manufacturing of clay bricks – T

ests on bricks – Compressive Strength – Water Absorption – Efflorescence – Bricks for special use –Refractory bricks – Cement, Concrete blocks – Light weight **concrete blocks**

WEEK - 2 UNIT TEST –I

WEEK – 3

UNIT -2

lime –cement–aggregates mortar

Lime – Preparation of lime mortar – Cement – Ingredients – Manufacturing process – Types and Grades – Properties of cement and Cement mortar

WEEK – 4

Hydration – Compressive strength – T ensile strength – Fineness– Soundness and consistency – Setting time – Industrial byproducts – Fly ash

WEEK - 5

Aggregates – Natural stone aggregates – Crushing strength – Impact strength – Flakiness Index – Elongation Index – Abrasion Resistance – Grading – Sand Bulking **WEEK – 6 UNIT**

TEST –II

WEEK – 7

UNIT- 3

Concrete

Concrete – Ingredients – Manufacturing Process – Batching plants – RMC – Properties of fresh concrete – Slump – Flow and compaction Factor – Properties of hardened concrete –

WEEK – 8

Compressive, T ensile and shear strength – Modulus of rupture – T ests – Mix specification – Mixproportioning – BIS method – High Strength Concrete and HPC – Self compacting Concrete –Other types of Concrete – Durability of Concrete

WEEK – 9 UNIT TEST –II

WEEK – 10 UNIT- 4

TIMBER AND OTHER MATERIALS 9

Timber – Market forms – Industrial timber– Plywood – Veneer – Thermacole – Panels of laminates –Steel – Aluminum and Other

WEEK - 11

Metallic Materials – Composition – Aluminium composite panel Uses – Market forms – Mechanical treatment – Paints – Varnishes – Distempers – Bitumens.

WEEK – 12 UNIT TEST –IV

WEEK – 13 UNIT – 5

MODERN MATERIALS

Glass – Ceramics – Sealants for joints – Fibre glass reinforced plastic – Clay products –Refractories

WEEK – 14

Composite materials –Types – Applications of laminar composites – Fibre textiles – Geomembranes and Geotextiles for earth reinforcement

WEEK – 15 UNIT TEST –V

WEEK - 16 & WEEK - 17

ICD CLASSES & MODEL EXAM

CE6402 STRENGTH OF MATERIALS

WEEK 1&2

UNIT 1-

ENERGY PRINCIPLES

Strain energy and strain energy density – strain energy due to axial load, shear, flexure and torsion – Castigliano’s theorems – Maxwell’s reciprocal theorems - Principle of

virtual work –application of energy theorems for computing deflections in beams and trusses Williot Mohr's **Diagram**

.WEEK – 2 UNIT TEST –I

WEEK – 3 UNIT -2

Indeterminate beams

Concept of Analysis - Propped cantilever and fixed beams-.

WEEK – 4

fixed end moments and reactions –Theorem of three moments

WEEK - 5

analysis of continuous beams – shear force and bending moment diagrams

WEEK – 6 UNIT TEST –II

WEEK – 7 UNIT- 3

Columns and cylinder

Euler's theory of long columns – critical loads for prismatic columns with different end conditions; Rankine-Gordon formula for eccentrically loaded columns

WEEK – 8

– Eccentrically loaded short columns –middle third rule – core section – Thick cylinders – Compound cylinders.

WEEK – 9 UNIT TEST –III

WEEK – 10 UNIT- 4

State of stress in three dimensions Determination of principal stresses and principal planes Volumetric strain –Theories of failure –Principal stress .

WEEK – 11

Principal strain – shear stress – Strain energy and distortion energy theories –application in analysis of stress, load carrying capacity

WEEK – 12 UNIT TEST –IV

WEEK – 13 UNIT – 5

Advanced topics in bending of beams

Unsymmetrical bending of beams of symmetrical and unsymmetrical sections

WEEK – 14

Shear Centre -curved beams – Winkler Bach formula.

WEEK – 15 UNIT TEST –V

WEEK - 16 & WEEK – 17

ICD CLASSES & MODEL EXAM

CE6403 APPLIED HYDRAULIC ENGINEERING

WEEK –1&2

UNIT - 1

UNIFORM FLOW 9

Definition and differences between pipe flow and open channel flow - Types of Flo- Properties of open channel - Fundamental equations Velocity distribution in open channel - Steady uniform flow: Chezy equation, Manning equation - Best hydraulic sections for uniform flow -Computation in Uniform Flow - Specific energy and specific force - Critical depth and velocity

WEEK – 2 UNIT TEST I

WEEK – 3 UNIT -2

Gradually varied flow

Dynamic equations of gradually varied and spatially varied flows - Water surface flow profile classifications

WEEK – 4

:Hydraulic Slope, Hydraulic Curve - Profile determination by Numerical method:

WEEK - 5

Direct step method and Standard step method, Graphical method - Applications.

WEEK – 6 UNIT TEST II

WEEK – 7 UNIT- 3

Rapidly varied flow

Application of the energy equation for RVF - Critical depth and velocity - Critical, Sub-critical and Super-critical flow - .

WEEK – 8

Application of the momentum equation for RVF - Hydraulic jump Types -Energy dissipation - Surges and surge through channel transitions

WEEK – 9 UNIT TEST III

WEEK – 10 UNIT- 4

Turbines

Impact of Jet on vanes - Turbines - Classification - Reaction turbines - Francis turbine, Radial flow turbines, draft tube and cavitation

WEEK - 11

- Propeller and Kaplan turbines - Impulse turbine - Performance of turbine - Specific speed - Runaway speed - Similarity laws

WEEK – 12 UNIT TEST IV

WEEK – 13 UNIT – 5

pumps

Centrifugal pumps - Minimum speed to start the pump - NPSH - Cavitations in pumps - Operating characteristics - Multistage pumps - Reciprocating pumps - Negative slip

WEEK – 14

Flow separation conditions - Air vessels, indicator diagrams and its variations - Savings in work done - Rotary pumps: Gear pump

WEEK – 15 UNIT TEST V.

WEEK - 16 & WEEK - 17

ICD CLASSES & MODEL EXAM

CE6404 SURVEYING II

WEEK – 1&2

UNIT - 1

Control surveying

Horizontal and vertical control – Methods – specifications
triangulation baseline instruments and accessories – corrections –
satellite stations reduction to centre- trigonometrical levelling –
single and reciprocal observations – traversing – Gale’s table.

WEEK – 2 UNIT TEST I

WEEK – 3 UNIT -2

SURVEY ADJUSTMENT

Errors Sources- precautions and corrections – classification of
errors – true and most probable values- normal equation.

WEEK – 4

weighed observations – method of equal shifts –principle of
least squares -0

WEEK - 5

correlates- level nets- adjustment of simple triangulation networks

WEEK – 6 UNIT TEST II

WEEK – 7 UNIT- 3

Total station surveying

Basic Principle Classifications -Electro-optical system:
Measuring principle, Working principle, Sources of Error ,
Infrared and Laser Total Station instruments. Microwave
system: Measuring principle, working principle, Sources of
Error , Microwave

WEEK – 8

Total Station instruments. Comparison between Electro-optical and Microwave system. Care and maintenance of Total Station instruments. Modern positioning systems – Traversing and Trilateration

WEEK – 9 UNIT TEST III.

WEEK - 10 UNIT- 4

GPS surveying

Basic Concepts - Different segments - space, control and user segments - satellite configuration -signal structure - Orbit determination and representation - Anti Spoofing and Selective Availability.

WEEK - 11

Task of control segment – Hand Held and Geodetic receivers –data processing - Traversing and triangulation

WEEK – 12 UNIT TEST IV

WEEK – 13 UNIT – 5

Advanced topics in surveying

Route Surveying - Reconnaissance - Route surveys for highways, railways and waterways -Simple curves – Compound and reverse curves - Setting out Methods – Transition curves -Functions and requirements - Setting out by offsets and angle Vertical curves -

WEEK – 14

Sight distanceshydrographic surveying – Tides - MSL - Sounding methods - Three-point problem - Strength of fix Sextants and station pointer- Astronomical Surveying – field observations and determination ofAzimuth by altitude and hour angle methods – fundamentals of Photogrammetry and Remote Sensing

WEEK – 15 UNIT TEST V

WEEK - 16 & WEEK - 17

ICD CLASSES & MODEL EXAM

CE6405 SOIL MECHANICS

WEEK –1&2

UNIT -1

Soil classification and compaction

Nature of soil – phase relationships – Soil description and classification for engineering purposes, their significance – Index properties of soils - BIS Classification system – Soil compaction –Theory, comparison of laboratory and field compaction methods – Factors influencing compaction **behaviour** of soils..

WEEK – 2 UNIT TEST I

WEEK – 3 UNIT -2

Soil water and water flow

Soil water – static pressure in water - Effective stress concepts in soils capillary stress

WEEK – 4

Permeability measurement in the laboratory and field pumping in pumping out tests –

WEEK - 5

factors influencing permeability of soils Seepage – introduction to flow nets – Simple problems. (sheet pile and weir). —

WEEK – 6 UNIT TEST II

WEEK – 7 UNIT- 3

stress distribution and settlement

Stress distribution - soil media – Boussinesq theory - Use of Newmarks influence chart –Components of settlement — immediate and consolidation settlement –

WEEK – 8

Terzaghi's onedimensional consolidation theory – computation of rate of settlement. - \sqrt{t} and $\log t$ methods–

e-log p relationship - Factors influencing compression behaviour

WEEK – 9 UNIT TEST III.

WEEK - 10

UNIT- 4

shear strength

Shear strength of cohesive and cohesionless soils – Mohr – Coulomb failure theory –Measurement of shear strength, direct shear

. WEEK - 11

Triaxial compression, UCC and Vane shear tests –Pore pressure parameters – cyclic mobility – Liquefaction

WEEK – 12 UNIT TEST IV

WEEK – 13 UNIT – 5

slope stability

Slope failure mechanisms – Types - infinite slopes – finite slopes – Total stress analysis for saturated clay

WEEK – 14

Fellenius method - Friction circle method – Use of stability number - slope protection measures

WEEK – 15 UNIT TEST V

WEEK - 16 & WEEK - 17

ICD CLASSES & MODEL EXAM

CE6411 STRENGTH OF MATERIALS LABORATORY

WEEK	EXPERIMENT
1.	Tension test on mild steel rod
2.	Compression test on wood
3.	Double shear test on metal
4.	Torsion test on mild steel rod
5.	Impact test on metal specimen (Izod and Charpy)
6.	Hardness test on metals (Rockwell and Brinell Hardness Tests)
7.	Deflection test on metal beam
8.	Compression test on helical spring
9.	Deflection test on carriage spring
10.	Test on Cement

WEEK

EXPERIMENT

A. Flow Measurement

1. Calibration of Rotometer
2. Flow through Venturimeter Orificemeter
3. Flow through variable duct area - Bernoulli's Experiment
4. Flow through Orifice, Mouthpiece and Notch

B. Losses in Pipes

5. Determination of friction coefficient in pipes
6. Determination of loss coefficients for pipe fittings

C. Pumps

7. Characteristics of Centrifugal pumps
8. Characteristics of Gear pump
9. Characteristics of Submersible pump
10. Characteristics of Reciprocating pump

D. Turbines

11. Characteristics of Pelton wheel turbine
12. Characteristics of Francis turbine
13. Characteristics of Kaplan turbine

E. Determination of Metacentric height

14. Determination of Metacentric height (Demonstration)

CE6413 SURVEY PRACTICAL II

1. Study of theodolite
2. Measurement of horizontal angles by reiteration and repetition and vertical angles
3. Theodolite survey traverse
4. Heights and distances - Triangulation - Single plane method.
5. Tacheometry - Tangential system - Stadia system - Subtense system.
6. Setting out works - Foundation marking - Simple curve (right/left-handed) - Transition curve.
6. Field observation for and Calculation of azimuth
7. Field work using Total Station