Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING & EXAMINATION
B.E. IV SEMESTER CIVIL ENGINEERING

S.No.	Board of Study	Subject Code	Subject	Periods per Week			Scheme of Exam Theory/Practical			Total Marks	Credit L+(T+P)/ 2
				L	T	P	ESE	CT	TA		
1	Civil Engg.	320411 (20)	Structural Analysis I	4	1		80	20	20	120	5
2	Civil Engg.	320412 (20)	Fluid Mechanics II	4	1		80	20	20	120	5
3	Civil Engg.	320413 (20)	Surveying II	3	1		80	20	20	120	4
4	Civil Engg.	320414 (20)	Civil Engineering Drawing	1	3		80	20	20	120	4
5	Civil Engg.	320415 (20)	Building Construction	3	1		80	20	20	120	4
6	Civil Engg.	320416 (20)	Engineering Geology	2	1		80	20	20	120	3
7	Civil Engg.	320421 (20)	Fluid Mechanics II Lab			3	40		20	60	2
8	Civil Engg.	320422 (20)	Surveying Field Work II			3	40		20	60	2
9	Civil Engg.	320423 (20)	Civil Engineering Drawing			3	40		20	60	2
10	Civil Engg.	320424 (20)	Engineering Geology Lab			3	40		20	60	2
11	Humanities etc.	300425 (46)	Health, Hygiene & Yoga			2			40	40	1
12			Library			1					
			Total	**17**	**8**	**15**	**640**	**120**	**240**	**1000**	**34**

L- Lecture T- Tutorial
P- Practical , ESE- End Semester Exam
CT- Class Test TA- Teacher's Assessment

Note (1) : Duration of all theory papers will be of **Three Hours.**

Note (2) : Industrial Training of six weeks is mandatory for B.E. student. It is to be completed in two parts. The first part will be in summer after IV sem. after which students have to submit a training report which will be evaluated by the college teachers during B.E. V sem.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **IV Sem.** Branch: **Civil Engineering**

Subject: **Structural Analysis-I** Code: **320411 (20)**

Total Theory Periods: **40** Total Tutorial Periods: **10**

Total Marks in End Semester Exam: **80**

Minimum number of class tests to be conducted: **2**

UNIT 1 Determinate Structures

Determinate vs. Indeterminate structures, static indeterminacy, External and internal indeterminacy, rules for determining degree of indeterminacy, Degree of Freedom Per Node, Kinematic Indeterminacy.

Pin Jointed determinate space trusses, distinction between determinate and indeterminate space trusses and simple and complex space trusses, Analysis of simple and determinate space trusses. Method of Substitution and Method of tension coefficient.

UNIT 2 Deflection and Slope

Moment curvature relation, The elastic curve, Relation between Loading, SF, BM, Slope and Deflection, Deflection and slopes of statically determinate beams by Double integration method, Macaulay's method, Area moment method. Basics of Conjugate beam method.

UNIT 3 Strain Energy

Strain energy due to axial load, bending, shear and torsion, Castigliano's theorem for deflection, Betti's theorem - Maxwell's law of reciprocal deflections, unit load and strain energy method for determination of deflections of statically determinate beams - pin-joined trusses and rigid frames.

UNIT 4 Rolling Loads & Influence Lines

Introduction to Rolling loads - concept of influence lines - influence lines for reaction, shear force and bending moment in simply supported beams - influence lines for forces in trusses - analysis for different types of rolling loads - single concentrated load - several concentrated loads - uniformly distributed load shorter and longer than the span, Absolute maximum bending moment.

UNIT 5 Cables, suspension bridges & arches

Analysis of forces in cables with concentrated and continuous loadings - suspension bridges with three-hinged and two-hinged stiffening girders, Theory of arches - Eddy's theorem - analysis of three-hinged and two-hinged arches - settlement and temperature effects, moving load & influence lines.

Name of Text Books:

Basic Structural Analysis (Vol. I & II) – Bhavikatti S.S. (Vikas Publishing)

Theory of Structures – B.C. Punmia (Laxmi Publication)

Name of Reference Books:

Theory & Analysis of Structures (Vol. – I & II) – Jain, O.P. and Jain B.K. (Nem Chand)

Structural Analysis – R.C. Hibber (Pearson Publication)

Structural Analysis – Ghali, A. & Neville, M. (Chapman & Hall Publication. 1974)

Elementary Structural Analysis – Willbur and Norris (Tata McGraw Hill)

Structural Analysis – Negi L.S. & Jangid R.S. (Tata McGraw Hill)

Theory of Structures – Ramamurtham S. & Narayan R. (Dhanpat Rai Publications)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: IV Sem. **Branch: Civil Engineering**
Subject: Fluid Mechanics – II Code: **320412 (20)**
Total Theory Periods: 40 Total Tutorial Periods: 10
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

Unit 1 Turbulent flow in pipe

Nature of turbulence, free and wall turbulence, turbulent flow in pipes, equation for velocity distribution over smooth and rough surfaces, energy and momentum correction factor, Resistance coefficient (Friction factor) and its variation, Colebrook-White equation, Moody's diagram, Explicit equation for friction factors, concept of equivalent length, pipes in series and parallel, Analysis of pipe network (Hardy-Cross method).

Unit 2 Boundary layer Analysis

Boundary layer thickness, boundary layer over a flat plate, laminar boundary layer, turbulent boundary layer, and laminar sub layer, Application of momentum equation, local and average friction coefficient.

Fluid flow past submerged bodies

Drag and lift, drag on sphere, cylinder and disc, Magnus effect.

Unit 3 Non-uniform flow in open channel

Specific energy, critical flow, analysis of flow over hump and transition, broad crested weir, equation of gradually varied flow, hydraulic jump and evaluation of its elements in rectangular channel.

Unit 4 Compressibility effect in pipe flow

Transmission of pressure waves in rigid and elastic pipes, water hammer, and analysis of simple Surge tank excluding friction.

Dimensional analysis and Hydraulic similitude

Dimensional analysis, Buckingham's theorem, important dimensionless numbers and their significances, geometric, kinematics and dynamic similarity, model study.

Unit 5 Hydraulic Machines

Turbines: Classification of turbines, draft tube, specific speed, unit quantities, and characteristics curves of turbines, and governing of turbine.

Pump: Classification of pumps, types, efficiencies, specific speed, selection, cavitations, characteristic curves.

Name of Text Books:

Fluid Mechanics and Machines – Dr. A.K. Jain (Khanna Publications)
Fluid Mechanics and Machines – Dr. R.K. Bansal (Laxmi Publications)

Name of Reference Books:

Fluid Mechanics – Dr. P.N. Modi (Standard Book House)
Mechanics of Fluid – Irving H. Shames (McGraw Hill)
Introduction to Fluid Mechanics – James A. Fay (Prentice Hall India)
Fluid Machines – Dr. Jagdish Lal (Metropolitan Book Company Private Ltd.)
Fluid Machines – John P. Douglas (Pearson Publication)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **IV Sem.** Branch: **Civil Engineering**

Subject: **Surveying-II** Code: **320413 (20)**

Total Theory Periods: **40** Total Tutorial Periods: **10**

Total Marks in End Semester Exam: **80**

Minimum number of class tests to be conducted: **2**

Unit 1 Trilateration and Triangulation

Principle of Trilateration, EDM instrument and their uses, Reduction of observation, Principle and classification of Triangulation System, Triangulation chains, Strength of Figures, Station marks and Signals, Satellite station, intersected and Resected points, field work- Reconnaissance, Intervisibillty of station, Angular measurement, Base line measurement and its extension, Adjustment of Field observation and computation of co-ordinates.

Unit 2 Adjustment Computations

Weighting of observations. Treatment of random errors, probability equation, Normal law of error, Most Probable Value 7 measures of precision, Propagation of errors and variances. Most probable value, Principle of Least square, Observations and correlative Normal Equations. Adjustment triangulation figures and level nets.

Unit 3 Tacheometery

Definitions, Principles of stadia systems. Instrument constants, Substance and Tangential Systems. Construction and use of Reduction Tacheometers, Range Finders,

Unit 4 Photographic and aerial surveying

Photo theodolite, principle of the method of terrestrial photogrammetry, stereo photogrammetry, aerial surveying, scale and distortion of the vertical and tilted photograph, comparison between air photograph and map.

Unit 5 Hydrographic surveying

Introduction, shore line survey, soundings methods, gauges, equipment required for hydrographic surveying, sounding party, methods of locating soundings, reduction of soundings and plotting of soundings, problems related to hydrographic surveying.

Name of Text Books:

- Surveying (Vol. I & II) – Punmia, B.C. (Laxmi Publications, New Delhi, 1996)
- Surveying (Vol. I & II) – Kanetkar T.P. (Pune Vidyarthi Griha Prakashan, Pune)

Name of Reference Books:

- Engineering Surveying Technology – Kennie, T.J.M. and Petrie G. (Blackie & Sons Pvt. Ltd., London, 1990)
- Surveying (Vol. II & III) – Agor, R (Khanna publications, Delhi, 1995)
- Surveying (Vol. II & III) – Arora, K.R. (Standard Book House, Delhi, 1993)
- Solving Problems in Surveying – Bannister A. and Baker, R. (Longman Scientific Technical, U.K., 1994)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **IV Sem.** Branch: **Civil Engineering**

Subject: **Civil Engineering Drawing** Code: **320414 (20)**

Total Theory Periods: **40** Total Tutorial Periods: **10**

Total Marks in End Semester Exam: **80**

Minimum number of class tests to be conducted: **2**

Duration of end semester exam: 4 hours

Unit 1

General Principles of planning - Aspects, Prospects, Circulation, Grouping, Roominess, Sanitation, Economy, Elegance, Furniture requirements, flexibility, Privacy.

Site selection and requirements of different public buildings such as hospitals, schools, hostels using line plan.

Municipal regulations and bye-laws for residential buildings.

Unit 2

Drawing of plan of single, double story residential buildings and hostels, single line plan of primary health centre, school, canteen for given site requirements.

Unit 3

Drawing of elevation of single and double story residential buildings, primary health centre, school, hostel, canteen for given site requirements.

Unit 4

Drawing of section of single and double story residential buildings, primary health centre, school, hostel, canteen for given site requirements.

Unit 5

Detailing of flush shutter, panelled shutter, fully glazed, half glazed, half glazed and half panelled doors and windows, elements of perspective, example on simple blocks.

Name of Text Books:

- A course in Civil Engineering Drawing – V.B. Sikka (Katson Technical Publications)
- Civil Engineering Drawing – Shah, Kala and Patki (Tata McGraw Hill)

Name of Reference Books:

- A Textbook of Civil Engineering Drawing: Buildings – R.P. Chandel (Katson Technical Publications)
- Planning and Designing Buildings – Y.S. Sane (Allies Book Stall and Engineering Book Publishing Co.)
- Hospitals: Planning, Design and Management – Kunders, Gopinath & Ashoka Katakam (Tata McGraw Hill)
- A Book of Home Plans – D. N. Ghose (CBS Publishers and Distributors)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **IV Sem.** Branch: **Civil Engineering**

Subject: **Building Construction** Code: **320415 (20)**

Total Theory Periods: **40** Total Tutorial Periods: **10**

Total Marks in End Semester Exam: **80**

Minimum number of class tests to be conducted: **2**

UNIT 1 Foundations

Brief study of different types of foundations, nature of soil (expansive or non-expansive, alluvial or residual, sandy or clayey for settlement etc.), approximate values of bearing capacities, breadth and depth of foundation, typical cross sections for foundations under walls and R.C.C. Columns. Foundations in black cotton soils, under reamed pile foundations, foundation failures and remedial measures.

UNIT 2 Masonry

Technical terms in masonry, classification and brief specifications of stone masonry, bonds in brick masonry, general principles to be observed in stone and Brick Masonry Construction.

Walls

Different types (load bearing, cavity-walls and partition walls), thickness considerations.

Doors, Windows And Lintels

Different types based on materials and methods of construction, technical terms, size and locations.

UNIT 3 Floors

Ground and upper floors, various types, their suitability, construction details of concrete and terrazzo floors, Floor tiles.

Roofs

Technical terms and different types of pitched and flat roofs. Various roof coverings for pitched and flat roofs.

Formwork

Different types of formwork, stripping times.

UNIT 4 Damp Proofing

Causes and effect of Dampness, parts of a building likely to be affected most, methods of damp proofing in different locations including roofs.

Plastering And Pointing

Types and considerations during plastering and pointing.

Joints

Construction, Contraction and Expansion Joints.

UNIT 5 Stairs

Types based on geometry and material, suitability, proportioning of stairs, lifts and escalators.

Sound Proofing

Materials and Methods of sound proof construction.

Fire Proofing

Materials and Methods of fire proof construction.

Name of Text Books:

Building Construction – B.C. Punmia (Laxmi Publication Pvt. Ltd.)

Building Construction – Sushil Kumar (Standard Publication Distributors)

Name of Reference Books:

Building Construction – Gurucharan Singh (Standard Publication Distributors)

Building Construction – S. C. Rangwala (Charotar Publishing House, Anand, Gujarat)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **IV Sem.** Branch: **Civil Engineering**

Subject: **Engineering Geology** Code: **320416 (20)**

Total Theory Periods: **40** Total Tutorial Periods: **10**

Total Marks in End Semester Exam: **80**

Minimum number of class tests to be conducted: **2**

UNIT 1

Minerals

Minerals, their physical properties, optical properties and chemical properties.

The detailed study of certain rock forming minerals with respect to the physical properties.

Unit 2

Rocks and Rock deformation

Their origin, structure, texture, classification of rocks in brief and their suitability as Engineering materials, dip and strike of bed, Folds, Faults, joints, unconformity and their classification, causes and relation to engineering bahaviour of rock masses.

Unit 3

Earthquake

Earthquake, its causes, classification, seismic zones of India and Geological consideration for construction of building, reservoir related, earthquake problem and its preventive measures, distribution of seismic zones in India.

Unit 4

Landslides and Land subsidence

Landslides, its causes, classification and preventive measures, land subsidence, its causes and preventive measures.

Unit 5

Engineering Geological Sites Selection

Engineering Geological considerations for site selection of Dams and Reservoirs, Tunnels, Bridges and Highways, Geological Maps, concept of geological maps, important terminology used for map and making a section from the map.

Name of Text Books:

A Textbook of Geology – Mukherjee P.K. (World Press Publishers)

Engineering Geology – D.S. Arora (Mohindra Capital Publisher, Chandigarh)

Name of Reference Books:

Geology and Engineering – Leggot, R.F. (Mc-Graw Hill, New York)

A Geology for Engineers – Blyth, F.G.M. (Arnold, London)

Civil Engineering Geology – Cyril Sankey Fox (C. Lockwood and son, U.K.)

Engineering and General Geology – Prabin Singh (Katson Publication House)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **IV Sem.** Branch: **Civil Engineering**

Subject: **Fluid Mechanics - II Lab** Practical Code: **320421 (20)**

Total Practical Periods: **36**

Total Marks in End Semester Exam: **40s**

Experiments to be performed(Minimum 10 experiments)

1. To study the transition from laminar to turbulent flow and to determine the lower critical Reynold's number.
2. To study the velocity distribution in pipe and to compute the discharge by integrating velocity profile.
3. To study the variation of friction factor for pipe flow.
4. To determine the roughness coefficient of a open channel.
5. To determine the coefficient of discharge of a weir.
6. To determine the coefficient of discharge of a venturiflume.
7. Study of the hydraulic jump in a open channel.
8. To determine the coefficient of discharge of a spillway.
9. To study the performance characteristics of Pelton wheel turbine.
10. To study the performance characteristics of Francis turbine.
11. To study the performance characteristics of Kaplan turbine.
12. To study the performance characteristics of variable speed centrifugal pump.
13. To study the performance characteristics of rated speed centrifugal pump.
14. To study the performance characteristics of multistage pump.
15. To study the performance characteristics of reciprocating pump.

List of Equipments / Machine Required:

1. Pipe Flow Apparatus
2. Tilting Flume
3. Pelton Wheel Turbine
4. Francis Turbine
5. Kaplan Turbine
6. Variable Speed Centrifugal Pump
7. Rated Speed Pump
8. Multistage Pump
9. Reciprocating Pump

Recommended Books:

Hydraulics Laboratory Manual – S.K. Likhi (New Age International Ltd.)

Fluid Mechanics – Jagdish Lal (Metropolitan Educational, New Delhi)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester: **IV Sem.** Branch: **Civil Engineering**

Subject: **Surveying Field Work II** Practical Code: **320422 (20)**

Total Practical Periods: **36**

Total Marks in End Semester Exam: **40**

Experiments to be performed(Minimum 10 experiments)

1. Determination of Tacheometric constants.
2. To find the most probable value of angle for combined triangle by method of difference.
3. To find the most probable value of triangles of a quadrilateral shapes by method of correlates.
4. To find the most probable value of triangles by the method of Gauss rule.
5. Determination of elevation and height by tangential method when both angles are angles of elevation.
6. Adjustment of two connected triangles.
7. Adjustment of quadrilateral by method of least square.
8. Adjustment of geodetic triangles with central station by method of least square.
9. To perform the experiment for reduction to centre from different positions of a satellite station when: (i) Satellite station in north position, (ii) Satellite station in left position.
10. To perform the experiment for reduction to centre from different positions of a satellite station when: (i) Satellite station in south position, (ii) Satellite station in right position.
11. Determination of elevation and distance when line of sight inclined upward.
12. Determination of elevation and distance when line of sight inclined downward.
13. Study of Electronic Digital Theodolite.
14. Study of Total Station.
15. Study of Auto level.

List of Equipments / Machine Required:

1. Metric Chain (30 m)
2. Tape (15m, 30 m)
3. Ranging Rod (2m, 3m)
4. Plumb bob
5. Arrows
6. Theodolite
7. Electronic Digital Theodolite
8. Auto level
9. Total Station
10. Leveling Staff (Folding and Non-folding)
11. Wooden Pegs
12. Cross Staff

Recommended Books:

Surveying (Vol. I & II) – Punmia, B.C. (Laxmi Publications, New Delhi, 1996)
Surveying (Vol. I & II) – Kanetkar T.P. (Pune Vidyarthi Griha Prakashan, Pune)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **IV Sem.** Branch: **Civil Engineering**

Subject: **Civil Engineering Drawing** Practical Code: **320423 (20)**

Total Practical Periods: **3**

Total Marks in End Semester Exam: **40**

Experiments to be performed(Minimum 10 experiments)

1. Introduction to AutoCAD drafting package.
2. Introduction to AutoCAD drafting package.
3. To draw the cross section of a wall and its foundation.
4. To draw the foundation details of internal and external walls.
5. To draw the line plan of a primary school building.
6. To draw the line plan of a hostel building.
7. To draw the line plan of a hospital building.
8. To draw the line plan of a single storey residential building.
9. To draw the ground floor plan of a residential building.
10. To draw the section for the above plan showing maximum details.
11. To draw the corresponding front elevation of the above residential building.
12. To draw the plan and section of a fully furnished bathroom.
13. To draw the plan and section of a fully furnished kitchen.
14. To draw section and elevation of flush shutter, paneled shutter doors and windows.
15. To draw section and elevation of fully glazed, half glazed, half glazed and half pannelled doors and windows

List of Equipments / Machine Required:

PC system.

AutoCAD Software.

Recommended Books:

AutoCAD 2000 Complete – et. al. (BPB Publications)

An introduction to AutoCAD 2000 – A. Yarwood (Pearson Educations)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: IV Sem. **Branch: Civil Engineering**

Subject: Engineering Geology Lab **Practical Code: 320424 (20)**

Total Practical Periods: 36

Total Marks in End Semester Exam: 40

Experiments to be performed(Minimum 10 experiments)

1. Megascopic description of granite, pegmatite, syenite.
2. Megascopic description of basalt, gabbro, charnokite, dolerite.
3. Megascopic description of limestone, sand - stone, shale.
4. Megascopic description of conglomerate, breccias, clay.
5. Megascopic description of slate, phyllite, marble.
6. Megascopic description of quartzite, schist, gneiss.
7. Simple geological maps
8. Drawing of cross section, filling of geological data there in, determination of thickness of beds.
9. Drawing of faults, with identification of folds, faults, unconformity, intrusion and combination of these.
10. Study of structural models of folds, faults, unconformity.
11. Megascopic study of Talc, gypsum, calcite, fluorite, apatite.
12. Megascopic study of feldspar, quartz, topaz, corundum.
13. Megascopic study of hornblende, garnet, tourmaline asbestos, olivine,.
14. Megascopic study of serpentine, barite, muscovite, biotite, arpiment, realgar, sulpher, amethyst & varieties of uartz, zeolite
15. Megascopic identification of Hematite, magnetite, pyrite, chalespyrite, pyrolusite, psilomelane, beryl, magnesite, bauxite, zincite, galena etc.

List of Equipments / Machine Required:

1. Crystallographic Model
2. Wooden Cabinet
3. Axis of symmetrical of 6 System
4. Planes of symmetrical of 6 System
5. Crystallographic Axis & Centre of System
6. Mohr Scale of Hardness
7. Collection of Minerals
8. Streak Plates
9. Hardness Testing Knife
10. Model Showing Strike, Dip, Pitch
11. Symmetrical Anticline Showing Axis-Axial Plane
12. Asymmetrical Anticline Showing Axis-Axial Plane
13. Isoclinals Anticline & Syncline
14. Recumbent Fold
15. Fan Fold
16. Model of Normal Fault
17. Model of Reverse Fault
18. Ridge & Trough Fault
19. Step Fault
20. Rock Specimen
21. Mineral Specimen For Habit & Structure
22. Mineral Specimen For Color & Lusture
23. Wooden Specimen Tray
24. Polarizing Petrological Microscope
25. Resistivity Meter
26. Mineral Specimens

Name of Text Books:

i. Engineering and General Geology – Prabin Singh (Katson Publication House)
ii. A Textbook of Geology – Mukherjee P.K. (World Press Publishers)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester : B.E. IV Sem.
Subject : **HEALTH, HYGIENE & YOGA**
No. of Periods : 2 pds/week
Total Marks in End Semester Exam. : NIL
Minimum number of class tests to be conducted: Two

Branch: Common for all branches
Code : 300425 (46)
Tutorial Periods : NIL
Teacher's Assessment: 40 Marks

UNIT- I

HEALTH & HYGIENE: Concept of health, Physical health and mentall health and wellbeing and how to achieve these, longevity and how to achieve it, concept and common rules of hygiene, cleanliness and its relation with hygiene; Overeating and undereating, amount of food intake required, intermittent fasting; adequate physical labour, sleep; consumption of junk fast food vs nutritious food; fruits, vegetables cereals and qualities of each of these.

UNIT- II

INTRODRCTORY KNOWLEDGE OF COMMON STREAMS OF MEDICINAL CURE: History, development, basic concepts, modes of operation of Alopathy, Ayurved, homocopathy, Biochemic, Unani, Siddha, Accurpressure, Accupunture, Naturopathy, Yogic and Herbal system of medicines, Introduction of Anatomy and Physicalogy Concerned.

UNIT- III

YOGASANS: Meaning and concept of Yoga, Yogasans and its mode of operation, How to perform Yogasans, Common Yogasans with their benefits, such as, Padahastasan, Sarvangasan, Dhanurasan, Chakrasan, Bhujangasan, Paschimottasan, Gomukhasan, Mayurasan, Matsyasan, Matsyendrasan, Pawanmuktasan, Vajrasan, Shalabhasan, Sinhasan, Shashankasan, Surya Namaskar, Halasan, Janushirasan, Utshep Mudra,

UNIT- IV

YOGASANS FOR COMMON DISEASES: From Yogic Materia Medica with symptoms, causes, asans and herbal treatment.

- **Modern silent killers**: High blood pressure, diabetes and cancer, causes and cure; Common health problems due to stomache disorders, such as, indigestion, acidity, dycentry, piles and fissures, artheritis, its causes, prevention and cure.
- **Asans for relaxation:** Shavasan, Makarasan, Matsyakridasan, Shashankasan.
- **Asans to increase memory and blood supply to brain**: Shirsh padasan, Shashankasan.
- **Asans for eye sight**: Tratak, Neti Kriya .
- **Pranayam** : Definition and types : Nadi Shodhan, Bhastrik, Shitakari, Bhramari useful for students.

UNIT V

CONCENTRATION: Concentration of mind and how to achieve it. Tratak ¼=kVd½] Concentration on breath, Japa ¼ti½] Ajapajap ¼vtikti½] internal silence ¼vUrekSZu½] visualization in mental sky ¼fpnkdk'k /kkj.kk½] Concentration on point of light ¼T;ksfr /;ku½] Concentration on feeling ¼Hkko /;ku½] Concentration on figure ¼ewÙkZ /;ku½-

REFERENCES

(1) Yogic Materia Medica
(2) Asan, Pranayam and Bandh

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