Appendix - C

GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT

Department of Civil Engineering

Academic Year: **2016-17** Semester**: EVEN**

COURSE PLAN

Semester: **VI** Subject Code& Name: **10CV64 & Geotechnical Engineering-II**

Name of Subject Teacher: **CHANDAN M R**

Name of Subject Expert (Reviewer): **ASIF**

For the Period: From: 30-01-17 to -05-17

Details of Book to be referred:

Text Books	**T1. Soil Engineering in Theory and Practice**- Alam Singh and Chowdhary G.R. (1994), CBS Publishers and Distributors Ltd., New Delhi. **T2. Soil Mechanics and Foundation Engg.** - B.C. Punmia (2005), 16th Edition Laxmi Publications Co., New Delhi.
Reference Books	**R1. Foundation Analysis and Design**- J.E. Bowles (1996), 5th Edition, McGraw Hill Pub. Co. New York. **R2. Soil Mechanics and Foundation Engineering**- V.N.S. Murthy (1996), 4th Edition, UBS Publishers and Distributors, New Delhi. **R3. Basic and Applied Soil Mechanics**- Gopal Ranjan and A.S.R. Rao (2000), New Age International (P) Ltd., New Delhi. **R4. Geotechnical Engineering**- Venkatrahmaiah C. (2006), 3rd Edition New Age International (P) Ltd., New Delhi. **R5. Soil Mechanics**- Craig R.F. (1987), Van Nostrand Reinhold Co. Ltd. **R6. Principles of Geotechnical Engineering**- Braja M. Das (2002), 5th Edition, Thomson Business Information India (P) Ltd., India. **R7. Text Book of Geotechnical Engineering**- Iqbal H. Khan (2005), 2nd Edition, PHI, India.

Lecture NO	Topic Planned	Practical Applications & Brief objectives	Book referred with No.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD
1.	**INTRODUCTION TO SUBJECT**	**Objective:** To obtain necessary information about the soil and hydrological conditions at the site and to know the engineering properties of soil. **Application:** To know about the sub-soil conditions for the design and execution of engineering works. **OUTCOME:** Determination of in-situ values of density, bearing capacity, shear strength, permeability and pore pressures.	**T2: 859-861 R4: 726-729**	7/2/2017				
2.	**Unit-1: SUBSURFACE EXPLORATION:** Importance of exploration Program. Methods of exploration: Boring.		**T2: 869-870 R4: 746**	8/2/2017				
3.	Seismic refraction method of geophysical exploration.		**T2: 864-866 R4: 733**	10/2/2017				
4.	Types of samples - undisturbed, disturbed and representative samples.		**T2: 864-865 R4: 734**	14/2/2017				
5.	Samplers, sample disturbance, area ratio, recovery ratio, clearance.		**T2: 862-863 R4: 730-732, 751**	15/2/2017				
6.	Stabilization of boreholes - Typical bore log. Number and depth of borings for various civil engineering structures, soil exploration report.		**T2: 267**	15/2/2017				
7.	**DRAINAGE AND DEWATERING:** Determination of ground water level by Hvorselev's method.		**T2: 268-269**	16/2/2017				
8.	Control of ground water during excavation: Dewatering - Ditches and sumps, well point system		**T2: 270-271**	21/2/2017				
9.	Vacuum method, Electro-Osmosis method.		VTU question paper	22/2/2017				
10.	**Revision / Unit Test**			22/2/2017				

11.	**UNIT-2 STRESSES IN SOILS:** Boussinesq's and Westergaard's theories for concentrated loads.	**Objective:** To know about the stresses and displacements in soil mass, due to various types of surface loading. **Application:** The stresses occurring in the soils are analyzed by various theories. **OUTCOME:** The vertical pressure distribution diagrams can be prepared.	**T2: 296-300 R4: 353, 360**	23/2/2017				
12.	Boussinesq's and Westergaard's theories for circular loads.		**T2: 303-305 R4: 366, 368**	28/2/2017				
13.	Boussinesq's and Westergaard's theories for rectangular loads.		**T2: 307-310 R4: 370, 373**	1/3/2017				
14.	Comparison of Boussinesq's and westergaard's analysis.		**T2: 316-319**	1/3/2017				
15.	Pressure distribution diagrams, Contact pressure, Newmark's chart.		**T2: 322-328 R4: 374**	2/3/2017				
16.	Numerical		**T2: 329**	3/3/2017				
17.	**Revision / Unit Test**		VTU question paper	3/3/2017				
18.	**Unit 3: FLOWNETS:** Laplace equation (no derivation) assumptions and limitations only. Characteristics and uses of flownets.	**Objective:** To know about the seepage analysis and the direction of flow. **Application:** Estimating the quantity of seepage and to draw phreatic line for dams. **OUTCOME:** Determination of phreatic line in earth dams with and without filter and providing protective filter.	**T2: 230 R4: 176**	4/3/2017				
19.	Methods of drawing flownets for Dams and sheet piles.		**R4: 168-172**	7/3/2017				
20.	Estimating quantity of seepage and Exit gradient.		**T2:235, 250 R4: 172**	8/3/2017				
21.	Determination of phreatic line in earth dams with and without filter.		**T2:238- 243**	8/3/2017				
22.	Piping and protective filter.		**T2: 250**	14/3/2017				
23.	**Revision / Unit Test**		VTU question paper	15/3/2017				

24.	**UNIT 4: LATERAL EARTH PRESSURE:** Active and Passive earth pressures, Earth pressure at rest.	**Objective:** To compute the lateral pressure exerted by the retained mass of soil. **Application:** Design of retaining walls, sheet piles or other earth-retaining structures. **OUTCOME:** Graphical solutions for active earth pressure using Culmann's and Rebhann's methods.	**T2: 499-503 R4: 451-454**	15/3/2017				
25.	Rankine's and Coulomb's Earth pressure theories-assumptions and limitations		**T2: 521-523 R4: 455, 471**	16/3/2017				
26.	Graphical solutions for active earth pressure (cohesionless soil only)		**T2: 532-533 R4: 458, 473**	17/3/2017				
27.	Culmann's and Rebhann's methods.		**T2: 524-525 R4: 481, 490**	17/3/2017				
28.	Lateral earth pressure in cohesive and cohesionless soils.		**T2: 504-510 R4: 499**	21/3/2017				
29.	Earth pressure distribution.		**T2: 535-537**	22/3/2017				
30.	Numerical		**T2: 529**	22/3/2017				
31.	**Revision / Unit Test**		VTU question paper	28/3/2017				
32.	**Unit 5: STABILITY OF EARTH SLOPES:** Types of slopes, causes and type of failure of slopes.	**Objective:** To determine the stressed internal surface and magnitude of shearing stress. **Application:** Analyzing the stability of earth slopes for railways, earth dams.	**T2: 603 R4: 318**	30/3/2017				
33.	Definition of factor of safety, Stability of infinite slopes.		**T2: 603-607 R4: 319**	31/3/2017				
34.	Stability of finite slopes by Method of slices.		**T2: 609-610 R4: 327**	31/3/2017				
35.	Stability of finite slopes by Friction Circle method.		**T2: 619-621 R4: 336**	4/4/2017				
36.	Stability of finite slopes by Taylor's stability number.		**T2: 621-624 R4: 340**	5/4/2017				
37.	Stability of finite slopes by Fellineous method.		**T2: 614 R4: 328-330**	5/4/2017				
38.	Numerical		**T2: 624**	6/4/2017				

39.	**Revision / Unit Test**	**OUTCOME:** Stability of finite and infinite slopes by various methods.	VTU question paper	7/4/2017				
40.	**Unit 6: BEARING CAPACITY:** Definitions of ultimate, net and safe bearing capacities, allowable bearing pressure.	**Objective:** To determine the bearing capacity of various types of soils and to design the footings. **Application:** Evaluation of bearing capacity by various field methods. **OUTCOME:** Effect of various parameters on bearing capacity. Designing the footings.	**T2: 639-641 R4: 541**	7/4/2017				
41.	Terzaghi's and Brinch Hansen's bearing capacity equations - assumptions and limitations.		**T2: 643-652 R4: 556, 565**	11/4/2017				
42.	Bearing capacity of footing subjected to eccentric loading.		**T2: 658**	12/4/2017				
43.	Effect of ground water table on bearing capacity.		**T2: 656-657 R4: 568**	12/4/2017				
44.	Field methods of evaluation of bearing capacity - Plate load test.		**T2: 673-678 R4: 573**	13/4/2017				
45.	Standard penetration test.		**T2: 680-681**	20/4/2017				
46.	Cone penetration test.		**T2: 682-683**	21/4/2017				
47.	Numerical		**T2: 689-692**	21/4/2017				
48.	**Revision / Unit Test**		VTU question paper	25/4/2017				
49.	**UNIT 7: FOUNDATION SETTLEMENT:** Importance and Concept of Settlement Analysis.	**Objective:** To determine the settlement of soils and to design the structure based on settlement analysis.	**T2: 339 R4: 390**	26/4/2017				
50.	Immediate, Consolidation and Secondary settlements (no derivations, but, computation using relevant formula for Normally Consolidated soils).		**T2: 371-375 R4: 393**	28/4/2017				

51.	Tolerance. BIS specifications for total and differential settlements of footings.	**Application:** To analyze the amount and type of settlement with the variation of time. **OUTCOME:** Designing of footings for maximum load.	**T2: 709-710**	28/4/2017				
52.	BIS specifications for total and differential settlements of rafts.		**T2: 714-715**	2/5/2017				
53.	Numerical		**T2: 722-724**	3/5/2017				
54.	**Revision / Unit Test**		VTU question paper	3/5/2017				
55.	**Unit 8: PROPORTIONING SHALLOW AND PILE FOUNDATIONS:** Allowable Bearing Pressure	**Objective:** To determine the factors influencing the selection and depth of foundation. **Application:** Proportioning of isolated, combined, strip and mat foundations. **OUTCOME:** To know about the types of shallow and deep foundations.	**R4: 607, 651**	4/5/2017				
56.	Factors influencing the selection of depth of foundation. Factors influencing Allowable Bearing Pressure.		**R4: 618**	5/5/2017				
57.	Factors influencing the choice of foundation.		**R4: 613**	6/5/2017				
58.	Proportioning isolated, combined, strip and mat foundations.		**T2: 711-712**	9/5/2017				
59.	Classification of pile foundation, Pile load capacity.		**T2: 727-729**	16/5/2017				
60.	Proportioning pile foundation.		**T2: 730-734**	17/5/2017				
61.	**Revision / Unit Test**		VTU question paper	17/5/2017				

Prepared By:_____ (Faculty) Date & Sign _____

Reviewed by: _____ (Sub. expert) Date & Sign _____

Approved by: _____ (HOD) Date & Sign _____

Approved by: _____ (Principal/ Acad. Co) Date & Sign _____