SRI BHARATHI

ENGINEERING COLLEGE FOR WOMEN

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

Kaikkurichi, Pudukkottai -622 303

www.sbec.edu.in

NAAC DOCUMENTS

Quality Indicator Frame Work

Criterion – 1

CURRICULAR ASPECTS

Submitted by

IQAC

Internal Quality Assurance Cell

Sri Bharathi Engineering College for Women

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Criterion 1	Curricular Aspects	100

1.1 Curricular Planning and Implementation(20)

1.1.1 The Institution ensures effective curriculum planning and delivery through a well-planned and documented process including Academic calendar and conduct of continuous internal Assessment

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SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF CIVIL ENGINEERING

PREFACE OF THE COURSE FILE

Batch : **2021 -2025**

Academic Year : **2022-2023 / EVEN**

Program : **BE - CIVIL ENGINEERING**

Year & Semester : **II Year / IV Semester**

Course Code : **CE3404** **NBA COURSE CODE: C213**

Name of the Course : **SOIL MECHANICS**

Faculty Incharge : **Ms.Raci.Mahizhini AP/Civil**

Signature of the Faculty 1.2.23

HoD/Civil 1/2/23

HOD / CIVIL
SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN
KAIKKURICHI,
PUDUKKOTTAI - 622 303

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
SRI BHARATHI ENGINEERING
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Kaikkurchi - 622 303, Pudukkottai Dt.

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DEPARTMENT OF CIVIL ENGINEERING

REVIEW OF COURSE FILE

(to be pasted on the inner side of the file-backside).(#-State Yes/No.)

S.NO	Details Date:	R-I-*	R-II-*&	R-III-*&	R-IV-*&$	R-V-*&$@
1.	Preface of the course file	Yes				
2.	Vision, Mission, PEOs, POs, PSOs, Blooms taxonomy	Yes				
3.	Subject handlers of yesteryears					
4.	Timetable/Workload of the staff – Distribution of teaching load – Roles and Responsibilities	Yes				
5.	Syllabus signed by staff & HoD	Yes				
6.	Lecture Schedule signed by staff & HoD	Yes				
7.	Course Committee meeting circular and minutes	Yes				
8.	Identification of Curricular gap and Content Beyond the syllabus	Yes				
9.	Self-study topics	Yes				
10.	Previous AU Question papers	Yes				
11.	Unit wise Q&A and Objective type questions	Yes				
12.	Unit wise course material	Yes				
13.	Assignment question paper with sample answer sheets and mark entry		Yes			
14.	Tutorial question paper with key and mark entry		Yes			
15.	Class test/IA test Q Paper with Key, sample answer papers and mark entry		Yes			
16.	IA Test- result analysis-CAP-evidence-root cause analysis.		Yes			
17.	Retest –Q paper-Attendance-marks		Yes			
18.	AU Web portal entry sheet		Yes			
19.	Very poor performance in first two tests-action taken.-communication to parents-evidence					
20.	Absence for two tests-action taken-communication to parents-evidence.					
21.	Indiscipline of student reported, if any					
22.	Special class/coaching class/remedial class/attendance-CAP					
23.	Conduct of Seminar, Quizzes - proof					
24.	Content beyond the syllabus - proof				Yes	
25.	Student feedback on faculty				Yes	
26.	Course end survey					
27.	Internal Assessment sheet				Yes	
28.	AU question paper with students feedback					
29.	Discrepancy of the question paper and correspondence, if any					
30.	AU result analysis-Details of arrear students.					
31.	AU grade sheet					Yes
32.	CO – PO & PSO attainment sheet					Yes
	Signature of Course handling faculty					
	Signature of HoD/Civil					

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DEPARTMENT OF CIVIL ENGINEERING

INDIVIDUAL STAFF WORKLOAD FOR EVEN SEMESTER (2022-2023)

S. No	STAFF NAME	SUB.CODE & SUB.NAME	YEAR / SEM	TOT. STUD	HRS	TOT. HRS
1.	Dr.S.Gunaselvi	CE8601-Design of Steel Structural Elements	III/ VI	06	6	15
		GE3251-Engineering Graphics	I/II	-	6	
		GE3271 Engineering Practices Lab	I/II	-	3	
2.	Mr. S. Rajapandian	GE3251-Engineering Graphics	I/II	-	12	15
		BE3255 - Basic Civil and Mechanical Engineering	I/II (EEE)	08	3	
3.	Mrs.R.Priya	CE8603-Irrigation Engineering	III/ VI	06	4	13
		BE3255 - Basic Civil and Mechanical Engineering	I/II (EEE)	08	3	
		GE3271 Engineering Practices Lab	I/II	-	6	
4.	Ms.G.Gayathri	CE3402-Strength Of Materials	II/ IV	09	4	15
		CE3412-Materials Testing Laboratory	II/ IV	09	5	
		GE3251-Engineering Graphics	I/II	-	6	
5.	Mrs.P.Dennis Flora	CE8604-Highway Engineering	III/ VI	06	4	15
		GE3451 Environmental Sciences and Sustainability	II/IV	23	3	
		CE3412-Materials Testing Laboratory (Skilled)	II/ IV	09	5	
		CE3413-Soil Mechanics Laboratory (Skilled)	II/ IV	09	3	
6.	Mrs.N.Chithirai Selvi	CE3403-Concrete Technology	II/ IV	09	3	12
		GE3251-Engineering Graphics	I/II	-	6	
		GE3271 Engineering Practices Lab	I/II	-	3	
7.	Mrs.R.Padma Rani	CE8021-Structural Dynamics And Earthquake Engineering	IV/VIII	10	5	14
		CE8811-Project work	IV/VIII	10	-	
		CE8611-Highway Engineering Laboratory	III/ VI	06	3	
		GE3251-Engineering Graphics	I/II	-	6	
8.	Mrs.R.Kayalvizhi	CE8602-Structural Analysis II	III/ VI	06	4	13
		GE3251-Engineering Graphics	I/II	-	6	
		GE3271 Engineering Practices Lab	I/II	-	3	
9.	Mr.A.Sivayogaraj	EN8592-Wastewater Engineering	III/ VI	06	4	15
		CE3401-Applied Hydraulics Engineering	II/ IV	09	5	
		GE3271 Engineering Practices Lab	I/II	-	3	
		CE3411-Hydraulic Engineering Laboratory	II/ IV	09	3	
10.	Ms.Mahizhini Raci	CE3404 -Soil Mechanics	II/ IV	09	4	16
		CE3405-Highway and Railway Engineering	II/ IV	09	4	
		CE3413-Soil Mechanics Laboratory	II/ IV	09	3	
		CE8612 -Irrigation and Environmental Engineering Drawing	III/ VI	06	5	

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DEPARTMENT OF CIVIL ENGINEERING

COURSE PLAN

Subject code & Name: CE3404& Soil Mechanics

Branch/Year/Sem: B.E CIVIL / II / IV Subject **Batch: 2021-2025**

Staff Name: Ms.Raci.Mahizhini **Academic year: 2022-2023**

COURSE OBJECTIVE

- To learn the soil based on index properties and to assess their engineering properties.
- To select geotechnical design parameters fundamental concepts of compaction, flow through soil, stress transformation, stress distribution.
- Also to learn the geotechnical design of design of both finite and infinite slopes.

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TEXT BOOK:

T1. Murthy, V.N.S., "Text book of Soil Mechanics and Foundation Engineering", CBS Publishers Distribution Ltd., New Delhi. 2014.

T2. Gopal Ranjan and Rao, A.S.R., "Basic and Applied Soil Mechanics", New Age Ltd. International Publisher New Delhi (India) 2006.

REFERENCES:

R1 McCarthy, D.F., "Essentials of Soil Mechanics and Foundations". Prentice-Hall, 2006.

R2 Coduto, D.P., "Geotechnical Engineering – Principles and Practices", Prentice Hall of IndiaPvt.Ltd. New Delhi, 2010.

R3 Das, B.M., "Principles of Geotechnical Engineering". Brooks/Coles /Thompson Learning Singapore, 8th Edition, 2013.

R4 Punmia, B.C., "Soil Mechanics and Foundations", Laxmi Publications Pvt. Ltd. New Delhi, 2005.

WEB RESOURCES

W1: https://archive.nptel.ac.in/courses/105/105/105105168/

W2: https://www.aboutcivil.org/soil-mechanics.html

W3: https://nptel.ac.in/courses/105103097

TEACHING METHODOLOGIES:

- BB - BLACK BOARD
- PPT - POWER POINT PRESENTATION

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CE3404 **SOIL MECHANICS** **L T P C**
3 0 0 3

OBJECTIVES

- To impart knowledge to classify the soil based on index properties and to assess their engineering properties based on the classification. To familiarize the students about the fundamental concepts of compaction, flow through soil, stress transformation, stress distribution, consolidation and shear strength of soils. To impart knowledge of design of bothfinite and infinite slopes.

UNIT I SOIL CLASSIFICATION AND COMPACTION 9

Formation of soil - Soil description – Particle – Size shape and colour – Composition of gravel, sand, silt, clay particles – Particle behaviour – Soil structure – Phase relationship – Index properties – Significance – BIS classification system – Unified classification system – Compaction of soils – Theory, Laboratory and field tests – Field Compaction methods – Factors influencing compaction ofsoils.

UNIT II EFFECTIVE STRESS AND PERMEABILITY 9

Soil - water – Static pressure in water - Effective stress concepts in soils – Capillary phenomena– Permeability interaction – Hydraulic conductivity – Darcy's law – Determination of Hydraulic Conductivity – Laboratory Determination (Constant head and falling head methods) and field measurement pumping out in unconfined and confined aquifer – Factors influencing permeability ofsoils – Seepage - Two dimensional flow – Laplace's equation – Introduction to flow nets – Simple problems. (Sheet pile and weir).

UNIT III STRESS DISTRIBUTION AND SETTLEMENT 9

Stress distribution in homogeneous and isotropic medium – Boussinesq theory – (Point load, Line load and udl) Use of New marks influence chart –Components of settlement — Immediate and consolidation settlement – Terzaghi's one dimensional consolidation theory – Computation of rate ofsettlement. - $\sqrt{t}$ and log t methods– e-log p relationship.

UNIT IV SHEAR STRENGTH 9

Shear strength of cohesive and cohesion less soils – Mohr-Coulomb failure theory – Measurement of shear strength - Direct shear, Triaxial compression, UCC and Vane shear tests – Pore pressure parameters – Cyclic mobility – Liquefaction.

UNIT V SLOPE STABILITY 9

Stability Analysis - Infinite slopes and finite slopes – Total stress analysis for saturated clay – Frictioncircle method – Use of stability number – Method of slices – Fellenious and Bishop's method - Slopeprotection measures.

TOTAL: 45 PERIODS

Signature of Faculty

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Topic No	Topic Name	Books For reference	Page No	Teaching Methodology	No of periods required	Cumulative periods
UNIT I	**SOIL CLASSIFICATION AND COMPACTION**					**(9)**
1	Formation of soil	T1	59-60	BB	1	1
2	Composition of gravel, sand,silt, clay particles	T1	60-61	BB	1	2
3	Soil structure and Phase relationship	T1	61-64	BB	1	3
4	Index properties and its significance	T1	28-33	BB	1	4
5	BIS classification system	T1	34-37	BB	1	5
6	Unified classification system	T1	113-115	BB	1	6
7	Compaction of soils	T1	116-118	BB	1	7
8	Field compaction methods	T1	119-120	BB	1	8
9	Factors influencing compaction of soils	T1	120-123	PPT	1	9
UNIT –II	**EFFECTIVE STRESS AND PERMEABILITY**					**(9)**
10	Effective stress concepts in soils	T1	197-198	BB	1	10
11	Capillary phenomena and Permeability interaction	T1	198-199	BB	1	11
12	Static pressure in water	T1	199-201	BB	1	12
13	Determination of Hydraulic Conductivity	T1	201-202	BB	1	13
14	Field measurement pumping out in unconfined aquifer	T1	202-204	BB	1	14
15	Field measurement pumping out in confined aquifer	T1	205-207	PPT	1	15
16	Factors influencing permeability of soils	T1	207-209	BB	1	16
17	Laplace's equation	T1	209-211	BB	1	17
18	Flow nets simple problems (sheet pile and weir)	T1	212-215	BB	1	18

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UNIT – III	**STRESS DISTRIBUTION AND SETTLEMENT**					**(9)**
19	Stress distribution in homogeneous and isotropic medium.	T1	237-238	BB	1	19
20	Boussinesq theory (Point load , Line load and udl)	T1	238-239	BB	1	20
21	Use of New marks influence chart	T1	239-240	BB	1	21
22	Components of settlement	T1	240-241	BB	1	22
23	Boussinesq theory	T1	242-244	BB	1	23
24	Immediate and consolidation settlement	T1	244-246	BB	1	24
25	Terzaghi's one dimensional consolidation theory	T1	247-248	PPT	1	25
26	Computation of rate of settlement	T1	249-251	BB	1	26
27	√t and log t methods and e-log p relationship.	T1	252-254	BB	1	27
UNIT IV	**SHEAR STRENGTH**					**(9)**
28	Shear strength of cohesive and cohesion less soils	T1	329-330	BB	1	28
29	Mohr-Coulomb failure theory	T1	330-331	BB	1	29
30	Measurement of shear strength	T1	332-334	BB	1	30
31	Direct shear test on sand and Vane shear tests	T1	335-338	BB	1	31
32	Triaxial compression test procedure on confined drained test.	T1	339-341	BB	1	32
33	Triaxial compression test procedure on unconfined undrained test.	T1	342-344	PPT	1	33
34	Unconfined compression test procedure for clay	T1	345-346	BB	1	34
35	Pore pressure parameters	T1	351-354	BB	1	35

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36	Cyclic mobility and Liquefaction of soil	T1	356-360	BB	1	36
UNIT V	**SLOPE STABILITY**					**(9)**
37	Stability Analysis	T1	527-528	BB	1	37
38	Infinite slopes and finite slopes	T1	529-530	BB	1	38
39	Total stress analysis for saturated clay	T1	530-532	PPT	1	39
40	Friction circle method	T1	533-535	BB	1	40
41	Use of stability number	T1	536-537	BB	1	41
42	Method of slices	T1	540-542	BB	1	42
43	Fellenious and Bishop's method	T1	544-547	BB	1	43
44	Slope protection measures	T1	548-550	BB	1	44
45	Stability analysis of retaining walls	T1	555-559	BB	1	45

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DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOME

At the end of the course student will be able to

C213.1	Explain the formation of soil and its unified classification system, formulate and solve engineering Problems.
C213.2	Describe the two dimensional flow through soil medium and its impact of engineering solution.
C213.3	Explain the basic concept of stress distribution in loaded soil medium and soil settlement due to consolidation.
C213.4	Illustrate the shear strength of cohesive and cohesion less soils and also will be aware of contemporary issues on shear strength of soils.
C213.5	Describe the stability analysis of finite slopes, component and process as per needs and specifications.
C213.6	Describe the stability analysis of infinite slopes and its failures protection measures.

CONTENT BEYOND THE SYLLABUS

- Soil stabilization methods and materials.

INTERNAL ASSESSMENT DETAILS

ASSESMENT NUMBER	I	II
UNITS	1st , 2nd & 3rd unit half	3rd unit half,4th & 5th unit

ASSIGNMENT DETAILS

ASSIGNMENT NUMBER	I	II	III	IV	V	VI	VII	VIII	IX	X
DEADLINE	16.2.23	28.2.23	09.3.23	17.3.23	10.4.23	20.4.23	28.4.23	04.5.23	11.5.23	18.5.23

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DEPARTMENT OF CIVIL ENGINEERING

ASSIGNMENT NUMBER	DESCRIPTIVE QUESTIONS/TOPIC
I	Soil structure.
II	Factors influencing compaction of soil.
III	Capillary phenomena and Permeability interaction.
IV	Seepage and Two dimensional flows.
V	Boussinesq theory (Point load, Line load and udl load).
VI	Terzaghi's one dimensional consolidation theory.
VII	Triaxial compression test procedure on confined drained test.
VIII	Shear strength of cohesive and cohesion less soils.
IX	Total stress analysis for saturated clay.
X	Friction circle method.

PREPARED BY
Raci.Mahizhini, AP/Civil

APPROVED BY
07/02/23

Principal

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VERIFIED BY
3/2/23
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DEPARTMENT OF CIVIL ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus(CBS)

Name of the Faculty : Ms.Raci.Mahizhini

Course Code & Name: CE3404 & Soil Mechanics

Academic Year: 2022 -2023 /EVEN

Degree & Program: B.E/CIVIL **Year/ Semester: II/IV**

I. Mapping of Course Outcomes with POs & PSOs.(before CBS)

Table.1 Mapping of COs, PSOs with POs - before CBS.

CE3404	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213.1	3	2	2	1	-	1	-	-	1	1	1	1	2	2	1
C213.2	3	2	2	1	-	1	-	-	1	1	1	1	2	2	1
C213.3	3	2	2	1	-	-	-	-	1	1	1	-	2	2	1
C213.4	3	2	2	1	-	-	-	-	1	1	1	-	2	2	1
C213.5	3	2	2	1	-	-	-	-	1	1	1	1	2	2	1
C213.6	3	2	2	1	-	-	-	-	1	1	1	1	2	2	1
C213	**3**	**2**	**2**	**1**	-	**1**	-	-	**1**	**1**	**1**	**1**	**2**	**2**	**1**

II. Identification of content beyond syllabus:

Table.2 Identification of content beyond syllabus

Details of Content Beyond Syllabus(CBS) added	POs strengthened/ vacant filled	CO/Unit
Soil stabilization methods and materials	PO6 (2) Vacant filled	C213.3 & C213.4/ III & IV

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III. Mapping of Course Outcomes with POs & PSOs. (After CBS)

Table.3 Mapping of COs, PSOs with Pos - after CBS.

CE3404	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213.1	3	2	2	1	-	1	-	-	1	1	1	1	2	2	1
C213.2	3	2	2	1	-	1	-	-	1	1	1	1	2	2	1
C213.3	3	2	2	1	-	1*	-	-	1	1	1	-	2	2	1
C213.4	3	2	2	1	-	1*	-	-	1	1	1	-	2	2	1
C213.5	3	2	2	1	-	-	-	-	1	1	1	1	2	2	1
C213.6	3	2	2	1	-	-	-	-	1	1	1	1	2	2	1
C213	**3**	**2**	**2**	**1**	-	**1***	-	-	**1**	**1**	**1**	**1**	**2**	**2**	**1**

Contribution: 1: Reasonable 2: Significant 3: Strong

Signature of the Faculty

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022 - 2023 (EVEN SEMESTER)

Assignment Question

Assignment – 06			Date of Issue:	14.4.23	Marks	10
Course code	CE3404	Course Title	Soil Mechanics			
Year	II	Semester	IV	Date of Submission:	20.4.23	

Q.No	Questions	CO
1.	What is immediate settlement?	C213.3
2.	What is primary consolidation settlement?	C213.3
3.	Explain the Newmark's influence chart in detail.	C213.3

14.4.23
Name and Signature of the Faculty Incharge
RAGI. MAHIZHINI

19/4/23
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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022 - 2023 (EVEN SEMESTER)

Assignment Answer Sheet

Name of the Student: M. RABIA BANU

AU Register Number: 912621103006

Assignment – 06			Date of Issue:	14.4.23	Marks	10
Course code	CE3404	Course Title	Soil Mechanics			
Year	II	Semester	IV	Date of Submission:	20.4.23	

Q.No	Questions	CO
1.	What is immediate settlement?	C213.3
2.	What is primary consolidation settlement?	C213.3
3.	Explain the Newmark's influence chart in detail.	C213.3

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Content Quality	6	6
Presentation Quality	2	2
Timely submission	2	1
Total marks	10	9

20/4/23
Name and Signature of the Faculty Incharge
[RAGI. MAHIZHINI]

20/4/23
HoD/Civil
[R. PADMA RANI]
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SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN
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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022 - 2023 (EVEN SEMESTER)

Tutorial Question Paper

Tutorial – 02			Date of Issue:	06.03.2023	Marks	10
Course code	CE3404	Course Title	Soil Mechanics			
Year	II	Semester	IV	Date of Submission:	10.03.2023	

Q.No	Questions	CO
1	A soil sample 5 cm in length and 60 cm in cross-sectional area, water perculates through the sample in 10 minutes is 480 ml under a constant head of 40 cm. Weight of oven dried sample is 498 gm and specific gravity of soil = 2.65. Calculate: (i) Coefficient of permeability (ii) Seepage velocity.	C213.2
2	A sand deposit is made up of three horizontal layers of equal thickness. The permeability of the top and bottom layers is 2 x10-4 cm/s and that of middle layer is 3.2 x 10-2 cm/s. Find the equivalent permeability in the horizontal and vertical direction and their ratio.	C213.2

6/3/23

Name and Signature of the Faculty Incharge

[RAGI. MAHIZHINI]

6/3/23

HoD/Civil

[R. PADMA RANI]

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022 - 2023 (EVEN SEMESTER)

Tutorial Answer sheet

Name of the Student : G. KALAIARASI

AU Register Number: 912621103302

Tutorial – 02			Date of Issue:	06.03.2023	Marks	10
Course code	CE3404	Course Title	Soil Mechanics			
Year	II	Semester	IV	Date of Submission:	10.03.2023	

Q.No	Questions	CO
1	A soil sample 5 cm in length and 60 cm in cross-sectional area, water perculates through the sample in 10 minutes is 480 ml under a constant head of 40 cm. Weight of oven dried sample is 498 gm and specific gravity of soil = 2.65. Calculate: (i) Coefficient of permeability (ii) Seepage velocity.	C213.2
2	A sand deposit is made up of three horizontal layers of equal thickness. The permeability of the top and bottom layers is 2 x10-4 cm/s and that of middle layer is 3.2 x 10-2 cm/s. Find the equivalent permeability in the horizontal and vertical direction and their ratio.	C213.2

Rubrics	Marks Allocated	Marks obtained
Problem solving approach	6	6
Correction of answer	2	1
Timely submission	2	2
Total marks	10	9

10/3/23

Name and Signature of the Faculty Incharge

RAGI. MAHISHINI3

10/3/23

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IQAC Academic Audit Form

ACADEMIC YEAR: 2022-2023 EVEN SEMESTER

Name of Department :	CIVIL	Year / Sem :	II / IV	No. of Students Registered :	09
Details of Examination :	CT-1 /CT -2 / CT-3 / Model Test				

S.No.	Course Code & Name	List of Reg.No Verified	Course Log Book Verified (Y / N)	Course File Verified (Y / N)	No of students Attended	No of Absentees	No of Failures	Pass %	Remarks
1.	CE3401- Applied Hydraulic Engineering	912621103005	Yes	Yes	08	01	-	100%	-
2.	CE3402 - Strength of Materials.	912621103004	Yes	Yes	06	02	01	85.7%	-
3.	CE3403 - Concrete Technology	912621103006	Yes	Yes	05	02	02	71.4%	-
4.	CE3404 - Soil Mechanics	912621103001	Yes	Yes	05	02	02	71.4%	-
5.	CE3405 - Highway and Railway Engineering	912621103007	Yes	Yes	06	01	02	75%	-
6.	CE3451 - Environmental Sciences and Sustainability	912621103003	Yes	Yes	06	01	02	75%	-

Verified by

External Member Name and Signature:	M. Palaniyappan AP/ECE 28/4/23
Internal Member Name and Signature:	P. Dennis Jhora, AP/Civil 28/4/23

Overall Remarks:

Try to score 90% above in all subjects.

HoD/ Civil 28/4/23 | IQAC Coordinator 28/4/23 | Principal

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022 - 2023 (EVEN SEMESTER)

SUBJECT CODE &TITLE: CE3404 & Soil Mechanics

YEAR/SEM: II/IV

STUDENT FEEDBACK ON FACULTY

S.NO.	DESCRIPTION	SCORED OUT OF 4	SCORED OUT OF 100
1.	Syllabus coverage as prescribed by University	3.75	93.75
2.	Technical knowledge of the teacher	3.62	90.62
3.	Teacher's communication skill	3.62	90.62
4.	Regularity in taking classes	3.87	96.87
5.	Helping the students in conducting the experiment through set of instructions and demonstrations	3.37	84.37
6.	Tendency of inviting opinion and questions on subject matter from students.	3.62	90.62
7.	Knowledge of the teacher in latest development of field	3.75	93.75
8.	Perfectness of valuation	3.75	93.75
OVERALL SCORE		**3.66**	**91.7**

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REPORT SHEET

S.NO	REG.NO	NAME	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
1	912621103001	AKILA .G	4	4	4	3	3	4	3	4
2	912621103003	JAYABHARATHI. R	3	3	4	4	4	4	4	3
3	912621103004	JAYA MANOHARI. B	4	4	4	4	4	3	4	4
4	912621103005	PRIYADHARSHINI. A	4	4	3	4	3	3	4	4
5	912621103006	RABIA BANU.M	4	3	4	4	3	4	4	3
6	912621103007	SHERLIN KAVYA. B	4	4	3	4	4	4	3	4
7	912621103301	JENIFAR .A	4	3	4	4	3	4	4	4
8	912621103302	KALAIARASI. G	3	4	3	4	3	3	4	4
		AVERAGE	3.75	3.62	3.62	3.87	3.37	3.62	3.75	3.75
		PERCENTAGE	93.75	90.62	90.62	96.87	84.37	90.62	93.75	93.75

EXCELLENT	VERY GOOD	GOOD	AVERAGE	POOR
4	3	2	1	0

Signature of the Faculty

HoD/Civil

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SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN
KAIKKURICHI, PUDUKKOTTAI – 622 303.

Circular Date: 15.03.2023

The First cycle test will be conducted from 20.03.2023 to 28.03.2023 for the IV, VI & VIII semester (II, III & IV year) students.

The following instructions are to be followed by the faculty members.

- Total marks for which the question paper to be set will be for 60 marks. **(PART A** 10X2=20, **PART B** 2X13=26 **& PART C** 1X14=14)
- It is the responsibility of the **question paper** setter to take the Xerox copies of the required number of question papers and it should be handed over to the Exam cell Coordinators Ms. G.Gayathri AP/ CIVIL / Mrs. G. Sugapriya AP/CSE along with **answer key** on or before **17.03.2023**.
- The Exam Coordinators (exam cell) are requested to make necessary arrangements (hall arrangements, invigilation duty etc.,) for conducting the test.
- Faculty members are requested to handover the valued answer scripts to the students on or before 29.03.2023 and the class in-charges are requested to send the consolidated mark sheet along with the attendance percentage (from 1st February 2023 to 28th March 2023) to the parents on or before 31.03.2023.

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15/03/23

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Cc:
- All HoD's CIVIL/CSE/EEE/ECE
- All faculty
- IQAC Co-ordinator
- Exam cell
- Office file

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Circular

Date: 15.03.2023

The First cycle test will be conducted from 20.03.2023 to 28.03.2023 for the IV semester (II year) B.E students for 60 marks as per the time table given below. Students are directed to prepare well and score good marks.

Date	10.00 am -12.00 noon
20-03-2023	CE3401- Applied Hydraulics Engineering (CIVIL) CS3491- Artificial Intelligence and Machine Learning (CSE) EE3402- Linear Integrated Circuits(EEE) EC3491- Communication Systems(ECE)
21-03-2023	CE3403- Concrete Technology (CIVIL) CS3492- Database Management Systems (CSE) EE3404- Microprocessor and Microcontroller(EEE) EC3401- Network and Security(ECE)
24-03-2023	CE3405- Highway and Railway Engineering (CIVIL) CS3401- Algorithms (CSE) EE3403- Measurements & Instruments(EEE) EC3492- Digital Signal Processing(ECE)
25-03-2023	CE3404 Soil Mechanics (CIVIL) CS3451- Introduction to Operating Systems (CSE) EE3405- Electrical Machines-II(EEE) EC3451- Linear Integrated Circuits(ECE)
27-03-2023	CE3402 -Strength Of Materials (CIVIL) CS3452- Theory of Computation(CSE) EE3401- Transmission and Distribution(EEE) EC3452- Electromagnetic Fields(ECE)
28-03-2023	GE3451- Environmental Science and Sustainability(CIVIL/CSE/EEE/ECE)

PRINCIPAL

15/03/23

Cc:

- All II year B.E Classes
- All faculty
- IQAC Co-ordinator
- Exam cell
- Notice Board
- Office file

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Register Number: | | | | | | | | | | | | |

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Cycle Test - I			Date/Session	25.03.2023/FN	Marks	100
Course code	CE3404	Course Title	Soil Mechanics			
Regulation	2021	Duration	180 minutes	Academic Year	2022-2023 (Even Sem)	
Year	II	Semester	IV	Department	Civil	

COURSE OUTCOMES: At the end of the course student will be able to

C213.1	Explain the formation of soil and its unified classification system, formulate and solve engineering Problems.
C213.2	Describe the two dimensional flow through soil medium and its impact of engineering solution.
C213.3	Explain the basic concept of stress distribution in loaded soil medium and soil settlement due to consolidation.
C213.4	Illustrate the shear strength of cohesive and cohesion less soils and also will be aware of contemporary issues on shear strength of soils.
C213.5	Describe the stability analysis of finite slopes, component and process as per needs and specifications.
C213.6	Describe the stability analysis of infinite slopes and its failures protection measures.

Q.No.	Question	CO	BTL
	PART A **(Answer all the Questions 10 x 2 = 20 Marks)**		
1	What is meant by degree of saturation?	**C213.1**	K2
2	Define Porosity of a given soil sample.	**C213.1**	K1
3	Draw a phase diagram for dry soil and saturated soil.	**C213.1**	K1
4	Distinguish between transported soil and residual soil.	**C213.1**	K2
5	Write any two engineering classification system of soil.	**C213.2**	K1
6	Define plasticity index, flow index and liquidity index.	**C213.2**	K1
7	List any four equipments/methods available for field compaction of soil.	**C213.2**	K1
8	What is capillary rise?	**C213.3**	K2
9	What is meant by total stresses and neutral stresses?	**C213.3**	K2
10	List out the forms of Soil water.	**C213.3**	K1
	PART B **(Answer all the Questions 5 x 13 = 65 Marks)**		
11a	A soil sample is found to have the following properties.Classify the soil according to IS classification system. Passing 75μ sieve = 10%; passing 4.75 mm sieve = 70%;Uniformity coefficient =8;coefficient of curvature = 2.8;Plasticity index = 4%.	**C213.1**	K3
	OR		
11b	A cubic meter of soil in its natural state weighs 17.75 kN, after being dried it weighs 15.08kN. The specific gravity of the soil is 2.70. Determine the degree of saturation, void ratio, porosity and water content of the original soil sample.	**C213.1**	K3
12a	Clayey soil in a borrow pit has unit weight of solids as 20 kN/m^3,moisture content is 13% and bulk unit weight equal to 15kN/m^3.How many cubic meter of compacted fill could be constructed of 5000 m^3 of clay excavated from borrow pit.	**C213.2**	K3
	OR		
12b	Sandy soil in a borrow pit has unit weight of solids as 25.8 kN/m^3 water content equal to 11% and bulk unit weight equal to 16.4 kN/m^3.How many cubic meter of compacted fill could be constructed of 3500 m^3 of sand excavated from borrow pit, if required value of porosity in the compacted fill is 30%. Also calculate the change in degree of saturation.	**C213.2**	K3
13a	Explain the factors affecting compaction of soil.	**C213.1**	K2
	OR		

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13b	Explain the Indian Standard soil classification system of soil.	**C213.1**	K2
14a	Explain the different modes of occurrences of water in soil.	**C213.2**	K2
	OR		
14b	Explain the prodecure for determining the relationship between dry density and moisture content by proctor compaction test.	**C213.2**	K2
15a	Calculate the height to which water will rise in a soil deposit consisting of fine silt of uniform in size. The depth of water below the ground surface is 20m. Assume the surface tension is $75X10^{-8}$ kN/cm and contact angle is zero. The average size of the pores is 0.004 mm.	**C213.3**	K3
	OR		
15b	A clay layer 3m thick is having water content 45%, specific gravity is 2.7. This clay layer is lying below another layer which is 5m thick sand layer. The sand layer lying at the top is having e=.6,S_r= 40% and G_s=2.65. The water table is at depth of 3m below. Determine total stress, pore water pressure and effective stress.	**C213.3**	K3
	PART C **(Answer all the Questions 1 x 15 = 15 Marks)**		
16a	An earthen embankment of 10^6 m^3 volume is to be constructed with a soil having a void ratio of 0.80 after compaction. There are three borrow pits marked A, B and C having soils with voids ratios of 0.90, 0.50 and 1.80 respectively. The cost of excavation and transporting the soil is Rs0.25, Rs 0.23 and Rs 0.18 per m^3respectively. Calculate the volume of soil to be excavated from each pit. Which borrow pit is the most economical?	**C213.1**	K3
	OR		
16b	A laboratory compaction test on soil having specific gravity equal to 2.67 gave a maximum dry unit weight of 17.8 kN/m^3 and a water content of 15%. Determine the degree of saturation, air content and percentage air voids at the maximum dry unit weight. What would be theoretical maximum dry unit weight corresponding to zero air voids at the optimum water content?	**C213.1**	K3

17/3/23

Course Faculty

(Name /Sign / Date)

RAGI. MANIMOHINI.

17/3/23

HoD/Civil

(Name /Sign / Date)

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B.E - CIVIL ENGINEERING

CYCLE TEST - I (MARCH - 2023)

FOURTH SEMESTER

CE3404 - SOIL MECHANICS.

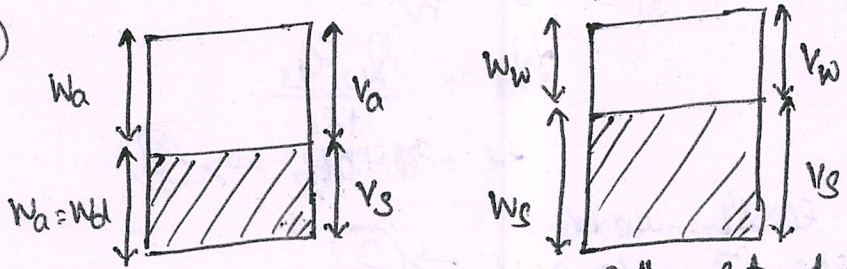
① The ratio of volume of water to the volume of voids

Degree of Saturation = $\frac{V_w}{V_v} \times 100$.

② The ratio of volume of voids to the volume of given soil mass

Porosity = $\frac{V_v}{V}$.

③



Fully dry soil — Fully Saturated soil.

④ Residual Soil: If the soil remain at the place due to weathering of Rocks.

Transported soil: Soil are found far away from their place of formati

⑤ i) Geological classification (or) classification by origin.
ii) Textural classification iii) Particle size classification.

⑥ Range of water content present between liquid limit and plastic lim

$I_p = w_L - w_p$, $I_f = \frac{w_1 - w_2}{\log_{10}(\frac{n_2}{n_1})}$.

⑦ i) Droping type ii) Pneumatic type iii) Sheep foot roller.

⑧ The rise of water in the fine pores of soil due to surfac

Tension $h_c = \frac{4T\cos\alpha}{\rho_w g d}$.

⑨ Total load acting per unit area - Pressure transmitted through the pore fluid in the soil mass.

⑩ i) Free water ii) Gravitational water iii) Structural water.

Part-B

(11) a) i) % Passing 75 μ sieve is 10%. (retained more than 50%) - coarse grained soil.

ii) % Passing 4.75mm sieve is 70% (less than 50%) retained - Sand.

iii) $C_u > 8$ - well graded sand, C_c - 1 to 3. $I_p = 4\%$. Sand with fine (SM)

b) ⑤ ← Weight of water $W_w = 2.67$ kN.

water content $w = \frac{W_w}{W_d} = 17.71\%$.

Dry unit weight $\gamma_d = \frac{W_d}{V} = 15.08$ kN/m³.

$\gamma_d = \frac{\gamma_w G_s}{1+e}$.

$e = 0.756$. → ③

$e \times S_r = w \times G$.

Degree of Saturation $S_r = 63.22\%$. → ③

Porosity $n = \frac{e}{1+e} = 43.1\%$ → ②.

12. a). i) Liquid limit: Minimum water content at which part of soil - cut by a groove of standard dimension - flow together for a distance of 10 mm - 25 blows. ④ ←

ii) Plastic limit: Minimum water content at which soil - begin to crumble - thread of 3mm in diameter.

iii) Shrinkage limit: Maximum water content - reduction in water content - decrease in the volume of soil mass. ③ ←

iv) Plasticity Index (I_p): $I_p = w_L - w_p$.

v) Liquidity Index: Difference between natural water content and plastic limit to the plastic Index. $I_L = \frac{w_n - P_L}{I_p}$ - ③ ←

vi) Consistency Index I_c: ratio of liquid limit minus natural water content to plastic Index $I_c = \frac{w_L - w_n}{w_L - w_p}$. ③ ←

$I_L + I_c = 1$.

b) $\gamma_b = \frac{\gamma_s}{1+e_p}$.

Void ratio at pit $e_p = 0.573$ → ③

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void ratio $e = \frac{n}{1-n}$; $e_f = 0.429$.

At borrow pit, $V_s = \frac{V_p}{1+e_p} = 2225.05\ m^3$.

$V_s = \frac{V_f}{1+e_f} \Rightarrow V_f = 3179.6\ m^3$. → (4)

Degree of saturation at borrow pit $e_f \times S_{r(f)} = w_f \times G_s$

$S_{r(f)} = 85.83\%$.

Degree of saturation at fill $S_{r(p)} = 50.49\%$.

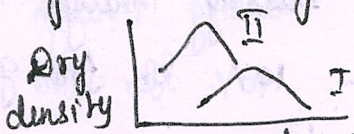
∴ Change in degree of saturation = $S_{r(f)} - S_{r(p)}$

$= 35.34\%$. → (2)

13. a) i) water content: If the water content increased - density of compacted soil goes on increasing - maximum dry density achieved.

(7) ← ii) Amount of compactive energy: Compactive energy increased - reduction of void in soil mass - Increases the density of soil mas

iii) Type of compaction: Soil may be compacted by ramming - rolling & vibrating.



→ (3)

(3) ← iv) Type of soil: variation in soil affects the compaction - higher density at lower OMC - than fine grained soil.

(5) → b) i) Gravel - More than half the coarse fraction (75M) - larger than 4.75mm sieve.

ii) Sand: More than half the coarse fraction - Smaller than 4.75m

Fine grained soil:

(4) ← i) Silt & clay of Low compressibility - $LL < 35$.

ii) Silt & clay of Medium High compressibility - $35 < LL > 50$

iii) Silt & clay of Med High compressibility - $LL > 50$.

GW - $C_u > 4$, C_c between 1 & 3.

GP - Poorly graded gravel.

SW - $C_u > 6$, C_c between 1 & 3

SP - poorly graded sand. → (4)

14. a). The capillary rise through the soil pores is given by

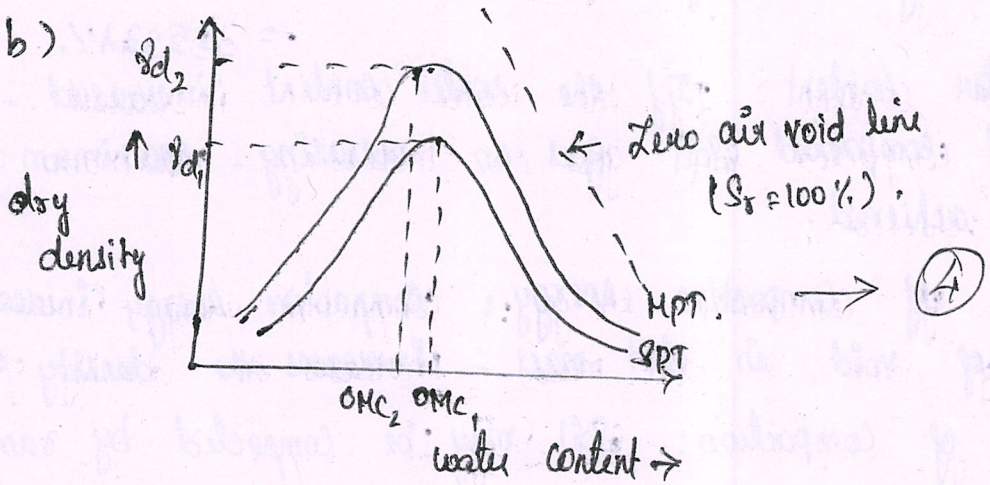
(4) $h_c = \frac{4\sigma\cos\theta}{\gamma_w d}$ ⇒

Surface Tension $\sigma = 75\times10^{-8}$ KN/cm $= 75\times10^{-6}$ KN/m. → (2)

Size of pore, $d = 4\times10^{-6}$ m } → (6)

$h_c = 7.645$ m.

b)



→ (4)

(5) ← About 3kg of dried soil mass passing through 4.75mm Sieve - 4% of coarse grained soil - 10% for fine grained soil. moist soil is placed in mould three layers - giving 25 blows - compactive effort (or) the energy transmitted - about 605 kNm per 1000 cm^3 of soil.

(4) ← Heavier compaction needed for airport pavement construction - filled in five layers - compaced with 25 blows - compactive energy delivered - 2726 N-m per 1000 cm^3 - 4.5 times that of Standard Proctor test. IS 2720 (part VII) - 1983 for light compaction - IS 2720 (part VIII) - 1983 for high compaction.

15. a) i) Free water (or) Gravitational water; free to move through soil mass influence of gravity - free water as saturated.

ii) Held water - part of water held in soil pores - force existing within the pores.

1. Structural water: chemically combined in crystal structure of soil - cannot be removed by oven drying 105°-110°C - Structural water and parcel of soil grain.

2. Adsorbed water: Parts of water freely adsorb from atmosphere by physical forces of attraction - held by the force of adhesion.

3. Capillary water: Soil water located interstices - void of soil mass - interstices of soil due to capillary force - acting with in the voids.

b) i) For Sand layer (above water table):

$$\gamma_b = \frac{G_s \gamma_w (1+w)}{1+e} = 17.73 \text{ KN/m}^3.$$

ii) For Sand layer (below water table):

$$\gamma_{sat} = \frac{G_s \gamma_w (1+w)}{1+e} = 19.93 \text{ KN/m}^3.$$

iii) For clay layer

$$\gamma_{sat} = \frac{G_s \gamma_w (1+w)}{1+e} = 17.34 \text{ KN/m}^3.$$

(5)

At top of water table B-B.

Total Stress $\sigma_B = 53.19 \text{ KN/m}^2$, Pore stress $u_B = 0$, Effective stress = 33.19

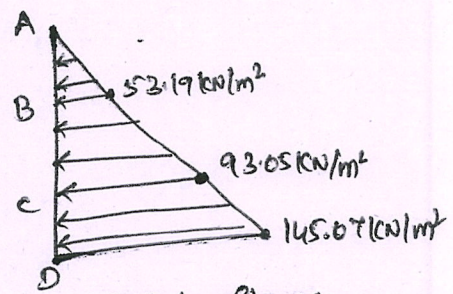
At top of clay C-C

Total Stress $\sigma_C = 93.05 \text{ KN/m}^2$, Pore Stress $u_C = 19.62 \text{ KN/m}^2$, Effective Stress $\sigma_C' = 73.43$

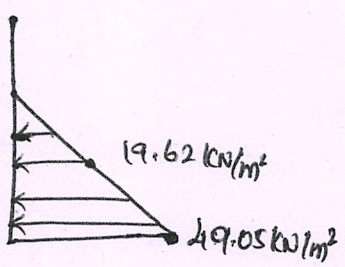
At bottom of clay D-D

Total Stress $\sigma_D = 145.07 \text{ KN/m}^2$, Pore Pressure $u_D = 49.05 \text{ KN/m}^2$, Effective Stress $\sigma_C' = 96.02 \text{ KN/m}$

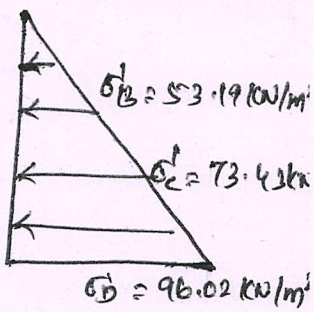
(4)



Total Stress



Pore Pressure



16. a)

$$V_s = \frac{V_f}{1+e_f} = 555.56 \times 10^{-3} \text{ m}^3$$

Borrow Pit - A $\quad V_s = \frac{V_1}{1+e_1}$, $V_1 = 1.56 \text{ m}^3$. → (3)

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Cost for Borrow pit A = Rs. 2,63,891/-

(5) Borrow pit -B, $V_s = \frac{V_2}{1+\ell_2} \Rightarrow V_2 = 1000.008 \times 10^3 m^3$.

Cost for Borrow pit B = Rs. 2,30,002/-

(4) Borrow pit -C: $V_s = \frac{V_3}{1+\ell_3}$

$V_3 = 1555.56 \times 10^3 m^3$.

Cost for Borrow pit C = Rs. 2,80,002/-.

(3) The most economical Borrow pit is 'B' having volume of 1000.008×10^3 m^3 having cost of Rs. 2,30,002/-.

Staff Incharge

HOD/civil

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Cycle Test Answer Book

Name	B. JAYANANDHARI			Year/ Semester	II / IV
Reg No.	912621103004	Date/Session	25.03.23 / FN	Department	Civil
Course code	CE3404	Course Title	Soil mechanics		
Cycle Test (Put a tick mark)	CT 1 ✓	CT 2	CT 3	Model	
Name and Signature of the Invigilator with date	25/3/23 [G. GOPPERUNDEVI]				

Instruction to the Student: Put tick mark to the question attended in the column against question.

Part A			Part B / Part C						Total Marks
Q. No.	✓	Marks	Q. NO.	✓	a Marks	✓	b Marks		
1	✓	2	11			✓	13		13
2	✓	2	12	✓	12				12
3	✓	2	13			✓	13		13
4	✓	2	14			✓	8		8
5	✓	2	15	✓	9				9
6	✓	2	16	✓	14				14
7	✓	2	Grand Total						69
8	✓	2							
9	✓	1							
10	✓	0							
Total		17	86/100 Grand Total				12/5/23 [RAJ. MAHIZHINI] Name and Signature of the Examiner with date		

To be filled by the examiner							
Course Outcomes	1	2	3	4	5	6	Total
Marks allotted	49	32	19	–	–	–	100
Marks Obtained	43	30	13	–	–	–	86

IQAC Audit - Remarks

28/4/23
Name and Signature of the IQAC member

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(Mrs. B. PRIYA)

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-2023 (EVEN SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

CYCLE TEST-I

SUBJECT CODE &TITLE: CE3404 & Soil Mechanics

YEAR/SEM: II/IV **MONTH & YEAR: MARCH & 2023**

S.NO	REG NO	STUDENT NAME	CO1 (49)	CO2 (32)	CO3 (19)	TOTAL (100)
1.	912621103001	AKILA.G	37	30	9	76
2.	912621103002	GAYATHRI G	-	-	-	AB
3.	912621103003	JAYABHARATHI.R	40	30	14	84
4.	912621103004	JAYA MANOHARI.B	43	30	13	86
5.	912621103005	PRIYADHARSHINI.A	26	24	10	60
6.	912621103006	RABIA BANU.M	-	-	-	AB
7.	912621103007	SHERLIN KAVYA.B	42	20	14	76
8.	912621103301	JENIFAR.A	23	18	02	43
9.	912621103302	KALAIARASI.G	22	10	03	35

MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
-	-	1	1	1	-	2	2	-

Total No. of Candidates Present	07
Total No. of Candidates Absent	02
Total No. of Students Pass	05
Total No. of Students Fail	02
Percentage of Pass	71%

27.3.23
Faculty Incharge

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27.3.23
HoD/Civil

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28/3/23
Principal

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DEPARTMENT OF CIVIL ENGINEERING

ROOT CAUSE ANALYSIS

Name of the Faculty : Ms.Raci.Mahizhini
Degree & Program : B.E/ CIVIL
Year/ Semester: II/ IV
Academic Year : 2022-2023 / EVEN
Cycle Test : I/II/III
Course Code & Name : CE3404 & Soil Mechanics
Result Target : 100%
Result Achieved: 71%

S.NO	REG NO	NAME OF THE STUDENT	CAUSES FOR FAILURE	CORRECTIVE ACTION TAKEN
1.	912621103006	M.RABIA BANU	Due to health issue	Insist the Student take Care of health.
2.	912621103301	A. JENIFAR	Confused in Problems	Insist the Student to Solve more Problems.
3.	912621103302	G. KALAIARASI	Not well Prepared	Insist the Student to Prepare well.

Signature of the Faculty

HoD/Civil

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Circular

Date: 29.03.2023

Retest for First cycle test will be conducted from 03.04.2023 to 8.04.2023 for the IV, VI & VIII semester (II, III & IV year) students.

The following instructions are to be followed by the faculty members.

- Total marks for which the question paper to be set will be for 50 marks. **(PART A** 5X2=10, **PART B** 2X13=26 **& PART C** 1X14=14)
- It is the responsibility of the **question paper** setter to take the Xerox copies of the required number of question papers.
- Concerned Faculty members are requested to conduct the examination as per the schedule and handover the valued answer scripts to the students on or before 10.04.2023.

PRINCIPAL

Cc:

- All HoD'S /CIVIL/CSE/EEE/ECE
- All faculty
- IQAC Co-ordinator
- Exam cell
- Office file

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Circular

Date: 29.03.2023

Retest for First cycle test will be conducted from 03.04.2023 to 8.04.2023 for the IV semester (II year) B.E students for 50 marks as per the time table given below. Students are directed to prepare well and score good marks.

Date	4.00 pm -5.30 pm
03-04-2023	CE3401- Applied Hydraulics Engineering (CIVIL) CS3491- Artificial Intelligence and Machine Learning (CSE) EE3402- Linear Integrated Circuits(EEE) EC3491- Communication Systems(ECE)
04-04-2023	CE3403- Concrete Technology (CIVIL) CS3492- Database Management Systems (CSE) EE3404- Microprocessor and Microcontroller(EEE) EC3401- Network and Security(ECE)
05-04-2023	CE3405- Highway and Railway Engineering (CIVIL) CS3401- Algorithms (CSE) EE3403- Measurements & Instruments(EEE) EC3492- Digital Signal Processing(ECE)
06-04-2023	CE3404 Soil Mechanics (CIVIL) CS3451- Introduction to Operating Systems (CSE) EE3405- Electrical Machines-II(EEE) EC3451- Linear Integrated Circuits(ECE)
07-04-2023	CE3402 -Strength Of Materials (CIVIL) CS3452- Theory of Computation(CSE) EE3401- Transmission and Distribution(EEE) EC3452- Electromagnetic Fields(ECE)
08-04-2023	GE3451- Environmental Science and Sustainability(CIVIL/CSE/EEE/ECE)

PRINCIPAL

Cc:

- All II year B.E Classes
- All faculty
- IQAC Co-ordinator
- Exam cell
- Notice Board
- Office file

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Register Number: | | | | | | | | | | | | |

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Cycle Test – I – Retest			Date/Session	06.04.23/AN	Marks	50
Course code	CE3404	Course Title	Soil Mechanics			
Regulation	2021	Duration	90 minutes	Academic Year	2022-2023 (Even Sem)	
Year	II	Semester	IV	Department	Civil	

COURSE OUTCOMES: At the end of the course student will be able to

C213.1	Explain the formation of soil and its unified classification system, formulate and solve engineering Problems.
C213.2	Describe the two dimensional flow through soil medium and its impact of engineering solution.
C213.3	Explain the basic concept of stress distribution in loaded soil medium and soil settlement due to consolidation.
C213.4	Illustrate the shear strength of cohesive and cohesion less soils and also will be aware of contemporary issues on shear strength of soils.
C213.5	Describe the stability analysis of finite slopes, component and process as per needs and specifications.
C213.6	Describe the stability analysis of infinite slopes and its failures protection measures.

Q.No.	Question	CO	BTL
	PART A **(Answer all the Questions 5 x 2 = 10 Marks)**		
1	Define Water content.	C213.1	K1
2	What is Porosity?	C213.1	K2
3	Define shrinkage ratio.	C213.2	K1
4	Define plasticity index, flow index and liquidity index.	C213.2	K1
5	Write any two engineering classification system of soil.	C213.2	K1
	PART B **(Answer all the Questions 2 x 13 = 26 Marks)**		
6a	A soil sample 5 cm in length and 60 cm in cross-sectional area, water perculates through the sample in 10 minutes is 480 ml under a constant head of 40 cm. Weight of oven dried sample is 498 gm and specific gravity of soil = 2.65. Calculate: (i) Coefficient of permeability (ii) Seepage velocity..	C213.2	K3
	OR		
6b	An earthen embankment of 10^6 m^3 volume is to be constructed with a soil having a void ratio of 0.80 after compaction. There are three borrow pits marked A, B and C having soils with voids ratios of 0.90, 0.50 and 1.80 respectively. The cost of excavation and transporting the soil is Rs0.25, Rs 0.23 and Rs 0.18 per m^3 respectively. Calculate the volume of soil to be excavated from each pit. Which borrow pit is the most economical?	C213.2	K3
7a	Explain the factors affecting compaction of soil.	C213.1	K2
	OR		
7b	Explain Indian Standard soil classification system of coarse grained soil.	C213.1	K2
	PART C **(Answer all the Questions 1 x 14 = 14 Marks)**		
8a	Granular soil in a borrow pit has unit weight of solids as 25.8 kN/m^3 water content equal to 11% and bulk unit weight equal to 16.4 kN/m^3. How many cubic meter of compacted fill could be constructed of 3500 m^3 of sand excavated from borrow pit, if required value of porosity in the compacted fill is 30%. Also calculate the change in degree of saturation.	C213.1	K3

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	OR		
8b	A laboratory compaction test on soil having specific gravity equal to 2.67 gave a maximum dry unit weight of 17.8 kN/m^3 and a water content of 15%. Determine the degree of saturation, air content and percentage air voids at the maximum dry unit weight. What would be theoretical maximum dry unit weight corresponding to zero air voids at the optimum water content?	**C213.1**	K3

3/4/23

Course Faculty

(Name /Sign / Date)

RAGI. MAHIZHINI

3/4/23

HoD/Civil

(Name /Sign / Date)

R. PADMA RONI

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DEPARTMENT OF CIVIL ENGINEERING

ATTENDANCE SHEET - RETEST FOR CYCLE TEST-I

Name of the Faculty : Ms.Raci.Mahizhini

Course Code & Name : CE3404 & Soil Mechanics

Academic Year : 2022 -2023 /EVEN

Degree & Program : B.E/CIVIL **Year/ Semester: II/IV**

S.NO	REG.NO	NAME	SIGNATURE
1.	912621103002	GAYATHRI G	AB
2.	912621103006	RABIA BANU.M	
3.	912621103301	JENIFAR.A	
4.	912621103302	KALAIARASI.G	

6.4.23
Faculty Incharge

6/4/23
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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-2023 (EVEN SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

CYCLE TEST-I – RETEST

SUBJECT CODE &TITLE: CE3404 & Soil Mechanics

YEAR/SEM: II/IV **MONTH & YEAR: MARCH & 2023**

S.NO	REG NO	STUDENT NAME	CO1 (31)	CO2 (19)	TOTAL (50)	TOTAL (100)
1.	912621103002	GAYATHRI G	-	-	-	AB
2.	912621103006	RABIA BANU.M	17	08	25	51
3.	912621103301	JENIFAR.A	20	12	32	65
4.	912621103302	KALAIARASI.G	18	12	30	60

MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
-	-	-	-	2	1	-	-	-

Total No. of Candidates Present	03
Total No. of Candidates Absent	01
Total No. of Students Pass	03
Total No. of Students Fail	-
Percentage of Pass	100%

8.4.23
Faculty Incharge

8/4/23
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8/4/23
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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022 – 2023 (EVEN SEMESTER)

FINAL INTERNAL STUDENTS MARK STATEMENT(Out of 40)

SUBJECT CODE &TITLE: CE3404& SOIL MECHANICS

YEAR/SEM: II/IV

S.NO	REG NO	STUDENT NAME	TOTAL (40)
1.	912621103001	AKILA G	33
2.	912621103003	JAYABHARATHI R	33
3.	912621103004	JAYA MANOHARI B	33
4.	912621103005	PRIYADHARSHINI A	28
5.	912621103006	RABIA BANU M	22
6.	912621103007	SHERLIN KAVYA B	32
7.	912621103301	JENIFAR A	24
8.	912621103302	KALAIARASI G	23

Faculty Incharge

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022 – 2023 (EVEN SEMESTER)

ANNA UNIVERSITY RESULT STATEMENT APR/MAY-2023

SUBJECT CODE &TITLE: CE3404 & SOIL MECHANICS

YEAR/SEM: II/IV

S.NO	REG NO	STUDENT NAME	GRADE
1.	912621103001	AKILA .G	A
2.	912621103003	JAYABHARATHI. R	B+
3.	912621103004	JAYA MANOHARI. B	B+
4.	912621103005	PRIYADHARSHINI. A	U
5.	912621103006	RABIA BANU.M	B
6.	912621103007	SHERLIN KAVYA. B	B+
7.	912621103301	JENIFAR .A	U
8.	912621103302	KALAIARASI. G	U

Faculty Incharge

HoD/Civil

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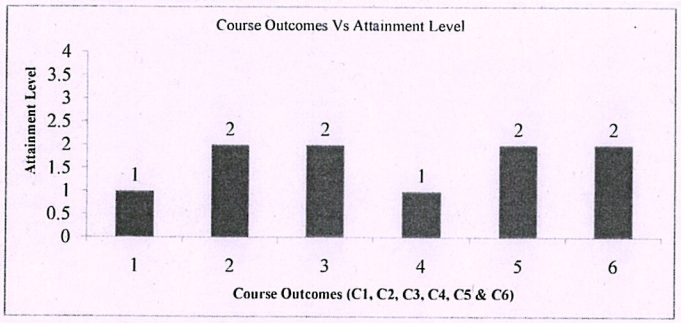
Department of Civil Engineering

Internal Assessment -Attainment of Course Outcomes (Through Direct Assessment)

ACADEMIC YEAR - 2022 - 23		BATCH	2021 - 2025					
COURSE CODE/TITLE	CE3404 (C213) / Soil Mechanics	COURSE OUTCOME	1	2	3	4	5	6
YEAR/SEM	II / IV	TARGET(%)	65	65	65	65	65	65
COURSE COORDINATOR	Ms.Raci Mahizhini	TOTAL STRENGTH	8					

ATTAINMENT LEVEL	Level	Range
	1	UP TO 60% of the students scored more than target
	2	61 - 79% of the students scored more than target
	3	80% & ABOVE of the students scored more than target

S.NO	REG NO	NAME OF THE STUDENT	IAT 1 - MARKS ALLOTED						IAT 2 - MARKS ALLOTED						IAT 3 - MARKS ALLOTED						Assignment / Mini Project /Tutorial / Seminar						TOTAL COURSE OUTCOME					
			C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6
			40	30	30							40	30	30								10	10		10	10	40	40	40	40	40	40
1	912621103001	AKILA G	34	25	25							32	25	25								8	7		9	8	34	33	32	32	34	33
2	912621103003	JAYABHARATHI R	35	27	27							31	23	23								7	9		8	8	35	34	36	31	31	31
3	912621103004	JAYA MANOHARI B	37	27	27							29	22	22								7	9		8	8	37	34	36	29	30	30
4	912621103005	PRIYADHARSHINI A	29	23	23							25	20	20								8	8		7	8	29	31	31	25	27	28
5	912621103006	RABIA BANU M	16	11	11							28	22	22								8	7		8	7	16	19	18	28	30	29
6	912621103007	SHERLIN KAVYA B	34	25	25							30	23	23								8	8		7	8	34	33	33	30	30	31
7	912621103301	JENIFAR A	25	20	20							21	16	16								9	7		8	9	25	29	27	21	24	25
8	912621103302	KALAIARASI G	24	18	18							21	16	16								7	7		8	9	24	25	25	21	24	25
		CO's Target Value																									26.0	26.0	26.0	26.0	26.0	26.0
		No. of Students scored above CO's Target Value																									5	6	6	5	6	6
		Percentage of Students scored above Target																									62.5	75.0	75.0	62.5	75.0	75.0
		CO Attainment																									1	2	2	1	2	2
		CO attainment Values to plot the Graph																									1	2	2	1	2	2



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SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN
DEPARTMENT OF CIVIL ENGINEERING
COURSE OUTCOME ATTAINMENT - UNIVERSITY EXAMINATION
ACADEMIC YEAR : 2022 - 2023 (EVEN SEM)

YEAR /SEM: II/ IV **Batch:2021-2025**
SUBJECT : CE3404 (C213) / Soil Mechanics
CO Attainment Level: 1 - (UPTO 60%) 2- (61%-79%) 3-(80% and Above)
TOTAL STRENGTH : 8

S.NO	Register No	NAME	Univ. Grade
1	912621103001	AKILA G	A
2	912621103003	JAYABHARATHI R	B+
3	912621103004	JAYA MANOHARI B	B+
4	912621103005	PRIYADHARSHINI A	U
5	912621103006	RABIA BANU M	B
6	912621103007	SHERLIN KAVYA B	B+
7	912621103301	JENIFAR A	U
8	912621103302	KALAIARASI G	U

No. of O Grade	0	0
No. of A+ Grade	0	0
No. of A Grade	1	1
No.of B+ Grade	3	3
No. of B Grade	1	1
No. of C Grade	0	0
No. of U Grade	3	3
No. of UA Grade	0	0
Target for course outcome Attainment	60	8
No of students above the target	5	
CO-Attainment University (%)	62.50	

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Overall Attainment Sheet – COs - POs & PSOs attainment calculation

CO	CO-Attainment Internal (CO-INT) (Avg. Attainment of All section) (%)	CO-Attainment University (CO-UNI) (Avg. Attainment of All section) (%)	Direct CO Attainment (0.20xCO-INT + 0.80xCO-UNI) (%)	CO Attainment Level
C213.1	62.5	62.50	62.5	2
C213.2	75.0	62.50	65.0	2
C213.3	75.0	62.50	65.0	2
C213.4	62.5	62.50	62.5	2
C213.5	75.0	62.50	65.0	2
C213.6	75.0	62.50	65.0	2

Expected CO-PO Level

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213.1	3	2	2	1	-	1	-	-	1	1	1	1	2	2	1
C213.2	3	2	2	1	-	1	-	-	1	1	1	1	2	2	1
C213.3	3	2	2	1	-	-	-	-	1	1	1	-	2	2	1
C213.4	3	2	2	1	-	-	-	-	1	1	1	-	2	2	1
C213.5	3	2	2	1	-	-	-	-	1	1	1	1	2	2	1
C213.6	3	2	2	1	-	-	-	-	1	1	1	1	2	2	1
C213	**3**	**2**	**2**	**1**	-	**1**	-	-	**1**	**1**	**1**	**1**	**2**	**2**	**1**

PO Attainment Level

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213.1	2	1.33	1.33	0.67	-	0.67	-	-	0.67	0.67	0.67	0.67	1.33	1.33	0.67
C213.2	2	1.33	1.33	0.67	-	0.67	-	-	0.67	0.67	0.67	0.67	1.33	1.33	0.67
C213.3	2	1.33	1.33	0.67	-	-	-	-	0.67	0.67	0.67	-	1.33	1.33	0.67
C213.4	2	1.33	1.33	0.67	-	-	-	-	0.67	0.67	0.67	-	1.33	1.33	0.67
C213.5	2	1.33	1.33	0.67	-	-	-	-	0.67	0.67	0.67	0.67	1.33	1.33	0.67
C213.6	2	1.33	1.33	0.67	-	-	-	-	0.67	0.67	0.67	0.67	1.33	1.33	0.67
C213	2	1.33	1.33	0.67	-	0.67	-	-	0.67	0.67	0.67	0.67	1.33	1.33	0.67

Attainment of POs and PSOs

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213	3	2	2	1	-	1	-	-	1	1	1	1	2	2	1
Attainment	2	1.33	1.33	0.67	-	0.67	-	-	0.67	0.67	0.67	0.67	1.33	1.33	0.67

Comments by Program Coordinator

1.

2.

Remarks by HoD

Name and Signature of the Faculty Member

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