Academic Course Description

BHARATH UNIVERSITY
Faculty of Engineering and Technology
Department of Civil Engineering

BCE079 - QUALITY CONTROL AND ASSURANCE IN CONSTRUCTION

Eighth Semester, 2016-17 (Even Semester)

Course (catalog) description
To understand the dynamics of earth and to estimate dynamic properties of soils to develop the site specific design spectrum for design of sub structure and• evaluation of liquefaction potential.

Compulsory/Elective course : Elective course for Civil students

Credit / contact hours : 3 credits / 45 hours

Course Coordinator : Mr.S.Vinothkumar

Instructors :

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@ bharathuniv.ac.in	Consultation
Mr.S.Vinothkumar	Fourth year Civil	Civil Block		vinothsenna@gmail.com	9.00 - 9.50 AM

Relationship to other courses:

Pre –requisites : Building Construction Technology

Assumed knowledge : Dynamics of earth and to estimate dynamic properties of soils

Following courses : NIL

Syllabus Contents

UNIT I GEOTECHNICAL PROBLEM 9
Occurrence and distribution - moisture equilibrium - Soil, structure, environmental interaction-distress symptoms - case histories.

UNIT II EXPANSIVE SOIL PROPERTIES 9
Clay mineralogy - swell potential - field exploration - laboratory tests for identification.

UNIT III SOIL HEAVING 9
Heave Prediction - Method of prediction of heave- Empirical methods - double of dometer tests – soil moisture suction - field observations, shrinkage.

UNIT IV DESIGN OF FOOTING 9
Foundation Design – Design consideration – individual and continuous footings- stiffened mats underreamed piles- coda provisions.

UNIT V STABILIZATION 9
Stabilization methods

REFERENCES:

1. James, J.O' Brian, Construction Inspection Handbook – Quality Assurance and Quality Control, Van Nostrand, New York, 1989.
2. Kwaku, A., Tena, Jose, M. Guevara, Fundamentals of Construction Management and Organisation, Reston Publishing Co., Inc., Virginia, 1985.
3. Juran Frank, J.M. and Gryna, F.M. Quality Planning and Analysis, Tata McGraw Hill, 1993
4. Hutchins.G, ISO 9000, Viva Books, New Delhi, 2000
5. Clarkson H. Oglesby, Productivity Improvement in Construction, McGraw-Hill, 1989.
6. John L. Ashford, the Management of Quality in Construction, E & F.N.Spon, New York, 1989.
7. Steven McCabe, Quality Improvement Techniques in Construction, Addison Wesley Longman Ltd, England. 1998.

Computer usage: Nil

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	100%

Broad area: Dynamics of earth and to estimate dynamic properties of soils

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	February 1st week	Session 1 to 14	2 Periods
2	Cycle Test-2	March 2nd week	Session 15 to 28	2 Periods
3	Model Test	April 2nd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

H: high correlation, M: medium correlation, L: low correlation

To understand the dynamics of earth and to estimate dynamic properties of soils To develop the site specific design spectrum for design of sub structure and• evaluation of liquefaction potential	Correlates to program outcome		
	H	**M**	**L**
1. To improve the engineering properties and make it suitable for construction	a,e,	b,d	
2. To understand the dynamics of earth and to estimate dynamic properties of soils	b	e	
3. The engineering properties, problems and solution need to be considered when constructing a foundation on expansive soils.	a,e		
4. To develop the site specific design spectrum for design of sub structure and evaluation of liquefaction potential	a	d	
5. To study the behaviour of the stabilized soil subjected to cyclic loading		e	

Draft Lecture Schedule

Session	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I	**GEOTECHNICAL PROBLEM**		
1.	Occurrence and distribution	No	[R2]
2.	Occurrence and distribution	No	
3.	Moisture equilibrium	No	
4.	Moisture equilibrium	No	
5.	Soil, structure, environmental interaction	No	
6.	Soil, structure, environmental interaction	No	
7.	Distress symptoms	No	
8.	Distress symptoms	No	
9.	Case histories	No	
UNIT II	**EXPANSIVE SOIL PROPERTIES**		
10.	Clay mineralogy	No	[R3]
11.	Clay mineralogy	No	
12.	Swell potential	No	
13.	Swell potential	No	
14.	Field exploration	No	
15.	Field exploration	No	
16.	Laboratory tests for identification	No	
17.	Laboratory tests for identification	No	
18.	Laboratory tests for identification	No	
UNIT III	**SOIL HEAVING**		
19.	Heave Prediction	No	[R4]
20.	Heave Prediction	No	
21.	Method of prediction of heave	No	
22.	Method of prediction of heave	No	
23.	Empirical methods	No	
24.	Double of dometer tests	No	
25.	Soil moisture suction	No	
26.	Field observations, shrinkage.	No	
27.	Field observations, shrinkage.	No	
UNIT IV	**DESIGN OF FOOTING**		
28.	Foundation Design	No	[R5]
29.	Design consideration	No	
30.	Individual footings	No	
31.	Continuous footings	No	
32.	Continuous footings	No	
33.	Stiffened matsunderreamed piles	No	
34.	Stiffened matsunderreamed piles	No	
35.	Stiffened matsunderreamed piles	No	
36.	Codal provisions.	No	
UNIT V	**STABILIZATION**		
37.	Stabilization methods	No	[R3]
38.	Stabilization methods	No	
39.	Stabilization methods	No	

40.	Stabilization methods	No	
41.	Stabilization methods	No	
42.	Stabilization methods	No	
43.	Stabilization methods	No	
44.	Stabilization methods	No	
45.	Stabilization methods	No	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.
- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	5%
Assignment	-	5%
Attendance	-	10%
Final exam	-	70%

Prepared by: Mr. Vinothkumar, Assistant Professor , Department of Civil Engineering **Dated :**

Addendum

ABET Outcomes expected of graduates of B.Tech / Civil / program by the time that they graduate:

a. An ability to apply knowledge of mathematics, science, and engineering
b. An ability to design and conduct experiments, as well as to analyze and interpret data
c. An ability to design a hardware and software system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
d. An ability to function on multidisciplinary teams
e. An ability to identify, formulate, and solve engineering problems
f. An understanding of professional and ethical responsibility
g. An ability to communicate effectively
h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. A recognition of the need for, and an ability to engage in life-long learning
j. A knowledge of contemporary issues
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Educational Objectives

PEO1: PREPARATION

Civil Engineering graduates will have knowledge to apply the fundamental principles for a successful profession and/or for higher education in Civil Engineering based on mathematical, scientific and engineering principles, to solve realistic and field problems that arise in engineering and non engineering sectors

PEO2: CORE COMPETENCE

Civil Engineering graduates will adapt to the modern engineering tools and construction methods for planning, design, execution and maintenance of works with sustainable development in their profession.

PEO3: PROFESSIONALISM

Civil Engineering Graduates will exhibit professionalism, ethical attitude, communication and managerial skills, successful team work in various private and government organizations both at the national and international level in their profession and adapt to current trends with lifelong learning.

PEO4: SKILL

Civil Engineering graduates will be trained for developing soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, inter personal relationship, group discussion and leadership skill to become a better professional.

PEO5: ETHICS

Civil Engineering graduates will be installed with ethical feeling, encouraged to make decisions that are safe and environmentally-responsible and also innovative for societal improvement.

Course Teacher	Signature
Mr.Vinothkumar	

Course Coordinator **HOD/CIVIL**