Academic Course Description

BHARATH UNIVERSITY
Faculty of Engineering and Technology
Department of Civil Engineering

BCE057 DESIGN OF R.C FRAMED STRUCTURES

Sixth Semester, 2016-17 (Even Semester)

Course (catalog) description

The design aspects and analysis methodologies of tall buildings will be introduced. The stability analysis of tall buildings is another important objective of this course

Compulsory/Elective course : Elective for Civil students

Credit/ contact hours : 3 credits / 45hours

Course Coordinator : Mr.T.P.Meikandan Assistant Professor

Instructors **:** Mr.Sathiskumar,Assistant professor.
Ms.Chitra.R, Assistant professor

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@ bharathuniv.ac.in	Consultation
Mr. Sathiskumar	Vii –A			Sathish_4549@yahoo.com	9.00 - 9.50 AM
Ms. Chitra R	VII B			chitraroopauma@gmail.com	12.45 - 1.15 PM

Relationship to other courses:

Pre –requisites **:** Reinforced concrete structures -1

Assumed knowledge : *B*asic knowledge about framed structure design

Following courses : Nil

Syllabus Contents

UNIT I INDUSTRIAL FRAMES **8**

Single Storey Industrial Frames: Estimation of member forces in single storey R.C.C. Industrial bents -of flat Top & gabled configuration from handbooks – Design of members, rigid joints and footing detailing.

UNIT II RC STRUCTURES ELEMENTS **10**

Medium – Rise Framed Buildings : Computation of design moments and shears using substitute frame methods of IS 456 and explanatory handbooks – Analysis for wind and earthquake effects – Design of beams, columns and slabs by Sp-16 Design aid – Detailing of reinforcement – Design of staircases and footings.

UNIT III DESIGN OF FLAT SLAB **9**

Flat Slab Design, Design of heavily loaded warehouse type – Multi storey frames using flat – slab type of construction – Design by empirical and rigid frame analysis – Detailing – Design of pile foundations.

UNIT IV FUNCTIONAL DETAILS OF TALL BUILDINGS **9**

Tall building - functional details – wells, staris and shear walls – lateral deflection - Frame and shear wall interaction - Design of various types of shear walls and detailing – Design of pile foundations.

UNIT V COMPUTER APPLICATION **9**

Computer Methods. Moment distribution and FEM methods of analysis of tall building using standard packages.

Computer usage: ANSYS SOFTWARE

Professional component

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

Broad area : DESIGN OF STRUCTURES

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 1ST week	Session 15 to 28	2 Periods
3	Model Test	March 4th week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

S. No	Topics	Problem Solving (Yes/No)	Text/ Chapter
UNIT I INDUSTRIAL FRAMES			
1.	Single Storey Industrial Frames	YES	T1&R1,R2
2.	Estimation of member forces in single storey	YES	
3.	Estimation of member forces in single storey	YES	
4.	Industrial bents -of flat Top & gabled configuration from handbooks	YES	
5.	Industrial bents -of flat Top & gabled configuration from handbooks	YES	
6.	Design of members, rigid joints and footing detailing	YES	
7.	Design of members, rigid joints and footing detailing	YES	
8.	Design of members, rigid joints and footing detailing	YES	
UNIT II RC STRUCTURES ELEMENTS			
9.	Medium – Rise Framed Buildings	YES	[T1] Chapter -4, [R1]Chapter-9,11
10.	Computation of design moments and shears using substitute frame methods of IS 456 and explanatory handbooks	YES	
11.	Computation of design moments and shears using substitute frame methods of IS 456 and explanatory handbooks	YES	
12.	Analysis for wind and earthquake effects	YES	
13.	Analysis for wind and earthquake effects	YES	
14.	Design of beams, columns and slabs by Sp-16 Design aid	YES	
15.	Design of beams, columns and slabs by Sp-16 Design aid	YES	
16.	Detailing of reinforcement	YES	
17.	Design of staircases and footings	YES	
18.	Design of staircases and footings		
UNIT III DESIGN OF FLAT SLAB			
19.	Flat Slab Design	YES	
20.	Flat Slab Design	YES	
21.	Design of heavily loaded warehouse type	YES	

22.	Design of heavily loaded warehouse type		[T1] Chapter -5,6 [R1]Chapter-4
23.	Multi storey frames using flat slab type of construction	YES	
24.	Design by empirical and rigid frame analysis Detailing	YES	
25.	Design by empirical and rigid frame analysis Detailing	YES	
26.	Design of pile foundations	YES	
27.	Design of pile foundations	YES	
UNIT IV FUNCTIONAL DETAILS OF TALL BUILDINGS			
28.	Tall building functional details	No	[T1] Chapter – 7, [R1]Chapter-7
29.	Tall building functional details	No	
30.	wells, stairs and shear walls - lateral deflection	No	
31.	wells, stairs and shear walls - lateral deflection	No	
32.	Frame and shear wall interaction	YES	
33.	Frame and shear wall interaction	YES	
34.	Design of various types of shear walls and detailing	YES	
35.	Design of various types of shear walls and detailing	YES	
36.	Design of pile foundations	YES	
UNIT V COMPUTER APPLICATION			
37.	Computer Methods	No	[T1] Chapter -8, 9 [R1]Chapter-12,14
38.	Moment distribution and FEM methods of analysis of tall building using standard packages	No	

39.	Moment distribution and FEM methods of analysis of tall building using standard packages	No	
40.	Moment distribution and FEM methods of analysis of tall building using standard packages	No	
41.	Moment distribution and FEM methods of analysis of tall building using standard packages	No	
42.	Moment distribution and FEM methods of analysis of tall building using standard packages	No	
43.	Moment distribution and FEM methods of analysis of tall building using standard packages	No	
44.	Moment distribution and FEM methods of analysis of tall building using standard packages	No	
45.	Moment distribution and FEM methods of analysis of tall building using standard packages	No	

Mapping of Instructional Objectives with Program Outcome

	Correlates to program outcome		
	H	**M**	**L**
1.Computation of design moments and shears.	C,d,e		
2. Analysis for wind and earthquake effects, Design of beams, columns and slabs.	C,d		
3. Design by empirical and rigid frame analysis.	C,d		
4 Design of various types of shear walls and detailing	C,d		
5. Moment distribution and FEM methods of analysis of tall building using standard packages.	C,d	a,	

Draft Lecture Schedule

Teaching Strategies

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

- Formal face-to-face lectures
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.

Evaluation Strategies

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

Prepared by: Ms. Shruthi M V Assistant Professor , Department of Civil **Dated :**

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
Electronics Engineering graduates are provided with a strong foundation to passionately apply the fundamental principles of mathematics, science, and engineering knowledge to solve technical problems and also to combine fundamental knowledge of engineering principles with modern techniques to solve realistic, unstructured problems that arise in the field of Engineering and non-engineering efficiently and cost effectively.

PEO2: CORE COMPETENCE
Electronics engineering graduates have proficiency to enhance the skills and experience to apply their engineering knowledge, critical thinking and problem solving abilities in professional engineering practice for a wide variety of technical applications, including the design and usage of modern tools for improvement in the field of Electronics and Communication Engineering.

PEO3: PROFESSIONALISM
Electronics Engineering Graduates will be expected to pursue life-long learning by successfully participating in post graduate or any other professional program for continuous improvement which is a requisite for a successful engineer to become a leader in the work force or educational sector.

PEO4: SKILL
Electronics Engineering Graduates will become skilled in soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, interpersonal relationship, group discussion and leadership ability to become a better professional.

PEO5: ETHICS
Electronics Engineering Graduates are morally boosted to make decisions that are ethical, safe and environmentally-responsible and also to innovate continuously for societal improvement.

Course Teacher	Signature
Mr. Sathiskumar	
Ms. Chitra R	

Course Co- Ordinator **HOD/CIVIL**