VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

THINDAL, ERODE

DEPARTMENT OF CIVIL ENGINEERING

15.11.2021

Circular

The Value Added course (VAC) on "Civil Engineering drawing and bar bending scheduling" is planned to be conducted by Department of Civil engineering from 18.11.2021 to 06.12.2021 for final year students. All Enrolled students are requested to attend without fail

Course Coordinator

HOD/Civil 151 17171

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Velalar College of Engineering and Technology
(Autonomous)
ERODE - 638 012.

VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE-12. DEPARTMENT OF CIVIL ENGINEERING

Submitted to the Principal for his kind Approval

13.11.2021

Respected Sir,

Sub: Requisition to conduct Value Added Course for Final Year students - reg.

Our department has planned to conduct the following Value-Added Course (VAC) on Civil Engineering drawing and bar bending scheduling for the benefit of Final year students.

We kindly request you permit us to conduct this programme as per the schedule.

Value Added Course Code (if available)	:	18CEV02					
Value Added Course Title	:	Civil Engineering drawing and bar bending scheduling					
Beneficiary	1	Final Year B.E. CIVIL Students					
Total number of students enrolled	:	34					
Dates & Days		: 18.11.2021 & 20.11.2021, 22.11.2021 to					
		24.11.2021,02.12.2021 to 04.12.2021,6.12.2021 – 9 Days					
Total number of contact periods	1	36					
Outcome of the Course		To gain knowledge on Civil Engineering drawing and bar bending scheduling, students will be able to Understand the RC detailing given in the drawing. Prepare Reinforced Concrete detailing for the Slab, Staircase, Beam and Footing.					

Thanking You,

Coordinator(s)

(Dr.E.Ravi)

Velalar College of Engineering and Technology



18CEV02

Civil Engineering drawing and bar bending scheduling

LTPC 0 0 2 1

Prerequisite:

18CET51 - DESIGN OF REINFORCED CONCRETE ELEMENTS

Preamble:

Bar bending schedule is an important structural working document that rightly gives the disposition. bending shape, and total length of all the reinforcements that have been provided in the structural drawing, including the quantity.

Course Outcomes: Upon completion of the course, students will be able to:

- Understand the RC detailing given in the drawing.
- Prepare Reinforced Concrete detailing for the Slab, Staircase, Beam and Footing.

Module 1 - Basics of bar bending schedule

10

- Basics of bar bending schedule
- Reading and understanding relevant specification given in the drawing
- Types of steel (TOR, MILD steel)
- Difference between clear cover and effective cover
- Importance of spacing and diameter of reinforcement
- Identification & importance of main & secondary bar
- Identification of different types of stirrups and cranks/ shear bars

Module 2 - RCC detailing using software

20

Generation of detailed drawings for given specification and preparation of bar bending schedule using AutoCAD

- Continuous one-way slab (with three equal spans)
- Simply supported two-way slab
- Doubly reinforced continuous beam with two equal spans
- Dog-legged staircase
- RCC column with square isolated footing

TOTAL: 30 PERIODS

REFERENCES:

- IS456:2000, Code of practice for Plain and Reinforced Concrete, Bureau of Indian Standards, New Delhi, 2000.
- 2. SP 34-1987 Handbook on reinforcement and detailing, Bureau of Indian Standards, New Delhi, 2000.

e-Resources:



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Session Details

S.No	Date	Periods	Topic	Remarks
1	18.11.2021	1	Basics of bar bending schedule	
2	18.11.2021	2	Reading and understanding relevant specification given in the drawing	
3	18.11.2021	3	Introduction to IS456 Code book	
4	18.11.2021	4	Introduction to SP34 Code book	XI T
5	20.11.2021	1	Types of steel, Difference between clear cover and effective cover	
6	20.11.2021	2	Importance of spacing and diameter of reinforcement	W
7	20.11.2021	3	Identification & importance of main & secondary bar	
8	20.11.2021	4	Identification of different types of stirrups and cranks/ shear bars	
9	22.11.2021	1	Doubly reinforced Simply supported beam	
10	22.11.2021	2	Doubly reinforced continuous beam with two equal spans	
11	22.11.2021	3	Practical Session	
12	22.11.2021	4	Practical Session	
13	23.11.2021	1	Simply supported one-way slab	
14	23.11.2021	2	Continuous one-way slab (with three equal spans)	
15	23.11.2021	3	Practical Session	
16	23.11.2021	4	Practical Session	uf I
17	24.11.2021	1	Simply supported Two-way slab	
18	24.11.2021	2	Dog-legged staircase	
19	24.11.2021	3	Practical Session	7_
20	24.11.2021	4	Practical Session	



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21	02.12.2021	1	RCC column
22	02.12.2021	2	Practical Session
23	02.12.2021	, 3	Practical Session
24	02.12.2021	4	Practical Session
25	03.12.2021	1	Cantilever Structures
26	03.12.2021	2	Practical Session
27	03.12.2021	3	Practical Session
28	03.12.2021	4	Practical Session
29	04.12.2021	1	Square Isolated footing
30	04.12.2021	2	Practical Session
31	04.12.2021	3	Practical Session
32	04.12.2021	4	Practical Session
33	06.12.2021	1	Opportunities in Rebar Detailing
34	06.12.2021	2	Test
35	06.12.2021	3	Test
36	06.12.2021	4	Feedback Session

HOD/CIVIL



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VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF CIVIL ENGINEERING VALUE ADDED COURSE NAME LIST

CLASS:18CE7

BATCH:2018-22

S.No	Reg. No.	Name of the Student					
1	18CEA001	VIJAYARANGAN V					
2	18CEL001	EDWIN.J -					
3	18CEL002	GOKULAKRISHNAN.C					
4	18CEL003	MOHANSHYAM.T					
5	18CEL004	SANTHOSH T K					
6	18CEL005	R.SANTHOSH KUMAR					
7	18CEL006	SATHEESH KUMAR,S					
8	18CEL007	S.YOGESH					
9	18CER001	DEVANATHAN A.P					
10	18CER002	DHARANI V N					
11	18CER003	A.DHIVYA					
12	18CER004	R.S.DIVAGAR					
13	18CER005	M.HARITHA					
14	18CER006	HRITHIK.K					
15	18CER007	R.JAYAMAIIIMA					
16	18CER008	JEEVANANDHAM.G					
17	18CER009	JEEVITHA R					
18	18CER010	KABILAN.PL					
19	18CER011	MATHESH R					
20	18CER012	P.MAYURII					
21	18CER013	MOHANAPRASHANTH B					
22	18CER015	NITHEESKUMAR.R					
23	18CER016	RAGESH R					
24	18CER017	S.RANJITHKUMAR					
25	18CER018	SHIVASHANGAR. M					
26	18CER019	SIJIN.S					
27	18CER020	D. SIVARANJANI					
28	18CER021	C.SOWMITHA					
29	18CER023	V.SRIPATHI					
30	18CER024	SUBHIKSHA. G. R					
31	18CER025	P.E.SURESH					
32	18CER026	S.SUVETHA					
33	18CER027	A.SWATHI PRIYA					
34	18CER028	V.VIVEKA					

Coordinators(s)

PHINCIPAL

HOD/Civi

Velalar College of Engineering and Technology (Autonomous)



VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF CIVIL ENGINEERING VALUE ADDED COURSE ATTENDANCE

BATCH:2018-22 CLASS:18CE7 Session Sessio

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Velalar College of Engineering and Technology

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VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF CIVIL ENGINEERING VALUE ADDED COURSE ATTENDANCE

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ABOUT THE INSTITUTION

Velalar College of Engineering and Technology, Thindal, Erode is a selfco-educational financing institution established in the year 2001 with all the infrastructural facilities necessary provided through the vision of Velalar Educational Trust that ably governs the institution. The college is approved by the AICTE. New Delhi, affiliated to Anna University, Chennai and is accredited by NAAC with 'A' Grade. The institution has completed 17 years of dedicated and excellent service in the field of technical education. This institution offers 7 UG &5 programmes. The following programmes were accredited by NBA, New Delhi, Viz. BME, CSE, ECE, EEE and IT. The institution has been conferred with autonomous status by UGC, New Delhi from the academic year 2017 onwards. There are six research centres in the institution viz. Chemistry, Management studies, EEE, ECE, CSE and Physics.

ABOUT THE DEPARTMENT

The Department of Civil Engineering was established in the academic year 2012-2013. It offers UG degree in Civil Engineering. Since inception, the department provides an encouraging environment and imparts the latest advancements in knowledge and skills through innovative methods of teaching. The Department has qualified faculty members with well equipped laboratories.

ABOUT THE SEMINAR

- To enhance their knowledge in bar bending schedule which is used in Civil Engineering buildings.
- To provide an in-depth knowledge in use of Detailing.

LOCATION

The College is situated at Thindal, 8km from Erode and 11km from Perundurai on Erode-Perundurai road.

ADDRESS FOR COMMUNICATION

Mr.S.Suresh

Assistant Professor,

Department of Civil Engineering,

Velalar College of Engineering and Technology,

Thindal, Erode-638 012.

Mobile - 9751677970

Mr.S.C.Sarath Kumar

Assistant Professor,

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Thindal, Erode-638 012.

Mobile - 9944558163

e-mail: vcetcivil@amail.com



Value Added Course on

"Civil Engineering Drawing and Bar Bending Scheduling" 18th Nov 2021 to 06th Dec 2021

Convenor Dr.E.Ravi, Prof.& Head/Civil

Course Coordinators Mr.S.Suresh, AP/Civil Mr.S.C.Sarathkumar, AP/Civil

Organized by **Department of Civil Engineering**



Velalar College of Engineering and Technology (Autonomous)

(Accredited by NAAC with 'A' Grade)
Thindal, Erode - 638 012.

Phone: 0424 - 2244201 to 204 and 206

Fax : 0424-2244205

e-mail: vcetcivil@gmail.com

Website: www.velalarengg.ac.i/n/

PRINCIPAL

Velalar College of Engineering and Technology

(Autonomous)

D. Rudgolistal



Name: W Dhuya

Register number: 19CER003

Date: 30-12-2021

ERODE - 638 012.

VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Value added course

CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING DETAILING OF REINFORCEMENT

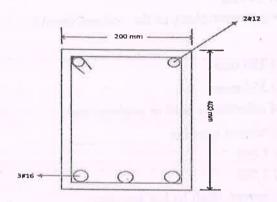
Sl. No.	Questi	ione'
1.	The minimum diameter of longitudinal steel s	should be
2.	a) 10 mm	b) 12 mm
	a) 200 mm	o) 250 mm
	c) 300 mm	1) 350 mm
3.	What is the effective length for the condition	of effectively held in position and
5.	a) 0.651 b) c) 0.801 The cross-sectional area of longitudinal reinfolor more than of the gross cross a) 0.6 % and 8% c) 0.6 % and 6% For a longitudinal reinforcing bar in the columless than a) 40mm c) 50mm	pression member 1) 1.001 2) 1.501 recement, shall be not less than s-sectional area of the column 1) 0.8 % and 6%
6. Calcu of bar =	ulate the developmental length for M20 grade of 12 mm	of concrete, Fe415, $C_{bd} = 1.92$, diameter
7. Write	the nominal cover for the following RCC elem	nents
a) slab		
b) beam		
c) columi	((0))	PRINCIPAL
d) footing	g (NOMO)	Velalar College of Engineering and Technology (Autonomous)

- 8. If length of bar is 12m with 10mm Dia then calculate the weight of bar
- 9. calculate the number of stirups in a beam, length of the beam is 5 m and spacing between the stirups is 200 mm
- 10. An RCC beam 350 mm wide and 500 mm deep with a length of 5000 mm is reinforced with four numbers of 12mm bars that are placed in one single row.

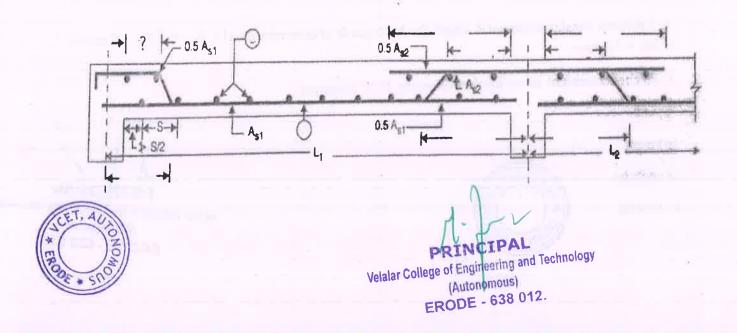
Out of the four bars, two of the bars are straight and two of the bars are bent up. Also, two additional anchor bars are provided on the top with a 10 mm diameter.

Stirrups of a diameter of 6 mm are provided at a c/c spacing of 150 mm. Determine the total quantity of steel required and the bar bending schedule.

- 11. calculate the length of the stirrups for the following cross sectional beam (200 mmx400 mm)
- 12. calculate the effective depth for the following cross sectional beam



- 13. Determine the lap length for two bars in which the diameter of one bar is 25mm and another of diameter 40mm.
- 14. Calculate the length of torsional reinforcement of slab at corner? If $l_x = 4m$, $l_y = 3m$
- 15. Mention the bent up and curtailment length for the given slab



Civil Engineering Drawing and Bon 18CERDO3

Bending Scheduling Detailing of Reinforcement.

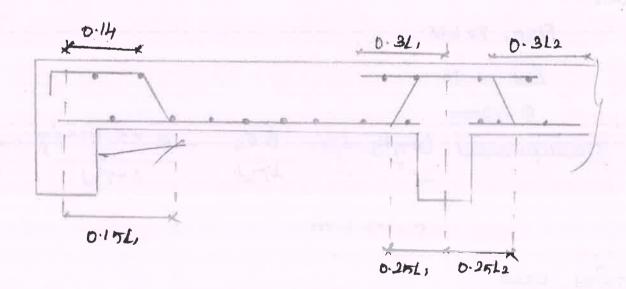
Value Added Course.

	Value 1-Idded Course.
l	b) 12mm
2.	() 300mm
3,	a) 0.651
	b) 0.8.1. and 6.4
	a) 40mm
6.	Gwen
	M20, Fe 416
	[bd = 1.92
	$\phi = 12mm$
	Developmental length 10= \$03 = \$x0.81x1y=56.6
J	LD = 156.6cm
7	Nominal cover
	a) 8/ab = 20mm
	b) beam = 25mm
	c) column = 40mm
	d) poting = 50mm
(8	Given length of boor = 12m
	PODE *
	weight of bou per metre = 0.617 kg Velalar College of Engineering and Technology (Autonomous) ERODE - 638 012.
	weight of box for 12 metre = 7.4 kg.

15)

12) Effective depts, d= 315mm.

dength of horsional ruthforcement =
$$\frac{Lu}{5} = \frac{4}{5} = 0.8 \text{ m}$$





Velalar College of Engineering and Technology

(Autonomous)

ERODE - 638





Name: V. N. Dharane

Register number: 18CER002

Date: 30-12-2021

VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Value added course

CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING DETAILING OF REINFORCEMENT

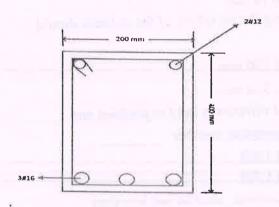
Sl. No.		Questions
1.	The minimum diameter of l	ongitudinal steel should be
2.	a) 10 mm c) 8 mm	b) 12 mm d) 14 mm bars measured along the periphery of the column should
	not exceed	
	a) 200 mm	b) 250 mm
	c) 300 mm	d) 350 mm
3.	What is the effective length	for the condition of effectively held in position and
	restrained against rotation in	both ends of compression member
	a) 0.651	b) 1.001
	c) 0.801	d) 1.501
 4. 5. 	a) 0.6 % and 8% c) 0.6 % and 6% For a longitudinal reinforcing	ongitudinal reinforcement, shall be not less than of the gross cross-sectional area of the column b) 0.8 % and 6% d) 0.8 % and 8% g bar in the column nominal cover shall in any case not be
	a) 40mm	b) 20mm
	c) 50mm	d) 60mm
6. Calc	ulate the developmental lengt	th for M20 grade of concrete, Fe415, $C_{bd} = 1.92$, diameter
7. Write	the nominal cover for the fol	llowing RCC elements
a) slab		M-1-2
b) beam	AUTON	PRINCIPAL
c) colun	nn (S)	Velalar College of Engineering and Technology
d) footin	g *FRODE *	(Autohomous) ERODE - 638 012.

- 8. If length of bar is 12m with 10mm Dia then calculate the weight of bar
- 9. calculate the number of stirups in a beam, length of the beam is 5 m and spacing between the stirups is 200 mm
- 10. An RCC beam 350 mm wide and 500 mm deep with a length of 5000 mm is reinforced with four numbers of 12mm bars that are placed in one single row.

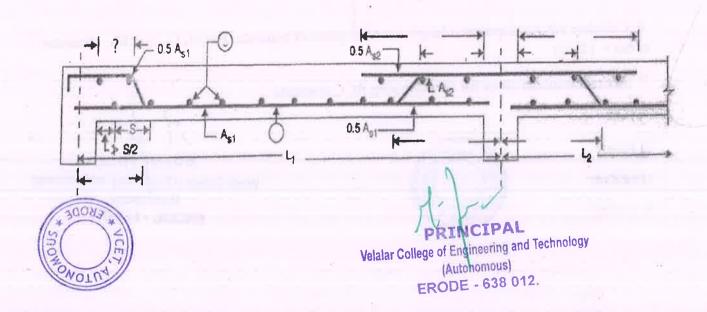
Out of the four bars, two of the bars are straight and two of the bars are bent up. Also, two additional anchor bars are provided on the top with a 10 mm diameter.

Stirrups of a diameter of 6 mm are provided at a c/c spacing of 150 mm. Determine the total quantity of steel required and the bar bending schedule.

- 11. calculate the length of the stirrups for the following cross sectional beam (200 mmx400 mm)
- 12. calculate the effective depth for the following cross sectional beam



- 13. Determine the lap length for two bars in which the diameter of one bar is 25mm and another of diameter 40mm.
- 14. Calculate the length of torsional reinforcement of slab at corner? If $l_x = 4m$, $l_y = 3m$
- 15. Mention the bent up and curtailment length for the given slab



Value added Course

V.N. Dharani

18CE 2002

Civil Engineering Drawing And Bas Bending Scheduling Detailing of Reinforcement.

30-12-2021

- 1). 6) 12 mm
- 2). c) 300 mm
- 3). a) 0.651
- 4). 6)0. 8% and 6%.
- 5. a) Lomm

6. Given: M20, Fe415

Ibd = 1.92

\$ = 12mm

Developmental length LD =

= \$ x0.87 fy 4 x Ibd

12 x D. 87 Yestaldr college of Engineering and Technology (Autonomous)

4×1.92

ERODE - 638 012.

= 56.4 cm

nominal cover

a) Whab - 26 mm

- b). beam 25 mm;
- c). Column 40 km

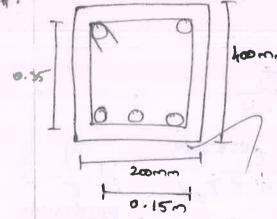
-11 1-chi- - ED.

length of box =
$$12m$$
 $\phi = 10mm$

Meight of box par meter = 0.617 by Weight of box bor 12 mate = 7.4 kg.

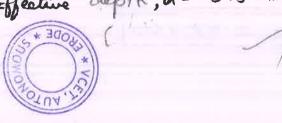
Griven: -Length of bean = 500 Spacing

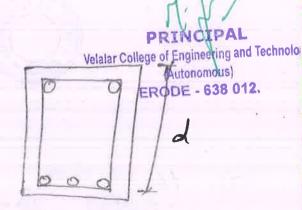
number of stirryps = 26



Length of Stirrups = 1.1 m

Effective depth, d = 375 mm

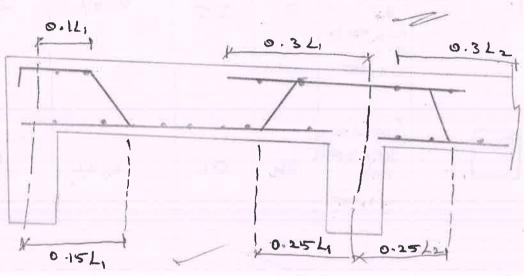




choose which ever dia is minimum

14. Length of torsional reinforcement = Los

15.



Grusen ! -

1 =5 m

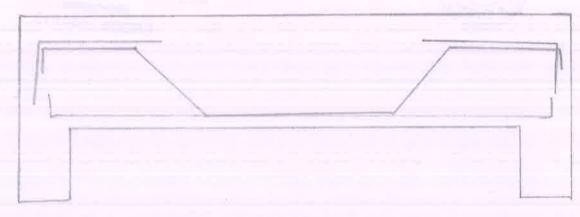
d = 450 mm

p = 320 ww



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(Autonomous)



Dia Shape	Length (1m)	No. of	Total length	Weight of bor by/m	Total by.
#D ₁₂	5-0.05) +0.225 +0.225 = 5.4	2	10.8	O - 8 &	9.6
#D12	t				The state of the s
+ D10	4 4+50D = 1.75	2	3-5	0.62	2.16
#D6	(400+400+ 300+300+ 100)	34	51	0.22	11.33



Velalar College of Engineering and Technology
(Autonomous)

ERODE - 638 012.

& Bragatan



Name: R. Jeevitha

Register number: 18CER009

Date: 30.12.2021

VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Value added course

CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING DETAILING OF REINFORCEMENT

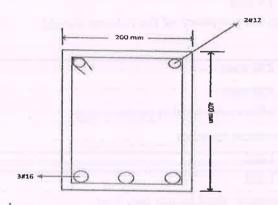
Sl. No.		Questions
1.	The minimum diameter of longi	tudinal steel should be mm
	a) 10 mm c) 8 mm	b) 12 mm d) 14 mm
2.	The spacing of longitudinal bars	measured along the periphery of the column should
	not exceed	be perspectly of the column should
	a) 200 mm	b) 250 mm
	c) 300 mm	d) 350 mm
3.	What is the effective length for t	he condition of effectively held in position and
	restrained against rotation in bot	h ends of compression member
	a) 0.651	
	c) 0.801	b) 1.001 d) 1.501
4.	•	tudinal reinforcement, shall be not less than
	nor more than of t	he gross cross-sectional area of the column
	a) 0.6 % and 8%	b) 0.8 % and 6%
	c) 0.6 % and 6%	d) 0.8 % and 8%
5.	For a longitudinal reinforcing ba	r in the column nominal cover shall in any case not be
	iess than	start in any case not be
	a) 40mm	b) 20mm
	c) 50mm	d) 60mm
6. Calo	culate the developmental length for 12 mm	or M20 grade of concrete, Fe415, $C_{bd} = 1.92$, diameter
7. Write	e the nominal cover for the follow	ring RCC elements
a) slab		
b) beam		
c) colur	mn (4) AU TOA	Velalar College of Engineering and Technology
d) footi	ng ***	(Autonomous) ERODE - 638 012.

- 8. If length of bar is 12m with 10mm Dia then calculate the weight of bar
- 9. calculate the number of stirups in a beam, length of the beam is 5 m and spacing between the stirups is 200 mm
- 10. An RCC beam 350 mm wide and 500 mm deep with a length of 5000 mm is reinforced with four numbers of 12mm bars that are placed in one single row.

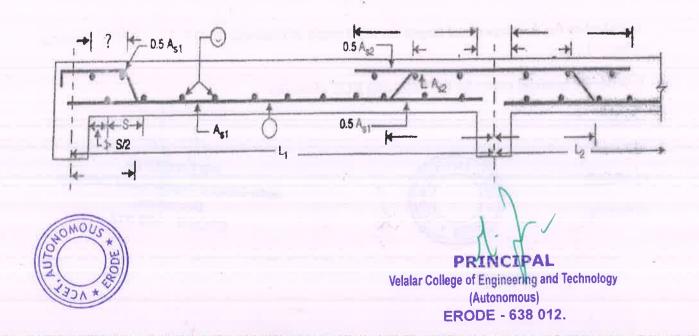
Out of the four bars, two of the bars are straight and two of the bars are bent up. Also, two additional anchor bars are provided on the top with a 10 mm diameter.

Stirrups of a diameter of 6 mm are provided at a c/c spacing of 150 mm. Determine the total quantity of steel required and the bar bending schedule.

- 11. calculate the length of the stirrups for the following cross sectional beam (200 mmx400 mm)
- 12. calculate the effective depth for the following cross sectional beam



- 13. Determine the lap length for two bars in which the diameter of one bar is 25mm and another of diameter 40mm.
- 14. Calculate the length of torsional reinforcement of slab at corner? If $l_x = 4m$, $l_y = 3m$
- 15. Mention the bent up and curtailment length for the given slab



Value added course

R. Jeevitha 18(ER009

- 1 b) 12mm.
- 2. c) 300 mm
- 3. a) 0.65 T
- 4. 6) 0.8% and 6 %.
 - 5. a)40mm
- 6. Given:

M20 grade convete:

Fe415

Ibd=1,92

\$ = 12mm

Ld = DOS 4 Tbd

os = 0.87 fy = 0.87 ×415 *

Ld = 12 x 0.87 x 415

4×1.92

Ld = 56.4.cm

Velalar College of Engineering and Technology

(Auton mous)

(638 012.

Nominal coverige

- a) slab = 20 minor
- b) Beam = : 25 mm
- c) Column = 30-40 mm
- d) Frating: 50 mm = 75 mm

8. Length of bar = 12 mm Dia of bon = 10 mm

weight of bor permeter for 10 mm = 0.617 kg weight of bol (12m) = 7.4 kg

9. Length of the beam = 5 m Spacing blu sturps = 200 mm

 $=\frac{5}{0.2}+1$

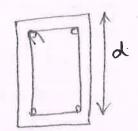
Number of y= 26 Nos.

Length of stirryps = 0.15 + 0.15 + 0.35 + 0.35 + 0.1



Velalar College of Engineering and Technology (Autonomous) ERODE - 638 012.

12. Effective depth = 375 mm



13.

Lap length = 50 d Consider derser diameter of bar among two

= 50×25

Lap length

= 1250 mm -

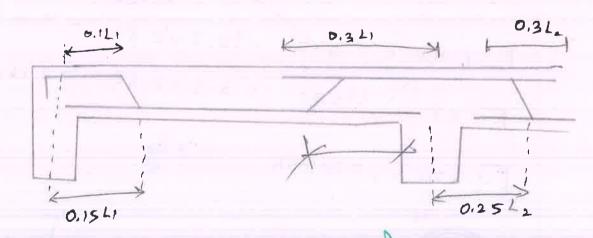
14. Torrional reinforcement of elab

lu = 4m. ly = 3m.

Length of torrional = Lx (oi) 0.2 Lx

= 0,8m

15.





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(Autonomous)
ERODE 638 012.

Straight bar
$$= (5-0.05) + 0.225 + 0.225$$

= 5.4 m

Anchory
$$= \frac{1}{4} + 50D$$

 $= \frac{5}{4} + (50 \times 0.01)$
1.75 m

Stirrup =
$$\begin{pmatrix} 5 \\ 0.15 \end{pmatrix}$$
 = 34 NBS
weight = 9,6 kg
 $1 \times 2 = 5.4 \times 2 = 10.8 \times 0.88 = 9,6 kg$
 $1 \times 2 = 1.75 \times 2 = 3.5 \times 0.63 = 2.16 kg$
 $1 \times 2 = 0.22 \times 54 = 11.8 kg$

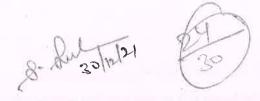


PRINCIPAL

Velalar College of Engineering and Technology

(Autonomous)

ERODE - 638 012.



Name: VIVERA V

Register number: 18CE RO28

Date: 30/12/21

ERODE - 638 012.

VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Value added course

CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING DETAILING OF REINFORCEMENT

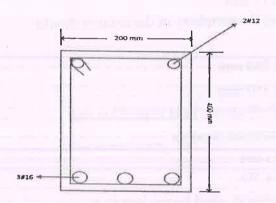
Sl. No.		Questions	
1.	The minimum diameter of longitude	udinal steel should be	mm
2.	a) 10 mmc) 8 mmThe spacing of longitudinal bars	b) 12 mm	
	not exceed		
	a) 200 mm	b) 250 mm	
3.	c) 300 mm What is the effective length for the	d) 350 mm te condition of effectively hel	d in nosition and
	restrained against rotation in both	ends of compression membe	r
	a) 0.651 c) 0.801	b) 1.001	
4.	The cross-sectional area of longitude nor more than of the a) 0.6 % and 8%	e gross cross-sectional area of b) 0.8 % and 6%	not less than f the column
5.	c) 0.6 % and 6% For a longitudinal reinforcing bar less than	d) 0.8 % and 8% in the column nominal cover	shall in any case not be
	a) 40mm	b) 20mm	
	c) 50mm	d) 60mm	
or our	culate the developmental length for 12 mm ethe tower for the following the nominal cover for the following		5 , $C_{bd} = 1.92$, diameter
a) slab		To o oldments	
b) beam c) colum d) footin	nn GAUTONO		PRINCEPAL e of Engineering and Technology (Autonomous)

- 8. If length of bar is 12m with 10mm Dia then calculate the weight of bar
- 9. calculate the number of stirups in a beam, length of the beam is 5 m and spacing between the stirups is 200 mm
- 10. An RCC beam 350 mm wide and 500 mm deep with a length of 5000 mm is reinforced with four numbers of 12mm bars that are placed in one single row.

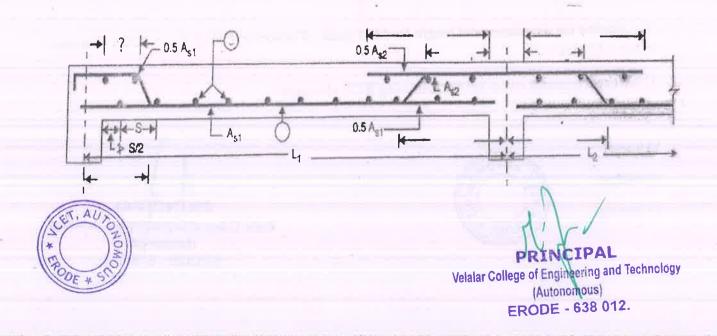
Out of the four bars, two of the bars are straight and two of the bars are bent up. Also, two additional anchor bars are provided on the top with a 10 mm diameter.

Stirrups of a diameter of 6 mm are provided at a c/c spacing of 150 mm. Determine the total quantity of steel required and the bar bending schedule.

- 11. calculate the length of the stirrups for the following cross sectional beam (200 mmx400 mm)
- 12. calculate the effective depth for the following cross sectional beam



- 13. Determine the lap length for two bars in which the diameter of one bar is 25mm and another of diameter 40mm.
- 14. Calculate the length of torsional reinforcement of slab at corner? If $l_x = 4m$, $l_y = 3m$
- 15. Mention the bent up and curtailment length for the given slab



Civil Engineering Drawing And Bax Bending Scheduling Detailing of Reinforcement Value Added Coarse

V. Viveka 18CE R028

- 1) b) 12 mm
- c) 300 mm
- a) 0.65 L
- b) 0.8 % and 64.
- 5) a) 40 mm
- 6) Griven

M20 grade, Fe415

Ibd = 1.92

Ø = 12 mm

\$ x 0.87 x fy Development Length Lo 4 tod 4 x 1.92

= 56.6 cm

7) Nominal Cover

- a) Slat = 20 mm
- b) Bram (25 8mm
- a) Column FRODE

d) footing = 50 mm

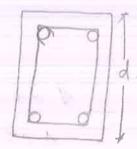
PRINCIPAL Velalar College of Engineering and Technology (Autonomous)

Length of Bar 12 mi

$$\phi = 10 \text{ mm}$$

Wgt of bar per meter = 0.617 kg
Wgt of bar for 12 m = 7.4 kg

12) Effective depth = 375 mm



Lap Longth = 50d Consider Jesser drameter of boar Among two Lap length = 1250 mm



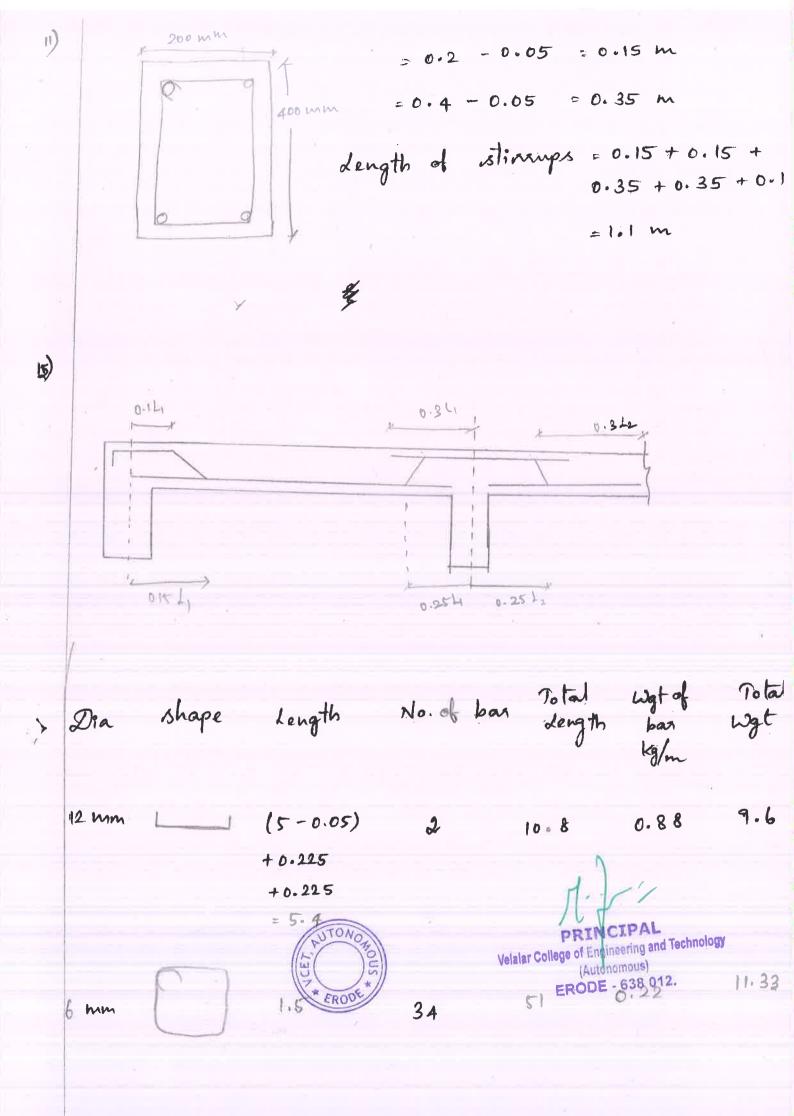
14) To asio Rem forcement of slab

PRINCIPAL

Velalar College of Engineering and Technology

(Autonomous) Length torsional = Ln/5 (or) 0.2 ERODE-638

=0.8 m





Name: of Suvetha

Register number: 18CER026

Date: 20/12/2021

VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Value added course

CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING DETAILING OF REINFORCEMENT

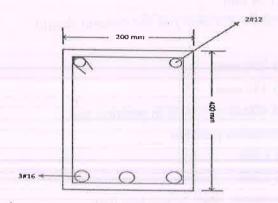
Sl. No.		Questions
1.	The minimum diameter	of longitudinal steel should be mm
2.	a) 10 mm c) 8 mm	b) 12 mm d) 14 mm nal bars measured along the periphery of the column should
3.	a) 200 mm c) 300 mm	b) 250 mm d) 350 mm
3.	a) 0.651	gth for the condition of effectively held in position and n in both ends of compression member b) 1.001
4.	c) 0.80l The cross-sectional area nor more than a) 0.6 % and 8%	d) 1.50l of longitudinal reinforcement, shall be not less than of the gross cross-sectional area of the column
5.	c) 0.6 % and 6%	b) 0.8 % and 6% d) 0.8 % and 8% reing bar in the column nominal cover shall in any case not be
	a) 40mm c) 50mm	b) 20mm d) 60mm
6. Calo of bar =	culate the developmental le	ength for M20 grade of concrete, Fe415, C_{bd} = 1.92, diameter
7. Write	e the nominal cover for the	following RCC elements
a) slab		0
b) beam		1.1
c) colun l) footir	121	PRINCIPAL Velalar College of Engineering and Technology (Autonomous) ERODE - 638 012.
		ERODE - 636 012.

- 8. If length of bar is 12m with 10mm Dia then calculate the weight of bar _____
- 9. calculate the number of stirups in a beam, length of the beam is 5 m and spacing between the stirups is 200 mm
- 10. An RCC beam 350 mm wide and 500 mm deep with a length of 5000 mm is reinforced with four numbers of 12mm bars that are placed in one single row.

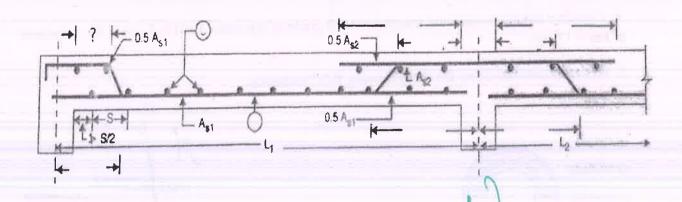
Out of the four bars, two of the bars are straight and two of the bars are bent up. Also, two additional anchor bars are provided on the top with a 10 mm diameter.

Stirrups of a diameter of 6 mm are provided at a c/c spacing of 150 mm. Determine the total quantity of steel required and the bar bending schedule.

- 11. calculate the length of the stirrups for the following cross sectional beam (200 mmx400 mm)
- 12. calculate the effective depth for the following cross sectional beam



- 13. Determine the lap length for two bars in which the diameter of one bar is 25mm and another of diameter 40mm.
- 14. Calculate the length of torsional reinforcement of slab at corner? If $l_x = 4m$, $l_y = 3m$
- 15. Mention the bent up and curtailment length for the given slab





Velalar College of Engineeting and Technology
(Autonomous)

CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING DETAILING OF REINFORCEMENT.

VALUE ADDED COURSE

of oscivetha 18CER026

- (1) b) 12 mm
- c) 300 mm
- a) 0.65 L 3
- b) 0-8% and 6%.
- a) 40 mm (3)
- epiven:

Mao, Fe 415

Tbd = 1.92

\$ = 12 mm

Development length
$$LD = \frac{\phi \, \sigma_s}{4 \, T_{bd}} = \frac{\phi \times 0.87 \, d\sigma}{4 \, T_{bd}} = 56.6 \, cm$$

Lp = 56.6 cm

Alominal cover:

- a) slab = 20 mm
- b) beam = 25 mm
- c) Column = 40 mm

footing = 50 mm

given:

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Velalar College of Engineering and Technology (Autonomous)

ERODE - 638 012.

length of bar = 12 m

Weight of bar per moter = 0.619 kg

weight of bor for 12m = 4.4 kg.

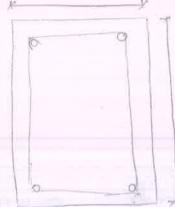
@ ejiven:

Length of beam = 5 m

spacing = 200 mm

Number of stirrups = Length / +1 = 5/0.2+1 = 26.

200 MM



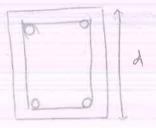
400 MM

Length of estimates = 0.15 + 0.15 + 0.35 + 0.35 + 0.35

= 1.1 M

Effective depth : 375 mm

12



Lap length = 50 d

consider lener diameter of bas airrorg two = 50 × 25

Lap Length = 1850 mm

(1) Torrional reinforcement of Oflab



f torsional

Lay (by) 0.2 Velalar Colle

0.2 PRINCIPAL

Velalar College of Engineering and Technology (Autonomous)

= 0.8 M

	0-16	(31)	0.312
			>
12	0.15	K	0.2512

10	Dia	Shape	Length	No. of bar	Motol Length	of one	Total wyt
	# De		(5-0.05) + 0.225 + 0.225	9_	8.01	0.88	9.6
	#D6		1.5	34	2/	0.22	11.23



PRINCIPAL
Velalar College of Engineering and Technology
(Autonomous)
ERODE - 638 012.





Name: D. Sivaranjawi Register number: 18CF Roso

ERODE - 638 012.

Date: 30.12.2021

VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Value added course

CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING DETAILING OF REINFORCEMENT

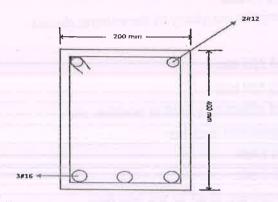
		والمتعالج فالمتعارض القرارات والمتعارض والمتعا				
Sl. No.		Questions				
1.	The minimum diameter of lo	Ongitudinal steel should be				
2	a) 10 mm c) 8 mm	b) 12 mm				
2.	The spacing of longitudinal bars measured along the periphery of the column should not exceed					
	a) 200 mm	b) 250 mm				
	c) 300 mm	d) 350 mm				
3.	What is the effective length t	for the condition of effectively held in modification of				
	What is the effective length for the condition of effectively held in position and restrained against rotation in both ends of compression member					
	a) 0.651					
	c) 0.801	b) 1.00l				
4.	The cross-sectional area of lo	d) 1.50l ongitudinal reinforcement, shall be not less than				
	nor more than	of the gross cross sectional area of the				
	a) 0.6 % and 8%	of the gross cross-sectional area of the column b) 0.8 % and 6%				
	c) 0.6 % and 6%					
		d) 0.8 % and 8%				
		g bar in the column nominal cover shall in any case not be				
	a) 40mm	b) 20mm				
	c) 50mm	d) 60mm				
	*=	a) comm				
6. Calcuof bar =	ulate the developmental lengtl 12 mm	h for M20 grade of concrete, Fe415, $C_{bd} = 1.92$, diameter				
7. Write	the nominal cover for the following	lowing RCC elements				
a) slab		J				
) beam	STONO	1, ='/				
colum	n (F)					
) C	(*) *)	PRINCIPAL				
) footing	g EROV	Velalar College of Engineering and Technology (Autonomous)				

- 8. If length of bar is 12m with 10mm Dia then calculate the weight of bar
- 9. calculate the number of stirups in a beam, length of the beam is 5 m and spacing between the stirups is 200 mm
- 10. An RCC beam 350 mm wide and 500 mm deep with a length of 5000 mm is reinforced with four numbers of 12mm bars that are placed in one single row.

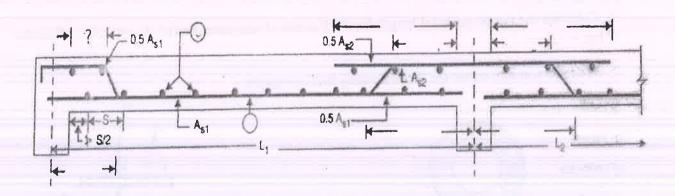
Out of the four bars, two of the bars are straight and two of the bars are bent up. Also, two additional anchor bars are provided on the top with a 10 mm diameter.

Stirrups of a diameter of 6 mm are provided at a c/c spacing of 150 mm. Determine the total quantity of steel required and the bar bending schedule.

- 11. calculate the length of the stirrups for the following cross sectional beam (200 mmx400 mm)
- 12. calculate the effective depth for the following cross sectional beam



- 13. Determine the lap length for two bars in which the diameter of one bar is 25mm and another of diameter 40mm.
- 14. Calculate the length of torsional reinforcement of slab at corner? If $l_x = 4m$, $l_y = 3m$
- 15. Mention the bent up and curtailment length for the given slab





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Value added course. CRVII Engineering Drawing and Bas Barding schooluling Detailing & Reinforcement. (. b) 12 mm 2. () 300mm 3. a) 0.6st 4 b) 0.8% and 6%. 5. a) 40 mm 6. Gm:- . N20, FRAIS \$= 12 mm Davelopment lengte 10: 45bd LD = dx 0.875y = 56.3cm Xx Thd 7. Nominal cover! a) Blab - 20 mm b) Beam - 25 mm c) Column - Aomm d) footing / some 8. Gen: Length of bar = 12m Weight of bor par metre = 0.612 kg Weight of bor for 12 metre = 7.4 kg Velalar College of Englineering and Technology (Autonomous) ERODE - 638 012.

9. Gm:length of boarn ==m
spacing = 200mm Number of Stirrups = longte spacing 12. Effective depth, d= 375mm. length of stirraps = 1.1 m Length of torsional reinforcement : Lx ±0.8m 15.



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VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF CIVIL ENGINEERING

VALUE ADDED COURSE on

Civil Engineering Drawing and Bar Bending Scheduling Marksheet

CLASS:18CE7

BATCH:2018-22

C No Dog No		DATCH.	T
S.No	7		Marks
1	18CEA001	VIJAYARANGAN 🗸	88
2	18CEL001	EDWIN.J	90
3	18CEL002	GOKULAKRISHNAN.C	93
4	18CEL003	MOHANSHYAM.T	92
5	18CEL004	SANTHOSH T K	83
6	18CEL005	R.SANTHOSH KUMAR	95
7	18CEL006	SATHEESH KUMAR.S	87
8	18CEL007	S.YOGESH	95
9	18CER001	DEVANATHAN A.P	92
10	18CER002	DHARANI V N	98
11	18CER003	A.DHIVYA	98
12	18CER004	R.S.DIVAGAR	93
13	18CER005	M.HARITHA	92
14	18CER006	HRITHIK.K	92
15	18CER007	R.JAYAMAHIMA	93
16	18CER008	JEEVANANDHAM.G	88
17	18CER009	JEEVITHA R	98
18	18CER010	KABILAN,PL	92
19	18CER011	MATHESH.R	97
20	18CER012	P.MAYURII	98
21	18CER013	MOHANAPRASHANTH B	97
22	18CER015	NITHEESKUMAR.R	95
23	18CERÒ16	RAGESH R	87
24	18CER017	S.RANJITHKUMAR	92
25	18CER018	SHIVASHANGAR. M	88
26	18CER019	SIJIN.S	92
27	18CER020	D. SIVARANJANI	98
28	18CER021	C.SOWMITHA	93
29	18CER023	V.SRIPATHI	90
30	18CER024	SUBHIKSHA. G. R	98
31	18CER025	P.E.SURESH	90
32	18CER026	S.SUVETHA	98
33	18CER027	A.SWATHI PRIYA	95
34	18CER028	V.VIVEKA	98

S. Www. AC Coordinator(s)

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Department of Civil Engineering

Value Added Course - Student Feedback Form

Date: 06.12.21

Register No: 18CERO25

Student Name: SURESH, P.E

Title of the course: Civil Engineering drawing and har hending scheduling

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The objective of the course were clearly defined.					
2. Participation and interaction was encouraged.					
3. The topics covered were relevant to course.					,
4. The content was organized and easy to follow.				V-	
5. Was the material presented clearly and understandable?		_			
6. Did you find it easy to navigate through the program?				14	
7. The course objectives were met.	1				
8. The time allotted for the course was sufficient.					
9. Would you enrol in refresh course in the same topic?	Yes/No (Tic	ck your ar	iswer)		

ings would you like to have in the future? Yes/No (Tick your answer)

11. Do you have any suggestions that would help us improve the quality of our course?

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18 CER 021 Sig rangoni

VELALAR COLLEGE OF ENGINERING AND TECHNOLOGY

Department of Civil Engineering Value Added Course – Student Feedback Form

00.42.21

Date: 06. 12. 21

Register No: 18 CE RO21

Student Name: Siva rangani

Title of the course: Civil Engineering drawing and bar bending scheduling

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The objective of the course were clearly defined.					
2. Participation and interaction was encouraged.		~			
3. The topics covered were relevant to course.					
4. The content was organized and easy to follow.					
5. Was the material presented clearly and understandable?	V7	2			
6. Did you find it easy to navigate through the program?		1			
7. The course objectives were met.					7.
8. The time allotted for the course was sufficient.	1				
9. Would you enrol in refresh course in the same topic?	Yes/No (Ti	ck your an	iswer)		-!-
10. Additional trainings would you like to have in the future	ire? Yes/No	o (Tick y	our answe	r)	
11. Do you have any suggestions that would help us impr	ove the qual	ity of our	course?		

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Department of Civil Engineering

Value Added Course – Student Feedback Form

Date: 06.12.2021

Register No: 18LER002

Student Name: DHAR ANI.D

Title of the course: Civil Engineering drawing and bar bending scheduling

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The objective of the course were clearly defined.	/				
2. Participation and interaction was encouraged.	✓				
3. The topics covered were relevant to course.	/				
4. The content was organized and easy to follow.	V				
5. Was the material presented clearly and understandable?	V				
6. Did you find it easy to navigate through the program?	V				
7. The course objectives were met.	~				
8. The time allotted for the course was sufficient.	V				

- 9. Would you enrol in refresh course in the same topic? Yes/No (Tick your answer)
- 10. Additional trainings would you like to have in the future? Yes/No (Tick your answer)
- 11. Do you have any suggestions that would help us improve the quality of our course?

No suggestions.

EROOF.

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Thank you for your feedback

ERODE - 638 012.

Department of Civil Engineering

Value Added Course - Student Feedback Form

Date: 06 / 12 / 21

Register No: 12 LERO08

Student Name: Jeevanandham. N

Title of the course: Civil Engineering drawing and bar bending scheduling

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The objective of the course were clearly defined.					-
2. Participation and interaction was encouraged.					
3. The topics covered were relevant to course.					
4. The content was organized and easy to follow.					
5. Was the material presented clearly and understandable?					
6. Did you find it easy to navigate through the program?					
7. The course objectives were met.	/				
8. The time allotted for the course was sufficient.					
9. Would you enrol in refresh course in the same topic?	Yes/No (Ti	ck your a	nswer)		1
10. Additional trainings would you like to have in the fu	ture? Yes/No	Tick y	our answe	r)	
11. Do you have any suggestions that would help us im	prove the qual	ity of our	course?		

NO.



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Department of Civil Engineering

Value Added Course - Student Feedback Form

Date: 06-12-2021

Register No: 18 CEL003

Student Name: Mohan Shyam. T

Title of the course: Civil Engineering drawing and bar bending scheduling

= -	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The objective of the course were clearly defined.	S :				
2. Participation and interaction was encouraged.	5				
3. The topics covered were relevant to course.	✓				
4. The content was organized and easy to follow.	5				
5. Was the material presented clearly and understandable?	√				
6. Did you find it easy to navigate through the program?	1				
7. The course objectives were met.	~				
8. The time allotted for the course was sufficient	1				

9. Would you enrol in refresh course in the same topic? Yes/No (Tick your answer)

10. Additional trainings would you like to have in the future? Yes/No (Tick your answer)

11. Do you have any suggestions that would help us improve the quality of our course? No

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CERTIFICATE

This is to certify that Ms.JEEVITHA R (18CER009) of final year has actively participated in Value Added Course (36 hours) on "CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING" organised by the Department of Civil Engineering from 18th November to 09th December 2021.

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CERTIFICATE

This is to certify that Ms.DHARANI V.N (18CER002) of final year has actively participated in Value Added Course (36 hours) on "CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING" organised by the Department of Civil Engineering from 18th November to 09th December 2021.

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CERTIFICATE

This is to certify that Mr.NITHEESKUMAR R (18CER015) of final year has actively participated in Value Added Course (36 hours) on "CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING" organised by the Department of Civil Engineering from 18th November to 09th December 2021

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CERTIFICATE

This is to certify that Mr.SIJIN S (18CER019) of final year has actively participated in Value Added Course (36 hours) on "CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING" organised by the Department of Civil Engineering from 18th November to 09th December 2021.

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CERTIFICATE

This is to certify that Ms.SIVARANJANI D (18CER020) of final year has actively participated in Value Added Course (36 hours) on "CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING" organised by the Department of Civil Engineering from 18th November to 09th December 2021.

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DEPARTMENT OF CIVIL ENGINEERING

CERTIFICATE

This is to certify that Mr.KABILAN PL (18CER010) of final year has actively participated in Value Added Course (36 hours) on "CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING" organised by the Department of Civil Engineering from 18th November to 09th December 2021.

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DEPARTMENT OF CIVIL ENGINEERING

CERTIFICATE

This is to certify that Ms.MAYURII P (18CER012) of final year has actively participated in Value Added Course (36 hours) on "CIVIL ENGINEERING DRAWING AND BAR BENDING SCHEDULING" organised by the Department of Civil Engineering from 18th November to 09th December 2021.

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DEPARTMENT OF CIVIL ENGINEERING

07.12.2021

Value Added Course on 'Civil Engineering drawing and bar bending scheduling'

A Report

The department of Civil Engineering of Velalar College of Engineering and Technology has organized a thirty-six hours Value Added Course on "Civil Engineering drawing and bar bending scheduling" during 18.11.2021 to 06.12.2021. Thirty-four students from Civil Final year has been actively participated the course. The course has been conducted at Civil Engineering CADD Lab on daily basis. The resource persons for the courses are Mr.S.Suresh and Mr.S.C.Sarathkumar, Assistant Professor of Civil Engineering Department, VCET.

The following portions are covered during the course

Basics of bar bending schedule

- Importance of spacing and diameter of reinforcement
- Identification & importance of main & secondary bar
- Identification of different types of stirrups and cranks/ shear bars

RCC detailing using software

Generation of detailed drawings for given specification and preparation of bar bending schedule using AutoCAD

- Continuous one-way slab (with three equal spans)
- Simply supported two-way slab
- Doubly reinforced continuous beam with two equal spans
- Dog-legged staircase
- RCC column with square isolated footing

Practical session on word processing, spread sheet and presentation has been held on Civil Engineering CADD lab. On the end the MCQ test for evaluation was held on 06.12.2021. All the Thirty-four students were participated and cleared the course successfully. Feedback about the course has been collected from the participants which reflects the usefulness of the course. Course completion certificate has been issues to all the successful participants.

8. (Sworth 19/21 Course Coordinator

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