Indra Ganesan
COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NAAC with 'B+' Grade, 2(f) & 12B Status Institution by UGC
IG Valley, Madurai Main Road, Manikandam, Tiruchirappalli - 620012

NAAC DOCUMENTS

QUALITY INDICATOR FRAME WORK

CRITERION – 1

CURRICULAR ASPECTS

SUBMITTED BY

IQAC

INTERNAL QUALITY ASSURANCE CELL

INDRA GANESAN COLLEGE OF ENGINEERING

Criteria 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

Table of Content

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF AGRICULTURAL ENGINEERING

PREFACE OF THE COURSE FILE

Batch : **2021-2025**

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

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

Program : **AGRICULTURAL ENGINEERING**

Year & Semester : **2nd Year / 3th Semester / 'A' Section**

Course Code : **CE3351** NBA Course Code: **C206**

Name of the Course : **SURVEYING AND LEVELLING**

Faculty in-charge : Ms.J.Vaishyaa (AP)

Signature of the Faculty in-charge

HoD / AGRI

INDRA GANESAN COLLEGE OF ENGINEERING

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

DEPARTMENT OF AGRICULTURAL ENGINEERING

REVIEW OF COURSE FILE

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

S.N	Details Date:	R-I-*	R-II-*&	R-III-*&	R-IV-*&$	R-V-*&$@
1.	Preface of the course file	Y				
2.	Vision, Mission, PEOs, POs, PSOs, Blooms taxonomy	Y				
3.	Subject handlers of yesteryears	Y				
4.	Timetable/Workload of the staff – Distribution of teaching load – Roles and Responsibilities	Y				
5.	Syllabus signed by staff & HoD	Y				
6.	Lecture Schedule signed by staff & HoD	Y				
7.	Course Committee meeting circular and minutes	Y				
8.	Identification of Curricular gap and Content Beyond the syllabus	Y				
9.	Self-study topics	Y				
10.	Previous AU Question papers	Y				
11.	Unit wise Q&A and Objective type questions	Y				
12.	Unit wise course material		Y	Y	Y	
13.	Assignment question paper with sample answer sheets and mark entry		Y	Y	Y	
14.	Tutorial question paper with key and mark entry		Y	Y	Y	
15.	Class test/IA test Q Paper with Key, sample answer papers and mark entry		Y	Y	Y	
16.	IA Test- result analysis-CAP-evidence-root cause analysis.		Y	Y	Y	
17.	Retest –Q paper-Attendance-marks		Y	Y	Y	
18.	AU Web portal entry sheet		Y	Y	Y	
19.	Very poor performance in first two tests-action taken.-communication to parents-evidence			Y	Y	
20.	Absence for two tests-action taken-communication to parents-evidence.			Y	Y	
21.	Indiscipline of student reported, if any					
22.	Special class/coaching class/remedial class/attendance-CAP		Y	Y	Y	
23.	Conduct of Seminar, Quizzes - proof					
24.	Content beyond the syllabus - proof					Y
25.	Student feedback on faculty					Y
26.	Course end survey					Y
27.	Internal Assessment sheet					Y
28.	AU question paper with students feedback					Y
29.	Discrepancy of the question paper and correspondence, if any					Y
30.	AU result analysis-Details of arrear students.					Y
31.	AU grade sheet					Y
32.	CO – PO & PSO attainment sheet					Y
	Signature of Course handling faculty					
	Signature of HoD					

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering

Indra Ganesan College of Engineering

Madurai Main Road (NH-45B), Manikandam, Tiruchirappalli-620012
Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai
NAAC Accredited, 2 (F) &12 (B) Status Institution by UGC

Department of Agri & Civil Engineering

Work Load - ODD Semester 2022-23

S.NO.	Teacher's Name	Course Code	Course Name	Semester	Lecture / week
1	Dr R Sivasankar	CE8403	Design of Reinforced concrete Elements	V / CIVIL	5
2	Ms K Vanisri	EN8491	Water supply Engineering	V / CIVIL	4
		AI3303	Fluid Mechanics & Pumps	III / AGRI	4
3	Ms J Vaishyaa	CE8591	Foundation Engineering	V / CIVIL	4
		CE 3351	Surveying and Levelling	III / AGRI	4
		CE 3361	Surveying and Levelling Laboratory	III / AGRI	6
4	Ms D Sheeba	CE 8501	Structural Analysis I	V / CIVIL	4
		AI3311	Fluid Mechanics Laboratory	III / AGRI	6
		CE 8511	Soil Mechanics Laboratory	V / CIVIL	6
5	Dr P Durairaj	ORO 551	Renewable enenrgy sources	V / CIVIL	4
		AI 3302	Unit Operations in Agricultural Engineering	III / AGRI	4
		CE8512	Wastewater Analysis Laboratory	V / CIVIL	6
6	Mr M Kaliraj	AI3301	Principles of Soil sceince Engineering	III / AGRI	4
		GE 8051	Disaster Management	V / CIVIL	4
		AI3312	Soil Science Lab	III / AGRI	6

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
Manikandam, Trichy.

3. Rattan, S.S, "Theory of Machines", McGraw-Hill Education Pvt. Ltd., 2014.
4. Robert L. Norton, Kinematics and Dynamics of Machinery. Tata McGraw-Hill, 2009.
5. Wilson and Sadler, Kinematics and Dynamics of Machinery, Pearson, 2008.

COs- PO's & PSO's MAPPING

CO	PO												PSO			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	2	2		2			1				1	3		1
2	3	2	2		2			1				1	3		1
3	3	2	2		2			1				1	3		1
4	3	2	2		2			1				1	3		1
5	3	2	2		2			1				1	3		1
Avg	3	2	2		2			1				1	3		1
Low (1) ; Medium (2) ; High (3)															

CE3351 SURVEYING AND LEVELLING **L T P C 3 0 0 3**

COURSE OBJECTIVES:

- To introduce the rudiments of plane surveying and geodetic principles to Agricultural Engineers and to learn the various methods of plane and geodetic surveying to solve the real world problems. To introduce the concepts of Control Surveying. To introduce the basics of Astronomical Surveying

UNIT I FUNDAMENTALS OF CONVENTIONAL SURVEYING **9**

Definition – Classifications – Basic principles – Equipment and accessories for ranging and chaining – Methods of ranging – Well conditioned triangles – Chain traversing – Compass – Basic principles – Types – Bearing – System and conversions – Sources of errors and Local attraction – Magnetic declination – Dip – compass traversing – Plane table and its accessories – Merits and demerits – Radiation – Intersection – Resection – Plane table traversing.

UNIT II LEVELLING **9**

Level line – Horizontal line – Datum – Benchmarks – Levels and staves – Temporary and permanent adjustments – Methods of leveling – Fly leveling – Check leveling – Procedure in leveling – Booking – Reduction – Curvature and refraction – Reciprocal leveling – Precise leveling - Contouring.

UNIT III THEODOLITE SURVEYING **9**

Horizontal and vertical angle measurements – Temporary and permanent adjustments – Heights and distances – Tacheometric surveying – Stadia Tacheometry – Tangential Tacheometry – Trigonometric leveling – Single Plane method – Double Plane method.

UNIT IV CONTROL SURVEYING AND ADJUSTMENT **9**

Horizontal and vertical control – Methods – Triangulation – Traversing – Gale's table – Trilateration – Concepts of measurements and errors – Error propagation and Linearization – Adjustment methods - Least square methods – Angles, lengths and levelling network.

UNIT V MODERN SURVEYING **9**

Total Station: Digital Theodolite, EDM, Electronic field book – Advantages – Parts and accessories – Working principle – Observables – Errors - COGO functions – Field procedure and applications. GPS: Advantages – System components – Signal structure – Selective availability and antispoofing receiver components and antenna – Planning and data acquisition – Data processing – Errors inGPS – Field procedure and applications.

TOTAL 45 PERIODS

COURSE OUTCOMES:

On completion of the course, the student is expected to

CO1 Introduce the rudiments of various surveying and its principles.
CO2 Imparts knowledge in computation of levels of terrain and ground features
CO3 Imparts concepts of Theodolite Surveying for complex surveying operations
CO4 Understand the procedure for establishing horizontal and vertical control
CO5 Imparts the knowledge on modern surveying instruments

TEXTBOOKS:

1. Dr. B. C. Punmia, Ashok K. Jain and Arun K Jain, Surveying Vol. I & II, Lakshmi Publications Pvt Ltd, New Delhi, Sixteenth Edition, 2016.
2. T. P. Kanetkarand S. V. Kulkarni, Surveying and Levelling, Parts 1 & 2, Pune Vidyarthi Griha Prakashan, Pune, 2008.

REFERENCES:

1. R. Subramanian, Surveying and Levelling, Oxford University Press, Second Edition, 2012.
2. James M. Anderson and Edward M. Mikhail, Surveying, Theory and Practice, Seventh Edition, Mc Graw Hill 2001.
3. Bannister and S. Raymond, Surveying, Seventh Edition, Longman 2004.
4. S. K. Roy, Fundamentals of Surveying, Second Edition, Prentice" Hall of India2010.
5. K. R. Arora, Surveying Vol I & II, Standard Book house, Twelfth Edition 2013.
6. C. Venkatramaiah, Textbook of Surveying, Universities Press, Second Edition, 2011.

COs- PO's & PSO's MAPPING

PO/PSO		Course Outcome					Overall Correlation ofCO s to POs
		CO1	CO2	CO3	CO4	CO5	
PROGRAM OUTCOMES(PO)							
PO1	Knowledge of EngineeringSciences	2	3	3	3	3	3
PO2	Problem analysis	2	3	3	3	3	2
PO3	Design / development ofsolutions	3	2	3	3	3	3
PO4	Investigation	2	2	2	3	3	2
PO5	Modern Tool Usage	2	2	3	3	3	3
PO6	Engineer and Society	3	3	3	3	3	3
PO7	Environment andSustainability				2	2	2
PO8	Ethics	2	2	2	2	3	2
PO9	Individual and Team work	2	2	2	3	2	2
PO10	Communication						
PO11	Project Management andFinance	2	2	2	2	2	2
PO12	Life Long Learning				2	2	2
PROGRAM SPECIFIC OUTCOMES(PSO)							
PSO1	Knowledge of Civil Engineering discipline	3	3	3	3	3	3
PSO2	Critical analysis of Civil Engineering problems andinnovation	3	3	3	3	3	3
PSO3	Conceptualization and evaluation of engineering solutions to Civil Engineering	3	3	3	3	3	3

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

INDRA GANESAN COLLEGE OF ENGINEERING
IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF AGRICULTURAL ENGINEERING

Lecture Schedule

Degree/Program: **B. Tech / AGRI** Course code &Name: **CE3351** –SURVEYING AND LEVELLING
Duration: **2022-23(ODD)** Semester: **III** Section : **A** Faculty: Ms. Vaishyaa J

OBJECTIVES:

- To introduce the rudiments of plane surveying and geodetic principles to Agricultural Engineers and to learn the various methods of plane and geodetic surveying to solve the real-world problems.
- To introduce the concepts of Control Surveying. To introduce the basics of Astronomical Surveying

PREREQUISITES: Surveying theory, levelling theory.

COURSE OUTCOMES:

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C206.1	Introduce the rudiments of various surveying and its principles.	1,2,3,4,5,6,8,9,11	1,2,3
C206.2	Imparts knowledge in computation of levels of terrain and ground features	1,2,3,4,5,6,8,9,11	1,2,3
C206.3	Imparts concepts of Theodolite Surveying for complex surveying operations	1,2,3,4,5,6,8,9,11	1,2,3
C206.4	Derive the procedure for establishing horizontal and vertical control	1,2,3,4,5,6,7,8,9,11,12	1,2,3
C206.5	Imparts the knowledge on modern surveying instruments	1,2,3,4,5,6,7,8,9,11,12	1,2,3
C206.6	The student will possess knowledge about survey field techniques	1,2,3,4,5,6,7,8,9,11,12	1,2,3

S.NO	Period	Topics to be covered	Reference/ Teaching aids and methods	Planned date
UNIT I FUNDAMENTALS OF CONVENTIONAL SURVEYING				
1	1	Definition – Classifications – Basic principles	T2, R3/BB	29.08.22
2	1	Equipment and accessories for ranging and chaining	T2, R3/BB	05.09.22
3	5	Methods of ranging	T2, R3/BB	06.09.22
4	6	Well-conditioned triangles, Chain traversing	T2, R3/BB	08.09.22
5	3	Compass, basic principles, types, bearing, system and convention	T2, R3/BB	08.09.22

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, 620 012

6	1	Sources of errors and Local attraction	T2, R3/BB	12.09.22
7	1	Magnetic declination – Dip	T2, R3/BB	12.09.22
8	5	compass traversing	T2, R3/BB	13.09.22
9	5,6	Plane table and its accessories – Merits and demerits – Radiation – Intersection – Resection – Plane table traversing	T2, R3/BB	14.09.22 15.09.22
10	6	QUIZ		15.09.22
		UNIT II LEVELLING		
11	1	Level line – Horizontal line – Datum – Benchmarks – Levels and staves	T2, R3/BB	19.09.22
12	1	Temporary and permanent adjustments	T2, R3/BB	20.09.22
13	3	Methods of levelling – Fly levelling – Check levelling	T2, R3/BB	21.09.22
14	5	Procedure in levelling	T2, R3/BB	22.09.22
15	1	Booking – Reduction	T2, R3/BB	26.09.22
16	1	Problems in rise and fall method	T2, R3/BB	27.09.22
17	5	Curvature and refraction	T2, R3/BB	28.09.22
18	5	Reciprocal levelling	T2, R3/BB	28.09.22
19	6	Precise levelling, Contouring.	T2, R3/BB	29.09.22
20	6	QUIZ		29.09.22
		UIT III THEODOLITE SURVEYING		
21	1	Horizontal and vertical angle measurements	T2, R3/BB	06.10.22
22	5	Temporary and permanent adjustments	T2, R3/BB	10.10.22
23	6	Heights and distances	T2, R3/BB	11.10.22
24	1	Tachometric surveying	T2, R3/BB	12.10.22
25	1	Stadia Tachometry	T2, R3/BB	13.10.22
26	5	Tangential Tachometry	T2, R3/BB	17.10.22
27	6	Trigonometric levelling	T2, R3/BB	18.10.22
28	5	Single Plane method	T2, R3/BB	18.10.22
29	5	Double Plane method.	T2, R3/BB	20.10.22
30	1	QUIZ		20.10.22
		UNIT IV CONTROL SURVEYING AND ADJUSTMENT		
31	1	Horizontal and vertical control	T2, R3/BB	26.10.22

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012

32	1	Triangulation	T2, R3/BB	26.10.22
33	3	Traversing – Gale 's table – Trilateration	T2, R3/BB	27.10.22
34	5	Concepts of measurements and errors	T2, R3/BB	31.10.22
35	5	Error propagation and Linearization	T2, R3/BB	31.10.22
36	6	Adjustment methods	T2, R3/BB	01.11.22
37	3	Least square methods	T2, R3/BB	02.11.22
38	3	Angles, lengths.	T2, R3/BB	03.11.22
39	1	levelling network.	T2, R3/BB	03.11.22
40	1	QUIZ		07.11.22

UNIT V MODERN SURVEYING

41		Total Station: Digital Theodolite, EDM, Electronic field book – Advantages – Parts and accessories –	T2, R3/BB	08.11.22
42	1	Working principle	T2, R3/BB	08.11.22
43	1	Observables – Errors - COGO functions – Field procedure	T2, R3/BB	09.11.22
44	3	GPS: Advantages – System components – Signal structure	T2, R3/BB	14.11.22
45	5	Selective availability and ant spoofing receiver components and antenna	T2, R3/BB	15.11.22
46	6	Planning and data acquisition	T2, R3/BB	16.11.22
47	1	– Data processing	T2, R3/BB	17.11.22
48	1	Errors in GPS	T2, R3/BB	21.11.22
49	3	Field procedure and applications	T2, R3/BB	21.11.22
50	3	QUIZ		21,11.22

Book Reference - Text Books

Sl.	Title of the Book	Author	Publisher	Year
1.	Surveying Vol. I & II	Dr. B. C. Punmia, Ashok K. Jain and Arun K Jain	Lakshmi Publications Pvt Ltd, New Delhi	2016
2.	Surveying and Levelling, Parts 1 & 2	T. P. Kanetkarand S. V. Kulkarni	Pune Vidyarthi Griha Prakashan	2008

Book Reference – References

Sl	Title of the Book	Author	Publisher	Year
1.	Fundamentals of	R.	Oxford University	2012

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

	Surveying,	Subramanian	Press, Second Edition	
2.	Surveying and Levelling	James M. Anderson and Edward M. Mikhail	Seventh Edition, Mc Graw Hill	2007
3.	Surveying Vol I & II,	S. K. Roy	Hall of India	2010
4	Textbook of Surveying	C. Venkatramaiah	Universities Press	2011

Signature of the Faculty in-charge

HoD / Agri

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF AGRICULTURAL ENGINEERING

Assignment Question Paper

Assignment – 01			Date of Issue:	6.09.22	Marks	10
Course code	CE3351	Course Title	SURVEYING AND LEVELLING			
Year	II	Semester/Section	III / A	Date of Submission:	20.09.22	

Q.No	Questions	CO
1	Explain the traversing and plotting procedures of chain survey.	C206.1
2	Define local attraction?	C206.1

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

VAISHYAA.J

Name and Signature of the Faculty Incharge

HoD/AGRI

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF AGRICULTURAL ENGINEERING

Assignment Answer Sheet

Name of the Student: ABINAYA R

AU Register Number: 811221225002

Assignment – 01			Date of Issue: 6.09.22	Marks 10
Course code	CE3351	Course Title	SURVEYING AND LEVELLING	
Year	II	Semester/Section	III / A	Date of Submission: 20.09.2022

Q.No	Questions	CO
1	Explain the traversing and plotting procedures of chain survey	CO1
2	Define local attraction?	CO1

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Content Quality	6	5
Presentation Quality	2	2
Timely submission	2	2
Total marks	10	9

VAISHYAA.J 21.09.22
Name and Signature of the Faculty Incharge

21/9/22
HoD Agri

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

INDRA GANESAN COLLEGE OF ENGINEERING
IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF AGRICULTURAL ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus(CBS)

Name of the Faculty : Vaishyaa J **Course Code & Name: CE3351/ Surveying and levelling**
Degree & Program: B. Tech/ AGRI **Semester & Section: III / A** **Academic Year: 2022 -2023 /ODD**

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

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

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206.1	3	3	3	3	3	3	-	3	2	-	2	-	3	3	3
C206.2	3	3	3	3	3	3	-	3	2	-	2	-	3	3	3
C206.3	3	3	3	3	3	3		3	2	-	2	2	3	3	3
C206.4	3	3	3	3	3	3	2	3	2	-	2	2	3	3	3
C206.5	3	3	3	3	3	3	2	3	2	-	2	2	3	3	3
C206.6	3	3	3	3	3	3	-	3	2	-	2	2	3	3	3
Cos,POs	3	3	3	3	3	3	2	3	2	-	2	2	3	3	3

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
Modernized surveying methods	PO7(2) Vacant filled	C206.1 & C206.2/ I & II

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

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

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206.1	3	3	3	3	3	3	2*	3	2	-	2	-	3	3	3
C206.2	3	3	3	3	3	3	2*	3	2	-	2	-	3	3	3
C206.3	3	3	3	3	3	3		3	2	-	2	2	3	3	3
C206.4	3	3	3	3	3	3	2	3	2	-	2	2	3	3	3
C206.5	3	3	3	3	3	3	2	3	2	-	2	2	3	3	3
C206.6	3	3	3	3	3	3	-	3	2	-	2	2	3	3	3
Cos,POs	3	3	3	3	3	3	2	3	2	-	2	2	3	3	3

Signature of the Faculty

HoD/AGRI

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

INDRA GANESAN COLLEGE OF ENGINEERING

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

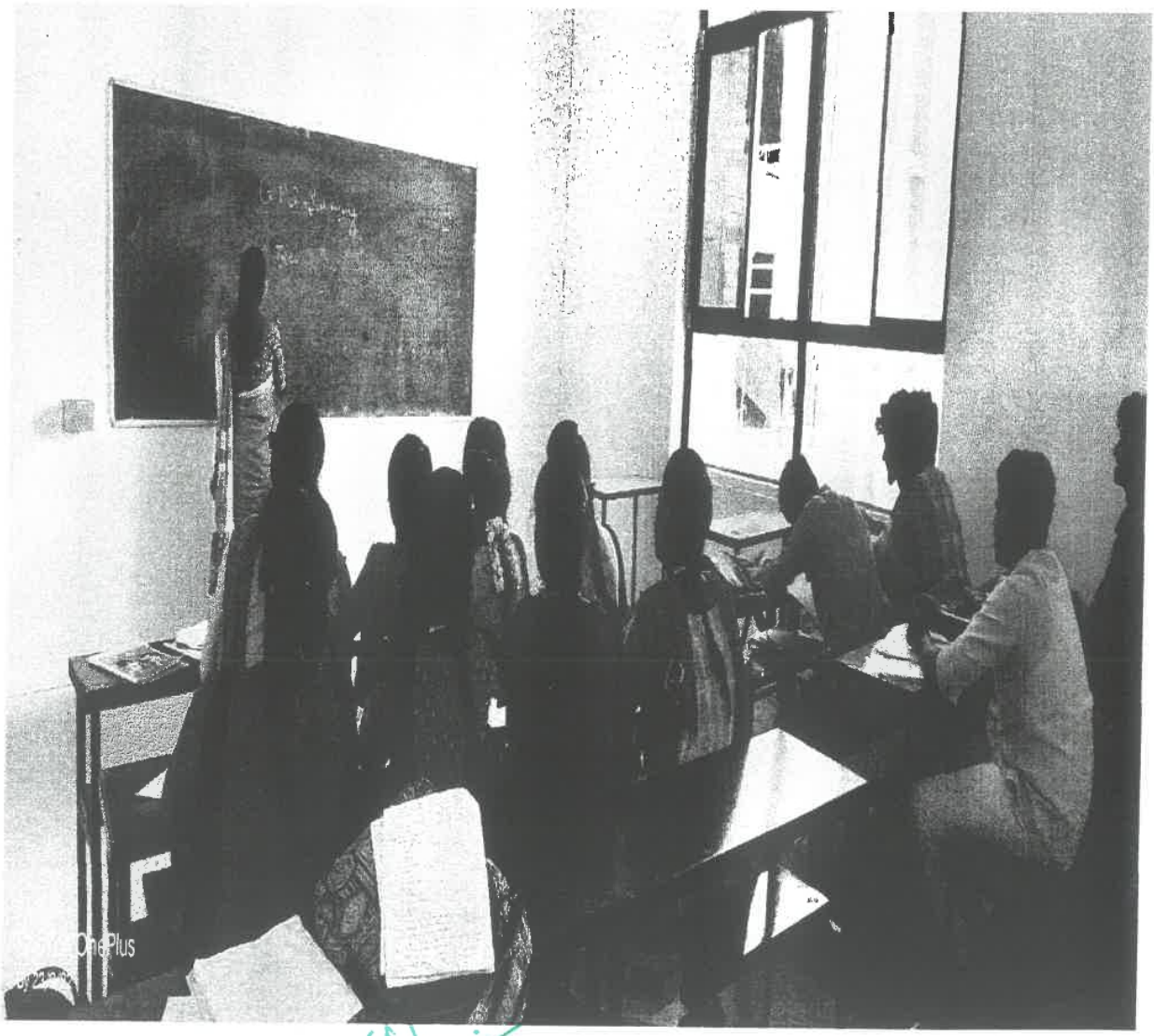
DEPARTMENT OF AGRICULTURAL ENGINEERING

CBS- PROOF

ACADEMIC YEAR: 2021-2022 (ODD) **SEM:** 03 **REGULATION:** 2021

PROGRAM: AGRI **NAME OF THE FACULTY: J.Vaishyaa (AP)**

TOPIC: MORDENIZED SURVEYING AND ITS EQUIPMENTS



Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

MATERIALS (PROOF)

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

GPS System

The GPS system has 3 major segments: space, control and user.

1. The Space Segment consists of a constellation of 24 satellites orbiting the earth at an altitude of 20,200 km. These satellites act as reference points from which receivers on the ground determine their position.
2. The Control Segment consists of 5 stations here on earth which track the satellites.
3. The User Segment consists of antennas and receiver-processors.

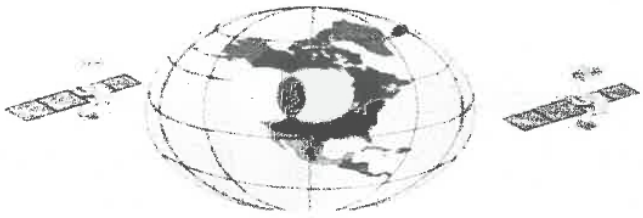
How does GPS work?

GPS receivers use the principle of "RANGING".

The receiver measures the distance from a location on earth to the positions of several satellites to determine the latitude and longitude of the position on earth.

Only 1 satellite

2 satellites



Typical Recreational Grade GPS units

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

INDRA GANESAN COLLEGE OF ENGINEERING
IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)

IA Exam - I			Date/Session	20.09.22/FN	Marks	50
Course code	CE3351	Course Title	SURVEYING AND LEVELLING			
Regulation	2021	Duration	90 min	Academic Year	2022-23	
Year	II	Semester	III	Department	AGRI	

COURSE OUTCOMES

C206.1	Introduce the rudiments of various surveying and its principles
C206.2	Imparts knowledge in computation of levels of terrain and ground features
C206.3	Imparts concepts of Theodolite Surveying for complex surveying operations
C206.4	Derive the procedure for establishing horizontal and vertical control
C206.5	Imparts the knowledge on modern surveying instruments
C206.6	The student will possess knowledge about survey field techniques

Q.No.	Question	CO	BTS
	PART A (Answer all the Questions 10 x 2 = 20 Marks)		
1	What is the object of surveying?	1	K2
2	Define plane surveying?	1	K1
3	what is compass surveying and its Types?	1	K2
4	Define the principle of levelling?	1	K1
5	List the source and errors in levelling?	1	K1
6	What is meant by geodetic surveying?	2	K2
7	What Is Two Point Problem?	2	K2
8	Name the different ways of classification of Surveying.	2	K1
9	What are the Sources Of Local Attraction?	2	K2
10	Explain the range of reciprocal ranging.	2	K1
	PART B (Answer all the Questions 2 x 10 = 20 Marks)		
11a	Equipment used in chaining and ranging?	1	K2
	OR		
11b	Explain the methods of ranging?	1	K2
12a	Determine the sag correction for a 30 m steel tape under a pull of 80 N in 3 bays of 10 m each. The area of the cross section of the tape is 8 mm2 and the unit weight of steel may be taken as 77 kN/m3 .	2	K3
	OR		
12b	Explain the methods of chaining while there are obstacles such as building or river.	2	K3
	PART C (Answer all the Questions 1 x 10 = 10 Marks)		
13a	Explain how you will conduct chain survey to measure a land parcel in agriculture field.	1	K2
	OR		
13b	Explain the field and office work in chain surveying?	1	K2

Course Faculty
Name /Sign / Date)
VAISHNAVA-J

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

HoD
(Name /Sign / Date)

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

INDRA GANESAN COLLEGE OF ENGINEERING
IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)

IA Exam - I			Date/Session	20.09.22/FN	Marks	50
Course code	CE3351	Course Title	SURVEYING AND LEVELLING			
Regulation	2021	Duration	90 min	Academic Year	2022-23	
Year	II	Semester	III	Department	AGRI	

COURSE OUTCOMES

C206.1	Introduce the rudiments of various surveying and its principles
C206.2	Imparts knowledge in computation of levels of terrain and ground features
C206.3	Imparts concepts of Theodolite Surveying for complex surveying operations
C206.4	derive the procedure for establishing horizontal and vertical control
C206.5	Imparts the knowledge on modern surveying instruments
C206.6	The student will possess knowledge about survey field techniques

Q.No.	Question	CO	BTS
	PART A **(Answer all the Questions 10 x 2 = 20 Marks)**		
1	**What is the object of surveying?** • Surveying is the Art of determining the relative position on above or beneath the Surface of the earth by means of direct or indirect measurements of distance,direction and elevation. • It also includes the art of establishing points by predetermined angular & Linear Measurements.	1	K1
2	**Define plane surveying?** • Plane Surveying is defined as the divison of Surveying in which all the survey works are carried based on the assumption that,the surface of earth is a plane and curvature of the earth is Ignored. • In Dealing with the plane Surveying,plane geometry and Trignometry are only required. • The Surveys having an area of about 260km2 may only be treated as plane surveys.	2	K1
3	**what is compass surveying and its Types?** • Compass surveying is a type of surveying in which the directions of surveying lines are determined with a magnetic compass, and the length of the surveying lines are measured with a tape or chain or laser range finder. i)Prismatic Compass ii)Surveyor Compass	2	K1
4	**Define the principle of levelling?** BASIC PRINCIPLE OF LEVELING • The fundamental principle of leveling lies in finding out the separation of level lines passing through a point of known elevation (B.M.) and that through an unknown point (whose elevation is required to be determined)	3	K1
5	**List the source and errors in levelling?** SOURCES OF ERRORS IN LEVELLING There are following types of Errors in Leveling :- 1. Instrumental Errors 2. Collimation Error 3. Error due to Curvature & Refraction 4. Other Errors	4	K1
6	**What is meant by geodetic surveying?** Geodetic surveying is a process of surveying in which the shape and size of the earth are considered. The methods used in geodetic surveying are beyond the scope of this training manual	5	K2
7	**What Is Two Point Problem?** Two Point Problem is defined as the process of locating the plane table on the sheet by sighting two well defined Points And its locations are already plotted on the Paper.	1	K1
8	**Name the different ways of classification of Surveying.** Classification Of Survey is based on i. Purpose of Surveying ii. Nature of the field iii. Methods employed	2	K1

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Trichy-620

13a	**Explain how you will conduct chain survey to measure a land parcel in agriculture field.** • Using chaining and ranging the distance between two points can be measured. The instruments required are chain, arrows, ranging rods, pegs and hammers. **Procedures:** • First mark a straight line of a standard length on a flat firm ground. The two end points A and B are selected on a survey line which is to be measured. • A ranging rod is erected at the point B, while the surveyor stands with another rod at point A. A rod is established at a point in line with AB at a distance not greater than one chain length from A. • The surveyor at A then signals the assistant to move transverse to the chain line till he is line with A and B. Similarly other intermediate points can be established. • Then by using chain, the distance is measured. To find the pacing length, we should walk along the chain line and it is found from pacing length. Pacing length = Distance between the points/No of steps ***The distance between two points = (No of arrow x Nominal length +Fractional length) m*** • The distance between two points can be calculated and also same procedure is used to find the other side of the line. The finally land parcel of agricultural field is measured	3	K2
	OR		
13b	**Explain the field and office work in chain surveying?** **Field and Office work:** The practice of surveying actually boils down to fieldwork and office work. The Fieldwork Consists Of Taking Measurements, Collecting Engineering Data, And Testing Materials. The Office Work Includes Taking Care Of The Computation And Drawing The Necessary Information For The Purpose Of The Survey. **Field Work** • Field work is of primary importance in all types of surveys. To be a skilled surveyor, you must spend a certain amount of time in the field to acquire needed experience. • The study of this training manual will enable you to understand the underlying theory of surveying, the instruments and their uses, and the surveying methods. • However, a high degree of proficiency in actual surveying, as in other professions, depends largely upon the duration, extent, and variation of your actual experience. • You should develop the habit of STUDYING the problem thoroughly before going into the field, you should know exactly what is to be done; how you will do it; why you prefer a certain approach over other possible solutions; and what instruments and materials you will need to accomplish the project. • It is essential that you develop SPEED and CONSISTENT ACCURACY in all your fieldwork. This means that you will need practice in handling the instruments, taking observations and keeping field notes, and planning systematic moves. • It is important that you also develop the habit of CORRECTNESS. You should not accept any measurement as correct without verification. Verification, as much as possible, should be different from the original method used in measurement. • The precision of measurement must be consistent with the accepted standard for a particular purpose of the survey. Fieldwork also includes adjusting the instruments and caring for field equipment. • Do not attempt to adjust any instrument unless you understand the workings or functions of its parts. Adjustment of instruments in the early stages of your career requires close supervision from a senior EA. **Office Work:** • Office work in surveying consists of converting the field measurements into a usable format.The conversion of computed, often mathematical, values may be required immediately to continue the work, or it may be delayed until a series of field measurements is completed. • Although these operations are performed in the field during lapses between measurements, they can also be considered office work. Such operations are normally done to save time. • Special equipment, such as calculators, conversion tables, and some drafting equipment is used in most office work. In office work, converting field measurements (also called reducing) involves the process of computing, adjusting, and applying a standard rule to numerical values	3	K2

Course Faculty

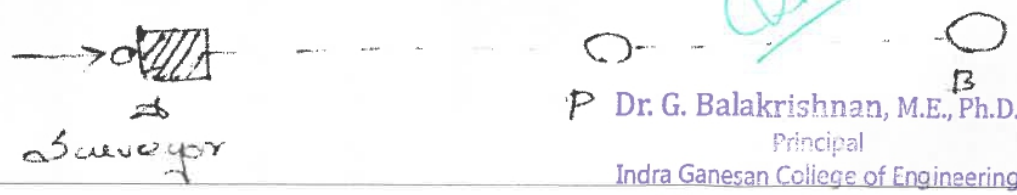
(Name /Sign / Date)

VALSHABA.J

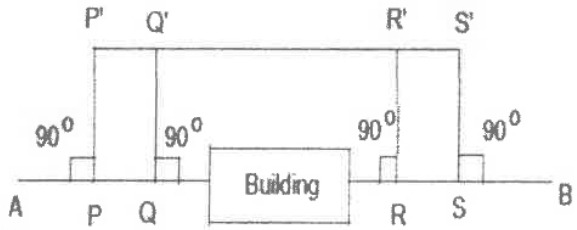
Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai - Trichy Main Road
Manikandam, Trichy-620 012.

HoD

(Name /Sign / Date)

	iv. Instruments Used		
9	**What are the Sources Of Local Attraction?** • Magnetic Materials such As magenetic Rocks,iron Ores,Electrical cables etc..are sources of Local Attraction.	2	K2
10	**Explain the range of reciprocal ranging.** The vision ranging and line ranger can be adopted only when the end stations are inter visible. The line of sight between two stations is obstructed by natural or man-made objects or not clearly visible. Under such conditions, indirect or reciprocal ranging is applicable.	2	K1
	PART B **(Answer all the Questions 2 x 10 = 20 Marks)**		
11a	**Equipment used in chaining and ranging?** EQUIPMENT AND ACCESSORIES FOR CHAINING AND RANGING: (i)Chain (ii)Arrows (iii) Pegs (iv)Surveyors' band (v) Ranging rods and ranging poles (vi) Offset rods (vii) Laths (viii) Whites (ix) Plumb bobs and (x) Line ranger. 1.CHAIN: • The Chain Is Made Up Of Steel Wire Which Is Divided Into Links And Togs (Rings) To Facilitate Folding. • It Is Sometimes Used As A Unit Of Measurement • It Has Brass Handles At Both Ends For Easy Handling. The Link Is 0.2m Or 200mm In Diameter. • The Length Is 20m Or 30m. (ii) ARROWS: • Arrows are made of steel wire of diameter 4mm and their ends are bent into a circle where red cloth is tied to facilitate visibility. They are used for showing points on the ground. iii)PEGS • Pegs are made of wood 40mm square by 50cm long and are used for permanently marking positions during survey iv)SURVEYORS' BAND • The surveyor's band is made of a steel strip which is rolled into a metal frame with a winding handle. It is 30m, 50m or 100m long. Is used in projects where more accuracy measurement is required (v) RANGING RODS AND RANGING POLES: • A ranging rod is a surveying instrument used for marking the position of stations and for sightings of those stations as well as for ranging • Ranging poles are used to mark areas and to set out straight lines on the field. They are also used to mark points which must be seen from a distance, in which case a flag may be attached to improve the visibility. (vi) OFFSET RODS • These rods are also similar to ranging rods and they are 3 m long. They are made up of hard wood and are provided with iron shoe at one end. • A hook or a notch is provided at other end. At height of eye, two narrow slits at right angles to each other are also provided for using it for setting right angles. (vii) LATHS Laths are 0.5 to 1.0 m long sticks of soft wood. They are sharpened at one end and are painted with white or light colours. They are used as intermediate points while ranging or while crossing depressions. viii) WHITES • Whites are the pieces of sharpened thick sticks cut from the nearest place in the field. One end of the stick is sharpened and the other end is split. White papers are inserted in the split to improve the visibility. Whites are also used for the same purpose as laths. (IX) PLUMB BOBS: • In measuring horizontal distances along sloping ground plumb bobs are used to transfer the position to ground.They are also used to check the verticality of ranging poles. (X) LINE RANGER: • It is an optical instrument used for locating a point on a line and hence useful for ranging. It consists of two isosceless prisms placed one over the other and fixed in an instrument with handle	2	K1
	OR		
11b	**Explain the methods of ranging?** METHODS OF RANGING i)Direct Ranging ii)Indirect Ranging i)DIRECT RANGING: • Direct Ranging is done when the two ends of the survey lines are intervisible.  	2	K1

ii)INDIRECT RANGING • It is done when both the ends of the survey line are not intervisible either due to Long distance between them.

12a	**Determine the sag correction for a 30 m steel tape under a pull of 80 N in 3 bays of 10 m each. The area of the cross section of the tape is 8 mm2 and the unit weight of steel may be taken as 77 kN/m3 .** Solution: Given: L = 30 m; n = 3; P = 80 N; Area = 8 mm2 = 8 x 10-6 m2 : γ = 77 kN/m3 Total weight of tape = 77 x 103 x 8 x 10-6 x 10 = 6.16 N Cs = LW 2 / 24n 2 P 2 =10 X 6.16 2 /24 X 1 2 X 80 2 = 0.00247 m Cs = 3 x 0.00247 = 0.00741 m True length = 30 – 0.00741 True length = 29.993 m	2	K1
	OR		
12b	**Explain the methods of chaining while there are obstacles such as building or river.** In this case it is required to prolong the chain line beyond the obstacle and to find the distance across it. In this case the typical obstacle is a building. One of the following two methods may be adopted. **FIRST METHOD:** On one side of the chain line AB, two points P and Q are selected. Perpendiculars of equal length PP' and QQ' are erected. The line P'Q' is extended till the building is passed. On the extended line, two points R and S are selected. The perpendicular at R and S are so erected such that RR' = SS' = QQ' = PP'. then the points P', Q', R' and S' will lie on the same line. Then Q'R = QR and the distance Q'R' is measured to set QR. then the line is extended.  **SECOND METHOD:** This method is also equally applicable for this condition. Two points P and Q on the chain line AB are selected on the one side of the chain line. A perpendicular QR is erected at Q such that QR = PR. Points P and R are jointed and extended upto S. A perpendicular SV is set at S such that PS = SV. On the line SV a point T is marked such that ST = SR. with V as centre and radius equal to QR cut an arc such that PQ = QR = VT = UT. Then U and V are on the chain line AB. The distance RT is measured. Thus the obstructed length, QU = RT.	3	K1

PART C
(Answer all the Questions 1 x 10 = 10 Marks)

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 622 012, India
(Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)

Internal Assessment Test Answer Book

Name	M Hasiharan			Year/ Semester/Section	II/III
Batch No.	8112212250 11	Date/Session	20/09/22	Department	Agri
Course code	CE3351	Course Title	Surveying and Levelling		
Internal Assessment Test	IAT 1 ☑	IAT 2 ☐	IAT 3 ☐	Model ☐	
Name and Signature of the Invigilator with date	G. DEEPAN KUMAR / G. [illegible]				

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

Part A			Part B / Part C					
Q. No.	✓	Marks	Q. NO.	✓	a Marks	✓	b Marks	Total Marks
1		2	11		-		10	10
2		2	12		10			10
3		2	13		-		10	10
4		2	14					-
5		-	15					-
6		2	16					-
7		2					Total	30
8		2						
9		-						
10		2						
Total		16	Grand Total				Name and Signature of the Examiner with date	

VAISHYAA J
21/09/22

To be filled by the examiner

Course Outcomes	1	2	3	4	5	6	Total
Marks allotted	30	20					50
Marks Obtained	28	18					46

IQAC Audit - Remarks

Name and Signature of the IQAC member

Dr.G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012

INDRA GANESAN COLLEGE OF ENGINEERING

IG VALLEY, MANIDANDAM, TIRUCHIRAPPALLI – 620 012

DEPARTMENT OF AGRICULTURAL ENGINEERING

ACADEMIC YEAR 2022 – 2023 (ODD SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

AIE-I

SUBJECT CODE &TITLE: CE3351- SURVEYING AND LEVELLING

YEAR/SEM: II/III **MONTH & YEAR: SEP/2022**

S.NO	REG NO	STUDENT NAME	CO1	CO2	TOTAL (50)	TOTAL (100)
1.	811221225002	Abinaya R	25	17	42	84
2.	811221225007	Charulatha V	22	16	38	76
3.	811221225011	Hariharan M	28	18	46	92
4.	811221225013	Ilayaraja E	23	12	35	70
5.	811221225014	Jayasoundarya M	22	17	39	78
6.	811221225016	Kalpana Priya R	25	12	37	74
7.	811221225019	Kaviya T	12	12	24	48
8.	811221225022	kowsalya I	24	17	41	82
9.	811221225025	Ponniyammal B	19	18	37	74
10.	811221225028	Rajabunisha M	20	20	40	80
11.	811221225029	Rajesh	26	18	44	88
12.	811221225030	Rajeshwari D			AB	AB
13.	811221225031	Sairam M	25	17	42	82
14.	811221225040	Vijayakrishna G	14	10	AB	AB

MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
0	1	0	0	0	0	5	5	1

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

Total No.of Candidates Present	12
Total No.of Candidates Absent	02
Total No.of Students Pass	11
Total No. of Students Fail	1
Percentage of Pass	91%

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

STAFF INCHARGE **HoD/AGRI** **PRINCIPAL**

Register Number:

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India

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

RETEST - I			Date/Session	31.09.22/FN	Marks	50
Course code	CE3351	Course Title	SURVEYING AND LEVELLING			
Regulation	2021	Duration	90 minutes	Academic Year	2022-23	
Year	II	Semester	III	Department	AGRI	

COURSE OUTCOMES

C206.1	Introduce the rudiments of various surveying and its principles
C206.2	Imparts knowledge in computation of levels of terrain and ground features
C206.3	Imparts concepts of Theodolite Surveying for complex surveying operations
C206.4	Derive the procedure for establishing horizontal and vertical control
C206.5	Imparts the knowledge on modern surveying instruments
C206.6	The student will possess knowledge about survey field techniques

Q.No.	Question	CO	BTS
	PART A (Answer all the Questions 10 x 2 = 20 Marks)		
1	What is the object of surveying?	1	K2
2	Define plane surveying?	1	K1
3	What are the instruments used in chain surveying?	1	K2
4	What is the classification of surveying?	1	K2
5	Define reciprocal levelling?	1	K1
6	What is meant by well conditional triangle?	2	K2
7	Differentiate between check line and tie line?	2	K4
8	What are the different source of error in chain surveying?	2	K2
9	Define true bearing?	2	K1
10	Define declination?	2	K1
	PART B (Answer all the Questions 2 x 10 = 20 Marks)		
11a	Explain the principals of surveying?	1	K1
	OR		
11b	Explain the classification of surveying?	1	K1
12a	Explain the method of direct ranging and reciprocal ranging?	2	K1
	OR		
12b	Explain the traversing and plotting procedures of chain surveying?	2	K1
	PART C (Answer all the Questions 1 x 10 = 10 Marks)		
13a	Convert the following whole circle bearing into reduced breaing? 1. 151.20 2. 112.04	1	K3
	OR		
13b	Convert the following RB into WCB S34 42E N02 18W	1	K3

Course Faculty
(Name /Sign / Date)

HoD
(Name /Sign / Date)

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 622 012, India
(Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)

Internal Assessment Test Answer Book

Name	T Kaviya.			Year/ Semester/Section	III/III/A
Batch No.	811720252509	Date/Session	31/09/22	Department	Agri
Course code	CE2351	Course Title	Surveying & Levelling		
Internal Assessment Test	IAT 1 RE TEST ☑	IAT 2 ☐	IAT 3 ☐	Model ☐	
Name and Signature of the Invigilator with date	K. Sinjini				

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 ✓		b	
				Marks		Marks	
1		2	11	10		-	10
2		-	12	10		-	10
3		2	13	10		-	10
4			14				
5		2	15				
6			16				
7		2				Total	30
8		-					
9		2					
10		-					
Total		10	Grand Total	40/50		Name and Signature of the Examiner with date	KALAIYARASI 31/09/22

To be filled by the examiner

Course Outcomes	1	2	3	4	5	6	Total
Marks allotted	30	20					50
Marks Obtained	20	10					40

IQAC Audit - Remarks

Name and Signature of the IQAC member

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

INDRA GANESAN COLLEGE OF ENGINEERING

IG VALLEY, MANIDANDAM, TIRUCHIRAPPALLI – 620 012

DEPARTMENT OF AGRICULTURAL ENGINEERING

ACADEMIC YEAR 2022 – 2023 (ODD SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

RETEST

SUBJECT CODE &TITLE: CE3351- SURVEYING AND LEVELLING

YEAR/SEM: II/III **MONTH & YEAR: SEP/2022**

S.NO	REG NO	STUDENT NAME	CO1	CO2	TOTAL (50)	TOTAL (100)
1.	811221225019	Kaviya T	25	15	40	80
2.	811221225030	Rajeshwari D	22	10	32	64
3.	811221225040	Vijayakrishna G	20	15	35	70

MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
0	0	0	0	0	1	1	1	0

Total No.of Candidates Present	3
Total No.of Candidates Absent	0
Total No.of Students Pass	3
Total No. of Students Fail	0

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

STAFF INCHARGE **HoD/AGRI** **PRINCIPAL**

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

IQAC Academic Audit Form

ACADEMIC YEAR: 2022-2023 ODD / SEMESTER

Name of Department: AGRI | Year / Sem / Sec: II / III / A | 02/III | No. of Students Registered: 14

Details of Examination: MODEL EXAM

S No	Course Code	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	MA3301	811921225019 811921225030 811921225040	Y	Y	13	1	2	91%	-
2	AI3301	811921225018 811921225002	Y	Y	14	-	2	88%	-
3	AI3302	811921225007 811921225011	Y	Y	14	-	2	91%	-
4	ME3491	811921225019 811921225030 811921225040	Y	Y	12	2	1	91%	-
5	CE3351	811921225020 811921225021	Y	Y	14	-	2	90%	-
6	AI3303	811921225019 811921225030 811921225040	Y	Y	14	-	2	90%	-

Verified by

External Member Name and Signature:

Internal Member Name and Signature: K. Vanisri - K.V

Overall Remarks:

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

K.V
HoD/AGRI

IQAC Co-ordinator

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu 620 012, India

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF CIVIL ENGINEERING

ROOT CAUSE ANALYSIS

Name of the Faculty : J VAISHYAA
Degree & Program : B Tech / Agricultural Eng
IA Test : IA Test I
Target : 90%
Course Code & Name : CE3351 / Surveying & Leveling
Semester & Section : III / A
University Exam/Month & Year: Sep/2022
Achieved : 91%

S NO	REGISTER NO	NAME OF THE STUDENT	CAUSES FOR FAILURE	CORRECTIVE ACTION TAKEN	PREVENTIVE ACTION TAKEN
	811221225019	T Kaviya	Health issue	Re-test Conducted	Advised to take care of health
	811221225040	Vijaya Krishna G	Family function	Re-test Conducted	Advised to not to take unnecessary leave.

Signature of the Faculty Member

Signature of the HoD/AGRI

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.