RAGHU ENGINEERING COLLEGE

AUTONOMOUS

(Approved by AICTE, New Delhi, & Permanently Affiliated to JNTU-GV, Vizianagaram)

NBA & NAAC A+ grade Accredited institute

Dakamarri, Bheemili Mandal, Visakhapatnam Dist. – 531 162 (A.P.)

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INSTITUTE VISION

Envisioning to be a world class technical institution by synergizing quality education with ethical values.

INSTITUTE MISSION

- To encourage training and research in cutting-edge technologies.
- To develop and strengthen strategic links with the industry.
- To kindle the zeal among the students and promote their quest for academic excellence.
- To encourage extra-curricular activities along with good communication skills.

QUALITY POLICY

RAGHU Engineering College underscores ethical values along with innovative teaching through an interactive, activity-based pedagogy, establishes the best of infrastructural facilities, inculcates engineering temper among the students through the use of the latest Information and Communication Technologies and strives for an efficient, responsive and transparent administration in all areas

Department of Civil Engineering

VISION

To become a pioneer in the field of civil engineering by providing high quality education and research to serve the public consistently with competitive spirit professional ethics.

MISSION

- M1: Provide quality knowledge and advance skills to the students in order to expertise theoretically and practically in the areas of civil engineering.
- M2: Improve the professional potentiality of the students and staff through educational programs to expand the knowledge in the field of civil engineering
- M3: Inculcate healthy competitive spirit towards the higher education and successful career in the field of civil engineering to serve the nation ethically.

PROGRAMME EDUCTIONAL OBJECTIVES(PEOs)

- PEO 1: Employ a practicing civil engineer in construction, design, testing, and allied fields.
- PEO 2: Engaging in self-directed learning research or undertaking higher studies in the rapidly changing civil engineering environment.
- PEO 3: Create new methods/processes to meet the needs of society with their civil engineering knowledge.

MAPPING OF MISSION STATEMENTS WITH PEOs

MS/PEO	PEO 1	PEO 2	PEO 3
MS 1	3	3	2
MS 2	3	3	2
MS 3	3	3	2

1-Slight, **2**- Moderate, **3**- Substantial

PROGRAM OUTCOMES	
Graduates of Civil Engineering Will:	
PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
PROGRAM SPECIFIC OUTCOMES (PSOs)	
PSO 1: Analyze, design and execute the civil engineering structures with good knowledge in engineering, mathematics & basic sciences.	
PSO 2: Follow the economic, environmental and safety factors involved in the construction industry.	

Mapping of PEOs with POs and PSOs

PEO/PO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
PEO 1	3	3	3	2	3	2	2	2	3	3	3	3	3	3
PEO 2	3	3	3	2	3	2	2	1	3	3	3	3	3	2
PEO 3	3	3	3	3	3	1	1	1	2	3	2	3	3	2

1-Slight, **2**- Moderate, **3**- Substantial

23ES105 – ENGINEERING SURVEYING AND GEOMATICS

(Civil Engineering)

Programme & Branch	B.Tech & CIVIL	Sem	Category	L	T	P	Credit
Prerequisites	Basics of Mathematics	3	Engineering Science	2	0	0	2

Course Objectives :

To import knowledge on conventional surveying which is reliable and accurate.

To impart the knowledge on latest technologies in surveying

Preamble :	Fundamentals of Mathematics and Physics are pre requisites

Course Contents:

Unit-1	**Introduction**	Contact Hours: 9

Classification and Principles of Surveying –Chain Surveying: Instruments used for Chain Surveying – Errors due to Incorrect Chain–Chaining on uneven and sloping Ground – Errors in Chaining – Tape Corrections – Basic Problems.

Prismatic Compass– Included angles, Local Attraction, Magnetic Declination and dip – Basic Problems in Compass Surveying - Plane Table Surveying: Introduction – Advantages, Accessories.

Unit-2	**Levelling and Theodolite**	Contact Hours: 9

Levelling: Definitions of Terms - Uses of levelling - Profile and Reciprocal levelling – Temporary and Permanent Adjustments of Dumpy Level – Effect of Curvature of Earth and Refraction - Related Problems

Theodolite – Types of Theodolites – Temporary Adjustments – Method of Repetition, Method of Reiteration – Uses of Theodolites

Unit-3	**Area and Volume**	Contact Hours: 9

Area: Determination of areas consisting of irregular boundary and regular boundary-Simpson's Rule-Trapezoidal Rule.

Volumes -Determination of volume of earthwork in cutting and embankments, volume of borrow pits, capacity of reservoirs.

Unit-4	**Tacheometric Surveying and Curves**	Contact Hours: 9

Tacheometric Surveying: Principles of Tacheometry, stadia and tangential methods of Tacheometry. Distance and elevation formulae for staff held vertical position.

Curves – Simple Curves – Elements of Simple Curves – Methods of Setting Simple Curves – Rankine's Method – Two Theodolite Method.

Unit-5	**Geomatics**	Contact Hours: 9

Total Station – Applications Introduction to Drone Surveying

Areal Photogrammetry– Types of photographs-Relief Displacements-Stereoscopy-DEM

GNSS-Principle-component of GNSS-DGPS-Errors and Corrections.

Digital Image Processing- Digital Image characteristics-Digital data formats.

Total Hours: 45

Text Books:	
1	Surveying, Vol No.1,2&3,B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain– Laxmi Publications Ltd, NewDelhi
2	Advance Surveying, Satish Gopi, R.Sathi Kumar and N.Madhu, Pearson Publications
3	Text book of Surveying, C.Venkataramaiah, University press, India Limited
Reference Books:	
1	Arrora K R, Surveying (Vol 1,2&3), 9th edition, Standard Book Hous, Delhi, 2018
2	SK Duggal – Surveying – Tata McGraw Hill Education Private Limited New Delhi
Web References :	
1	https://www.youtube.com/watch
2	https://onlinecourses.nptel.ac.in/noc22_ce05/preview
3	https://onlinecourses.nptel.ac.in/noc22_ce78/preview

COURSE OUTCOMES: Upon completion of the course, students shall have ability to		BT Mapped (Highest Level)
CO 1	Perform field compass surveying.	2
CO 2	Perform profile levelling.	3
CO 3	Determine the volume of earth work for different sections.	4
CO 4	Set out the horizontal curves on the ground.	4
CO 5	Conduct digital surveying using total station and GPS instruments.	4

Mapping of Cos with POs and PSOs														
COs/POs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO 1	3	3	2	1	-	2	1	1	3	3	2	2	3	1
CO 2	3	3	3	1	2	2	1	1	3	3	2	3	3	1
CO 3	3	3	2	2	1	2	1	1	3	3	3	3	2	1
CO 4	3	3	2	2	3	2	1	1	3	3	2	3	3	2
CO 5	3	3	2	2	3	2	1	1	3	3	3	3	3	1
1 – Slight, 2 – Moderate, 3 – Substantial														

ASSESSMENT PATERN - THEORY							
TEST	Remembering (K2)%	Understanding (K2)%	Applying (K2)%	Analyzing (K2)%	Evaluating (K2)%	Creating (K2)%	Total %
MID-1	35	35	25	5	-	-	100
MID-2	25	25	30	20	-	-	100
SEE	30	30	25	15	-	-	100
*± 3% may be varied							