GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3152008
Semester – V
Subject Name: Mine Surveying - II

Type of course: Regular

Prerequisite: Zeal to learn the

subject

Rationale:

The course is designed to help the student in understanding the different difficulties occur during mine working, planning and designing, their probable causes and remedies by accurate surveying. Various practical are to be performed to help in understanding the problems of mining field. This course is helpful to solve the errors which are occurring during surveying, which is essentially expected from expert surveyor.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
4	0	2	5	70	30	30	20	150

Content:

Sr. No.	Content	Total	Weightage
1	**Curve Ranging:** Introduction, types, Definitions and Notations, Designation, Elements of simple curve, Setting out of horizontal simple curves, methods, Problem faced during curve ranging, Worked out problems in horizontal curves, Types of vertical curves; length; setting out of it.	09	20
2	**Mine Surveying** Correlation surveying, Purpose; methods of correlation surveying; precautionary measure and necessary steps for accuracy. Stope Surveying, Purpose; methods of stope surveying. Instruments used in underground mine: Miners' dial, Clinometer, Planimeter, Hanging Compass. Hanging compass.	15	40

3	**Photogrammetry:** Introduction; types, Basic Principles, Scale of vertical and tilted photograph, Cameras, Photograph versus maps, Application in mining.	06	10
4	**Remote Sensing**: Introduction, Classifications; Principles; observations platforms; sensors, applications in Mining; Visual image interpretation. **GPS:** Concept; Principles and application in mining industry. **GIS:** Concept; Basic functions and advantages; Principles; application in mining industries.	09	20
5	**Mine Plans and Sections:** Legal requirements, preparation and preservations of it; Representation of geological features in it, its symbols. Enlargement of plans and tool used for it, Mine Models.	06	10

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
12	**15**	**18**	**10**	**10**	**05**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Mine Surveying and leveling (Vol I,II,III), S.Ghatak; Lovely Publications.
2. Surveying; Volume II; Dr. B C Punmia, Ashok K. Jain and A. K. Jain; Laxmi Publications Pvt. Ltd.
3. Surveying and Levelling; N N Basak; McGraw Hill Educations; 2018
4. Surveying; Dr. R. P. Rethaliya and Mayur R. Rethaliya; Atul Prakashan, 2020

Course Outcome:

After learning the course the students should be able to:

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following

course outcomes.

1. Setting out a curve for underground mine and calculation of its numerical.
2. Correlate the surface and underground features by mine survey.
3. Fundamental applications of photogrammetry, Remote sensing, GPS and GIS and advantages of it.
4. Understand the statutory provisions for mine plans and their maintenance including survey instruments.

List of Experiments:

1. Setting out of simple circular curves by linear methods.
2. Correlation survey by Co-planning method.
3. Correlation survey by Weiss batch triangle method - Survey practices.
4. Correlation survey by Weiss Quadrilateral method - Survey practices.
5. To study photogrammetry
6. To study the Principles, applications and advantages of Remote sensing, GIS and GPS in the mining industries.

Design based Problems (DP)/Open Ended Problem:

Visit to survey section of mines. Study of various plans and section and also survey practices at different locations.

Major Equipment:

1. Theodolite
2. Other Instruments like measuring tape, magnetic compass, ranging rod, arrow, wooden peg, plumb- bob, etc.

List of Open Source Software/learning website:

1. http://nptel.ac.in/courses/105107122/modules/module11/html/38-4.htm
2. http://nptel.ac.in/courses/105107122/modules/module11/html/39-10.htm