GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

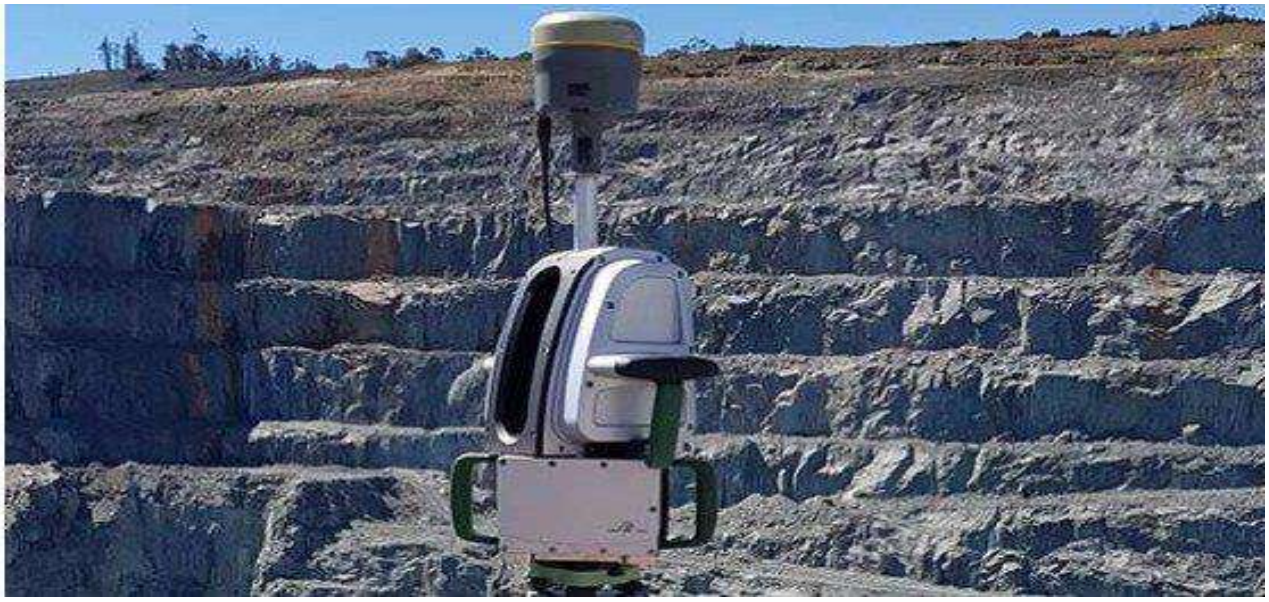
AMANAT CUM SURVEYOR

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

(Flexi MoU)

NSQF LEVEL- 4



SECTOR – MINING

Directorate General of Training

Skill India
कौशल भारत - कुशल भारत

AMANAT CUM SURVEYOR

(Engineering Trade)

(Designed in 2021)

Version: 1.0

CRAFTSMEN TRAINING SCHEME (CTS)

(Flexi MoU)

NSQF LEVEL - 4

Developed By

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&
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1. COURSE INFORMATION

During the one year, of Amanat cum Surveyor trade a candidate will be trained on professional skill, professional knowledge and Employability skill related to job role. A Program is a One year Program that aims to train young individuals to build careers in the FinTech Industry and is ideal for anyone who want to get entry into the BFSI sector.

In the beginning of the course the trainees are acquainted with occupational safety & health. The practical part starts with basic drawing (consisting of lettering, numbering, geometrical figure, symbols & representations). Later the drawing skills imparted are drawing of different scales, projections, perform site survey and prepare a site plan using chain / tape, prismatic compass. Trainee will perform different site survey like Detection of fault in map and comparison with original map, tabling map data details with different methods- open traverse, closed traverse, radiating method, triangulation method. Land revenue-zamindari system, ryotwari system, mahalwari system, zamindari evolution act, responsibility of land revenue system. Land selling- tips and tricks for selling plots of land, known your audience, contract builder or sellers.

2. TRAINING SYSTEM

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under the aegis of Directorate General of Training (DGT). Under the Flexi MOU scheme offer, DGT & K.K. TECHNO - SOLUTIONS PRIVATE LIMITED offer to pioneer strengthening of vocational training. "Amanat cum Surveyor" trade under Flexi MOU scheme is a course, which will be delivered nationwide. The course is of One-year duration. It mainly consists of Domain area and Core area.

K.K. Techno - Solutions Private Ltd. shall conduct courses pan-India locations leveraging the facilities and services available at ITIs, regional training centers, training centers of training partners, vendors and dealers associated with K.K. Techno - Solutions Private Limited. They will ensure that not less than 50% of trainees are placed with K.K. Techno - Solutions Private Limited or its business partners for not less than one year duration. It will also ensure the eligible trainees take up Apprenticeship / higher education in suitable streams and shall also guide the students to become Entrepreneurs. Paytm will strictly follow the policy guidelines for Flexi - MoU as in place from time to time. No deviation for the same would be permitted. Every Alternate Month Admission and Exam for trades run under Flexi MoU at training locations of K.K. Techno - Solutions Private Limited. Theory content to be 30% and practical content to be 70%.

Broadly candidates need to demonstrate that they are able to:

- Read & interpret technical parameters/documentation, plan work, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional knowledge, core skills & employability skills while performing the job.
- Check the survey drawing and data and rectify errors.
- Document the technical parameters related to the task undertaken. Process data recorded during field measurements and make relevant conclusions.

2.2 PROGRESSION PATHWAYS

- Can take admission in diploma course in notified branches of Engineering.

- Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITI.

- Can join Advanced Diploma (Vocational) courses under DGT as applicable

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of One Year: -

S No	Course Element	National Training Hours
1	Professional Skill (trade practical)	1472
2	Professional Knowledge (trade theory)	368
3	Workshop Calculation & Science	92
4	Employability Skills	138
5	Extra-Curricular Activities/ Library	138
6	Project Work	192
7	Revision & Examination	96
	TOTAL	**2496**

2.4 ASSESSMENT & CERTIFICATION

I. Conducting training of selected candidates is the sole responsibility of Industrial Training Partner (ITP).
II. Assessment will be jointly done by ITP and DGT. Practical and formative assessment shall be conducted by ITP, and Computer Based theoretical exams shall be conducted by DGT.
III. ITP must refer to the latest examination reform guidelines issued by DGT dated 4th October 2018 any changes or revisions to the same shall be applicable to flexi-MoU scheme.
IV. Maximum attempts for clearing the exam and obtaining NTC shall be in line with CTS.
V. For practical examination and formative assessment, ITP has been given flexibility to design the questions, assess the candidates and upload their marks in the scheme portal.
VI. ITP shall develop a comprehensive Question Bank (in English and Hindi) of minimum 1000 questions, grouped by chapters and difficulty level. The same shall be vetted by NIMI experts and then be handed over to DGT for conducting theory exams. DGT may add some questions to the same before conducting actual exams.
VII. Theoretical exams shall be conducted by DGT in Computer Based Test format. Upon completion of course and payment of requisite examination fee by ITP, admit cards shall be generated by scheme portal.

VIII. DGT shall arrange for conduct of computer based theory exam at designated examination centres & certify the successful trainees with e-NTC under flexi-MoU scheme with mention of ITP name in the Certificate.

IX. Students, who have successfully appeared in the final exam after completion of course, are eligible to register as apprentices.

The trainee will be tested for his skill, knowledge and attitude during the period of the course and at the end of the training program as notified by the Government of India (GoI) from time to time. The employability skills will be tested in the first year itself.

The **Internal Assessment** during the period of training will be done by **Formative Assessment Method** by testing for assessment criteria listed against learning outcomes. The training institute has to maintain an individual trainee portfolio as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure –II).

The learning outcome and assessment criteria will be the basis for setting question papers for final assessment. The examiner during final examination will also check the individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

The minimum pass percentage for practical is 60% & minimum pass percentage of theory subjects is 33%.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment

- Project work

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining body. The following marking pattern to be adopted while assessing:

Performance Level	Evidence
(a) Weightage in the range of 60%-75% to be allotted during assessment	
For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices	• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment. • 60-70% accuracy achieved while undertaking different work with those demanded by the component/job. • A fairly good level of neatness and consistency in the finish. • Occasional support in completing the project/job.
(b) Weightage in the range of 75%-90% to be allotted during assessment	
For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices	• Good skill levels in the use of hand tools, machine tools and workshop equipment. • 70-80% accuracy achieved while undertaking different work with those demanded by the component/job. • A good level of neatness and consistency in the finish. • Little support in completing the project/job.
(c) Weightage in the range of more than 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels in the use of hand tools, machine tools and workshop equipment. • Above 80% accuracy achieved while undertaking different work with those demanded by the component/job. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

3. JOB ROLE

Surveyor, Topographical surveys land to determine out line, contours and relative position of control points (land marks) on tract of land, cost, harbour, etc. for preparing topographical and other maps and records. Establishes control points and pillars to do instrumentation work on ground to prepare maps. Provides identification marks on ground for photographs taken in aerial survey. Fixes position of control points on ground in relation to some permanent position and with reference to celestial bodies using astrolabes (for lat. and long), transit telescopes (for time and longitudes), field magnate instruments (for magnetic forces and elements), theodolites and precise levels, tellurometers (electronic distance measuring instruments) barometers for atmospheric pressure, etc. Adjusts and sets theodolites, compasses, plane tables, levelling and other instruments for surveyor, observes and records measurements and angles from three determined points (triangulation), locations to scale on proper sketch. Corrects margin of error due to worn-out tapes which become incorrect, and readings on instruments which are affected by light, sound, heat, tension, environments and gravitational changes due to varying reserves underneath ground. May be known as Superintendent Surveyor Officer Surveyor or Surveyor according to degree of authority.

Reference NCO 2015:

a) 2165.0200 – Surveyor, Topographical

4. GENERAL INFORMATION

Name of the Trade	**Amanat cum Surveyor (Flexi MoU)**
Qualification Code	DGT/7020
NCO – 2015	2165.0200
NSQF Level	LEVEL - 4
Duration of Craftsmen Training	One Year (2496 Hours)
Entry Qualification	Passed 10th Class examination
Minimum Age	16 years as on first day of academic session.
Unit Strength (No. Of Student)	20
Space Norms	64 Sq. M
Power Norms	3 KW
Instructors Qualification for	
1. Amanat cum Surveyor Trade	Degree in Survey Engineering / Civil Engineering from recognized university with one year experience in relevant field. **OR** Diploma in Survey Engineering /Civil Engineering from recognized board of education with two years' experience in relevant field. **OR** NTC/NAC in the Trade of "Amin" With 3 years post qualification experience in the relevant field. **Desirable: -** Preference will be given to a candidate with CIC (Craft Instructor Certificate) in Amanat Survey trade. ***Out of two Instructors required for the unit of 2 (1+1), one must have Degree/ Diploma and other must have NTC/NAC qualifications.***
2. Workshop Calculation & Science	Degree in Engineering with one year experience. **OR** Diploma in Engineering with two years experience. **Desirable:** Craft Instructor Certificate in RoD& A course under NCVT.
3. Employability Skill	MBA or BBA with two years experience or Graduate in Sociology/ Social Welfare/ Economics with Two years

	experience or Graduate/ Diploma with Two years experience and trained in Employability Skills from DGT institutes. **AND** Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above. OR **Existing Social Studies Instructors duly trained in Employability Skills from DGT institutes.**
4. Minimum Age for Instructor	21 Years
List of Tools and Equipment	As per Annexure – I

Distribution of training on Hourly basis: (Indicative only)

Total hours /week	Trade Practical	Trade Theory	Workshop Cal. & Sc.	Employability Skills	Extracurricular Activity
48 Hours	32 Hours	8 Hours	2 Hours	3 Hours	3 Hours

5. NSQF LEVEL COMPLIANCE

NSQF level **Amanat cum Surveyor** trade under CTS **(Flexi MoU)**: **Level -4.**

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

a. Process
b. Professional Knowledge
c. Professional Skill
d. Core Skill
e. Responsibility

The broad learning outcome of **Amanat cum Surveyor** trade under CTS **(Flexi MoU)** mostly matches with the Level descriptor at Level- 4.

The NSQF Level-4 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skills	Core Skills	Responsibility
Level 4	Work in familiar, predictable, routine, situation of clear choice.	Factual knowledge of field of knowledge or study.	Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts.	Language to communicate written or oral, with required clarity, skill to basic Arithmetic and algebraic principles, basic understanding of social political and natural environment.	Responsibility for own work and learning.

6. LEARNING OUTCOME

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

6.1 SPECIFIC LEARNING OUTCOMES

1. Perform Basic workshop operation of Amanat survey. Draw conventional signs & symbols used in surveying.
2. Plan & carryout site survey using chain/ tape & prepare a site plan.
3. Identify and select Farzi map.
4. Study and verify about land revenue & record field book.
5. Carryout site survey using prismatic compass.
6. Perform different types of levelling activities at site.

7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Perform Basic workshop operation of Amanat survey. Draw conventional signs & symbols used in surveying.	1.1 Prepare Situation analysis report/ category report/ standard report/ boundary momentum.
	1.2 Draft a plan about Batwara /Zamin/ House /Batwarwnama
	1.3 Read Maps/ contours / drainage Maps.
	1.4 Draw some conventional signs & symbols used in maps of ground or surface.
2. Plan & carryout site survey using chain/ tape & prepare a site plan.	2.1 Performing surveying measuring distance by chain/ tape and other accessories
	2.2 Measure distance with chain about 1500m.
	2.3 Perform Line ranging with the help of ranging rod by direct ranging method/ indirect ranging method.
	2.4 Determining Errors in chaining and their corrections.
	2.5 Entering measured data in field book and plotting the same.
	2.6 Conduct chain surveying and prepare a site plan.
	2.7 Calculating area of a plot.
	2.8 Measure distance on plain ground with the help of chain and tape.
	12.1 Measure distance on slopping ground with the help of chain.
3. Identify and select Farzi map.	3.1 Detect fault in map.
	3.2 Compare faulty map with original map.
	3.3 Identify land map of individual.
	3.4 Property mutation of land.
	3.5 Table map data details with open traverse/ closed traverse/ radiating method/ triangulation method.
	3.6 Plot longitudinal profile.
4. Study and verify about land	4.1 Demonstrate different land revenue system e.g. zamindari system/ ryotwari system/ mahalwari system.

revenue & record field book.	4.2	Identify Tips and tricks for selling plots of land.
	4.3	Select your audience/ contract builder or sellers.
	4.4	Demonstrate Use of field book.
	4.5	Carry out record of survey and plan record, status of plan, base plans- water, drainage &sewerage.
5. Carryout site survey using prismatic compass.	5.1	Measure bearings of a line using prismatic compass & others accessories.
	5.2	Conduct the traverse survey using prismatic compass & others accessories.
	5.3	Making Entry in field book and Compute the correct bearings of the plot.
	5.4	Plott the traverse & adjust the closing error.
	5.5	Calculating the area of the traverse.
6. Perform different types of levelling activities at site.	6.1	Set up a level & performing temporary adjustments.
	6.2	Make permanent adjustment of dumpy & auto levels.
	6.3	Perform simple levelling differential levelling, reciprocal levelling, fly levelling, longitudinal sectioning, cross sectioning and check levelling, Reduction of levels
	6.4	Prepare sections and working profiles; Setting out gradients.

8. SYLLABUS

SYLLABUS – AMANAT CUM SURVEYOR			
FIRST YEAR			
Week No.	**Reference Learning Outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
Professional Skill – 320 hours Theory – 80 hours	Perform Basic workshop operation of Amanat survey. Draw conventional signs & symbols used in surveying	**Rules of Survey & Batware** Situation analysis report, category report, standard report, boundary momentum, reference and boundary line, survey of property.	Rules of survey: situation analysis report, category report, standard report, boundary momentum, reference and boundary line, survey of property. Principle of survey, objective of survey, Preliminary Survey, reconnaissance Survey, detailed Survey of Lands.
		Drafting of plan about -Batwara -Zamin -House -Jewelry -Batwarwnama,	Batwara : rules of batwara, property partition kaanoon, civil law for partition, Zaminbatwara, house batwara, jewelry batwara, sarkari batwara, batwara cast. Batwaranama format, joint property batwara, bibhajan property batwara, vashiayat Drafting of plan: Introduction of Scale & its types, Projection, R.F, Plan, Drawing to Scale. Projection of point, straight line, lettering, symbols & signs of various features
Professional Skill – 416 hours Theory – 104 hours	Plan & carryout site survey using chain/ tape & prepare a site plan	**Surveying** Testing and adjustment of chain. Measurement of distance with chain about 1500m Line ranging with the help of ranging rod by direct ranging method.	Introduction &Basic concepts:- Definition of chain survey, Classification of chain, Principle of chain surveying, Scale-Representation of scale. Study & Use of instrument:- Measurement of chain, tape, Ranging

		Line ranging with the help of ranging rod by indirect ranging method	Rod, arrows, pegs, cross staff, optical square, line Ranger.
		Construction and use of optical square and open cross staff for setting out perpendicular and running a survey line of locating details. Measurement of distance on plain ground with the help of chain and tape. Measurement of distance on slopping ground with the help of chain	Errors in chain:- Concept of Errors in measurement, Types of Errors- Gross errors, systematic errors, random errors, applying Correction for chain &Tape (Numerical problems), Errors due to use of wrong scale. Planning &carrying out chain survey:- Reconnaissance, selection of stations running survey lines, recoding field notes, plotting a chain survey- selection of scale, plotting of frame work, plotting of offsets, Title, scale, legends, inking in, coloring.
		Plot the cross staff survey of field and calculate its area. Plot Base line, Tie line, Check line, Main survey line on field book. Draw the conventional symbols use in surveying.	Obstacles in chaining:- Definition of obstacles, classification of obstacles, possibility of chain obstacles. Linear measurement:- different method, direct measurement, instrument for chaining – chain or tape, arrows, pegs, ranging rods, plumb bob, plasters laths &whites, chaining-follower & leader, folding & unfolding of chain, chaining on uneven or sloping ground by direct method &indirect method, first order measurement -base line measurement. Chain triangulation:- Definition, survey stations, survey lines, check line, tie lines, arrangement of survey lines, locating ground features offsets, limiting length of offset, field book, field work, basic problem in chaining.

Professional Skill – 288 hours Theory – 72 hours	Identify and select Farzi map.	**<u>Farzi Map</u>** Detection of fault in map and comparison with original map, tabling map data details with different methods- open traverse, closed traverse, radiating method, triangulation method	History – Outline Map of India, topographic map, scale of maps, choosing a correct scale as like small scale map, large scale map, reduction scale map. use of protector and sacle. Detection of fault in map and comparison with original map, tabling map data details with different methods- open traverse, closed traverse, radiating method, triangulation method.
		Identification of land map of individual, plot longitudinal profile, continuous line draw through point of known elevation Registration of land, verbal contract, preparation of contract, pay stamp duty, execute and register sale deed Property mutation of land, registration fees, online registration of land, offline registration of land Principle of Compass Survey.	Identification of land map of individual, plot longitudinal profile, continuous line draw through point of known elevation Registration of land, verbal contract, preparation of contract, pay stamp duty, execute and register sale deed Property mutation of land, registration fees, online registration of land, offline registration of land.
Professional Skill – 320 hours Theory – 80 hours	Study and verify about land revenue & record field book	Land revenue-zamindari system, ryotwari system, mahalwari system, zamindari evolution act, responsibility of land revenue system. Land selling- tips and tricks for selling plots of land, known your audience, contract builder or sellers **Field Book** Use of field book, function of	Land revenue-zamindari system, ryotwari system, mahalwari system, zamindari evolution act, responsibility of land revenue system. Land selling- tips and tricks for selling plots of land, known your audience, contract builder or sellers Field Book Use of field book, function of field book, survey and plan record, status of plan, base plans- water, drainage &

		field book, survey and plan record, status of plan, base plans- water, drainage &sewerage.	sewerage.
		Map index, survey field book register- data time period, series in date. Types of field book- single and double line field book. Use of symbol on a field book, General sketch of layout of a field book, details of survey line, page index of survey line, location sketch of survey station.	Map index, survey field book register- data time period, series in date. Types of field book- single and double line field book. Use of symbol on a field book, General sketch of layout of a field book, details of survey line, page index of survey line, location sketch of survey station.
Professional Skill – 64 hours Theory – 16 hours	Carryout site survey using prismatic compass	Scale of chaining, choice of scale of map, types of scale-plane, diagonal, vernier, scale of chord. Error due to use of wrong scaling, shrunk scale, solve simple problems related to error & shrunk. Use of prismatic compass and observing fore bearing and back bearing. MeasuringForebearingandBackbearingof5-6sideclosedpolygon.Identifyingstationsaffectedbylocalattractionandcalculationofcorrected F.B.&B.B. Measuring fore bearing and back bearing for an open traverse (5 to 6 sided). Calculate direct angles between successive lines.	Offset in chaining, space between chaining, errors in chaining, correction in chaining. Scale of chaining, choice of scale of map, types of scale-plane, diagonal, vernier, scale of chord. Error due to use of wrong scaling, shrunk scale, solve simple problems related to error & shrunk Bearing of lines–Meridian–True, Magnetic, and Arbitrary. Bearing–fore bearing, Back bearing, Whole circle bearing, Quadrantal bearing system and Reduced bearing, Conversion of bearings, finding include dangles from bearings. Prismatic Compass–Component, construction and use. Local attraction, Causes, precautions to be taken to avoid and correction of bearings affected due to local attraction, calculation of include

			dangles.
Professional Skill – 64 hours Theory – 16 hours	Perform different types of levelling activities at site	Use of Dumpy level, temporary adjustments and taking reading on leveling staff. Recording readings in field book. Differential leveling practice, reduction of level by H.I. method. Differential leveling practice, reduction of level by rise & fall method. Carrying Benchmark from one point to another point about 200m by fly leveling with tilting level.	Traversing–open traverse, closed traverse, check on open and closed traverse. Graphical adj Definitions– Level surface, Level line, horizontal line, Vertical line, Datum surface, Reduced level, Benchmark and its types. Dumpy level–Components, Construction, Line of sight, Line of Collimation, Bubble tube axis, leveling Staff–Telescopic and folding type. Foresight, back sight, Intermediate sight, Change point, Height of collimation. Fundamental axes and their relationship. Recording in level book. Temporary adjustments of dumpy level. Method of Reduction of levels–Height of instrument method and Riseand fall method. Arithmetical checks, Numerical problems, Computation of missing readings. Classifications of leveling-simple, differential, profile, cross sectional, fly and check levelling.
	Project work		
	Revision		
	Examination		

9. SYLLABUS - CORE SKILLS

9.1 Syllabus for Workshop Calculation and Science

S No.	Workshop Calculation	Workshop Science
1.	**Unit**: Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units	**Material Science**: properties - Physical & Mechanical, Types – Ferrous & Non-Ferrous, difference between Ferrous and Non-Ferrous metals, introduction of Iron, Cast Iron, Wrought Iron, Steel, difference between Iron and Steel, Alloy steel, carbon steel, stainless steel, Non-Ferrous metals, Non- Ferrous Alloys.
2.	**Fractions:** Fractions, Decimal fraction, L.C.M., H.C.F., Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems using Scientific Calculator.	**Mass, Weight and Density**: Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density, specific gravity of metals.
3.	**Square Root:** Square and Square Root, method of finding out square roots, Simple problem using calculator.	**Speed and Velocity**: Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation, equations of motions, simple related problems.
4.	**Ratio & Proportion**: Simple calculation on related problems.	**Work, Power and Energy**: work, unit of work, power, unit of power, Horse power of engines, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy.
5.	**Percentage:** Introduction, Simple calculation. Changing percentage todecimal and fraction and vice-versa.	
6.	**Algebra**: Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).	**Heat & Temperature**: Heat and temperature, their units, difference between heat and temperature, boiling point, melting point, scale of temperature, relation between different scale of temperature, Thermometer, pyrometer, transmission of heat, conduction, convection, radiation.

7.	**Mensuration :**Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle, Volume of solids – cube, cuboid, cylinder and Sphere. Surface area of solids – cube, cuboid, cylinder and Sphere.	**Basic Electricity**: Introduction, use of electricity, how electricity is produced, Types of current - AC, DC, their comparison, voltage, resistance, their units. Conductor, insulator, Types of connections – series, parallel, electric power, Horse power, energy, unit of electrical energy.
8.	**Trigonometry:** Trigonometrical ratios, measurement of angles. Trigonometric tables	**Levers and Simple Machines:** levers and its types. Simple Machines, Effort and Load, Mechanical Advantage, Velocity Ratio, Efficiency of machine, Relationship between Efficiency, velocity ratio and Mechanical Advantage.

9.2 EMPLOYABILITY SKILLS

Duration: One Year (Total 138 Hours)	
1. English Literacy	**Duration: 30 hrs.** **Marks : 09**
Pronunciation	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)
Functional Grammar	Transformation of sentences, voice change, change of tense, Spellings.
Reading	Reading and understanding simple sentences about self, work and environment
Writing	Construction of simple sentences Writing simple English
Speaking/ Spoken English	Speaking with preparation on self, on family, on friends/ classmates, on known people, picture reading, gain confidence through role-playing and discussions on current happenings, job description, asking about someone's job, habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing on messages and filling in message forms, Greeting and introductions, office hospitality, Resumes or curriculum vitae essential parts, letters of application reference to previous communication.
2. IT Literacy	**Duration: 30 hrs.** **Marks : 09**
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.
Computer Operating System	Basics of Operating System, WINDOWS, the user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc., Use of Common applications.
Word Processing and Worksheet	Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets.
Computer Networking and Internet	Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and

	use of email. Social media sites and its implication. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cybercrimes.
3. Communication Skills	**Duration: 22 hrs.** **Marks : 07**
Introduction to Communication Skills	Communication and its importance Principles of effective communication Types of communication - verbal, non-verbal, written, email, talking on phone. Non-verbal communication-characteristics, components-Para-language Body language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort.
Listening Skills	Listening-hearing and listening, effective listening, barriers to effectivelistening, guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active listening skills.
Motivational Training	Characteristics essential to achieving success. The power of positive attitude. Self-awareness Importance of commitment Ethics and values Ways to motivate oneself Personal Goal setting and Employability Planning.
Facing Interviews	Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview.
Behavioral Skills	Problem Solving Confidence Building Attitude
4. Entrepreneurship Skills	**Duration: 18 hrs.** **Marks : 06**
Concept of Entrepreneurship	Entrepreneur - Entrepreneurship - Enterprises: Conceptual issue Entrepreneurship vs. Management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise and relation to the economy, Source of business ideas, Entrepreneurial opportunities, and the process of setting up a business.
Project Preparation & Marketing Analysis	Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales & distribution Management. Difference

	between small scale &large scale business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.
Institution's Support	Preparation of Project. Role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the Policies/Programmed, procedure and the available scheme.
Investment Procurement	Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.
5. Productivity	**Duration: 15 hrs.** **Marks : 05**
Benefits	Personal/ Workman - Incentive, Production linked Bonus, Improvement in living standard.
Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation – How it improves or slows down productivity.
Comparison with Developed Countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.
Personal Finance Management	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.
6. Occupational Safety, Health and Environment Education	**Duration: 20 hrs.** **Marks : 06**
Safety & Health	Introduction to Occupational Safety and Health, importance of safety and health at workplace.
Occupational Hazards	Basic Hazards, Chemical Hazards, Vibro-acousticHazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.
Accident &Safety	Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.
First Aid	Care of injured &sick at the workplaces, First-Aid and Transportation of sick person.
Basic Provisions	Idea of basic provision legislation of India. Safety, health, welfare under legislative of India.

Ecosystem	Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of Energy, re-use and recycle.
Global Warming	Global warming, climate change and Ozone layer depletion.
Ground Water	Hydrological cycle, ground and surface water, Conservation and Harvesting of water.
Environment	Right attitude towards environment, Maintenance of in-house environment.
7. Labor Welfare Legislation	**Duration: 10 hrs.** **Marks : 03**
Welfare Acts	Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, Workmen' Compensation Act.
8. Quality Tools	**Duration: 15 hrs.** **Marks : 05**
Quality Consciousness	Meaning of quality, Quality characteristic.
Quality Circles	Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.
Quality Management System	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping	Purpose of House-keeping, Practice of good Housekeeping.
Quality Tools	Basic quality tools with a few examples.

ANNEXURE-I

LIST OF TOOLS & EQUIPMENT			
Amanat cum Surveyor (Flexi MoU) (For batch of 20 candidates)			
S No.	**Name of the Tools and Equipment**	**Specification**	**Quantity**
A. TOOLS, EQUIPMENT & GENERAL OUTFIT			
1.	Engineering Instrument Box	15 cm	21 Nos.
2.	Protractor full circular		21 Nos.
3.	Card board/ plastic metric scale set- A to H		21 Nos.
4.	Diagonal scale, electroplated		21 Nos.
5.	Celluloid set square	45˚ & 60˚	21 Nos.
6.	T square / Mini drafter	1250 mm	21 Nos.
7.	Erasing shield small size		21 Nos.
8.	Architect's & builder's template		21 Nos.
9.	Chisel- steel blade	80 mm	21 Nos.
10.	French curve- set of 12		21 Nos.
11.	Abney level		8 Nos.
12.	Ammonia printing machine with box		8 Nos.
13.	Box sextant		8 Nos.
14.	Boning rod		8 Nos.
15.	Binocular		8 Nos.
16.	Chalk board/White board		2 Nos.
17.	Cupboard (Big)		2 Nos.
18.	Ceylon ghat tracer with stand & target		8 Nos.

19.	Scientific calculator		8 Nos.
20.	Computing scales two hectares		21 Nos.
21.	Computing scales five hectares		21 Nos.
22.	Wooden cross staff- box type		21 Nos.
23.	Wooden cross staff- open type		21 Nos.
24.	Engineer's chain		8 Nos.
25.	Engineer's level		8 Nos.
26.	Hold all canvas for instruments		8 Nos.
27.	Gunter's chain		8 Nos.
28.	Hand press for numbering & lettering		21 Nos.
29.	Canvas bag		21 Nos.
30.	Height indicators		8 Nos.
31.	Metric chain	30 m & 20 m 5 each	8 Nos.
32.	Magnifying glass		8 Nos.
33.	Magnet bar (for magnetizing through compass needles		8 Nos.
34.	Plastic tubes for keeping drawings		21 Nos.
35.	Pen knife		5 Nos.
36.	Pentograph		8 Nos.
37.	Prismatic compass		8 Nos.
38.	Planimeter (digital)		8 Nos.
39.	Proportionate compass		8 Nos.
40.	Ranging rod	4 m	8 Nos.
41.	Indian pattern clinometers		8 Nos.
42.	Offset rod		8 Nos.

43.	Optical square		8 Nos.
44.	Telescopic alidade		8 Nos.
45.	Survey plotting scale-8 scales with offset scale in box		8 Nos.
46.	Metallic tape	30 m	8 Nos.
47.	Metallic tape	20 m	8 Nos.
48.	Steel tape	30 m	8 Nos.
49.	Steel band	30 m & 20 m	8 Nos.
50.	Surveyor's umbrella		8 Nos.
51.	Wooden set square, T square & Compass in a box		8 Nos.
52.	Drawing sheet-A1 size		21 Nos.
53.	Field book as required for the survey work		21 Nos.
54.	Tracing paper roll		21 Nos.
55.	Drawing pencil	HB, 2H, H, etc.	21 Nos. Each
56.	Eraser		21 Nos.
57.	Adhesive tape		21 Nos.

Tools & Equipment for Employability Skills		
S No.	**Name of the Equipment**	**Quantity**
1	Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software	30 no.
2	UPS - 500VA	30 no.
3	Scanner cum Printer	1 no.
4	Computer Tables	30 no.
5	Computer Chairs	30 no.
6	LCD Projector – One in each class room	One in each class room
7	White Board 1200mm x 900mm	One in each class room