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

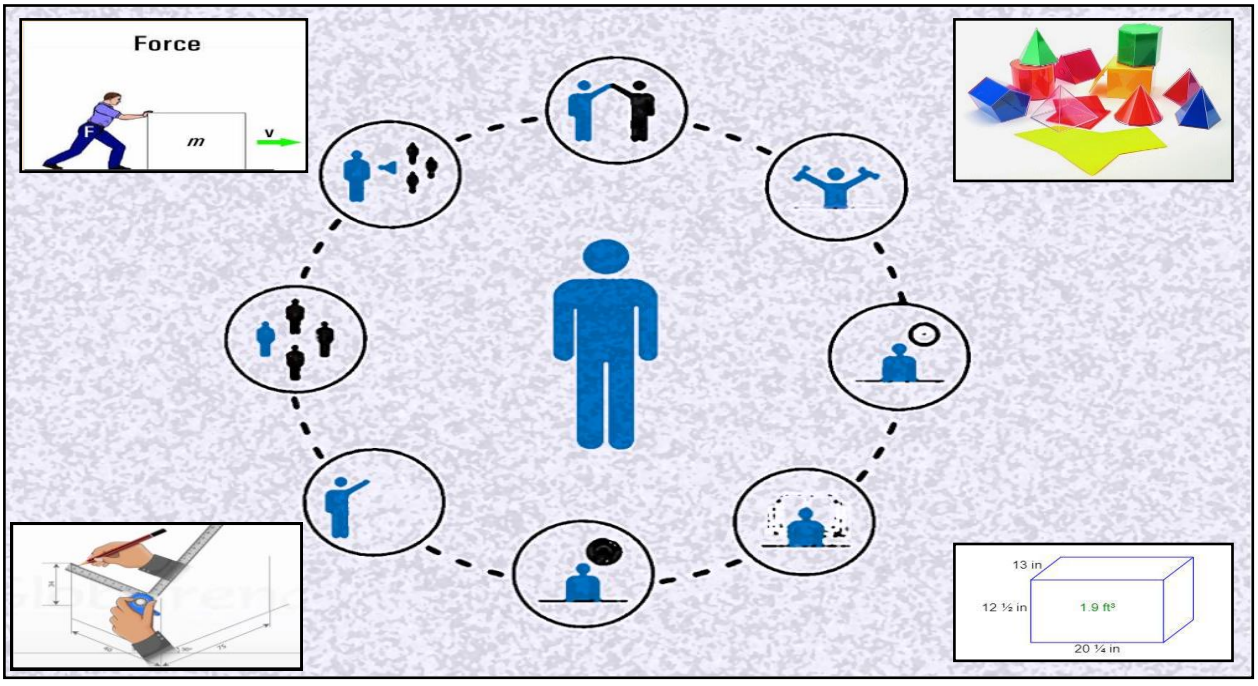
COMPETENCY BASED CURRICULUM

CORE SKILLS

(Workshop Calculation & Science, Engineering Drawing and Employability Skills)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4



Designed in 2019

Developed By

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CONTENTS

Syllabus for
WORKSHOP CALCULATION & SCIENCE

RATIONALE

Core skills enhance knowledge, Analytical ability, problem solving ability, understanding or comprehending drawings & designs and also enriches on scientific principles. At the same time, it creates the base for achieving Hard skills. To carry out any skill related task the know how about basic science & related calculation is essential as it helps in scientific way of executing the task.

Presently the employers want not only simple execution of assigned task but also give weightage on Innovative ideas in workplace along-with problem solving. A person can stimulate innovative ideas and solve problems if he possesses basic core skill such as (Calculation and Science). More importantly the productivity of a person also enhances and gives confidence to person to perform task competently.

Recognizingthis importance, the core skills (Workshop Calculation and science) made an integral part of all Engineering Trade run under DGT. The content of Workshop Calculation and science is common for first year for all Engineering Trades. The content of 2nd year is also made common for all Engineering Trades having duration of more than one year.

GENERAL INFORMATION

1. Name of the subject	**WORKSHOP CALCULATION & SCIENCE**
2. Applicability	CTS- For all engineering trades
3. Hours of Instruction	80Hrs for 1st Year & 80Hrs for 2nd Year
4. Examination	The examination for the subject will be held at the end of each year.
5. Marks Distribution	Full marks – 50 Pass Marks - 17
6. Instructor Qualification	B.Voc/Degree in Engineering from AICTE/ UGC recognized Engineering College/ University with one year Experience in the relevant field. OR 03 years Diploma in Engineering from AICTE/ recognized Board of Technical Education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field. OR NTC/ NAC in any one of the engineering trades with three years' experiencein the relevant field. **Essential Qualification:** National Craft Instructor Certificate (NCIC) in relevant trade OR NCIC in RoDA or any of its variants under DGT.
7. Minimum Age	**14 years as on first day of academic session.**

LEARNING OUTCOME WITH ASSESSMENT CRITERIA

LEARNING OUTCOME	ASSESSMENT CRITERIA
1. Demonstrate basic mathematical concept and principles to perform practical operations.	Solve different problems like phase angle, etc. with the help of a calculator.
	Demonstrate conversion of Fraction to Decimal and vice versa.
	Explain BCD code, conversion from decimal to binary and vice-versa, all other conversions.
2. Understand and explain basic science in the field of study including simple machine.	Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction.
	Explain levers and its types.
	Explain relationship between Efficiency, velocity ratio and Mechanical Advantage.
	Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	Solve simple problems on lifting tackles like crane-Solution of problems with the aid of vectors.

Workshop Calculation & Science – I
(Common for CTS Engineering trades during 1st year)

Sl. No.	Syllabus	Time in hrs.
I.	**Unit, Fractions**	**4**
1	Classification of Unit System	
2	Fundamental and Derived Units F.P.S, C.G.S, M.K.S and SI Units	
3	Measurement Units and Conversion	
4	Factors, HCF, LCM and Problems	
5	Fractions – Addition, Subtraction, Multiplication and Division	
6	Decimal Fractions - – Addition, Subtraction, Multiplication and Division	
8	Solving Problems by using calculator	
II.	**Square Root: Ratio and Proportions, Percentage**	**6**
1	Square and Square Root	
2	Simple problems using calculator	
3	Application of Pythagoras Theorem and related problems	
4	Ratio and Proportions	
5	Direct and Indirect proportion	
6	Percentage	
7	Changing percentage to decimal	
III.	**Material Science**	**8**
1	Types of metals	
2	Physical and Mechanical Properties of metals	
3	Types of ferrous and non-ferrous metals	
4	Introduction of iron and cast iron	
5	Difference between iron and steel, alloy steel and carbon steel	
6	Properties and uses of rubber, timber and insulating materials	
IV.	**Mass, Weight, Volume, and Density**	**4**
1	Mass, volume, density, weight & specific gravity	
2	Related problems for mass, volume, density, weight & specific gravity	
V.	**Speed and Velocity, Work Power and Energy**	**12**
1	Rest, motion, speed, velocity, difference between speed and velocity, acceleration and retardation	
2	Related problems on speed and velocity	
3	Potential energy, Kinetic Energy and related problems with related problems	
4	Work, power, energy, HP, IHP, BHP and efficiency	
VI.	**Heat &Temperature and Pressure**	**12**
1	Concept of heat and temperature, effects of heat, difference between heat and temperature	
2	Scales of temperature, Celsius, Farenhieght,Kelvin and Conversion between scales of temperature	
3	Temperature measuring instruments, types of thermometer, pyrometer and transmission of heat - Conduction, convection and radiation	

4	Co-efficient of linear expansion and related problems with assignments	
5	Problem of Heat loss and heat gain with assignments	
6	Thermal conductivity and insulators	
7	Boiling point and melting point of different metals and Nonmetals	
8	Concept of pressure and its units in different system	
VII.	**Basic Electricity**	**12**
1	Introduction and uses of electricity, molecule, atom, how electricity is produced, electric current AC, DC and their comparison, voltage , resistance and their units	
2	Conductor, Insulator, types of connections- Series and Parallel,	
	Ohm's Law, relation between VIR & related problems	
3	Electrical power, energy and their units, calculation with assignments	
4	Magnetic induction, self and mutual inductance and EMF generation	
5	Electrical Power, HP, Energy and units of electrical energy	
VIII.	**Mensuration**	**10**
1	Area and perimeter of square, rectangle and parallelogram	
2	Area an Perimeter of Triangle	
3	Area and Perimeter of Circle, Semi-circle , circular ring, sector of circle, hexagon and ellipse	
4	Surface area and Volume of solids- cube, cuboids, cylinder, sphere and hollow cylinder	
5	Finding lateral surface area , total surface area and capacity in liters of hexagonal, conical and cylindrical shaped vessels	
IX.	**Levers and Simple Machines**	**6**
1	Simple machines, Effort and load, mechanical advantage, velocity ratio, efficiency of machine, relation between efficiency, velocity ratio and mechanical advantage	
2	Lever and its types	
X.	**Trigonometry**	**6**
1	Measurement of Angle, Trigonometrical Ratios, Trigonometric Table	
2	Trigonometry-Application in calculating height and distance (Simple Applications)	
	Total	**80**

Workshop Calculation & Science - II
(Common for CTS Engineering trades during 2nd year)

Sl. No.	Title of Syllabus	Time in hrs.
I.	**Friction**	**10**
1	Advantages and disadvantages, Laws of friction, co- efficient of friction, angle of friction, simple problems related to friction	
2	Friction – Lubrication	
3	Co- efficient of friction, application and effects of friction in workshop practice	
II.	**Centre of Gravity**	**6**
1	Centre of gravity and its practical application	
III.	**Area of cut – out regular surfaces and area of irregular surfaces**	**14**
1	Area of cut – out regular surfaces – circle, segment and sector of circle	
2	Related problems of area of cut – out regular surfaces – circle, segment and sector of circle	
3	Area of irregular surfaces and application related to shop problems	
IV.	**Algebra,**	**12**
1	Addition, Subtraction, Multiplication & Divisions	
2	Algebra – Theory of indices, Algebraic formula, related problems	
V.	**Elasticity**	**8**
1	Elastic, plastic materials, stress, strains and their units and young modulus	
2	Ultimate stress and working stress	
VI.	**Heat Treatment**	**8**
1	Heat treatment and advantages	
2.	Different heat treatment process – Hardening, Tempering, Annealing, Normalising, Case Hardening	
VII.	**Profit and Loss**	**12**
1	Simple problems on profit & loss	
2	Simple and compound interest	
VIII.	**Estimation and Costing**	**10**
1	Simple estimation of the requirement of material etc., as applicable to the trade	
2	Problems on estimation and costing	
	Total	**80**

Syllabus for
ENGINEERING DRAWING

(3 Groups)

RATIONALE

Core skills enhance knowledge, analytical ability, problem solving ability, understanding or comprehending scientific principles and drawings & designs also. At the same time it creates the base for achieving Hard skills. To carry out any skill related task knowledge about basic Engineering Drawing is essential as drawing is the language of engineers.

Knowledge of Engineering Drawing complements the skills of an Artisan / Trade person. More importantly, ability to read drawing increases the productivity of a person besides enhancing confidence to perform task competently.

Recognizing this importance, the core skills (Engineering Drawing) made an integral part of all Engineering Trades under DGT. The syllabus of Engineering Drawing is common for first year for all Engineering Trades. The syllabus of 2nd year are made trade group specific.

GENERAL INFORMATION

1. Name of the Subject	**ENGINEERING DRAWING**
2. Applicability	CTS- For all engineering trades
3. Hours of Instruction	80Hrs for 1st Year & 80Hrs for 2nd Year
4. Examination	The examination for the subject will be held at the end of each year
5. Marks Distribution	Full marks – 50 Pass Marks - 17
6. Instructor Qualification	B.Voc/Degree in Engineering from AICTE/ UGC recognized Engineering College/ University with one year Experience in the relevant field. OR 03 years Diploma in Engineering from AICTE/ recognized Board of Technical Education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field. OR NTC/ NAC in any one of the relevant engineering group of trades categorized under Engineering Drawing / D'man (Mech. / Civil) with three years' experience. **Essential Qualification:** National Craft Instructor Certificate (NCIC) in relevant trade OR NCIC in RoDA / D'man (Mech. / Civil) or any of its variants under DGT.

LEARNING OUTCOME WITH ASSESSMENT CRITERIA

ENGINEERING DRAWING	
LEARNING OUTCOME	**ASSESSMENT CRITERIA**
1. Read and apply engineering drawing for different application in the field of work.	Read & interpret the information on drawings and apply in executing practical work.
	Read &analyse the specification to ascertain the material requirement, tools and assembly/maintenance parameters.
	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.

Engineering Drawing - I
(Common for CTS Engineering trades during 1st year)
(Not applicable for Draughtsman trade Group)

Sl. No.	Topic	Time in hrs.
1.	Engineering Drawing – Introduction Introduction to Engineering Drawing and Drawing Instruments – • Conventions • Viewing of engineering drawing sheets. • Method of Folding of printed Drawing sheet as per BIS SP: 46-2003	1
2.	Drawing Instrument • Drawing board, T-square, Drafter (Drafting M/c), Set squares, Protector, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), pencils of different grades, Drawing pins/ Clips.	1
3.	Free hand drawing of – • Lines, polygons, ellipse etc. • Geometrical figures and blocks with dimension • Transferring measurement from the given object to the free hand sketches. • Solid objects – Cube, Cuboids, Cone, Prism, Pyramid, Frustum of Cone with dimensions. • Free hand drawing of hand tools and measuring tools, simple fasteners (nuts, bolts, rivets etc.) trade related sketches	10
4.	Lines • Definition, types and applications in drawing as per BIS: 46-2003 • Classification of lines (Hidden, centre, construction, extension, Dimension, Section) • Drawing lines of given length (Straight, curved) • Drawing of parallel lines, perpendicular line • Methods of Division of line segment	2
5.	Drawing of Geometrical figures: Definition, nomenclature and practice of – • Angle: Measurement and its types, method of bisecting. • Triangle: different types • Rectangle, Square, Rhombus, Parallelogram. • Circle and its elements • Different polygon and their values of included angles. Inscribed and circumscribed polygons	8
6.	Lettering & Numbering –	6

	• Single Stroke, Double Stroke, Inclined.	
7.	Dimensioning and its Practice • Definition, types and methods of dimensioning (functional, non-functional and auxiliary) • Position of dimensioning (Unidirectional, Aligned) • Types of arrowhead • Leader line with text • Symbols preceding the value of dimension and dimensional tolerance.	4
8.	Sizes and layout of drawing sheets • Selection of sizes • Title Block, its position and content • Item Reference on Drawing Sheet (Item list)	2
9.	Method of presentation of Engg. Drawing • Pictorial View • Orthographic View • Isometric View	2
10.	Symbolic representation – different symbols used in the trades • Fastener (Rivets, Bolts and Nuts) • Bars and profile sections • Weld, Brazed and soldered joints • Electrical and electronics element • Piping joints and fitting	6
11.	Projections • Concept of axes plane and quadrant • Orthographic projections • Method of first angle and third angle projections (definition and difference) • Symbol of 1st angle and 3rd angle projection in 3rd angle.	15
12.	Orthographic projection from isometric projection	15
13.	Reading of fabrication drawing	8
Total		**80**

Engineering Drawing– II

(03 groups of CTS Engineering trades during 2nd year)

(Not applicable for Draughtsman trade Group)

2nd Year – (Group - I)- Mechanical trade group – Fitter, Turner, Machinist, Machinist Grinder, Mechanic Machine Tool Maintenance, Operator Advance Machine Tool, Mechanic Motor Vehicle, Mechanic Agriculture Machinery, Ref. & A/C Mechanic, Central Air Conditioning Plant, Mechanic Mining Machinery, TDM (D&M), TDM (J&F), Marine Fitter, Aeronautical Structure, Spinning Technician, Textile Wet Processing Technician, Weaving Technician, Textile Mechatronics, Painter General, Mechanic Maint. (Chemical Plant), Refractory Technician, - 22 trades.

Sl. No.	Topic	Time in hrs.
1.	Construction of scales and diagonal scales	4
2.	Conic sections (Ellipse and Parabola)	3
3.	Sketches of nuts, bolt, screw thread, different types of locking devices e.g. Double nut, Castle nut, Pin, etc.	6
4.	Sketches of foundation	08
5.	Rivets and rivetted joints, welded joints	10
6.	Sketches of pipes and pipe joints	10
7.	**Assembly view of** Vee blocks, Bush & Bearing, Different types of Coupling viz., Muff coupling, Half Lap Coupling, Flange coupling, etc. Simple work holding device e.g. vice Drawing details of two mating blocks and assembled view	25
8.	Sketch of shaft and pulley, belt, gear, gear drives	14
	Total	**80**

2nd Year – (Group - II)- Electrical, Electronics & IT trade Group – (Electroplater, Lift &Escalator Mechanic, Electrician, Medical Electronics, Technician Mechatronics, Wireman, Electrician Power Distribution, Instrument Mechanic, Technician Power Electronics System, Electronics Mechanic, Mechanic Consumer Electronics Appliances, Instrument Mechanic (Chemical Plant),Attendant Operator (Chemical Plant), Laboratory Attendant (Chemical Plant), Information &Communication Technology System Maintenance, Information Technology) – 16 trades.

Sl. No.	Topic	Time in hrs.
1.	Sign and Symbols of Electrical, Electronics and related trades	4
2.	Sketch of Electrical and Electronics/ trade related components	6
3.	Electrical and Electronics wiring diagram/ trade related Layout diagram	14
4.	Electrical earthing diagram - Drawing the schematic diagram of plate and pipe earthing.	8
5.	Electrical, Electronics/ trade related circuit diagram	30
6.	Block diagram of Instruments/ equipment of related trades	18
Total		**80**

2nd Year – (Group - III) – Vessel Navigator - 01 Trade

Sl. No.	Topic	Time in hrs.
1.	Construction of scales and diagonal scales	4
2.	Basic Navigational Chart Work Practice Introduction of a navigational chart. Various type of navigational chart. Parallel Ruler and instruments used. Measurement of distance, sea miles, International nautical mile, geographical mile.	6
3.	Great circle, parallels of latitude and Longitudes. Important features of Mercator chart. Simple plotting of position and measurement of distance. Variation, Deviation, Conversion of compass course to true course.	6
4.	Conversion of true course to compass course. Calculation involving deviation, variation, and compass error. A few terms associated with chart work, symbols and Abbreviations	4
5.	True bearing, compass bearing, abeam bearing. Current, wind and its effects. Allowing current and leeway.	5
6.	To counter act current and wind. Find actual current experienced.	4
7.	Method of fixing the ship position by bearing and depth, bearing and distance by vertical sextant angle, horizontal angle or Radar Given: course steered engines speed direction and rate of current wind and leeway to find course and speed made good. Give: Initial position / final position to find set and rate of drift Transfer position line and simple running fix.	5
8.	ADVANCED NAVIGATIONAL CHART WORK PRACTICE Transfer of	4

	position line and running fix with current. Running fix with current and leeway.	
9.	Transfer to position line while makes more than one course to given running fix. To find course to steer to counteract the current and leeway.	4
10.	To find course to steer and speed to steer in order to maintain the required ETA in prevailing current. Three bearing method to find course made good	4
11.	To find CMG direction by three bearing of same object from different position.[only set is given rate is not known]	6
12.	To find CMG direction by three bearing of same object from different position[both set and rate is given]	6
13.	Dipping and rising bearing of lights[dipping range or rising range]	5
14.	To find true set and drift [actual set and rate of current experienced]	4
15.	Tide problems	4
16.	To arrive with a given point right ahead at extreme range.	4
17.	Nautical publications.	5
	TOTAL	**80**

LIST OF TOOLS AND EQUIPMENT FOR ENGINEERING DRAWING			
S No.	**Name of the items**	**Specification**	**Quantity**
1.	Drawing instrument box	Containing - Compass with pencil point, divider, protractor, scale, etc.	01 set per trainee
2.	Set square celluloid 45°	250 X 1.5 mm	01 no. per trainee
3.	Set square celluloid 30°-60°	250 X 1.5 mm	01 no. per trainee
4.	French-curves (set of 12 celluloid)		4sets.
5.	T-Square orMini drafter	750mm	01 no. per trainee
6.	Drawing boardIS: 1444	700mm x500 mm	01 no. per trainee
7.	Almirah steel	As required	As required

Syllabus for
EMPLOYABILITY SKILLS

RATIONALE

Employability skills play an important role in one's career. Professional skills are a person's skill set and ability to perform a certain type of activity or task. Employability skills are a person's ability to interact effectively with co-workers and customers. Hard skills are mainly applicable at the work place. Employability skills are applicableboth at workplace and outside the work place. Employability skills complement the hard skills which are occupational requirement of a job. It also complements many other activities even outside the work place. Presently employability skills are increasingly sought out by employers in addition to standard qualification. There are instances of professions where employability skills proved to be more important, on a long term basis than occupational skills. Employability skills refer to behavior, communication, IT Skill, work ethics etc. which makes a person suitable to effectively work in a team. Studies suggest that employability skills are equally important indication of job performance as hard skills. The competency level of the worker increases with the Employability skills and takes him to the next level.

Recognizing this importance of soft skills the DGT during its 38th Meeting held on 31st May, 2011 recommended introduction of subject "Employability Skills" replacing "Social Studies" in ITI curricula. Government of India accepted the above recommendationand introduced the subject "Employability Skills" in ITI curricula in place of "Social Studies" from the August, 2012 session.

In the STRIVE meeting held on 26th march 2019 through video conferencing for "Improved Teaching with blended mode of Learning" with CSTARI and NIMI along with DDG (C&P), chaired by DG/AS, It was directed to revamp the present employability skills of 110 Hrs.Accordingly, Employability Skills syllabus of 80 hrs. duration for all six months trades and 160 Hrs. duration for all other one and two year CTS trades is designed during 1st year. Further for 2 year CTS trades, an additional 80 Hrs web based module on "English and Communication Skills" is designed and to be implemented during the 2nd year.

GENERAL INFORMATION

1. Name of the subject	**EMPLOYABILITY SKILLS**
2. Applicability	• CTS - Mandatory for all trades
3. Hours of Instruction	• 80 Hrs. for all CTS trades of six months duration • 160 Hrs. in 1st year for all one and two yearCTS trades • Additional 80 hrs. web based module in 2nd year for 2 years trade only.
4. Examination	• The examination for the subject will be held at the end of course / each year
5. Instructor Qualification	MBA/ BBA /any Graduate / Diploma in any discipline with Two years' experience with short term ToT course in Employability Skills from DGT institutes. (Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above). **OR** Existing Social Studies Instructors in ITIs with short term ToT course in Employability Skills from DGT institutes.

EMPLOYABILITY SKILLS - I
Common for all One year and Two year trades(160 Hrs.)

LEARNING OUTCOMES AND ASSESSMENT CRITERIA

EMPLOYABILITY SKILLS- I	
LEARNING OUTCOME	**ASSESSMENT CRITERIA**
1. Apply safe working practices	Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy.
	Report all unsafe situations according to site policy
	Identify and take necessary precautions on fire and safety hazards and report according to procedures.
	Identify, handle and store / dispose of dangerous goods and substances according to site policy and procedures following safety regulations and requirements.
	Identify site policies and procedures in regard to illness or accident.
	Apply safety alarms accurately.
	Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	Execute site evacuation procedures according to site policy.
	Use Personal ProtectiveEquipment (PPE) as per related working environment.
	Perform basic first aid and use them under different circumstances.
	Use different fire extinguisher as per requirement during Drill or other necessary situation.
2. Comply with environment regulation and housekeeping.	Identify environmental pollution & contribute to the avoidance of instances of environmental pollution.
	Apply different components of 5S in the working environment.
	Use energy and materials in an environment friendly manner.
	Reduce waste and dispose of the waste as per procedure.
3.Interpret & use formal and technical communication.	Identify and use appropriate words for communication.
	Choose proper tools to communicate.
	Use Positive body language while communicating.
	Maintain proper eye contact to built trust and confidence.
4. Apply the concept in productivity & quality management in day to day	Identify the trades and critical ingredients.
	Identify factors affecting productivity.
	Awareness on quality concepts.

work to improve productivity & quality.	Maintain quality management systems (QMS) via using PDCA, Fishbone,5S, 5D,Kaizen.
5. List and interpret various acts of labour welfare legislation.	Explain benefits guaranteed under various applicable Acts.
	Interpret applicable labour and industrial laws.
6. Explain energy conservation, global warming and pollution andcontribute in day to day work by optimally using available resources.	Explain energy conservation, cause of global warming and pollution.
	Show protective measures to balance the resources of nature.
	Explain effects of global warming and its precautions from damage. Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	Explain personnel finance and entrepreneurship.
	Explain 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/Programmes, procedure and available schemes.
	Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Utilize basic computer applications and internet to take benefit of IT developments in the industry.	Work with MS Office viz., word, excel, etc.
	Use internet for finding out various data pertaining to the trade.

Syllabus for Employability Skills – I(160 Hrs.)	
Module	**Topics**
1. Behavioural Skills Duration: 10 Hrs.	
Expectation Setting	Creating a focused and responsible learning environment
Personal Strength Analysis/Strength Blindness	Self -awareness and confidence building
Perception Management	Display Professionalism at the institute and work place
Ethics, Values& Etiquette	Increased social initiations relationships and networks Acceptance of peers from different cultures and social groups and work with them. Collaboration with team to prioritize the common goal and compromise individual priorities.
Social Etiquette	Characteristic of a responsible citizen- Display the same by respecting self, others, environment, care for duty and value for time.
Role Modeling	Adopting best practices and aspire to follow success stories of individual for personal development.
2. English Literacy Duration: 30 Hrs.	
Functional English	Importance of Learning English Different Naming words, Words used for replacing names, Action words, Describing people, place and their use. Introduction to punctuation - Comma, Full stop, Question mark. Singular plural Change of tense - Simple present, past; present, past progressive Construction of simple sentences - Kinds of sentences Usage of appropriate words to express themselves Greetings & Self Introduction Asking &responding to questions Sharing information with others Formal & Informal communication Speak and provide information about workplace Discussions on current happenings.
Reading	Reading simple sentences about: a) Self b) Work c) Environment
Written English	Simple writing skills
3. Communication Skills Duration: 20 Hrs.	
Self- Introduction	Interview Skills/Confidence Building
Perception Management	Professionalism and Display of same at the institute and work place
a. Verbal Communication	Understand the usage of appropriate words to express themselves Communicate effectively on telephone.
b. Non-Verbal Communication	Manage Personal Hygiene and Presentation
	Positive body language: adopt and use it appropriately to build a positive impression

	Different spatial zones: Understanding and need to maintain it, create safe zones for communication
	Maintaining appropriate eye-contact in building trust and confidence
	Impact of touch in a formal environment. Acceptable and unacceptable touch.
	Role of tone in any communication.
Campus to Work	Time Management and Planning Skills
	Interview skills- its phases & ways to crack interview.
	Handling setbacks/rejection and recover from it with an action plan.
	Developing strong professional contacts/network to gain support in learning process and career as a whole.
4. I.T. LiteracyDuration: 20 Hrs.	
Basics of Computers	Introduction to Computers and its applications Hardware and peripherals Starting and shutting down of computer Basic of computer Networks.
Operating System	Basics of Operating System Types of Operating Systems User interface of Windows 10 OS/ latest Create, Copy, Move and delete Files and Folders Use of External memory like pen drive, CD, DVD etc, Introduction to inbuilt windows apps, Tools and features.
MS-Word	Basic operating of Word Processing Creating, opening and closing Documents Use of shortcuts, Creating and Editing of Text, Formatting the Text Creating simple document like - resume, letter writing, job application etc., Printing document
MS-Excel	Basics of Excel worksheet & its importance Creating simple worksheets Adding and average functions Printing of simple excel sheets
Web browsers & Search Engines	Introduction to world wide web (WWW), Useful websites, web browser - usage, search engine etc. Using popular sites like Bharat Skills, Skill Training related Government portals, naukri.com and other job portals, CITS applications, Apprenticeship portal (NAPS), resize images, signing up, Online fund transfer using UPI gateway.
Email	Creating & using an email account –like Gmail or any other. Usage of CC & BCC. Attaching documents Checking email and composing Email.
Mobile application	Scanning QR/AR code, Sharing best practices and downloading trade related videos using Wi-Fi, Fund transfer through App like BHIM.
5. Entrepreneurship Skills Duration: 20 Hrs.	
Entrepreneur	Need of becoming entrepreneur
	Ways to become a good entrepreneur
	Enabling environment available to become an entrepreneur. Different Govt. institutions/schemes promoting Entrepreneur viz., Gramin banks, PMMY-MUDRA loans, DIC, SIDA, SISI, NSIC, SIDO. Ways to set up an enterprise and different aspects involved viz., legal compliances, Marketing aspect, Budgeting, etc. Day to day monitoring mechanism for Maintaining an enterprise.

	Different Government schemes supporting entrepreneurship. Examples of successful and unsuccessful entrepreneurs.
6. Maintaining Efficiency at Workplace Duration: 10 Hrs.	
Maintaining Efficiency at Workplace	Factors affecting productivity
	Improving Productivity
	Personal finance literacy Planning, Saving, Tax, Govt. schemes for financial safety e.g. Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY), etc.
7. Occupational Safety, Health and Environment Education Duration: 10 Hrs.	
Safety and Health	Introduction to Occupational Safety & health at work place, Occupational Hygiene
Occupational Hazards	Basic Hazards. Chemical ,Physical (Electrical, Temperature, Illumination) Ergonomic, Biological, Vibro acoustic, Mechanical, Psychosocial Hazards, Prevention of hazards
Accident and Safety	Different types of Personal Protective Equipment (PPE) Accident Prevention techniques
First-aid	Care of injured & Sick at the workplace First-Aid& Transportation of sick person
Basic provisions on safety and Health	Basic provisions of safety & health
Environmental Issues	Introduction to Environment, ecosystem and factors causing imbalance Pollution and pollutants including liquid, gaseous, solid and hazardous waste Protecting the environment - Energy Conservation, ground water, global warming Responsibility about the environment Segregation and disposal of waste
Environmental ethics	Different actions people that affect others and the environment.
Disaster Management	Types, causes & effects, areas in India that are prone to be affected, preparedness & mitigation, dos and don'ts- Before, During and After any Disaster, how to reduce man-made disasters.
8. Essential skills for success Duration: 10 Hrs.	
Essential skills for success	Building basic skills to navigate life and career. Self-Awareness, articulating personal values, Value-based decision making, Dilemma situations. Identify sources and types of stress (positive / negative stress), Managing stress (long-term / short-term), Handling rejection and building resilience, Identify day wasters.
9. Labour Welfare Legislation Duration: 05 Hrs.	
Labour Welfare Legislation	Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act, POSH. Interpret applicable labour and industrial laws.
10. Quality Management Duration: 05 Hrs.	
Quality Concept and Consciousness	Create awareness on introduction of quality Concepts.

Concept of Quality Management (QMS) & PDCA	Concept of Quality Management (QMS), PDCA, Fishbone, 5S, 5D, KAIZEN
Concept of ISO	Introduction of ISO
11. Preparation to the world of work Duration: 10 Hrs.	
Career Plan	Identify the difference between job and career
Basic Professional Skills	Job roles available in respective trades
Career Pathways	Awareness of industries, and the respective professional pathways
Search and apply for a job	Awareness of higher education / up skilling (short-term) options Steps involved in online application for Instructor course, Apprenticeship and different jobs in popular site like theindiajobs.com, naukri.com, monsterindia.com, Govt. website.
12. Customer Interaction / service Duration: 10 Hrs.	
Greeting customers	Forms of greeting
Probing-understanding customer requirements	Use of positive body language
Handling grievances	Handling grievances (Use of ask-listen-repeat technique)
Relationship building with customers	Relationship building with customers, importance of probing.
To identify the importance of probing	Use of open-ended/ close-ended questions to gauge requirement

EMPLOYABILITY SKILLS – II(80 Hrs.)
Common for six months CTS trades

LEARNING OUTCOMES AND ASSESSMENT CRITERIA

EMPLOYABILITY SKILLS- II	
LEARNING OUTCOME	**ASSESSMENT CRITERIA**
1. Apply safe working practices	Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy.
	Identify, handle and store / dispose of dangerous goods and substances according to site policy and procedures following safety regulations and requirements.
	Identify site policies and procedures in regard to illness or accident.
	Apply safety alarms accurately.
	Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	Execute site evacuation procedures according to site policy.
	Use Personal ProtectiveEquipment (PPE) as per related working environment.
	Perform basic first aid and use them under different circumstances.
2. Comply with environment regulation and housekeeping.	Identify environmental pollution & contribute to the avoidance of instances of environmental pollution.
	Use energy and materials in an environment friendly manner.
	Reduce waste and dispose of the waste as per procedure.
3.Interpret & use formal and technical communication.	Identify and use appropriate words for communication.
	Choose proper tools to communicate.
	Use Positive body language while communicating.
	Maintain proper eye contact to built trust and confidence.
4. Apply the concept in productivity & quality management in day to day work to improve productivity & quality.	Identify factors affecting productivity.
	Awareness on quality concepts.
5. List and interpret various acts of labour welfare legislation.	Explain benefits guaranteed under various applicable Acts.
	Interpret applicable labour and industrial laws.

6. Explain energy conservation, global warming and pollution andcontribute in day to day work by optimally using available resources.	Explain energy conservation, cause of global warming and pollution.
	Show protective measures to balance the resources of nature.
	Explain effects of global warming and its precautions from damage. Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	Explain personnel finance and entrepreneurship.
	Explain 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/Programmes, procedure and available schemes.
8. Utilize basic computer applications and internet to take benefit of IT developments in the industry.	Work with MS Office viz., word, etc.
	Use internet for finding out various data pertaining to the trade.

Syllabus for Employability Skills – II(80 Hrs.)	
Module	**Topics**
1. BehaviouralSkillsDuration: 6 Hrs.	
Expectation Setting	Creating a focused and responsible learning environment
Personal Strength Analysis/Strength Blindness	Self -awareness and confidence building
Perception Management	Display Professionalism at the institute and work place
Ethics, Values& Etiquette	Increased social initiations relationships and networks Acceptance of peers from different cultures and social groups and work with them. Collaboration with team to prioritize the common goal and compromise individual priorities.
Social Etiquette	Characteristic of a responsible citizen- Display the same by respecting self, others, environment, care for duty and value for time.
2. English LiteracyDuration: 20 Hrs.	
Functional English	Importance of Learning English Different Naming words, Words used for replacing names, Action words, Describing people, place and their use. Introduction to punctuation - Comma, Full stop, Question mark. Singular plural Change of tense - Simple present, past; present, past progressive Construction of simple sentences - Kinds of sentences Usage of appropriate words to express themselves Greetings & Self Introduction Asking &responding to questions Sharing information with others Speak and provide information about workplace
Reading	Reading simple sentences about: a) Self b) Work c) Environment
Written English	Simple writing skills
3. Communication Skills Duration: 10 Hrs.	
Self- Introduction	Interview Skills/Confidence Building
a. Verbal Communication	Understand the usage of appropriate words to express themselves Communicate effectively on telephone.
b. Non-Verbal Communication	Manage Personal Hygiene and Presentation
	Positive body language: adopt and use it appropriately to build a positive impression
	Maintaining appropriate eye-contact in building trust and confidence
	Impact of touch in a formal environment. Acceptable and unacceptable touch.
	Role of tone in any communication.

Campus to Work	Time Management and Planning Skills
	Interview skills- its phases & ways to crack interview.
4. I.T. LiteracyDuration: 10 Hrs.	
Basics of Computers	Introduction to Computers and its applications Hardware and peripherals Starting and shutting down of computer Basic of computer Networks.
Operating System	Basics of Operating System Types of Operating Systems User interface of Windows 10 OS/ latest Create, Copy, Move and delete Files and Folders Use of External memory like pen drive, etc,
MS-Word	Basic operating of Word Processing Creating, opening and closing Documents Use of shortcuts, Creating and Editing of Text, Formatting the Text Creating simple document like - resume, letter writing, job application etc., Printing document
Web browsers & Search Engines	Introduction to world wide web (WWW), Useful websites, web browser - usage, search engine etc. Using popular sites like Bharat Skills, Skill Training related Government portals, naukri.com and other job portals, CITS applications, Apprenticeship portal (NAPS), resize images, signing up, Online fund transfer using UPI gateway.
Email	Creating & using an email account –like Gmail or any other. Usage of CC & BCC. Attaching documents Checking email and composing Email.
Mobile application	Scanning QR/AR code, Sharing best practices and downloading trade related videos using Wi-Fi, Fund transfer through App like BHIM.
5. Entrepreneurship Skills Duration: 10 Hrs.	
Entrepreneur	Need of becoming entrepreneur
	Ways to become a good entrepreneur
	Enabling environment available to become an entrepreneur. Different Govt. institutions/schemes promoting Entrepreneur viz., Gramin banks, PMMY-MUDRA loans, DIC, SIDA, SISI, NSIC, SIDO. Different Government schemes supporting entrepreneurship.
6. Maintaining Efficiency at Workplace Duration: 6 Hrs.	
Maintaining Efficiency at Workplace	Factors affecting productivity
	Improving Productivity
	Personal finance literacy Planning, Saving, Tax, Govt. schemes for financial safety e.g. Pradhan Mantri Jeevan Jyoti Bima Yojana (**PMJJBY**), etc.
7. Occupational Safety, Health and Environment Education Duration: 6 Hrs.	
Safety and Health	Introduction to Occupational Safety & health at work place, Occupational Hygiene
Occupational Hazards	Basic Hazards. Chemical,Physical (Electrical, Temperature, Illumination) Ergonomic, Biological, Vibro acoustic, Mechanical, Psychosocial Hazards, Prevention of hazards

Accident and Safety	Different types of Personal Protective Equipment (PPE) Accident Prevention techniques
First-aid	Care of injured & Sick at the workplace First-Aid& Transportation of sick person
Basic provisions on safety and Health	Basic provisions of safety & health
Environmental Issues	Introduction to Environment, ecosystem and factors causing imbalance Pollution and pollutants including liquid, gaseous, solid and hazardous waste Protecting the environment - Energy Conservation, global warming Segregation and disposal of waste
8. Labour Welfare Legislation Duration: 04 Hrs.	
Labour Welfare Legislation	Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act, POSH. Interpret applicable labour and industrial laws.
9. Quality Management Duration: 02Hrs.	
Quality Concept and Consciousness	Create awareness on introduction of quality Concepts.
10. Preparation to the world of work Duration: 6 Hrs.	
Career Plan	Identify the difference between job and career
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LIST OF TOOLS &EQUIPMENTFOREMPLOYABILITY 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 (Licensed) (all softwares should either be latest version or one/two version below)	01 computer for two trainees
2.	UPS	As required
3.	Scanner cum Printer	1 no.
4.	Computer Tables	As required
5.	Computer Chairs	01 no. for each trainee
6.	LCD Projector	1 no.
7.	White Board 1200mm x 900mm	1 no.
Note: Above Tools &Equipment not required, if Computer LAB is available in the institute.		

2nd Year Employability skills syllabus for 80 hrsweb based module on "English and Communication Skills" is designed separately along with Tools and Equipment List.

Members participated for Trade committee meeting to finalize the syllabus of Employability Skills at NIMI, Chennai			
S No.	**Name & Designation (Shri/Smt)**	**Organization**	**Remarks**
1.	R.P.Dhingra, Director	NIMI, Chennai	Chairman
2.	Sanjay Kumar, Director	DGT, New Delhi	Member
3.	B.V.S.Sesha Chari, Director	CSTARI, Kolkata	Member
4.	Dr.T.Jayasudha, Deputy Director	NIMI, Chennai	Secretary
5.	NirmalyaNath, Deputy Director	NIMI, Chennai	Member/ coordinator
6.	SaritaUpadhyay	Medha Leaning Foundation	Member
7.	Shivani Sharma	Medha Leaning Foundation	Member
8.	Padma Jayaraman	Mahindra Pride Classroom	Member
9.	AnandhiArvind, State Head	Mahindra Pride Classroom	Member
10.	Mohammed Faiyaz	Mahindra Pride Classroom	Member
11.	DeoniziaSampai, Manager, Facilitator Development	TATA STRIVE	Member
12.	SailasPraveenth, Project Manager,Programme Execution	TATA STRIVE	Member
13.	CharuBabbar, Specialist – Content Design & Development	TATA STRIVE	Member
14.	AjitaKarve, LEAD – Design & Incubation	TATA STRIVE	Member
15.	SarmilaMohapatra, YDM – Facilitator	TATA STRIVE	Member
16.	Muthurama Subramanian, Manager Service Training	Ashok Leyland Limited, Guindy	Member
17.	Ashish Katiyar	KPMG – PMC Team STRIVE PROJECT	Member
18.	Dhanya Narayanan, COO	Rubicon Skill Development	Member
19.	Pravir Kumar, CEO	Rubicon Skill Development	Member
20.	ShaliniMehra, Associate Director	Quest Alliance	Member
21.	SushmithaSridhara, Manager Training & Content	Quest Alliance, Bangaluru	Member
22.	AshutoshTosaria	Quest Alliance	Member
23.	Kotresh H. B	Quest Alliance	Member

24.	Dr.SumathiShivakumar, Asst. Professor of English	A. M. Jain Collage, Chennai	Member
25.	AshokeRarhi, Dy. Director	CSTARI Kolkata	Member
26.	K.Karpagam, Deputy Director	DET, Chennai	Member
27.	Mayank N Parikh, Principal	ITI Saraspur, Ahmedabad, Gujarat	Member
28.	K.V.Satya Narayana, Trg. Officer	CSTARI,Kolkata	Member
29.	C.Gopinath,Trg. Officer	NSTI Chennai	Member
30.	A. Vairamani	Govt. ITI, Aruppukottai, Tamil Nadu	Member
31.	J.Kingsly Peter	GOVT ITI Coonoor, Tamil Nadu	Member
32.	K.ManiKandan, Trainer	GOVT ITI Cuddalore, Tamil Nadu	Member
33.	P.Selvam, Trainer	GOVT ITI – Ariyalur, Tamil Nadu	Member
34.	J.Sajin, Trainer	GOVT ITI – Konam, Nagercoil, Tamil Nadu	Member
35.	B.R.Srikanth, Trainer	GOVT ITI, Trichy, Tamil Nadu	Member
36.	Dr. Poonam Sinha, Director	NEISBUD	Expert
37.	Ashwinder Singh Bahal, Director (Voc)	NIOS, New Delhi	Expert
38.	Rajeev Khurana, Senior Advisor	Training Academy Division, Maruti Suzuki India Limited,Gurgaon	Expert
39.	Leena Deshpande, Associate Vice President (HR) and Head CSR	Bharat Forge Ltd., Pune	Expert
40.	G. Murali, Principal	Ramkrishna Mission Vidyalaya, Coimbatore	Expert
41.	JeetamitraSatpathy, Principal	ITI, Bhubaneswar	Expert