Syllabus for the subject

of

WORKSHOP CALCULATION & SCIENCE

(For 3rd & 4th semester)

Under

CRAFTSMEN TRAINING SCHEME (CTS)

For the trades of

Under Group - A

Re-Designed

in

2015

By

Government of India

Ministry of Skill Development & Entrepreneurship

Directorate General of Training

CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE

Block - EN - 81 SECTOR - V, SALT LAKE CITY, KOLKATA - 700 091

Grouping of Workshop Science & Calculation as per sector under CTS:

Group	Sector	Name of Trade	Engg. Drg Code No. ED-3rd sem-Gr. A	Engg.Drg Code No. ED- 4thsem –Gr. A	WSC Code No. WSC- 3rd Sem-Gr. A	WSC Code No. WSC-4th Sem-Gr. A
A	Production & Manufacturing	Turner	✓	✓	✓	✓
		Fitter	✓	✓	✓	✓
		Machinist	✓	✓	✓	✓
		Machinist Grinder	✓	✓	✓	✓
		Tool & Die Making (Dies & Moulds)	✓	✓	✓	✓
		Tool & Die Making (Press Tools,Jigs & Fixture)	✓	✓	✓	✓
		Refractory Technicians	✓	✓	✓	✓
		Operator Adv. Machine Tools	✓	✓	✓	✓
		Mechanic Machine Tool Maintainance	✓	✓	✓	✓
		D/Mans Mechanical	X	X	✓	✓
	Automobile	Mechanic Motor Vehicle	✓	✓	✓	✓
		Mechanic Agriculture Machinery	✓	✓	✓	✓
	Construction	Mechanic Refrigerator & Air conditioner	✓	✓	✓	✓
		Civil Draftsman	X	X	✓	✓

SYLLABUS FOR WORKSHOP SCIENCE AND CALCULATION
Code No. WSC- 3rdSem-Gr. A
CTS-SEMESTER-III

Topic No	Workshop Calculation	Workshop Science	Total Hrs.
			42
1	- Geometrical construction & theorem: division of line segment, parallel lines, similar angles, perpendicular lines, isosceles triangleand right angled triangle.	- Forces definition. - Compressive, tensile, shear forces and simple problems. -Stress,strain, ultimate strength, factor of safety. -Basic study of stress-strain curve for MS.	
2	- Area of cut-out regular surfaces: circle and segment and sector of circle.	- Temperature measuring instruments. Specific heats of solids & liquids.	
3	- Area of irregular surfaces. - Application related to shop problems.	- Thermal Conductivity, Heat loss and heat gain.	
4	- Volume of cut-out solids: hollow cylinders, frustum of cone, block section. - Volume of simple machine blocks.	- Average Velocity, Acceleration & Retardation. - Related problems.	
5	- Material weight and cost problems related to trade.	- Circular Motion: Relation between circular motion and Linear motion, Centrifugal force, Centripetal force	
6	- Finding the value of unknown sides and angles of a triangle by Trigonometrical method.		
7	- Finding height and distance by trigonometry.		
8	- Application of trigonometry in shop problems. (viz. taper angle calculation).		

SYLLABUS FOR WORKSHOP SCIENCE AND CALCULATION
Code No. WSC- 4th Sem-Gr. A
CTS-SEMESTER-IV

Topic No	Workshop Calculation	Workshop Science	Total Hrs.
			42
1	**Graph:** - Read images, graphs, diagrams – bar chart, pie chart. - Graphs: abscissa and ordinates, graphs of straight line, related to two sets of varying quantities.	- Friction- co-efficient of friction, application and effects of friction in Workshop practice. **Centre of gravity** and its practical application.	
2	Simple problem on Statistics: - Frequency distribution table - Calculation of Mean value. - Examples on mass scale productions. -Cumulative frequency -Arithmetic mean	- Magnetic substances- natural and artificial magnets. - Method of magnetization. Use of magnets.	
3	Acceptance of lot by sampling method (within specified limit size) with simple examples (not more than 20 samples).	- Electrical insulating materials. - Basic concept of earthing.	
4		- Transmission of power by belt, pulleys & gear drive. - Calculation of Transmission of power by belt pulley and gear drive.	
5		- Heat treatment and advantages.	
6		Concept of pressure – units of pressure, atmospheric pressure, absolute pressure, gauge pressure – gauges used for measuring pressure	
7		Introduction to pneumatics & hydraulics systems.	