



GOVERNMENT OF TAMILNADU

DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI-25

STATE PROJECT COORDINATION UNIT

*(Established under Canada India Institutional Cooperation Project)*

**CURRICULUM**

Course Name	<b>Gold Appraiser</b>
Course Code	JT/2020/001
Course Duration	70 Hours
Minimum Eligibility Criteria and Pre-requisites (if any)	10 <sup>th</sup> Std & above
Course Objectives	<p>Training module has been designed to provide the participants</p> <ul style="list-style-type: none"> <li>• Understanding of basic Metallurgy</li> <li>• Understanding of Gold jewellery and jewellery fineness assaying.</li> <li>• Analyzing of tools and test equipments used for Gold Assaying kits</li> <li>• Learning of conversion of alloy gold into pure gold and vice versa.</li> <li>• Practicing of touch stone testing, Cupellation Fire Assay</li> <li>• Calculating jewel loan.</li> <li>• Gaining of knowledge of gold jewellery fineness analyses</li> <li>• Learning of original value (or) loan allowed by signing authority</li> </ul>
Course Outcomes	<p>At the end of training the participants will be able to</p> <ul style="list-style-type: none"> <li>• Value Gold fineness</li> <li>• Act as an verifier</li> <li>• Financial valuator in Gold assay &amp; Refining sectors of jewellery field.</li> </ul>
Expected Job Roles	<ul style="list-style-type: none"> <li>• Government Banking &amp; Private Financial Sector Services</li> <li>• Government Endowment Board Gold and Silver Assessor Services.</li> </ul>

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours	Assessment Marks		Duration of Examination	
			Min	Max		
JT/2020/001	Gold Appraiser	Theory	40	10	20	3 hours
		Practical	30	40	80	
		Total	70	50	100	

**JT/2020/001- GOLD APPRAISER**

**DETAILED SYLLABUS**

Unit No	Modules	No. of. Hours	
		Theory	Practical
<b>I</b>	<b>Introduction to Basic Metallurgy</b>	<b>6 Hours</b>	
1.1	Gold Jewellery subject content explanation	6	-
1.2	Fundamentals of Metallurgy		
1.3	Karat and carat- Measure of Gold Purity and measure of Gems weight.		
1.4	Introduction to the weighing scale techniques International standard weights for pure gold used for marketing (24 Karat)		
<b>II</b>	<b>Calculation of Alloy Gold</b>	<b>8 Hours</b>	
2.1	Percentages of Gold and alloy materials in standard karat gold alloy	8	-
2.2	Price calculations of karat alloy gold.		
2.3	Market price Calculation of International 24 Karat gold.		
2.4	Calculation of National gold market price and local gold market price		
<b>III</b>	<b>Typical Gold alloy Compositions</b>	<b>9 Hours</b>	
3.1	Typical Gold alloy Compositions	9	-
3.2	Keen observation of gold & gold alloys data.		
3.3	Typical gold solder compositions i) KDM Solder ii) Non KDM solder iii) KDM Free solder		
3.4	Conversion of fine gold into alloy gold		
<b>IV</b>	<b>Mixing of Alloys in Gold</b>	<b>7 Hours</b>	
4.1	Increasing the percentage of gold	4	3
4.2	Decreasing the percentage of gold		
4.3	<b>Practical:-</b> Using Base metals & Precious metals Acid reaction :- Touch stone method		
<b>V</b>	<b>Types of Assaying</b>	<b>28 Hours</b>	
5.1	Assaying of gold Jewellery <ul style="list-style-type: none"> <li>• Density Measurement</li> <li>• Touch Stone Testing</li> <li>• Cupellation (Fire-assay)</li> <li>• Parting method</li> <li>• X-ray Fluorescence spectrometry (XRF)</li> <li>• Inductivity –coupled plasma spectrometry(ICP)</li> </ul> <b>Practical:</b> <b>a)</b> Acid Reaction : Touch stone method Gold & Gold alloy data <b>b)</b> Cupellation fire assay	3	25
5.2	Keen observation of acid reaction and Touch stone of Gold & Gold alloys Touch stick practical: 99.9%, 91.6%, 87.5%, 85%, 80%, 75%, 65%&58.5%		

<b>VI</b>	<b>Jewel loan calculation</b>	<b>8 Hours</b>	
6.1	Loans based on types of jewels, weight and percentage.	6	2
6.2	Calculation of loan amount for plain jewellery		
6.3	Estimation of stone size and weight		
6.4	Calculation of loan amount for open / closed studded stone jewellery.		
<b>VII</b>	<b>Gold refining Methods and Hall Marking</b>	<b>4 Hours</b>	
7.1	Refining of Gold i) 6k-parting process ii) Aqua regia process	4	-
7.2	BIS Hallmark system.		
<b>Total Theory and Practical hours</b>		<b>40</b>	<b>30</b>
<b>Total Hours</b>		<b>70 Hours</b>	

## HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS /EQUIPMENTS
1	Balancer (weighing) Max:220g, d= 0.1mg
2	Touch stone & Types of Different size stones
3	Digital Vernier caliper
4	Eye Loop(10X)
5	Acid Bottle set
6	Nose player
7	Tweezers
8	Side cutter
9	Black wax
10	Gold
11	Silver
12	Acid :HNO <sub>3</sub> , HCL,H <sub>2</sub> SO <sub>4</sub> ,Borex
13	Mini– Rolling mill (sheet & wire)
14	Furnace CE 200-240V 10A-50 to60Hz 1300W
15	Lead sheet
16	Cupell (crucible)

## REFERENCE BOOKS

S.NO	NAME OF THE BOOK	AUTHOR	PUBLISHER
1	Technical Manual Gold Jewellery	Technical journal	Industrial Division World Gold Council, Kings House, 10 Haymarket ,London SW1Y 4BP, England
2	Jewellery concepts and Technology	Oppi Untracht	Robert Hale Limited, 45-47 Clerkenwell Green, London EC1ROHT

## ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training , certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnic.

### END EXAMINATION

#### ALLOCATION OF MARKS

S.No	Description	Max.Marks
1	Theory	20
2.	Practical	
	a)Procedure(steps) to be followed	10
	b)Execution	25
	c)Calculation	10
	d)Fineness Result	10
	e)Viva	05
	f)Record	20
<b>Total Marks</b>		<b>100</b>

**THEORY MODEL QUESTION PAPER**

**JT/2020/001- Gold Appraiser Course**

(Maximum Marks:20)

(N.B:Answer any **Twenty** Questions)

20x1=20 Marks

1. List the Precious and Base metals.
2. What is the melting temperature of gold?
3. Write any two types of gold assay method.
4. Write about non-KDM solder.
5. Mention the weight of 10 tola gold.
6. Write about hardness of fine gold.
7. Write the difference between open stone setting & Closed stone setting.
8. Mention any two gold mine names in India.
9. Mention the Percentage of the alloy present in 18kt gold.
10. Write any two types of acid used for gold refining.
11. Write the percentage of pure gold?
12. The price of pure gold is Rs.4915/gram. Calculate the price for 22kt gold
13. Mention the percentage of alloy present in 22kt gold.
14. What is purpose of mercury in gold field?
15. Mention the Aqua regia ratio?
16. List the name of gems stones.
17. Mention the unit of measurement of gold.
18. Expand- XRF.
19. Write about 6k parting method.
20. Write about hallmarks.
21. List the reaction of low kartagegold alloy combine with acids.
22. Mention the percentage of alloy present in sterling silver.
23. List the chemical Symbols for gold, silver, copper and platinum.
24. What is touch stone testing?
25. List the hallmark gold available in the current market as per BIS norms.