GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN MECHANICAL ENGINEERING
Semester – V

Subject Code **: 2351905**
Subject Name **: Estimating, Costing And Contracting**

Sr. No.	Subject Content	Hrs.
1.	**Introduction to ECC:** 1.1 Need, Scope & importance of ECC in industries. 1.2 Need of attitude, knowledge & skill required for ECC. 1.3 Difference between costing and estimating.	1
2.	**Elements of Cost and Overhead Allocation:** 2.1 Terminology associated with various cost elements and their classification. 2.2 Terminology associated with overheads, their classification and allocation. 2.3 Determination of selling price and catalogue price. 2.4 Depreciation and obsolescence : Definition, Types Different methods of calculating depreciation. 2.5 Determination of cost of production. 2.6 Concept of Machine Hour Rate (MHR). 2.7 Method to calculate MHR for any machine/machine tool. 2.8 Example to calculate MHR of Lathe, Milling, Drilling, Grinding and Press tool.	5
3.	**Cost Estimation of Welding:** 3.1 Elements of cost in welding. 3.2 Factors effecting welding cost. 3.3 Estimating cost elements in gas and arc welding. 3.4 Estimation of production cost of given welding job for above methods.	2
4.	**Cost Estimation of Forging, Casting, Machining and Press Tools:** 4.1 Cost terminology associated with each shop(i.e. forging shop, machine shops(Turning, Milling, Drilling, Cylindrical grinding, Keyway milling/Slotting/Broaching and Gear cutting), foundry shop and press shop(Punching and bending). 4.2 The procedure of calculating material cost of a product for each shop. 4.3 Procedure of estimating cost of forging dies. 4.4 Procedure of estimating forging cost. 4.5 Procedure of estimating cost of pattern making. 4.6 Procedure of estimating foundry cost. 4.7 The terminology associated with machine shop estimation.	11

	4.8 Procedure of estimating cost of machined part 4.9 Procedure of estimating cost in sheet metal shop. 4.10 For given data compute cost of forging, casting, pattern making, machining and sheet metal. 4.11 Determine selling price of given parts made by forging, casting, pattern making, machining and sheet metal process.	
5.	**Break Even Analysis:** 5.1 Classification of costs, Fixed and variable costs, Classification of given set of costs as fixed and variable, Relationship between the costs and quantity of production. 5.2 Break Even Chart : - Definition of Break Even Point (BEP) and its needs in industry. - Procedure of construction of Break Even Chart. - Assumptions made in constructing Break even chart. - Calculation of B.E.P. analytically and graphically. - Margin of safety, its importance and its derivation. - Effect of changing various parameters on B.E.P. - Define and derive profit/volume ratio. - Compute profit/volume from the given data.	3
6.	**Problems and Solution of Cost:** 6.1 Problem of cost reduction. 6.2 Areas of cost reduction. (Explain in brief) 6.3 Identify the factors to reduce the cost of production 6.4 Modern tools and techniques of cost reduction in brief.	2
7.	**Budgeting and Industrial Accounting:** 7.1 Define Budget and Budgetary control. 7.2 Purpose of budget. 7.3 Various types of budgets. 7.4 Benefits of budget. 7.5 With given example, interpret industrial budget. 7.6 Explain various accounting terminology like book value, Net Present Value, Work in progress, Gross Domestic Product (GDP),balance sheet terminology, etc. 7.7 Explain in brief different accounts used in industrial accounting. 7.8 Interpret the balance sheet of a given industry.	2
8.	**Contracting:** 8.1 Define contracts and its characteristics. 8.2 Types of contract. 8.3 Advantages of contract 8.4 Provision of different conditions in a contract. 8.5 Documents required in an engineering contract (explain).	2
	Total	28

Laboratory Experiences:

Experience Type	Experience Number	Description of Laboratory Experience	Hrs.
Preparatory Activity (Includes Home Assignments Also)	1	g. Various equations to calculate area and volume of commonly used shapes. h. Densities of commonly used materials. i. Process parameters of various manufacturing processes (Covered in this subject) for commonly used materials. j. Various equations used to calculate process(Covered in this subject) times.	2
Market Collection (Includes Home Assignments Also)	2	Collect the finished parts from industries/market/scrap merchants consisting: I. Five to six machining operations like cutting, turning, threading, grinding, milling, drilling, etc.(Minimum FIVE). II. Welded parts (Minimum THREE) III. Casted parts (Minimum TTHREE) IV. Forged parts (Minimum TWO) V. Sheet metal parts (Minimum THREE having blanking/Piercing/Bending). Note: Each student will be assigned to bring at least one specified part so that all varieties of about 16 parts are collected in a batch. All parts must be brought in first week duration only. Parts are to be approved by teacher.)	2
AutoCAD Drafting	3	Each student will draft 2D production drawing for the part he/she has brought. All batch student will interchange their part drawing print and will get photocopy so that each student will have drawings of all parts .	4
Cost Estimation	4	Estimate pattern cost for casting parts (Also sketch pattern with all dimensions).Estimate material cost and total production cost for casting parts.	14
	5	Estimate forging die cost for forged parts(Also sketch die with all dimensions). Estimate material cost and total production cost for forged parts.	
	6	Estimate material cost and total production cost for remaining parts.	
Download, Seminar Presentation And Shop Talk(Includes Self	7	Download minimum two balance sheets of any Indian industries and interpret them.	4
		Download minimum two contract drafts/conditions between two firms (One should be National and another should be international) and interpret	

/ Home Assignments Also)		them.	
		Download videos/content on machining time estimation standards/norms/procedure.	
		On topic approved by batch faculty, prepare the Seminar. Also present the seminar at least for 10 minutes using Power point Presentation.	
		Deliver the talk on your experience for market collection of parts. Also prepare the report on this.	
Tutorials(Home Assignment)	8	Solve given tutorials on budgets and break even analysis.	-
Case Study	9	Select and get it approved from batch teacher, any one field/factory base case and analyze the case in context of cost reduction. Suggest your opinions for cost reduction methods.	2
Assignments (Home Assignment)	10	Solve the given assignments.	-
		Total	28

Notes:

1. Term work report content of each experience should also include following.
   a. Experience description / data and objectives.
   b. Skill/s which is / are expected to be developed in student after completion of experience.
   c. The specifications of machines / equipments / devices / tools / instruments /items/elements which is / are used to carry out the operations for cost estimation.
   d. Process parameters / setup settings' values applied to carry out operations for cost estimation.
   e. Steps / procedure to execute experience.
   f. Information on recent machines / equipments / devices / tools / instruments /items available in market to carry out the operations.
   g. Special / Additional notes or remarks.
2. Term work report of student of regular mode should exclude Distance Learning manual, photocopies(except part drawing of other students) , printed content, etc. Focus should be on developing the term work as original efforts of students.
3. Term work should also include experience logbook duly certified by subject teachers.

Reference Books:

1. Mechanical Estimating and Costing, Banga and Sharma
2. Mechanical Estimating and Costing, Shrimali and Jain
3. Mechanical Costing and Estimation, Singh and Khan
4. Learning Package in E.C.C., TTTI, Bhopal
5. Fundamentals of P.W.D. Accounts and Procedures, Pandya.
6. Construction Management and Accounts, Vajirani and Chandola
7. L.P.in Industrial Management, TTTI, Bhopal
8. A Text book of Industrial Engineering, Mansurali and Dalela