GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD,GUJARAT

COURSE CURRICULUM
COURSE TITLE: COSTING ESTIMATION & PRODUCTION MANAGEMENT
(COURSE CODE: 3385501)

Diploma Programme in which this course is offered	Semester in which offered
Fabrication Technology	8th Semester

1. RATIONALE

Diploma Fabrication Engineer is supposed to know the concept and apply their skills and understanding of Estimation, Costing and Production Management in the field of work after passing Diploma Course. This will enable pass outs Students in getting Placements in Techno- Commercial Departments in Fabrication Industry.

2. LIST OF COMPETENCY

The course content should be taught and curriculum should be implemented with the aim to develop required skills so that students are able to acquire following competency:

- Perform various Calculations for Estimation and Costing of Fabricated Products.
- Prepare and Execute Production Plans to manufacture Fabricated Products, Equipments, Structures and Piping Systems.
- Perform various Destructive and Non Destructive Inspection/testing applicable in fabrication industries.

3. COURSE OUTCOMES (CO's)

The theory should be taught and practical should be carried out in such a manner that students are able to required learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes-

i. Calculate estimation of given job.
ii. Calculate costing of given job.
iii. Prepare production plan for given job.
iv. Execute follow up of given production plan.
v. Prepare MRP-1(Material Requirement Planning) for given job.
vi. Describe modern management techniques.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	150
4	-	2	6	70	30	20	30	

Legends: L-Lecture; **T**–Tutorial/Teacher Guided Student Activity; **P**-Practical; **C**–Credit; **ESE**-End Semester Examination; **PA**- Progressive Assessment.

5. DETAILED COURSE CONTENTS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-Topics
Unit –I Basics of estimating, costing and management	**1 a.** Describe Basics of Estimating, Costing and Management.	**INTRODUCTION TO COSTING ESTIMATION AND MANAGEMENT** 1.1 Meaning of Administration, Management and Organization. 1.2 Meaning of Capital, Estimating Costing and Bill of Material.
Unit–II Costing	**2 a.** Describe Costing and its types. **2 b.** Describe Material Cost Economics. **2 c.** Describe Mensuration of different Areas and Shapes of Objects.	**COSTING** 2.1 Costing definition , Aims 2.2 Classification of cost. 2.3 Procedure for costing 2.4 Advantage of efficient costing 2.5 Process costing 2.6 Material costing 2.6.1. Cost of material 2.6.2. Control over material cost 2.6.3. Waste control 2.6.4. Valuation of material issue from stores. 2.7 Labour Costing 2.7.1. Introduction 2.7.2. Objective of labour costing 2.7.3. Wages and Incentives 2.7.4. Method of wage payment 2.7.5. Method study. 2.8 Material Cost Economics 2.8.1. Analyse cost and usage 2.8.2. Check purchasing practice 2.8.3. Use of value Analysis 2.8.4. Simplification 2.8.5. Standardization 2.8.6. Rationalisation, update all idea. 2.9 Indirect Expenses And depreciation 2.9.1. Introduction 2.9.2. Factory expenses 2.9.3. Administrative expenses 2.9.4. Shell and distribution expenses 2.9.5. Depreciation 2.9.6. Method of calculating depreciation 2.10 Mensuration 2.10.1. Area of plain figure 2.10.2. Area of Irregular figure, Volume and surface area of solid

Unit–III Estimation	**3 a.** Describe Estimation and its types.	**ESTIMATION** 3.1 Estimation Definition, Aims, Function 3.2 Importance of Estimation 3.3 Organization of estimation department. 3.4 Estimation of material cost. 3.4.1. Introduction 3.4.2. Procedure 3.5 Estimation in machine shop 3.5.1. Introduction 3.5.2. Machine shop operation 3.5.3. Cutting speed 3.5.4. Depth of cut 3.5.5. Lathe operation 3.6 Estimation in sheet metal shop. 3.6.1. Introduction 3.6.2. Operation in sheet metal shop 3.6.3. Sheet metal joint 3.6.4. Blank layout 3.7 Estimation in forging shop 3.7.1. Forging-Hand forging, 3.7.2. Machine forging 3.7.3. Forging operation 3.7.4. Estimation procedure 3.7.5. Estimation of Weight, Loss and time 3.8 Estimation in Welding Shop 3.8.1. Welding, Type of welding joint 3.8.2. Gas welding 3.8.3. Electric welding 3.8.4. Estimation of arc welding cost 3.8.5. Factor affecting welding cost
Unit-IV Production management	**4 a.** Describe Production Management. **4 b.** Describe facility location and Plant Layout. **4 c.** Describe Material Handling Equipments.	**PRODUCTION MANAGEMENT** 4.1 production planning & control 4.1.1. Definition 4.1.2. Objective 4.1.3. Function of PPC 4.2 Industrial Engineering 4.2.1. Work measurement 4.2.2. Introduction 4.2.3. The use of work measurement 4.2.4. The technique of work measurement 4.2.5. Times study 4.2.6. Work sampling 4.2.7. Predetermine motion time and system 4.3 Ergonomics. 4.3.1. Concept and objective of

		4.4 Facility location 4.4.1. Nature of location 4.4.2. Decision/Choice of site for location 4.5 Plant layout 4.5.1. Plant layout 4.5.2. Objective of good plant layout 4.5.3. Type of plant lay out 4.5.4. Advantage & limitation of type of layout 4.6 Material handling requirement 4.6.1. Function of material handling, 4.6.2. Material handling device 4.7 CPM/PERT 4.7.1. Introduction 4.7.2. CPM/PERT 4.7.3. Term related with CPM/PERT 4.7.4. Difference Between CPM/PERT
Unit –V Material management	**5 a.** Describe Material Management **5 b.** Describe Material Requirement Planning	**MATERIAL MANAGEMENT** 5.1 Introduction 5.1.1. Definition 5.1.2. Objective 5.1.3. Function 5.1.4. Importance of material management 5.1.5. Factor promoting economy in material management 5.2 Inventory control 5.2.1. Introduction 5.2.2. Classification 5.2.3. Function of inventory control 5.3Material Requirement Planning 5.3.1. Concept of MRP 5.3.2. Input to MRP
Unit-VI **Product design and process selection**	**6 a.** Describe Product Design **6 b.** Describe Process Selection	**PRODUCT DESIGN AND PROCESS SELECTION** 6.1 Product design process 6.1.1 Product development 6.1.2 Product development procedure 6.2 Product Analysis 6.2.1 Product design and production design 6.2.2 Drawing & design specification 6.2.3 Tech. Product development

		6.3 Process Selection 6.3.1 Process selection & process analysis 6.4 Process flow design 6.4.1 Process planning, 6.4.2 Perquisites 6.4.3 Step in Process Planning 6.4.4 Organization of process planning dept 6.4.5 Operation planning 6.4.6 Step in planning operation sequence
Unit-VII **Modern management tools & techniques**	**7 a.** Describe Modern Management Tools & Techniques	**MODERN MANAGEMENT TOOLS & TECHNIQUES** 7.1 Introduction of Process planning 7.2 Retrieval CAPP system 7.3 Generative CAPP system 7.4 Concurrent Engineering 7.5 Advance manufacturing planning 7.6 Lean production and waste in manufacturing

6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total
I	**Introduction to costing estimation and management**	1	0	7	0	07
II	**Costing**	12	0	7	7	14
III	**Estimation**	12	0	7	7	14
IV	**Production management**	8	0	7	0	07
V	**Material management**	8	0	7	0	07
VI	**Product design and process selection**	5	0	7	0	07
VII	**Modern management tools & techniques**	10	0	14	0	14
	TOTAL	**56**	**0**	**56**	**14**	**70**

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's Revised taxonomy)

NOTE:-Suggested specification table shall be treated as a general guidance for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

7. SUGGESTED LIST OFEXERCISE/PRACTICAL/EXPERIMENTS

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills **(outcomes in psychomotor and affective domain)** so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

***Note**: Here only outcomes mainly in psychomotor domain are listed as practical/exercises. However, If these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus overall development of **Programme Outcomes (**as given in a common list at the beginning of curriculum document for this programme) would be assured.*

Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes

S. No.	Unit No.	Exercise /Practical (Outcomes in psychomotor domain)	Approx. Hrs. Required
1.	II	Calculate Cost of Product from given data.	2
2.	II	Prepare Mensuration Chart of Standard Areas and Volumes.	2
3.	III	Calculate Estimated Cost of Machine Shop Product from given data.	4
4.	III	Calculate Estimated Cost of Sheet Metal Shop Product from given data.	4
5.	III	Calculate Estimated Cost of Forging Shop Product from given data.	2
6.	III	Calculate Estimated Cost of Welding Shop Product from given data.	2
7.	IV	Perform Time Study for given activity.	2
8.	IV	Draw Suitable Plant Lay out for production of given product.	2
9.	IV	Find out Project Duration Time from given data by CPM/PERT	2
10.	IV	Draw different Material Handling Equipment and Identify their	2
11.	V	Prepare Material Requirement Planning for given Product.	2
12.	VI	Prepare Process flow Diagram for given Product.	2
		Total Hrs.	**28**

8. SUGGESTED LIST OF PROPOSED STUDENTACTIVITIES

Following is the list of proposed student activities:

8.1 Prepare sketchbook of drawing of different types of Plant Lay Out and Material Handling Equipments.

8.2 10 min PPT presentation from the topic of syllabus and beyond the syllabus

8.3 Report writing on different Morden Management Tools & Technique.

9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

i. Arrange industrial visit.
ii. Arrange expert lecture.
iii. Show video films/animation films/photographs of different automated manufacturing process and discuss their features.

10. SUGGESTED LEARNING RESOURCES

A. List of Books

S. No.	Title of Books	Author	Publication
1.	Mechanical Estimating and Costing	T.R Banga & S.C Sharma	Khanna publisher, New Delhi
2.	Industrial Engineering and Production management	M. Mahajan	Dhanpatrai Pub. Pvt.ltd., New Delhi
3.	Industrial Engineering and management	O.P.khanna	Dhanpatrai Pub. Pvt.ltd., New Delhi
4.	Statical Quality Control	M. Mahajan	Dhanpatray Pub. Pvt.ltd
5.	Quality Management	Kanishka bedi	Oxford University Press

B. List of Major Equipment/Instrument

i. Engineering Drawing Board
ii. Time Study Watch Least Count :1/100 min.
iii. Video Auditorium

C. List of Software/Learning Websites

i. http://www.voltas-mh.com/
ii. http://www.bt-forklifts.com/
iii. http://www.meyermat.com/
iv. http://www.global-toyotaforklifts.com/
v. http://wes.sagepub.com/
vi. http://www.slideshare.net/
vii. http://www.umsl.edu/

11. COURSE CURRICULUM DEVELOPMENTCOMMITTEE

Faculty Members from Polytechnics

- **Prof. P. B. Pathak,** I/C HOD**,** Deptt. of Fabrication Technology, Sir B.P.I., Bhavnagar
- **Prof. B. K. Gandhi,** Sr. Lecturer, Deptt. of Fabrication Technology, Sir B.P.I., Bhavnagar
- **Prof. S. Y. Merchant**, Sr. Lecturer, Deptt. of Fabrication Technology, Sir B.P.I., Bhavnagar
- **Prof. K. B. Pipavat**, Lecturer, Deptt. of Fabrication Technology, Sir B.P.I., Bhavnagar

Co-coordinator and Faculty Members from NITTTR Bhopal