

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

**COURSE CURRICULUM
COURSE TITLE: PRODUCTION PLANNING
(COURSE CODE: 3352904)**

Diploma Programme in which this courses offered	Semester in which offered
Textile Manufacturing Technology	5 th Semester

1. RATIONALE

Due to rapid rate of change in technology, needs of industries have also changed so the industries require highly skilled technicians. Accordingly production planning in spinning and weaving has also changed. This course will make the students able to understand production planning technique with respect to latest spinning and weaving technology. The students also will be able to plan production schedule for textile industries especially in the area of spinning and weaving with either conventional or sophisticated machines.

2. LIST OF COMPETENCY

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

- **Plan the production for various types of jobs according to available machines in a textile manufacturing plant.**

3. COURSE OUTCOMES

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

- Plan production in spinning and weaving.
- Calculate the production of spinning machinery.
- Calculate the production of weaving machinery.
- Compute the various parameters related to fabric manufacturing
- Compute speed and draft in textile manufacturing.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Mark s
				Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	ESE	PA	150
4	2	2	8	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. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
I-Layout and Yarn Numbering System	1a. Sketch the plan and layout of Spinning and weaving machines. 1b. Distinguish the relation of each of the numbering systems in Textile production sector 1c. Compute Average count (Direct and Indirect) 1d. Compute Resultant count (Direct and Indirect) 1e. Convert given count system in different count system (Nm., Ne., NeC.) 1f. Explain planning and controlling the processes of Spinning, Weaving and the sub-processes of sizing machine, warping machine, winding machine, according to the end product for optimum efficiency and best quality.	1.1 Lay out of spinning machine and weaving machine 1.2 Computation of count, length and weight of yarn from given data (Direct and Indirect) 1.3 Average count and Resultant count (Direct and Indirect) 1.4 Count system in different count system (Nm., Ne., NeC.)
II-Spinning calculation	2a. Compute production efficiency, hank of lap, weight of lap, length of lap, time required to prepare lap, draft between C R and L R for Blow room 2b. Compute time required to exhaust and fill up can from given data for carding machine, draw frame machine, comber machine, draw sliver can, ring frame, O.E machine, two for one twister. 2c. Compute hank of roving, draft of machine, TPI, and time required prepare lap, to exhaust lap, to fill can, to exhaust can, to exhaust roving bobbin, to prepare ring bobbin. 2d. Describe the steps to compute spinning organization for production of various carded, combed, P/C yarn and OE yarn.	2.1 Production efficiency, hank of lap, weight of lap, length of lap, time required to prepare lap, draft between C R and L R for Blow room. 2.2 Production efficiency, hank of sliver, draft, cleaning efficiency, time required to exhaust and fill up can from given data for carding machine, draw frame machine. comber machine, speed frame, ring frame, O.E machine, two for one twister 2.3 Calculation of spinning organization for production of various carded, combed, P/C yarn and OE yarn.
III-Weaving Calculation	3a. With the given data, compute the production efficiency, time required to prepare one cone, exhaust one ring bobbin for winding machine, warping machine, sizing machine. 3b. Calculate the production of loom,	4.1 Production efficiency, time required to prepare one cone, time required to exhaust one ring bobbin for winding machine, warping machine, sizing

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	<p>efficiency, waste of warp, waste of weft.</p> <p>3c. Compute production of weaving organization for different fabrics (i.e. shirting suiting, saree, bedsheet)</p> <p>3d. Calculate the production weaving department and time to exhaust ring bobbin, time to prepare cone, beam length, size take up %,</p> <p>3e. Describe the methods to control the warp and weft waste.</p>	<p>machine.</p> <p>4.2 production of loom, efficiency, waste of warp, waste of weft</p>
IV-Fabric Calculation	<p>4a. Describe the procedure to set the GSM of fabric.</p> <p>4b. Describe the steps and precautions to set the fabric cover, EPI and PPI on loom.</p> <p>4c. Compute weight of warp, weight of weft, GSM, heald count, reed count for give data.</p> <p>4d. For given data, compute contraction of warp, weft, cover factor for warp, weft, max. epi and ppi.</p> <p>4e. From the given data, identify to control the problem related to loss of production.</p>	<p>4.1 Weight of warp, weight of weft, GSM, heald count, reed count for give data.</p> <p>4.2 Contraction of warp, weft, cover factor for warp, weft, max. epi and ppi for given data.</p>
V-Speed and draft calculation	<p>5a. Explain the need of gearing techniques in textile manufacturing machines such as spinning, weaving, winding, twisting, warping, sizing, Draw frame and Carding, combing, gilling – auto-levelling, control Mixing machines.</p> <p>5b. Distinguish draft, hank fed and hank delivered from gearing.</p> <p>5c. Compute gearing ratio, draft from gearing, hank fed and hank delivered.</p>	<p>Speed and draft Computation</p> <p>5.1 Gearing calculation.</p> <p>5.2 Calculation of draft from gearing, from hank fed and hank delivered.</p>

6. SUGGESTED SPECIFICATION TABLE WITH HOURS and MARKS (Theory)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total
I.	Layout an Yarn Numbering System	08	04	06	08	88
II.	Spinning Calculation	16	04	08	06	18
III.	Weaving Calculation	16	04	06	06	16
IV.	Fabric Calculation,	08	02	04	03	09
V.	Speed and Draft calculation	08	02	04	03	09
	Total	56	16	28	26	70

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

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

7. SUGGESTED LIST OF PRACTICALS

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills (**outcomes in psycho-motor 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 in psycho-motor 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 over all 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.	Practical/Exercise (Major outcomes in Psychomotor Domain)	Approx. No. of Hours
1	III	Layout for Blowroom machines.	04
2	III	Prepare a layout for carding machines for required production.	02
3	III	Prepare a layout for Draw Frame machines for required production.	02
4	VI	Prepare a layout for Speed Frame machines for required production.	02
5	III	Prepare a layout for Ring Frame machines for required production.	02
6	III	Prepare a layout for O.E. machines for required production.	02
7	III	Prepare a layout for Winding machines for required production.	02
8	IV	Prepare a layout for Warping machines for required production.	02
9	IV	Prepare a layout for Sizing machines for required production.	03
10	IV	Prepare a layout for Non-Auto machines for required production.	02
11	V	Prepare a layout for Loom machines for required production.	03
12	V	Prepare a layout for Auto Loom machines for required production.	02
		Total	28

8.SUGGESTED LIST OF PROPOSED STUDENT ACTIVITIES

Following is the list of proposed student activities like: course/topic based seminars, internet based assignments, teacher guided self learning activities, course/library/internet/lab based mini-projects--etc.

- i. Internet based assignment topic wise.
- ii. Collection of various process parameters of draw frame lap former, comber and speed frame from industries (Lmw, Rieter, Trutzscheler.)
- iii. Visit to Spinning unit, and preparing report with sketches.
- iv. Industrial visit.

9. SPECIAL INSTRUCTIONAL STRATEGY (If Any)

- i. Arrange industrial visit and show production planning and control systems in use.
- ii. Arrange expert lectures on related topics.
- iii. Project based on spinning organisation and weaving organisation.

10. SUGGESTED LEARNING RESOURCES

A. List of Books

S.No.	Author	Title of Books	Publication
1	R.Jagannathan	Textile mechanics and spinning calculation	Mahajan publication
2	T. K. Pattabhiraman	Spinning calculation	Soumaya Pub,Bombay
3	San gupata	Weaving Calculation	Mahajan publication
4	T C Shah, P M Valand, V H Vadalikar	Aritho spin weave	Vadalikar publication

B. List of Major Equipment/ Instrument with Broad Specification

- i. Textile laboratory: spinning machine, weaving machine.

C. LIST OF SOFTWARE /LEARNING WEBSITES-

- i. [http:// www.textileschool.com/.../spinning-form](http://www.textileschool.com/.../spinning-form)
- ii. [http:// www.textilelearner.blogspot.com/.../calculation](http://www.textilelearner.blogspot.com/.../calculation)
- iii. [http:// www.cs.arizona.edu/patterns/](http://www.cs.arizona.edu/patterns/)
- iv. <http://www.textile.netal.net/spinning/spinning>
- v. [http:// www.cs.arizona.edu/.../pea_calc.pdf](http://www.cs.arizona.edu/.../pea_calc.pdf)
- vi. http://www.academia.edu/.../spinning_calculation
- vii. <http://www.textileschool.com/.../weaving>
- viii. <http://www.weavetex.blogspot.com>
- ix. http://www.academia.edu/.../textile_calculation
- x. http://www.scribd.com/.../weaving_calculation
- xi. [http://www.docstoc.com/.../spinning_calculation.](http://www.docstoc.com/.../spinning_calculation)

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof. R T Patel**, Lecturer in Textile Manufacturing, R.C Technical Institute, Ahmedabad
- **Prof. S. S. Parmar**, Lecturer in Textile Manufacturing, R C technical Institute Ahmedabad
- **Prof. S. P. Patel**, Lecturer in Textile Manufacturing, R C technical Institute Ahmedabad
- **Prof. D. V. Bihola**, Lecturer in Textile Manufacturing, R C technical Institute Ahmedabad

Co-ordinator and Faculty Member from NITTTR Bhopal

- **Dr. C. K. Chugh**, Professor, Department of Mechanical Engineering
- **Dr. Joshua Earnest**, Professor, Department of Electrical and Electronics Engineering