GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)

Competency-focused Outcome-based Green Curriculum-2021 (COGC-2021)
Semester-III

Course Title: Mechanical Engineering for Textile
(Course Code: 4332906)

Diploma Programs in which this course is offered	Offered in Which Sem
Textile Manufacturing Technology & Textile Processing Technology	Third

1. RATIONALE

As a shop floor supervisor, the diploma Engineers are required to install, operate and maintain different types of textile equipments, which may have mechanical systems, like- gears, shafts, bearings, couplings, etc. As well as textile industry uses many mechanical equipments like- steam boilers, air compressors, fluid pumps, material handling equipments etc. for its functioning / working. A fresh diploma holder should have the basic knowledge of these equipments for effective functioning in textile industries. Besides equipments, the diploma engineers should also be well aware of different hazards of textile industry, and must be able to maintain necessary preventive measures during processes. This course aims to provide such knowledge and skills to achieve the required industrial environmental competencies**.**

2. EXPECTED COMPETENCY

The course content should be taught with the aim to develop different types of skills so that students are able to acquire following competency:

Ability to do different operations / processes using textile machines along with preventive maintenance of material handling equipments by applying basic knowledge & skills of mechanical engineering.

3. COURSE OUTCOMES (COs)

The practical exercises, the underpinning knowledge and the relevant soft skills associated with this competencies are to be developed in the student to display the following COs:

CO 1). Understand the application of steam and humidity in textile industry.
CO 2). Interpret the concept of using Pump, Air Compressor and Valves in textileindustry.
CO 3). Idetify various Power transmission systems and causes of vibrations in textilemachineries.
CO 4). Use the terms industrial safety and maintenance in textile industry.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P/2)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	CA	ESE	CA	
0	0	2	1	00	00	25	25	50

Legends: L-Lecture; T–Tutorial/Teacher Guided Theory Practice; P - Practical; C – Credit, PA - Continuous Assessment; ESE - End Semester Examination.

5. SUGGESTED LIST OF EXERCISES/PRACTICALS

Sr. No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Hrs. Required
1	Study about steam and its application in textile industry.	02
2	Demonstrate construction & working of a reciprocating air compressor.	02
3	Study about Air Psychrometry and its application in textile industry.	02
4	Study about steam humidifier and its application in textile industry.	02
5	Demonstrate construction & working of a centrifugal and reciprocating pumps.	02
6	Study about different types of valves used in textile industry.	02
7	Demonstrate construction & working of a belt & chain drivepower transmission system used in textile machineries.	02
8	Demonstrate construction & working of a gear drive power transmission system used in textile machineries.	02
9	Study about vibrations and its effects on textile machineries.	02
10	Study about material handling equipments like plastic trays, fabric bags and trolleys, fork lift trucks, overhead cranes, elevators, racks, conventional side tables with bins etc. required for textile industry.	04
11	Study about preventive and corrective maintenance of machines used in textile industry.	02
12	Study about Industrial safety in texile Industries. A. Expalination of major accidents, its causes, control & results. B. Create awareness among the students by showing safety colour codes, safety equipments, guards, fire extinguishers etc. available in workshop or laboratory.	04
	Total Hours	28

6 MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

Basic Mechanical engg. practicals need following Lab Equipments

- Centrifugal Pump Apparatus.
- Reciprocating Pump Apparatus.
- Setups/Models to show different modes of Power transmissions
- Setup of Air Compressor
- Sling Psychrometer for reltive humidity

7 AFFECTIVE DOMAIN OUTCOMES

The following sample Affective Domain Outcomes (ADOs) are embedded in many of the above-mentioned COs. More could be added to fulfill the development of this course competency.

a) Work as a leader/a team member.
b) Follow ethical practices.
C) Vision of finding faults in defective machines and different modes of maintenance for shop floor.

8 . SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

i. Arrange a visit to nearby textile industry and explain the working of pumps, compressors, valves, humidifiers, material handling equipment etc. and discuss their maintenance shedule and common maintenance problems.

ii. Show educational videos / animation films on working of pumps, compressors, valves, humidifiers and material handling equipment.

9. SUGGESTED LEARNING RESOURCES

Sr. No.	Author	Title of Books	Publication
1.	D.S.Kumar	Fluid mechanics and Hydraulic machines	S.K. Kataria & Sons
2.	P L Bellaney	Refrigeration and Air Conditioning	Khanna Publications, New Delhi
3.	S S Ratan	Theory of Machines	Tata McGraw Hill New Delhi
4	R S Khurmi & J K Gupta	Theory of Machines	S Chand, New Delhi
5.	P.K.Nag	Thermodynamics	Tata McGraw Hill, New Delhi

10 LIST OF SOFTWARE / LEARNING WEBSITES

- https://youtu.be/xIRI2fDbn_Q
- https://archive.nptel.ac.in/courses/112/104/112104121/
- https://www.michael-smith-engineers.co.uk/resources/useful-info/centrifugal-pumps#:~:text=A%20centrifugal%20pump%20operates%20through,it%20towards%20the%20pump%20outlet.
- https://whatispiping.com/reciprocating-pump/#:~:text=Reciprocating%20Pump%20is%20a%20Positive,one%20place%20to%20another%20place.
- https://www.generalfilters.com/blog/How-Does-a-Steam-Humidifier-Work_AE155.html#:~:text=When%20the%20humidistat%20senses%20that,in%20tandem%20with%20your%20furnace.
- https://www.youtube.com/watch?v=WXmIdbVDJqE

11 PO - COMPETENCY - CO MAPPING

Semester III	BASICS OF MECHANICAL ENGINEERING FOR TEXTILE						
	POs						
Competency& Course Outcomes-Cos	PO 1 Basic & Discipline specific knowledge	PO 2 Problem Analysis	PO 3 Design/ development of solutions	PO 4 Engineering Tools, Experimentation &Testing	PO 5 Engineering practices for society, sustainability & environment	PO 6 Project Management	PO 7 Life-long learning
Understand the application of steam and humidity in textile industry.	3	-	-	2	1		2
Interpret the concept of using Pump,Air Compressor and Valves in textile industry.	3	-	-	2	1		2
Idetify the different Power transmission systems and vibration in textile machineries	3	-	-	2	1		2
Use the terms industrial safety and maintenance in textile industry.	3	-	-	2	1		2

12 COURSE CURRICULUM DEVELOPMENT COMMITTEE

GTU Resource Persons:

Sr. No	Name and Designation	Institute	Contact No.	Email
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