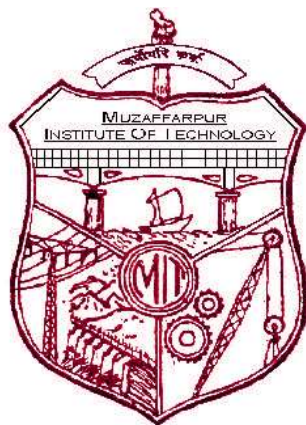


MIT MUZAFFARPUR



COURSE FILE OF Principles of Material Testing (071613)



Faculty Name:

ARATI KUMARI

**ASSISTANT PROFESSOR, DEPARTMENT OF LEATHER
TECHNOLOGY**



विज्ञान एवं प्रावैधिकी विभाग
Department of Science and Technology
Government of Bihar

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VISION STATEMENT

- To emerge as a national leader in graduate level studies in all sub areas of leather field and to make significant contribution to the development of the society, industry, nation and the world.

MISSION STATEMENT

- Educate leather technology students to produce quality engineers who serve leading firms and different sectors of the industry and can work in multi-disciplinary environment to anticipate and address evolving challenges of the 21st century in tanning and footwear industry.
- Impart high performance knowledge in leather and footwear sector that are economic and environment friendly.
- To establish national leadership and provide technological support to the Indian leather industry.
- Improve fundamental knowledge of inter relationship between the built environment and natural systems.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

After successful completion of program, graduates will be able to

PEO1: Work in the Leather and chemical and footwear field.

PEO2: Pursue higher studies.

PEO3: Contribute in teaching, research and other developmental activities of Leather technology and its allied fields.

PEO4: Work in the multicultural and multidisciplinary groups for the sustainable development and growth of leather industry projects and profession.

PROGRAMME OUTCOMES (PO):

Students who complete the B.E. degree in leather technology will be able to:

1. An ability to apply knowledge of mathematics, science, and engineering,

2. The ability to conduct laboratory experiments and to critically analyze and interpret experimental data.
3. The ability to perform design in leather by means of design experiences integrated throughout the professional component of the curriculum.
4. An ability to function on teams, that must integrate contributions from different areas of leather technology towards the solution of multi-disciplinary projects.
5. An ability to identify, formulate, and solve Leather industries problems.
6. An understanding of professional practice issues in leather technology including professional and ethical responsibility.
7. An ability to write and speak effectively.
8. The broad education necessary to understand the impact of leather fields solutions in a global and societal context.
9. A recognition of the need for, and an ability to engage in life-long learning,
10. An ability to use the techniques, skills, and modern tools necessary for leather technology practices.
11. Possess a thorough understanding of techniques that are appropriate to environment and country.
12. Possess ability to estimate costs, estimate quantities and evaluate materials for leather manufacturing.

COURSE OBJECTIVE AND COURSE OUTCOMES:

Institute / College Name :	MUZAFFARPUR INSTITUTE OF TECHNOLOGY		
Program Name	B. Tech. Leather Technology		
COURSE CODE	071613		
COURSE NAME	Physical Testing of Leather		
Lecture / Tutorial / Practical (per week):	3 – 0- 3	Course Credits	5
Course Coordinator Name	ARATI KUMARI		

Course objective:

The objective of this course is to have a clear concept of traditional and scientific methods of testing, to understand the specifications of different types of testing of various types of leathers and also to identify and rectify the processing mistakes when the leather does not agree with the specifications.

Course outcomes (CO):

CO1: Became able to perform tests for upper leather, sole leather, finished leathers, sports goods leathers, garment leathers, belting leathers etc.

CO2: Became able to know the specification limits of various tests.

CO3: Became able to identify and rectify the processing mistakes when the leather does not agree with the specifications.

CO4: Became able to model mathematically and analyze various testing problems and recognize the need of industries

MAPPING OF COs AND POs

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	✓		✓	✓	✓	✓		✓			
CO2		✓		✓		✓	✓					
CO3				✓	✓	✓	✓	✓	✓	✓		
CO4	✓	✓		✓	✓		✓	✓	✓		✓	✓

Correlation level: 1- slight (Low) 2- moderate (Medium) 3-substantial (High)

COURSE SYLLABUS:

Topics	Number of Lectures	Weightage (%)
<p>Introduction</p> <p>Thumb tests, Necessity of physical testing Classification, Sampling positions, Conditioning of test samples,</p>	5	8
<p>Different Strengths of Leather</p> <p>Determination of tensile strength and % elongation at break Stitch tear strength, tearing strength, tongue tearing strength, buckle tear strength, split tear strength Distension and strength of grain by Ball burst test – i) The Lastometer ii) The Tensometer</p>	9	21

Few more Tests For Upper and Light Leather Flexing Endurance test, air and water vapour permeability Dynamic water proofness test, dry and wet rub fastness test, measurement of shrinkage temperature	9	21
Tests For Sole Leather Measurement of apparent and real density, Determination of abrasive resistance of sole leather Dynamic water proofness of leather (kubelka method), Grain cracking in sole leather (Mandrel test)	9	14
Tests for Finish-film Determination of bond strength between the leather surface and finish film Cold crack resistance, Light fastness test	5	10
Specification Shoe upper, sole, lining leather, clothing, glove, Technical leathers, Upholstery and fancy leathers	3	26

MUZAFFARPUR INSTITUTE OF TECHNOLOGY
B.Tech. 6th Semester (2015 Batch) PROVISIONAL TIME TABLE WITH EFFECT
FROM 09.02.2018

6 th SEMESTER Leather technology					ROOM NO. LB-1			
	10:00 - 10:50	10:50 - 11:40	11:40 - 12:30	12:30 – 1: 20	1:20 – 1:50	1:50- 2:40	2:40 - 3:30	3:30 – 4:20
MON					R E C E S S			
TUES								
WED						POMT LAB(AK)		
THUR		POMT(AK)						
FRI								POMT(AK)
SAT				POMT(AK)				
FACULTY NAME: AK: ARATI KUMARI PAPER NAME: POMT: PRINCIPLES OF MATERIAL TESTING								

STUDENTS LIST:

Sl. No.	College Roll No.	NAME
1	15LT01	MANJAY KUMAR
2	15LT02	ANSHU PRIYA
3	15LT03	MD. AQUIB JAVED
4	15LT04	DIVYANSHU
5	15LT05	SAMRIDDDHI
6	15LT06	ANKIT KUMAR
7	15LT07	VIKASH KUMAR
8	15LT08	PRASHANT KUMAR
9	15LT09	CHANDRAKANT PRASAD
10	15LT10	SARIKA KUMARI
11	15LT11	ARVIND KUMAR

Text Books:

TB1.: Physical Testing of Leather by S.S.Dutta

COURSE PLAN

Topic No.	Topic	No. of Lecture/ lecture no.	Text book
1.	Introduction	5	TB1
	Thumb tests, Necessity of physical testing	1-2	
	Classification, Sampling positions, Conditioning of test samples,	3-5	
2.	Different Strengths of Leather	9	TB1
	Determination of tensile strength and % elongation at break	6-7	
	Stitch tear strength, tearing strength, tongue tearing strength, buckle tear strength, split tear strength	8-11	
	Distension and strength of grain by Ball burst test – i) The Lastometer ii) The Tensometer	12-14	

3.	Few more Tests For Upper and Light Leather	9	TB1
	Flexing Endurance test, air and water vapour permeability	15-17	
	Dynamic water proofness test, dry and wet rub fastness test, measurement of shrinkage temperature	18-23	
4.	Tests For Sole Leather	9	TB1
	Measurement of apparent and real density, Determination of abrasive resistance of sole leather	24-28	

	Dynamic water proofness of leather(kubelka method), Grain cracking in sole leather(Mandrel test)	29-32	
5.	Tests for Finish-film	5	TB1
	Determination of bond strength between the leather surface and finish film	33-34	
	Cold crack resistance, Light fastness test	35-37	
6.	Specification	3	TB1
	Shoe upper, sole, lining leather, clothing, glove, Technical leathers, Upholstery and fancy leathers	38-40	
	Total Number of Lectures	40	

DETAIL OF ASSIGNMENTS:

S.No.	Assignment	Topic No.
1	Assignment 1	1,2
2	Assignment 2	3
3	Assignment 3	4
4	Assignment 4	5,6

Principles of material testing (071613)

Assignment -1

- Q.1 Discuss the key test, grain crackiness test and looseness thumb tests which are practiced in domestic leather industry.
- Q.2 Mention the dimension of the sample for stitch tear strength and tongue tear strength determination.

Principles of material testing (071613)

Assignment - 2

- Q.1 Mention the name of various scientific methods of testing which are performed for upper leather in global market.
- Q.2 Discuss the principles of water vapour permeability test.

Principles of material testing (071613)

Assignment -3

- Q. 1 Mention the name of various tests which are performed for upper leather in global market.
- Q. 2 Define abrasion resistance.

Principles of material testing (071613)

Assignment -4

- Q.1 What do you mean by cold crack resistance?
- Q.2 Mention the specification of thickness, tensile strength and stitch tear strength for upper leather, football leather, belting leather, garment leather and lining leather.

B.Tech. VI sem. Leather Technology
Mid Semester Examination-2018

Subject: Principles of Material Testing Code: LT-071613

Max. marks:20

Time :2Hours

Note: Attempt any **four** questions. All questions have equal marks. Assume any missing data.

- Q1.** Detail the various thumb tests which are practiced in domestic leather industry.
- Q2.** Mention the advantages of scientific methods of testing. How will you find out the sampling positions for different type of hides/skins?
- Q3.** Differentiate between tensile strength & stitch tear strength. Explain why a distance of 6mm is kept between the two holes during stitch tear strength determination?
- Q4.** Explain a) Water Vapour Permeability
b) Dry & Wet rub fastness
- Q5.** Mention the specification of shoe upper, sole leather, lining leather, garment leather, glove leather, belting leather & football leather for the following parameters: thickness, tensile strength, stitch tear strength, water vapour permeability, dry & wet rub fastness, run, Cr, oils & fats.
- Q6.** Write short notes on any three:
- (a) Lastometer (b) Shrinkage temperature
 - (c) Abrasion resistance d) Cold crack resistance of finish-film
 - e) Mandrel test

Question bank:

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Code : 071613

**B.Tech (Leather Technology) 6th
Semester Exam., 2018**

PRINCIPLES OF MATERIAL TESTING

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

1. Answer any seven of the following questions :

2×7=14

- ~~(a)~~ Discuss briefly on thumb tests.
- ~~(b)~~ Discuss briefly on sampling positions.
- ~~(c)~~ Discuss briefly on the conditioning of test samples.
- ~~(d)~~ Discuss briefly on the significance of sampling position.

8AK/400

(Turn Over)

(e) Discuss briefly on static water absorption test.

(f) Discuss briefly on cold crack resistance.

(g) Discuss briefly on the light fastness of VT leather.

(h) Discuss briefly on Mandrel test.

(i) Discuss briefly on buckle tear strength.

(j) Discuss briefly on split tear strength.

2. Discuss in detail the necessity of physical testing of leather. 14

3. Discuss with principle and process of determination of tensile strength and percentage of elongation. 14

4. Discuss in detail the properties required for the following materials : 14

Toe puff, sole and insole for a standard footwear

5. Discuss the procedure for determination of bond strength between (a) protein finished and (b) resin finished leather surface. 14
6. Discuss with tabular sheet the comparative values of physical properties for shoe upper leather, chrome tanned sole leather, fancy glove leather and car upholstery leather. 14
- ~~7.~~ Discuss the following : 14
- (a) Dynamic waterproofness test
 - (b) Dry and wet rub fastness
 - (c) Measurement of apparent and real density
- ~~8.~~ Discuss in detail on the significance and specifications of conditioning of test samples before physical and chemical tests. 14
9. Discuss on the following : 14
- (a) Measurement of shrinkage temperature
 - (b) Process of flexing endurance test

