

***Diploma in Leather and Footwear Technology***  
***University Polytechnic, AMU, Aligarh***

***Annexure – I***  
***B.O.S – 11.02.2013***

**SEMESTER - I**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Technology - I	BLT - 101	04	--	03	10	15	75	100

- UNIT – I      Development of Footwear Manufacturing and its Accessories Industry:**  
History of footwear manufacturing and route of development to modern footwear manufacturing. Footwear manufacturing industry in India. Types of production in artesian, small and organized sectors. Footwear consumption in India. Role of different institutions, agencies, associations, training and R&D institutions, fairs and exhibitions in the development of footwear and accessories industry. Domestic and Export markets of footwear. Locations of footwear and its accessories industries in India.  
20%
- UNIT – II      Classification of Footwear.:**  
Formal Footwear, Industrial Safety Footwear, Sports Footwear, Orthopedic Footwear etc. with their further classification.  
20%
- UNIT – III      Anatomy of Leather & Footwear:**  
Identification of different Parts of Leather and their properties.  
Identification of different Parts of Footwear and their properties.  
20%
- UNIT – IV      Clicking Technology:**  
Definition and classification of clicking. Machineries and Tools used in Clicking. Qualities and Specifications required for a clicker and the clicking Section. Qualities and Specifications required for Upper Materials. Leather is an ideal material to be use as upper material. Identification of defects in leather. Placement of permissible defects in upper components.  
20%
- UNIT – V      Material Consumption :**  
Leather grading and storing. Layout preparations. Classification of wastages. Calculation of consumption by Russ and Small and Tracing method. Preparation of Job Card for a clicker. Work-study and time management in clicking section.  
20%

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		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
<b>Theory of Leather Manufacturing - I</b>	<b>BLT-102</b>	<b>04</b>	<b>--</b>	<b>03</b>	<b>10</b>	<b>15</b>	<b>75</b>	<b>100</b>

**UNIT-I**      Anatomical structure of hides and skins. Chemical composition and constituents of hides and skins. Proteins: nature & types of proteins, physical & chemical composition and properties of skins proteins. **20%**

**UNIT-II**      Curing & preservation: methods & chemistry of curing of hides & skins. Merits & demerits of each method. **20%**

**UNIT-III**      Pre-tanning Operations: Principles & objectives involved in-  
a) Soaking b) Liming c) De-liming d) Bating e) Pickling f) De-pickling **20%**

**UNIT-IV**      Chrome Tanning: Warner's coordination theory of chrome compounds, chemistry of chromium complexes, self basify chrome powder hydrolysis, olation, oxolation, polymerization, effect of masking salts, factors influencing chrome tanning like pH, concentration, time, temperature & neutral salts. Basification and basicity principles & chemistry of various chrome tanning methods. **20%**

**UNIT-V**      Vegetable tanning: classification, identification, physical & chemical properties and study of vegetable tanning materials. Leaching, factors involved in VT tanning & its mechanism. Oil Tanning: types, properties and mechanism of oil tanning. Aldehyde tanning: Reaction of formaldehyde with proteins, mechanism of Aldehyde tanning. **20%**

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Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Technology Lab -I	BLT-191	--	03	03	60	--	40	100

**Practical Exercises on the followings :-**

**a) Introduction with Clicking Section:**

- i. Introduction & operational practice with the machines in Clicking section.
- ii. Introduction with the tools used in clicking section.

**b) Introduction with Closing Section:**

- i. Introduction & operational practice with the machines in Closing section.
- ii. Introduction with the tools used in closing section.

**c) Introduction with Bottoming Section:**

- i. Introduction & operational practice with the machines in Bottoming section.
- ii. Introduction with the tools used in bottoming section.

**d) Preproduction of Upper Cutting :**

- i. Layout Practice on paper by R.S & Tracing method
- ii. Skiving practice.
- iii. Splitting Practice.
- iv. Identification of natural & synthetic materials.
- v. Identification of different defects in leather.
- vi. Introduction with different materials used in footwear industry.
- vii. Introduction with different components and parts of a shoe.

**e) Preproduction of Upper Closing :**

- i. Different type of stitching.
- ii. Different type of edge treatment
- iii. Different type of seam
- iv. Sequence of upper making
- v. Introduction with the accessory materials used in closing section.

**Note :- Quantity of experimental work depend upon availability of time.**

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**SEMESTER – II**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
* Footwear Design Lab - I	BLT-291	--	03	03	60	--	40	100

**Practical Exercises on the followings :-**

**a) Designing Section:**

- i. Introduction with the tools used in designing section and their functions.
- ii. Demonstration of different styles of footwear.

**b) Free hand sketching:**

- i. A student has to submit a file of 20 free hand sketched designs on different styles.

**c) LAST measurement and masking :**

- i. Introduction with last
- ii. Demonstration of different points and measurements on last.
- iii. Masking on last.

**d) Mean Forme :**

- i. Development of Mean Forme .
- ii. Development of Insole and sock pattern.

**e) Designing and Pattern Cutting of Derby Shoes :**

- i. Development of upper and lining standards.
- ii. Development of upper and lining patterns.

**\*Note :- The students will be taken on compulsory visit for 01 day to any reputed Footwear Manufacturing Unit at Noida / Delhi along with the staff members of LFT Section to give them a working knowledge of Footwear Design & Development. The University will pay the travelling expenses for the students and the staffs on actual basis**

**Note :- Quantity of experimental work depend upon availability of time.**

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**SEMESTER – III**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Technology - II	BLT - 301	04	--	03	10	15	75	100

**UNIT – I      Pre Assembly Operations:**

Definition of Skiving and its classification. Skiving Machine and function of its different parts. Marking, Stamping, Embossing and their functions.

**20%**

**UNIT – II      Stitching Machines :**

Classification of stitching machines and its different parts and their functions.

**20%**

**UNIT – III      Stitching :**

Definition of stitching. Classification of stitching, Process of stitch formation.

**20%**

**UNIT – IV      Needles and Threads :**

Anatomy of Needles and its different parts and their functions. Classification and numbering of Needle. Threads and different materials used for making of threads. Classification and numbering of threads.

**20%**

**UNIT – V      Seams and Edge Treatments:**

Definition of seams, Classification of seams, Different edge treatment, Reinforcement tapes and its use.

**20%**

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**SEMESTER – III**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
<b>Theory of Leather Manufacturing- II</b>	<b>BLT-302</b>	<b>04</b>	<b>--</b>	<b>03</b>	<b>10</b>	<b>15</b>	<b>75</b>	<b>100</b>

**UNIT-I** Syntans: classification, reactions with skin proteins used in leather manufacture, Resin Syntans. Alum tanning, Chemistry of Alum Salts (Chlorides and Sulphate), hydrolysis, olation, oxolation, basification effect of masking salts, mechanism of aluminium tanning .Zirconium Tanning, Zirconium Sulphate and chlorides hydrolysis, basification and mechanism of zirconium tanning, use of zirconium salt in tanning.

**20%**

**UNIT-II** Combination tannage: Application of vegetable oil and synthetic tannin in various combination in the production of semi chrome and alum, chrome and alum retan, , chrome zirconium tannage, selection of wet blue leather, Machine Operations on Wet Blues like Sammying, splitting and shaving operation.

**20%**

**UNIT-III** Rechroming & Neutralization: different chemicals used in neutralization and their application in order to preference, principal of neutralization and the reaction involved and formulations.

**20%**

**UNIT-IV** Dying: various types of dyes and their elementary chemistry and behavior towards leather, different types of dyeing auxiliaries (leveling, fixing agents etc). Principle and methods of dyeing and uses of different products with different recipes.

**20%**

**UNIT-V** Fat Liquoring: oils, fats, emulsion and their type, different type of fat liquors and their properties and their formulation in the manufacturing of different type of leather. Factors affecting choice of fat liquor, mechanism of fat liquoring. Stuffing: various types of fats, oils and their properties, recipes, Stuffing.

**20%**

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**SEMESTER – III**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear General Materials	BLT -303	04	--	03	10	15	75	100

<b>UNIT – I</b>	<b>Upper Material (Leather, Synthetic &amp; Fabrics ) :</b> (Importance, Categories, Properties, and Specifications)	<b>20%</b>
<b>UNIT – II</b>	<b>Threads, Tacks, Reinforcement Tapes etc:</b> (Importance, Properties, Specifications and Manufacturing Process)	<b>20%</b>
<b>UNIT – III</b>	<b>Toe and Counter Stiffeners :</b> (Importance, Materials used, Specifications and Manufacturing Process)	<b>20%</b>
<b>UNIT – IV</b>	<b>Insoles &amp; Foot beds :</b> (Importance, Materials used, Specifications and Manufacturing Process)	<b>20%</b>
<b>UNIT – V</b>	<b>Shank &amp; Shank Boards.</b> (Importance, Materials used, Specifications and Manufacturing Process)	<b>20%</b>

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		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Design	BLT -304	04	--	03	10	15	75	100

**UNIT – I      Anatomy of Foot :**

Bone structure, Ligaments, Muscles, Joints, Sweat Glands, Arches etc and their importance in functioning of foot.

**20%**

**UNIT – II      Footwear Fashion, Foot Survey & Product Development :**

General Fashion, Apparel Fashion and Relation with Footwear Fashion.  
 Origin of Footwear Fashion.  
 Product Development & its parameters.  
 Foot Survey & its significance.

**20%**

**UNIT – III      LAST:**

Importance, types & materials used in making last.  
 Points and measurements on Last.  
 Functional and Structural difference between Last and Foot.

**20%**

**UNIT – IV      Foot Measurement Techniques , Size and Fitting System :**

English, French , American Size System etc.  
 Size Conversion.  
 English & French Fitting Scale.

**20%**

**UNIT – V      Foot Development and Deformities :**

Different development phases of foot from birth to adult age.  
 Different deformities of foot due to shoes.

**20%**



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		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Tech Lab - II	BLT - 391	--	03	03	60	--	40	100

**Practical Exercises on the followings :-**

**a. Preproduction of Upper Lasting :**

- i. Introduction with the accessory materials used in bottoming section.
- ii. Demonstration / practice of hand lasting.
- iii. Demonstration / practice of machine lasting.

**b. Cutting & Closing of Casual Shoes**

**c. Lasting & Bottoming of Casual Shoes**

**d. Cutting & Closing of Derby Shoes**

**e. Lasting & Bottoming of Derby Shoes**

**Note :- Quantity of experimental work depend upon availability of time.**

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Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Design Lab - II	BLT - 392	--	03	03	60	--	40	100

**Practical Exercises on the followings :-**

**a) Designing and Pattern Cutting of Oxford Shoes :**

- i. Development of upper and lining standards.
- ii. Development of upper and lining patterns.

**b) Designing and pattern cutting of Casual Gents Shoes :**

- i. Development of upper and lining standards.
- ii. Development of upper and lining patterns.

**c) Designing and pattern cutting of Casual Ladies Shoes :**

- i. Development of upper and lining standards.
- ii. Development of upper and lining patterns.

**d) Designing and pattern cutting of Casual Boys Shoes :**

- i. Development of upper and lining standards.
- ii. Development of upper and lining patterns.

**e) Grading of patterns :**

- i. Manual grading of Upper, Lining, Insole, Socks and Stiffeners Patterns..

**Note :- Quantity of experimental work depend upon availability of time.**

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**SEMESTER - III**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Physical Testing Lab	BLT - 393	--	03	03	60	--	40	100

**Practical Exercises on the followings :-**

- a) Tensile strength of Upper Materials,
- b) Tear strength of Upper Materials ,
- c) Split Tear strength of Upper Materials,
- d) Tongue Tear Strength of Upper Materials,
- e) Elongation % of Upper Materials,
- f) Abrasion Resistance of Soling Materials,
- g) Adhesion strength of adhesive,
- h) Grain crack resistance of Upper Materials
- i) Full Shoe Flexing
- j) Antistatic Test of Full Shoes.
- k) Flex Test of Upper Materials,
- l) Water Vapour Permeability of Upper Materials
- m) Toe Cap Impact Test
- n) Water Penetration Resistance of Upper Materials
- o) Toe Cap Compression Test,
- p) Rub Fastness Test of Upper Materials

**Note :- Quantity of experimental work depend upon availability of time.**

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**SEMESTER – IV**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Technology - III	BLT - 401	04	--	03	10	15	75	100

**UNIT – I      Lasting and Construction :**

Definition and Classification of lasting & construction. Different Machineries used in Lasting and Construction.

**20%**

**UNIT – II      Flat Lasting :**

(Different steps of operation with detailed specification and working of machines.)

**20%**

**UNIT – III      Stuck-on Construction :**

(Different steps of operation with detailed specification and working of machines.)

**20%**

**UNIT – IV      Veldtschoen Lasting and Stuck-on Construction :**

(Different steps of operation with detailed specification and working of machines.)

**20%**

**UNIT – V      Slip-on Lastings and Stuck-on Construction :**

(Different steps of operation with detailed specification and working of machines.)

**20%**

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**SEMESTER – IV**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P		Course Work	Mid Sem Exam	End Sem Exam	TOTAL
<b>Theory of Leather Manufacturing-III</b>	<b>BLT-402</b>	<b>04</b>	<b>--</b>	<b>03</b>	<b>10</b>	<b>15</b>	<b>75</b>	<b>100</b>

**UNIT-I**      Machine Operation after Fat liquoring like Sammying, Setting, Drying, Conditioning, Staking Toggling, Significance of these operations  
**20%**

**UNIT-II**      Machine operations on crust like Buffing, Snuffing Plating, Finishing, Different Machines & Techniques of Finishing.  
**20%**

**UNIT-III**      Composition and classification: general structure and composition of finishes, classification of finishes.  
**20%**

**UNIT-IV**      Pigments: classification of pigments, their properties and uses in leather finishing, preparations of pigments and applications. Binders: types of binders (casein, shellac, mucilage and gums) properties and use. Plasticizers, luster, name of various materials and used and their application. Resin binder or polymer binder-types and classification of different binders. Filling and impregnation agents and methods.  
**20%**

**UNIT-V**      Nitro cellulose lacquer. Properties and uses. N.C. Lacquer emulsion, classification formulation , dilatable with water or organic solvent with reference to fastness to wet rubbing. Elementary knowledge of, Polyvinyl acetate co-polymer lacquer and polyurethane and their application. Solvents and diluents. Seasons, their formulation and method of applications. Spraying, Glazing, Hot Plating, Measuring.  
**20%**

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**SEMESTER – IV**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
<b>Industrial Organization &amp; Management</b>	<b>BLT - 403</b>	<b>04</b>	<b>--</b>	<b>03</b>	<b>10</b>	<b>15</b>	<b>75</b>	<b>100</b>

**UNIT – I :** Principles of Scientific Management – Nature and Importance of Management – Function of Management – Fundamental of Planning –Motivation and control of managerial Personnel-co-ordination-Decision making. Method study – Work measurement technique – Principles of time study - Elements of production control – Forecasting – Planning- Routing- Scheduling- Dispatching.

**20%**

**UNIT – II :** Methods of Job Evaluation-Ranking Methods-Wage rate structure – Merit Rating-methods of training. Capital cost and Depreciation- Estimate of capital cost and working capital-Invested capital and Profitability-Preparation of profit and loss Account.

**20%**

**UNIT – III :** Forms of Business Organization – Sole proprietor- Partnership- Joint stock companies- (Private and Public) – Co-operative Societies- Government companies, Public co-operations etc. Insurance related to fire, marine, general accident and other risks. Business finance – financial needs of business- methods and source of raising finance- special financial institution – role of Government agencies like TIIC, SIDCO, IDBI, ICICI, NSIC, and Banks etc. Extra Premiership development concept, Licenser and Registration.

**20%**

**UNIT – IV : Marketing - Sales:** Management- Function of Sales Management – Product Research – Market Research – Sales Promotion – Sales Planning – Sales Forecasts – Prices and Terms – Standardization and Grading etc. Foreign Trade – General Procedure for Export and Import. Quotation like F.O.B., C.I.F. etc. Bill of Loading – Letter of Credit – Export Promotion etc. introduction to CPM and PERT and application.

**20%**

**UNIT – V : Personnel Management:** Principles – Proper selection – Recruitment program and procedures – Categories of Recruitment – Employee Training and management development – Job analysis – Job description – Employee valuation – Motivation.

**20%**

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**SEMESTER – IV**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P		Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Process of Leather Manufacturing -I	BLT -404	04	--	03	10	15	75	100

**UNIT – I      Basic Raw Hides Selection & Identification of Defects.**

Selection of raw hides.  
Grading of raw hides.  
Identification of Defects.

**20%**

**UNIT – II      Unit Operations of Processing.**

Different sequences of processing.  
Differences in processing for different finish of leather.  
Machineries used in processing  
Basic infrastructure required for leather processing.

**20%**

**UNIT – III      Process of Wet-Blue making.**

(a)    Cow      (b)    Cow Calf      (c)    Sheep

**20%**

**UNIT – IV      Process of Wet-Blue making.**

(a)    Buff      (b)    Buff Calf      (c)    Goat

**20%**

**UNIT – V      Selection and Processing of Hides & Skins for Leather for Shoe Upper.**

1.      Full Grain Leather
2.      Corrected Grain Leather .

**20%**

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Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Tech Lab - III	BLT - 491	--	03	03	60	--	40	100

**Practical Exercises on the followings :-**

- a. Cutting & Closing of Oxford Shoes
- b. Lasting & Bottoming of Oxford Shoes
- c. Cutting & Closing of Court Shoes
- d. Lasting & Bottoming of Court Shoes
- e. Cutting & Closing of Boys Shoes
- f. Lasting & Bottoming of Boys Shoes

**Note :- Quantity of experimental work depend upon availability of time.**



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**SEMESTER – IV**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Design Lab - III	BLT -492	--	03	03	60	--	40	100

**Practical Exercises on the followings :-**

**i. Designing and Pattern Cutting of Gents Ankle Boot.**

1. Development of upper and lining standards.
2. Development of upper and lining patterns.

**ii. Designing and pattern cutting of Ladies Booty.**

1. Development of upper and lining standards.
2. Development of upper and lining patterns.

**iii. Designing and pattern cutting of Gents Moccasin.**

1. Development of upper and lining standards.
2. Development of upper and lining patterns.

**iv. Designing and pattern cutting of Gents Stroble Shoe.**

1. Development of upper and lining standards.
2. Development of upper and lining patterns.

**v. Designing and pattern cutting of Gents / Ladies Open Fancy Footwear.**

1. Development of upper and lining standards.
2. Development of upper and lining patterns.

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**SEMESTER – IV**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
<b>**Leather Processing &amp; Production Technology Lab</b>	<b>BLT -493</b>	--	03	03	60	--	40	100

**\*\*Note :-** Students will be taken on compulsory visits for 15 days to different tanneries at different places along with the staff members of LFT Section to give them the knowledge of Leather Production Technology and Machines Operations. Visit Report and Lab Sessional will jointly carry 60 marks. All Lab expenses like raw materials, different chemicals etc. for conducting the laboratory works will be borne by the university on actual basis. TA & DA and other expenses towards the students and the staffs will be borne by the university as per rules.

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**SEMESTER – V**

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		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Technology - IV	BLT -501	04	--	03	10	15	75	100

**UNIT – I      Direct Injection Procedure (DIP) :**

Classification, Material processing, Sequences of operations, Machineries and Quality Control in DIP.

**20%**

**UNIT – II      Direct Vulcanizing Procedure (DVP) :**

Classification, Material processing, Sequences of operations, Machineries and Quality Control in DVP.

**20%**

**UNIT – III      Polyurethane Reaction Moulding :**

Classification, Material processing, Sequences of operations, Machineries and Quality Control in PU Moulding.

**20%**

**UNIT – IV      Finishing, Packaging and Branding :**

Different finishing procedure for different upper materials. Materials used in finishing process. Importance and process of packing . Importance and process of Branding.

**20%**

**UNIT – V      Production Technology :**

Classification of different production technology in footwear industry. Conveyor System, Toyota System, JIT System, Rink System etc.

**20%**

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**SEMESTER – V**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P		Course Work	Mid Sem Exam	End Sem Exam	TOTAL
<b>Costing &amp; Quality Control</b>	<b>BLT -502</b>	<b>04</b>	<b>--</b>	<b>03</b>	<b>10</b>	<b>15</b>	<b>75</b>	<b>100</b>

**UNIT – I      Quality Control**

Quality determination , Quality concept from view point of Customer – traders- manufacturers, Quality Factors , Inspection Vs Quality Control, Specification and Quality Standards, Quality Control by random selection , Final Inspection, Control Charts, Quality cost control ISO specification. On-line process control, quality control for various footwear making unit operations.

**20%**

**UNIT – II      Material Costing**

Procedure used for estimation allowances for footwear components and effects on these allowances of material variations-the influence on these allowances of the type of part being produced in respect of wear requirements, conditioning during manufacture, constructional details and shape and size of individual components-The incorporation of cost factors in footwear specifications.

**20%**

**UNIT – III      Overheads and Wage**

Overheads- Fixed overheads, variable overheads and semi variable overheads- labour – procedure adopted for estimating labour allowances – payment system- a knowledge of labour values for all operations-effect of labour cost on footwear requirements and manufacturing processes.

**20%**

**UNIT – IV      Financial Control**

Financial Budgeting and budgetary control- data needs- financial projects- project feasibility- understanding balance sheet and financial statements.

**20%**

**UNIT – V      Marketing Control**

Marketing- product research- brand building- export- import guidelines and trade issues- global trade in leather- inter country comparison of strength and weaknesses of market place-WTO and related issues influencing footwear industry.

**20%**

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**SEMESTER – V**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Polymeric Materials	BLT -503	04	--	03	10	15	75	100

**UNIT - I :-** Classification and types of polymers. Natural and Synthetic Polymers. Basic Chemistry of polymerization process.

**20%**

**UNIT - II:-** Rubber, its structure. Vulcanization processes of Rubber, its Properties and uses as

- Natural Rubber
- Rubber Solution
- Vulcanized SBR
- Micro cellular Rubber, Translucent Rubber

**20%**

**UNIT - III:-** Thermoplastics, their properties, & monomers, structure, chemistry and method of manufacture.

- Poly vinyl chloride, (PVC)
- Thermo Polyurethane, (TPU)
- Thermo Plastic Rubber, (TPR)

**20%**

**UNIT - IV:-** Thermosetting Plastics :- Introduction to thermoplastics, their raw material, chemistry, production, properties uses.

- Polyurethane(PU)
- Ethylene vinyl Acetate.(EVA)
- Melamine Formaldehyde Resin.

**20%**

**UNIT- V:-** Adhesives;- Natural and Synthetic

- Natural Rubber solution, its composition chemical structure Properties and method of production.
- Polychloroprene (Neoprene), composition chemical structure Properties and method of production.
- Polyurethane Adhesives, (One & Two Part )its composition chemical structure Properties and method of production.
- Hotmelt Adhesives Polyester & Polyamide its composition chemical structure Properties and method of production.

**20%**

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**SEMESTER – V**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Process of Leather Manufacturing- II	BLT -504	04	--	03	10	15	75	100

**UNIT – I      Selection and Processing of Hides & Skins for Leather for Shoe Upper.**

1.      Nubuck Leather
2.      Oil Pull-up Leather

**20%**

**UNIT – II      Selection and Processing of Hides & Skins for Leather for Shoe Upper.**

1.      Celtic Leather
2.      Printed Dry Milled Leather

**20%**

**UNIT – III      Selection and Processing of Hides & Skins for Leather for Shoe Upper.**

1.      Natural Dry Milled Leather
2.      Zuggrain Leather

**20%**

**UNIT – IV      Selection and Processing of Hides & Skins for Leather for Shoe Upper.**

1.      Split Leather & Pigmented Split Leather.
2.      Swede Leather.

**20%**

**UNIT – V      Selection and Processing of Hides & Skins for Leather for Shoe Upper.**

1.      Glace Kid Leather
2.      Patent Leather etc.

**20%**

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**SEMESTER – V**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Performance & Customer Services	BLT -505	04	--	03	10	15	75	100

<b>UNIT – I</b>	<b>Footwear Performance.</b> Definition of Footwear Performance Customer Expectations Comparative measurement of Performance for Footwear.	<b>20%</b>
<b>UNIT – II</b>	<b>Customer Complaints.</b> Customer Complaints and its classification. Justified and unjustified complaints. Customer attitude and international obligations.	<b>20%</b>
<b>UNIT – III</b>	<b>Customer Services</b> Product Liability Different types of customer services. Settlement of complaints. Declaration of Services, Guarantee & Warranty.	<b>20%</b>
<b>UNIT – IV</b>	<b>Importance of Testing.</b> Significance of Testing for assessment of Footwear Performance. List of testing and their methodology.	<b>20%</b>
<b>UNIT – V</b>	<b>Avoidance of Complaints.</b> Fashion Vs. Suitability. Taking care of Footwear Shoe care products. Defects check list & maintaining quality in production	<b>20%</b>

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Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Tech Lab - IV	BLT -591	--	03	03	60	--	40	100

**Practical Exercises on the followings :-**

- i. Cutting & Closing of Moccasin Shoes**
  
- ii. Lasting & Bottoming of Moccasin Shoes**
  
- iii. Cutting & Closing of Stroble Shoes**
  
- iv. Lasting & Bottoming of Stroble Shoes**
  
- v. Cutting & Closing of Ladies Long Boot**
  
- vi. Lasting & Bottoming of Ladies Long Boot**

**Note :- Quantity of experimental work depend upon availability of time.**



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**SEMESTER – V**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P		Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Computer Application & 2D CAD Lab	BLT -592	--	03	03	60	--	40	100

**Practical Exercises on the followings :-**

- i. Knowledge of computer operating system – XP , Professional etc.
- ii. Knowledge of MS Word.
- iii. Knowledge of MS Excel.
- iv. Knowledge of MS Power Point.
- v. Knowledge of Internet.
- vi. Knowledge of basic hardware and software requirements for CAD in shoe.
- vii. Introduction to CAD in shoe designing.
- viii. Demonstration of 2D CAD designing by audio and video clippings.
- ix. CAD / CAM applications in footwear industries.
  - x. Market availability & suitability of software packages.
  - xi. CAD application in production control.
- xii. 2D digitization of standard ( any style)
- xiii. Upper & lining patterns development.
- xiv. Pattern nesting and grading.
- xv. Shoe Specification detailing through GDM.
- xvi. Skiving, Stitching, Perforation, Edge Treatments etc.

**Note :- Quantity of experimental work depend upon availability of time.**

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**SEMESTER – V**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Final Project (Minor)	BLT -593	--	03	03	150	--	50	200

**Practical Exercises on the followings :-**

- a. **Theory**
  - i. Importance of Final Project, Overall Demonstration of the content, Market Survey, Range Building, Distribution of Styles.
- b. **Range Building**
  - i. 10 Hand and Coloured Sketches on Selected Styles.
  - ii. Selection of 02 Designs.
  - iii. Last & Sole Selection / Development.
- c. **Designing & Pattern Cutting.**
  - i. Designing of 02 Designs.
  - ii. Complete set of Pattern Development for 02 Designs.
- d. **File Making for Pattern Designing.**

**Note :- Quantity of experimental work depend upon availability of time.**

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**SEMESTER – VI**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Entrepreneurship & Industry Establishment	BLT -601	04	--	03	10	15	75	100

**UNIT – I      Entrepreneurship Development & its importance in Technical & Management Education.**

Different learning styles on activists, reflectors, pragmatists, theorists etc.  
Tutorials to identify different leaning styles of students.

**20%**

**UNIT – II      Entrepreneur Competencies.**

Initiators, Persistence, Opportunities Identifications, Information Seeker, Assertiveness.  
Tutorials to identify different Entrepreneurship Competencies among students.

**20%**

**UNIT – III      Identification of Business Opportunity.**

Preparation of Personal Profile.  
Idea Generation & other steps related with opportunity selection.

**20%**

**UNIT – IV      Market Assessment of a Selected Business Opportunity.**

Understanding of customer, competitors, environment, customer requirement etc.

**20%**

**UNIT – V      Preparation of a Plan for Industry Establishment.**

Making of a detailed project report.  
Sources of non-financial support for SSI entrepreneurs.

**20%**

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**SEMESTER – VI**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Foot Comfort	BLT -602	04	--	03	10	15	75	100

**UNIT – I      Foot Comfort.**

Classification of Foot Comfort.

General & Technical Parameters for Foot Comfort.

Forces & Pressures on Foot Comfort.

**20%**

**UNIT – II      Last and Design in Foot Comfort.**

The effect of Last Development in Foot Comfort.

The effect of Shoe Designing in Foot Comfort.

**20%**

**UNIT – III      Materials in Foot Comfort**

The effect of Upper Materials in Foot Comfort.

The effect of Bottom Materials in Foot Comfort.

The effect of Other Accessories Materials in Foot Comfort.

**20%**

**UNIT – IV      Shoe Engineering in Foot Comfort.**

The effect of different shoe constructions in Foot Comfort.

**20%**

**UNIT – V      Breeze Technology, Shoe Finishes, Foot Hygiene & Health.**

The effect of Breeze Technology in Foot Comfort.

The effect of different shoe finishes in Foot Comfort.

The effect of Foot Hygiene & Health in Foot Comfort.

**20%**

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**SEMESTER – VI**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Sports Shoe Technology	BLT -603	04	--	03	10	15	75	100

**UNIT – I History of Sports Footwear.**

The earliest sports shoes.

Modernization of Sports Shoe and Athletic Footwear industry – Nineteenth Century.

The Sneaker Era.

Different categories in Athletic Footwear.

Growth of Running Shoes, Court Shoes, Field Shoes, Winter Shoes, Out Door Sports Shoes and Specialty Sports Shoes.

Branding in sports shoes.

**20%**

**UNIT – II Biomechanical Aspects of Running**

History of Biomechanics in Athletic Footwear.

Biomechanics of walking, running & others sports. Types of forces, frictional moments.

Injuries in sports related athletics & their prevention in making specified footwear.

Biomechanical Tests and testing procedures.

**20%**

**UNIT – III Biomechanical Design for Sports Shoes.**

Importance of Biomechanical Designed sports shoes.

Development of Last for specific sports and its different parameters.

Biomechanical footwear design & fitting for athletic footwear.

**20%**

**UNIT – IV Basic Construction and Material Requirement for Athletic Footwear.**

Basic requirement for Upper Materials.

Basic requirement for Soling Materials.

Basic requirement for Accessories Materials.

Basic requirement for complete construction..

**20%**

**UNIT – V Specific requirement for Different Sports Footwear.**

Running Shoes, Court Shoes, Field Shoes, Winter Shoes, Out Door Sports Shoes and Specialty Sports Shoes.

**20%**

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**SEMESTER – VI**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Process of Leather Manufacturing- III	BLT -604	04	--	03	10	15	75	100

**UNIT – I      Selection of Hides & Skins and manufacturing of**

1.      Pigmented Lining
2.      Drum Dyed Lining

**20%**

**UNIT – II      Selection of Hides & Skins and manufacturing of**

1.      Split Lining
2.      Heel Grip Lining

**20%**

**UNIT – III      Heavy Leathers**

Selection of Hides and Skins, manufacturing of Vegetable and chrome sole leather and water proofing of sole & insole leather, manufacturing of harness and saddle leathers etc.

**20%**

**UNIT – IV      Sports Goods Leather**

Selection of Hides and Skins, Leathers for inflated balls (Football, Basketball, Volleyball, handball, rugby ball etc.) hockey and cricket ball leather, batting and wicket keeping gloves leather, golf glove leather and industrial glove leather. Lace leather

**20%**

**UNIT – V      Industrial Safety Shoe Leather**

Selection of Hides and Skins, Leathers for different industrial safety purpose shoes like Ammunition Shoes, Mining Shoes, Anti-static Shoes, Oil Field Shoes, etc.

**20%**

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**SEMESTER – VI**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
***Footwear Production Technology Lab	BLT -691	--	03	03	60	--	40	100

**\*\*\*Note :-** Students will be taken on compulsory visits for 15 days to different footwear manufacturing units at different places along with the staff members of LFT Section to give them knowledge on Footwear Production Technology and Industrial Set Up. Visit Report and Lab Sessional will jointly carry 60 marks. All Lab expenses for conducting the laboratory works will be borne by the university on actual basis. TA & DA and other expenses towards the students and the staffs will be borne by the university as per rules.

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**SEMESTER – VI**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Computer Application & 3D CAD Lab	BLT -692	--	03	03	60	--	40	100

**Practical Exercises on the followings :-**

- i. 2D digitization of Mean-Forme ( any style)
- ii. Direct Designing on digitized Mean-Forme.
  
- iii. Upper & Lining patterns development.
- iv. Pattern nesting and grading.
  
- v. Springing of patterns
- vi. Scanning, styling, design sketches through CAD
  
- vii. Direct Designing on Scanned Last.
- viii. Material Selection on Design.
- ix. Sole Selection on Design.
- x. Other Accessories material Selection on Design.
  
- xi. Transfer of 2D Design to 3D.
- xii. Transfer of 3D Design to 2D.
- xiii. Use of plotter cutter

**Note :- Quantity of experimental work depend upon availability of time.**



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**SEMESTER – VI**

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P		Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Final Project (Major)	BLT -693	--	03	03	150	--	50	200

**Practical Exercises on the followings :-**

**i. Theory**

1. Shoe Making, Material Selection, Factory Set-up, Costing Procedure.

**ii. Making of Shoes**

1. Making of 02 prs. Of self designed Shoes.

**iii. Project Report on Material Testing.**

1. A complete report with practical data's on material testing to be prepared on those materials which are to be used in making of 02 prs. of shoes.

**iv. Project Report on Costing & Industrial Set Up.**

1. A complete report on factory set-up and a detailed costing of 02 prs. self made shoes has to be prepared.

**Note :- Quantity of experimental work depend upon availability of time.**

## **ANNEXURE - IV**

### **Modification in Syllabus of Leather Processing & Production Technology Lab (BLT-493)**

Since LFT section has very recently established a Leather Processing Lab, so course no. BLT-493 (Leather Processing & Production Technology Lab) may be carried out at LFT Section, University Polytechnic, AMU. Students may be taken for visit to different tanneries at Agra, Kanpur etc. to give them knowledge of different machine operations performed during processing of Leather for their further exposure. The syllabus and Examination Scheme is recommended as follows-

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Leather Processing & Production Technology Lab	BLT -493	--	03	03	60	--	40	100

### **Practical Exercises on the followings :-**

Wet blue Selection, Identification of Chemicals, Wet End Operation on Buff/Bovine/Goat We blue for manufacturing of -

1. Lining Leather
2. Upper Leather
3. Gloving Leather

Finishing of following crust Leathers-

1. Lining Leather
2. Upper Leather
3. Gloving Leather

**Note :- Quantity of experimental work depend upon availability of time & materials**

***(Mohd. Sayeduzzaman)***  
***Co-ordinator, LFT***

***(Prof. S. Iqbal Ali)***  
***Principal, Univ. Polytechnic***

## **ANNEXURE - IV**

### **Modification in Syllabus of Footwear Production Technology Lab ( BLT-691)**

The syllabus and Examination Scheme is recommended as follows-

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Footwear Production Technology Lab	BLT -691	--	03	03	60	--	40	100

Students may be sent on training for 15 days, after V<sup>th</sup> Semester examination, to different footwear manufacturing units at different places to give them knowledge on Footwear Production Technology or In house training for manufacturing of self designed footwear (at least two types) may be conducted for students and they will be taken for visit of different footwear production units with staffs to give them knowledge of Industrial Set Up. Visit Report and Lab Sessional will jointly carry 60 marks. TA & DA and other expenses towards the students and the staffs on this visit will be borne by the university as per rules.

*(Mohd. Sayeduzzaman)*  
*Co-ordinator, LFT*

*(Prof. S. Iqbal Ali)*  
*Principal, Univ. Polytechnic*

## SEMESTER – VI

Course Name	Course No.	Study Scheme		Evaluation Scheme				
		Pds / Week		Duration of Exam	Maximum Marks			
		L	P	Hrs.	Course Work	Mid Sem Exam	End Sem Exam	TOTAL
Leather Goods Merchandising	BLT -605	04	--	03	10	15	75	100

<b>UNIT – I</b>	<b>Fashion Forecasting:</b> Introduction to Leather Fashion Forecasting, Market & Consumer Research technique in forecasting.	<b>20%</b>
<b>UNIT – II</b>	<b>Introduction to Leather Products Merchandising:</b> Meaning of Merchandising, Classification of Merchandising, Major Areas of Merchandise Management, Role and Responsibilities of merchandisers. Technique & Management of Leather Accessories Merchandising.	<b>20%</b>
<b>UNIT – III</b>	<b>Introduction to Leather Products Buying:</b> Meaning of Buying, Types of Buyers, Types of Suppliers, Buying Cycle & Seasons and their significance in Product Panning, Selection of suppliers, the process buyer & supplier contact to merchandise deliver.	<b>20%</b>
<b>UNIT – IV</b>	<b>Retail Industry &amp; Retail Supply Chain:</b> Meaning of Retailing, Scope of Retailing--Supply Chain and Merchandising, Retail supply chain management, Retail supply chain vs. Manufacturing supply chain, Retail supply chain and logistics, Strategic, Supply Chain in Apparel and Leather Accessories Retailing.	<b>20%</b>
<b>UNIT – V</b>	<b>Visual Merchandising and Space Management:</b> Meaning and objectives of Visual Merchandising, Growth of Visual Merchandising, Product Positioning and Visual Merchandising of Leather Accessories. Concept of Space Management, Role of IT in Space Management, Concept of Planogram.	<b>20%</b>