SEMESTER - I

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<th>Course Name</th>
<th>Course No.</th>
<th>Study Scheme</th>
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<td>Pds / Week</td>
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<tr>
<td>Footwear Technology - I</td>
<td>BLT - 101</td>
<td>04</td>
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Course Objective:
To introduce the concept of F/w Clicking to make students apply these for employability in F/w Industry

Course Outcomes:
The students will be able to learn:
1. The evolution of footwear, different brands/companies/fairs
2. Identification of different class of F/w and their parts
3. Different clicking technologies and m/c for clicking footwear
4. Consumption of materials with different methods

Syllabus:

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.

15 Marks

UNIT – II Classification of Footwear and Anatomy of Leather & Footwear:
Formal Footwear, Industrial Safety Footwear, Sports Footwear, Orthopedic Footwear etc. with their further classification. Identification of different Parts of Leather and their properties. Identification of different Parts of Footwear and their properties.

20 Marks

UNIT – III 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 Marks

UNIT – IV Material Consumption :

20 Marks

BOOKS RECOMMENDED:

2. New Zealand Leather and Shoe Research Association (LASRA), Edited by I H Harvey
## SEMESTER – I

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<tr>
<td>Theory of Leather Manufacturing - I</td>
<td>BLT - 102</td>
<td>04</td>
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### Course Objective:
To introduce the outer covering of animals as degradable proteinous matter and different methods of its preservation.

### Course Outcomes:
The students will be able to learn:
1. Chemical composition and constituents of hides and skins.
2. Techniques of temporary preservation of H/S
3. Chrome tanning & its Chemistry
4. VT tanning & its chemistry

### Syllabus:

**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.

15 Marks

**UNIT-II**
Curing & preservation: methods & chemistry of curing of hides & skins. Merits & demerits of each method. Pre-tanning Operations: Principles & objectives involved in-
a) Soaking  b) Liming  c) De-liming  d) Bating  e) Pickling  f) De-pickling

20 Marks

**UNIT-III**
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 Marks

**UNIT-IV**

20 Marks

### BOOKS RECOMMENDED:
1. An Introduction to the Principles of Leather Manufacture by S.S Dutta, ILTA Kolkata
2. Handbook of Tanning by B.M. Das, ILTA Kolkata
# SEMESTER – I

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<th>Course Name</th>
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<td>BLT - 191</td>
<td>Pds / Week Duration of Exam Maximum Marks</td>
<td>L P Hrs. Course Work Mid Sem Exam End Sem Exam TOTAL</td>
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<td>03 02 60 -- 40 100</td>
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**Course Objective:**
To introduce practical aspect of different F/w industrial sections like clicking, closing bottoming etc to make students more industry oriented.

**Course Outcomes:**
The students will be able to learn:
1. M/C/Equipments/tools used in clicking section of F/w
2. M/C/Equipments/tools used in Closing section of F/w
3. M/C/Equipments/tools used in Bottoming section of F/w
4. Hands on to different types of practices and procedures in the above sections

**Syllabus:**

*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.
   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.
### SEMESTER – II

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<tr>
<td>* Footwear Design Lab - I</td>
<td>BLT - 291</td>
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<table>
<thead>
<tr>
<th>Course Objective:</th>
<th>Course Outcomes:</th>
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<tbody>
<tr>
<td>To introduce practical</td>
<td>The students will be able to learn:</td>
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<tr>
<td>aspect of designing a shoe</td>
<td>1. Different F/w</td>
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<td>to make students ready to</td>
<td>designing tools and free hand sketching</td>
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<td>work as a designer in F/w</td>
<td>2. Masking of last</td>
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<tr>
<td>industry.</td>
<td>and its points</td>
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<td>3. Conversion of 3D</td>
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<td>last to 2D mean</td>
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<td>form</td>
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<td>4. Designing &amp;</td>
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<td></td>
<td>Pattern cutting</td>
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<td>of Derby shoe</td>
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### Syllabus:

**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 may pay the travelling expenses for the students and the staffs on actual basis*
SEMESTER – III

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<tr>
<td>Footwear Technology - II</td>
<td>BLT - 301</td>
<td>04</td>
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</table>

Course Objective:
To introduce the concept of F/w upper making

Course Outcomes:
The students will be able to learn:
1. Different Pre Assembly operations
2. Different Stitching M/c and stitches
3. Different types of Sewing Needle and Threads
4. Different Types of seams and Edge treatments

Syllabus:

UNIT – I Pre Assembly Operations:

15 Marks

UNIT – II Stitching Machines and operations:
Classification of stitching machines, and its different parts with their functions.
Definition of stitching, Classification of stitching. Process of stitch formation.

20 Marks

UNIT – III 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 Mark

UNIT – IV Seams and Edge Treatments:
Definition of seams, Classification of seams, Different edge treatment, Reinforcement tapes and its use.

20 Mark

BOOKS RECOMMENDED:
2. FDDI Different Handbooks Publications on pre assembly & closing operations
### Course Name: Theory of Leather Manufacturing- II  
**Course No.:** BLT - 302

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<td>Course Work</td>
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<td>Mid Sem Exam</td>
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<td>End Sem Exam</td>
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- **L**: 04  
- **P**: --  
- **Hrs.**: 02  
- **Course Work**: 10  
- **Mid Sem Exam**: 15  
- **End Sem Exam**: 75  
- **TOTAL**: 100

### Course Objective:

To introduce the concept of Permanent Preservation of H/S and Conversion of Putrescible H/S into Non-putrescible attracive leather

### Course Outcomes:

The students will be able to learn:

1. Synthetic tanning agents  
2. Combination of different tanning methods and their outcomes  
3. Roles of Rechroming/Chrome Shaving and neutralization process  
4. Imparting colour and softness to leather

### Syllabus:

#### UNIT-I

Sytants: classification, reactions with skin proteins used in leather manufacture, Resin Syntans. Alum tanning, Chemistry of Alum Salts (Chlorides and Sulphate), mechanism of aluminium tanning. Zirconium Tanning, Zirconium Sulphate and chlorides hydrolysis, basification and mechanism of zirconium tanning, use of zirconium salt in tanning.  

**15 Marks**

#### UNIT-II

Combination tannage: Application of vegetable oil and synthetic tannins 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 Marks**

#### 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 Marks**

#### UNIT-IV

Dying & Fat Liquoring: 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. 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 Marks**

### BOOKS RECOMMENDED:

1. An Introduction to the Principles of Leather Manufacture by S.S Dutta, ILTA Kolkata  
2. Handbook of Tanning by B.M. Das, ILTA Kolkata  
3. Synthetic tanning Agents by Samir Dasgupta, ILTA Kolkata  
4. Treatise on Fatliquor and Fatliquoriing of Leather by Samir Dasgupta, ILTA Kolkata
**SEMESTER – III**

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<th>Course Name</th>
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<tr>
<td>Footwear General Materials I</td>
<td>BLT - 303</td>
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</table>

**Course Objective:**
To introduce the understanding of different Footwear Materials and their manufacturing processes

**Course Outcomes:**
The students will be able to learn:
1. Difference among Leather, Synthetic & fabrics
2. Different types of threads, tacks & Reinforcement tapes and their manufacturing
3. Different types of Puffs for F/w and their manufacturing
4. Different types of Bottom materials and accessories

**Syllabus:**

**UNIT – I**  
**Upper Material (Leather, Synthetic & Fabrics):**
(Importance, Categories, Properties, and Specifications)  
15 Marks

**UNIT – II**  
**Threads, Tacks, Reinforcement Tapes etc:**
(Importance, Properties, Specifications and Manufacturing Process)  
20 Marks

**UNIT – III**  
**Toe and Counter Stiffeners :**
(Importance, Materials used, Specifications and Manufacturing Process)  
20 Marks

**UNIT – IV**  
**Insoles & Foot beds, Shank & Shank Boards.**
(Importance, Materials used, Specifications and Manufacturing Process)  
20 Marks

**BOOKS RECOMMENDED:**
2. New Zealand Leather and Shoe Research Association (LASRA), Edited by I H Harvey
## SYLLABUS

### UNIT – I

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

15 Marks

### 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 Marks

### UNIT – III

**Last, Foot Measurement Techniques, Size and Fitting System:**
Importance, types & materials used in making last.  
Points and measurements on Last.  
Functional and Structural difference between Last and Foot.  
English, French, American Size System etc.  
Size Conversion.  
English & French Fitting Scale.

20 Marks

### UNIT – IV

**Foot Development and Deformities:**
Different development phases of foot from birth to adult age.  
Different deformities of foot due to shoes.

20 Marks

### BOOKS RECOMMENDED:

2. FDDI Different Handbooks Publications on Designing
SEMESTER – III

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<tr>
<td>Footwear Tech Lab - II</td>
<td>BLT - 391</td>
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Course Objective:
To introduce practical aspect of manufacturing of a casual and derby shoe to make students ready to work as a floor manager in F/w industry.

Course Outcomes:
The students will be able to work on:
1. Mechanized lasting as well as hand lasting
2. Cutting, closing & lasting of Casual shoes
3. Cutting, closing & lasting of Derby shoes

Syllabus:

*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
## SEMESTER – III

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<td>Footwear Design Lab - II</td>
<td>BLT - 392</td>
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### Course Objective:
To introduce Hands on practices of designing an Oxford & Casual shoes to make students ready to work as a designer in F/w industry.

### Course Outcomes:
The students will be able to learn:
1. Designing & Pattern cutting of Oxford shoe Making
2. Designing & Pattern cutting of Casual shoe Making
3. Manual Grading of patterns

### Syllabus:

**Practical Exercises on the followings :-**

a) **Designing and Pattern Cutting of Oxford Shoes :**
   1. Development of upper and lining standards.
   2. Development of upper and lining patterns.

b) **Designing and pattern cutting of Casual Gents Shoes :**
   1. Development of upper and lining standards.
   2. Development of upper and lining patterns.

c) **Designing and pattern cutting of Casual Ladies Shoes :**
   1. Development of upper and lining standards.
   2. Development of upper and lining patterns.

d) **Designing and pattern cutting of Casual Boys Shoes :**
   1. Development of upper and lining standards.
   2. Development of upper and lining patterns.

e) **Grading of patterns :**
   1. Manual grading of Upper, Lining, Insole, Socks and Stiffeners Patterns..
# SEMESTER – III

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<tr>
<td>Physical Testing Lab</td>
<td>BLT - 393</td>
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**Course Objective:**
To introduce different Testing M/c, & Testing methods of different F/w Materials and Complete F/w

**Course Outcomes:**
The students will be able to learn and hands on:
1. Different types of strengths of F/w Materials & F/w
2. Testing of Different Physical parameters of leathers & F/w

**Syllabus:**

*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
## SEMESTER – IV

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<th>Course Name</th>
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<th>Study Scheme</th>
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<td>Pds / Week</td>
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<td>Footwear Technology - III</td>
<td>BLT - 401</td>
<td>04</td>
<td>-- 02 Hrs.</td>
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### Course Objective:
To introduce the concept of different types of Lastings & Constructions different to make students more industry oriented

### Course Outcomes:
The students will be able to learn:
1. Different Types of Lasting & Constructions methods
2. Different operations/procedures & working related to Flat Lasting, Stitch Down and San-Crispino Lasting

### Syllabus:

**UNIT – I Lasting and Construction:**
Definition and Classification of lasting & construction. Different Machineries used in Lasting and Construction.

15 Marks

**UNIT – II Flat Lasting and Stuck-on Construction:**
(Different steps of operation with detailed specification and working of machines.)

20 Marks

**UNIT – III Stitch Down & Moccasin Lasting/Construction:**
(Different steps of operation with detailed specification and working of machines.)

20 Marks

**UNIT – IV Slip-on Lasting and San-Crispino Lasting:**
(Different steps of operation with detailed specification and working of machines.)

20 Marks

### BOOKS RECOMMENDED:

2. FDDI Different Handbooks Publications on Lasting Technology
## SEMESTER – IV

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<tr>
<td>Theory of Leather Manufacturing-III</td>
<td>BLT-402</td>
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</table>

**Course Objective:**
To introduce the concept of different types of M/c operations on wet blue & crust leather and different finishing aspects of leather

**Course Outcomes:**
- The students will be able to learn:
  1. Role & Importance of M/c operations on wet blue & Crust leather
  2. Classifications and compositions of different finishes on leather
  3. Different types of Colouring Materials/Film forming materials/Lacquers and their formulation/classification & Mechanisms

**Syllabus:**

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

15 Marks

**UNIT-II**
Machine operations on crust like Buffing, Snuffing Plating, Finishing, Different Machines & Techniques of Finishing. Composition and classification: general structure and composition of finishes, classification of finishes.

20 Marks

**UNIT-III**
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 Marks

**UNIT-IV**

20 Marks

**BOOKS RECOMMENDED:**

1. An Introduction to the Principles of Leather Manufacture by S.S Dutta, ILTA Kolkata
2. Treatise on Fatliquor and Fatliquoring of Leather by Samir Dasgupta, ILTA Kolkata
3. Theory and Practice of Leather manufacture by K.T.Sarkar
## SEMESTER – IV

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</table>

### Course Objective:
To introduce the concept of Managing & Organizing a Industry to develop Entrepreneurial approach among students

### Course Outcomes:
The students will be able to learn:
1. Different forms of business organization their formation & management
2. Different management techniques related to personal management, production control and marketing & sales

### Syllabus:

15 Marks


20 Marks

**UNIT – III**: Different Forms of Business Organizations – Sole proprietor- Partnership- Joint stock companies-(Private and Public) – Co-operative Societies- Government companies, Public co-operations etc and their formations and Regulations.

20 Marks


20 Marks

### BOOKS RECOMMENDED:
1. Industrial Organization and Management by T.R Banga & S.C Sharma, Khanna Publication
2. www.wfglobal.org
SEMESTER – IV

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<td>BLT-404</td>
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Course Objective:
To introduce the concept of Different process to make different categories of leather to make students ready to get employability as floor managers in leather tanning industries

Course Outcomes:
The students will be able to learn:
1. Different types of H/S to make different types of Leather
2. Different units operations in leather processing
3. Wet Blue making from Different Bovine/Goat/Sheep H/S

Syllabus:

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

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.

UNIT – III  Process of Wet-Blue making.
(a) Cow  (b) Cow Calf  (c) Sheep
(d) Buff  (e) Buff Calf  (f) Goat

UNIT – IV  Selection and Processing of Hides & Skins for Leather for Shoe Upper.
1. Full Grain Leather
2. Corrected Grain Leather

BOOKS RECOMMENDED:
1. An Introduction to the Principles of Leather Manufacture by S.S Dutta, ILTA Kolkata
2. Theory and Practice of Leather manufacture by K.T.Sarkar
Diploma in Leather Goods and Footwear Technology
University Polytechnic, AMU, Aligarh

Annexure – III
B.O.S – 27.03.2019

SEMESTER – IV

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<tr>
<td>Footwear Tech Lab - III</td>
<td>BLT - 491</td>
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</table>

Course Objective:
To introduce practical aspect of manufacturing of a Oxford, Children shoe and Court shoe to make students ready to work as a floor manager in F/w industry.

Course Outcomes:
The students will be able to work on:
1. Mechanized lasting as well as hand lasting of F/w
2. Cutting, closing & lasting of Oxford shoes
3. Cutting, closing & lasting of Court shoes & Children shoes

Syllabus:

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

Annexure – III
B.O.S – 27.03.2019

SEMESTER – IV

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<td>L P</td>
<td>Hrs.</td>
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<tr>
<td>Footwear Design Lab - III</td>
<td>BLT -492</td>
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</table>

Course Objective:
To introduce Hands on practices of designing an Ankle Boot, Ladies Booty, Gents Moccasin & Stroble shoes to make students ready to be employable as specific designer in F/w industry or start a venture related to F/w designing.

Course Outcomes:
The students will be able to learn:
1. Designing & Pattern cutting of Gents Ankle Boot
2. Designing & Pattern cutting of Ladies Booty
3. Designing & Pattern cutting of Gents Moccasin
4. Designing & Pattern cutting of Gents Stroble Shoe
5. Designing & Pattern cutting of Gents/Ladies Open Fancy F/w

Syllabus:

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.
## SEMESTER – IV

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<tr>
<td><strong>Leather Processing &amp; Production Technology Lab</strong></td>
<td>BLT -493</td>
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</table>

### Course Objective:

To introduce different Leather Processing operations from wet blue to crust to make students ready to get employability in Tanning Industries

### Course Outcomes:

The students will be able to learn:

1. Wet Blue selection to manufacture different types of Leather
2. Nature of different chemicals and their applications
3. Colour matching
4. Hands on different leather wet end processes

### Syllabus:

**Practical Exercises on the followings**

- Wet blue Selection, Identification of Chemicals, Wet End Operation on Buff/Bovine/Goat for manufacturing of:
  - Lining Leather
  - Upper Leather
  - Gloving Leather
  - Antique Leather

**Note :-** Students may be taken on visits for 1-2 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, as LFT Section has installed a tanning drum but could installed other big industrial M/c of leather processing to make their understanding better.
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<tr>
<td>Footwear Technology - IV</td>
<td>BLT -501</td>
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**Course Objective:**
To introduce the concept of different types of Automatic Bottoming processes to make students ready for synergism with advance industrial technologies

**Course Outcomes:**
The students will be able to learn:
1. M/c, materials, process involved & benefits of DIP
2. M/c, materials, process involved & benefits of DVP
3. M/c, materials, process involved & benefits of PU Soles
4. Shoe Finishing Materials their Branding & packaging

**Syllabus:**

**UNIT – I**  
**Direct Injection Procedure (DIP):**
Classification, Material processing, Sequences of operations, Machineries and Quality Control in DIP.

15 Marks

**UNIT – II**  
**Direct Vulcanizing Procedure (DVP):**
Classification, Material processing, Sequences of operations, Machineries and Quality Control in DVP.

20 Marks

**UNIT – III**  
**Polyurethane Reaction Moulding:**
Classification, Material processing, Sequences of operations, Machineries and Quality Control in PU Moulding.

20 Marks

**UNIT – IV**  
**Finishing, Packaging and Branding:**
Different finishing procedure for different upper materials. Materials used in finishing process. Importance and process of packing, Different Shoe production conveyors systems, Importance and process of Branding.

20 Marks

**BOOKS RECOMMENDED:**

### SEMESTER – V

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<th>Course Name</th>
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<tr>
<td>Costing &amp; Quality Control</td>
<td>BLT -502</td>
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#### Course Objective:
To introduce the concept of Costing, Quality, Financial & Marketing control to make student ready for their own entrepreneurial journey

#### Course Outcomes:
The students will be able to learn:
1. Different quality control aspect related to process & product & its documentation
2. Different costing aspects including overheads
3. Different aspects of Financial & Marketing control

#### Syllabus:

**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.

15 Marks

**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 Marks

**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 Marks

**UNIT – IV Financial & Marketing Control**

20 Marks

#### BOOKS RECOMMENDED:

1. Industrial Organization & Management by T R Banga & S C Sharma, Khanna Publication
2. Structure of Production cost in Footwear manufacture, UNIDO
SEMESTER – V

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<th>Course Name</th>
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**Course Objective:**
To introduce the concept of different Polymeric materials used in leather manufacturing to orient students to search/get ready to use more innovative materials for F/w manufacturing

**Course Outcomes:**
The students will be able to learn:
1. Classification of polymeric materials & polymerization process & its techniques
2. Different Rubber based materials their properties & processes
3. Different Thermoplastic (PVC/TPU/TPR) & Thermoset materials their properties, processes & Chemistry
4. Different Surface treatments, Adhesives & its application in F/w

**Syllabus:**

**UNIT - I:** Classification and types of polymers. Natural and Synthetic Polymers. Basic Chemistry of polymerization process. 15 Marks

**UNIT - II:** Rubber, its structure. Vulcanization processes of Rubber, its Properties and uses as
a) Natural Rubber
b) Rubber Solution
c) Vulcanized SBR
d) Micro cellular Rubber, Translucent Rubber 20 Marks

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

a) Poly vinyl chloride, (PVC)
b) Thermo Polyurethane, (TPU)
c) Thermo Plastic Rubber, (TPR)

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

a) Polyurethane(PU)
b) Ethylene vinyl Acetate.(EVA)
c) Melamine Formaldehyde Resin. 20 Marks

**UNIT- IV:** Adhesives:- Natural and Synthetic

a) Natural Rubber solution, its composition chemical structure Properties and method of production.
b) Polychloroprene (Neoprene), composition chemical structure Properties and method of production.
c) Polyurethane Adhesives, (One & Two Part )its composition chemical structure Properties and method of production.
d) Hotmelt Adhesives Polyester & Polyamide its composition chemical structure Properties and method of production. 20 Marks

**BOOKS RECOMMENDED:**
1. Polymer Science, By V R Gowarikar, Viswanathan, Sreedhar, New Age International Publication
SEMESTER – V

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<td>BLT-504</td>
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Course Objective:
To introduce the concept of Different process to make different categories of leather to enable students ready to get employability as floor managers in leather tanning industries.

Course Outcomes:
The students will be able to learn:
1. Different types of H/S to make different types of Leather
2. Different units operations in Dye house of tannery
3. Different types of Crust Leather making from Different Bovine/Goat/Sheep wet blues

Syllabus:

UNIT – I Selection and Processing of Hides & Skins for Leather Lining for Shoe Upper.
1. DD Lining
2. Split Lining

UNIT – II Selection and Processing of Hides & Skins for Leather for Shoe Upper.
1. Celtic Leather
2. Printed Dry Milled Leather
3. Nubuck Leather

UNIT – III Selection and Processing of Hides & Skins for Leather for Shoe Upper.
1. Natural Dry Milled Leather
2. Zuggrain Leather
3. Oil Pull-up Leather

UNIT – IV Selection and Processing of Hides & Skins for Leather for Shoe Upper.
2. Swede Leather.
3. Glace Kid Leather

BOOKS RECOMMENDED:
1. An Introduction to the Principles of Leather Manufacture by S.S Dutta, ILTA Kolkata
2. Theory and Practice of Leather manufacture by K.T.Sarkar
## SEMESTER – V

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<tr>
<td>Footwear Performance &amp; Customer Services</td>
<td>BLT -505</td>
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**Course Objective:**
To introduce the concept of Product performance, and how to handle customer complaints & service to make student ready for their own entrepreneurial journey

**Course Outcomes:**
The students will be able to learn:
1. Different aspect of product performance
2. Categories of different Customer Complaints & their settlement methodology
3. Testing & its role in F/w performance

**Syllabus:**

**UNIT – I**  
**Footwear Performance.**  
Definition of Footwear Performance  
Customer Expectations  
Comparative measurement of Performance for Footwear.  

**UNIT – II**  
**Customer Complaints & Services**  
Customer Complaints and its classification.  
Justified and unjustified complaints.  
Customer attitude and international obligations.  

**UNIT – III**  
**Customer Services**  
Product Liability  
Different types of customer services.  
Settlement of complaints.  
Declaration of Services, Guarantee & Warranty.  

**UNIT – IV**  
**Avoidance of Complaints & Importance of Testing.**  
Fashion Vs. Suitability.  
Taking care of Footwear  
Shoe care products.  
Defects check list & maintaining quality in production  
Significance of Testing for assessment of Footwear Performance.  
List of testing and their methodology.  

**BOOKS RECOMMENDED:**

1. Performance Management by T V Rao  
2. Hug Your Haters: How to Embrace Complaints and Keep your Customers by Jae Baer
SEMMESTER – V

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Course Objective:
To introduce practical aspect of manufacturing of specialized fashion F/w to make students ready to work as a floor manager in F/w Fashion industry.

Course Outcomes:
The students will be able to work on:
1. Mechanized lasting of some typical fashion F/w
2. Cutting, closing & lasting of Moccasin shoes
3. Cutting, closing & lasting of Stroble shoes
4. Cutting, closing & lasting of Ladies Long Boot

Syllabus:

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
SEMINTER – V

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<tr>
<td>Computer Application &amp; 2D CAD Lab</td>
<td>BLT -592</td>
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Course Objective:
To introduce concept of Computer Aided Designing (2D) for F/w to make students ready to get employability as CAD designer in F/w industry as per the advanced industrial needs

Course Outcomes:
The students will be able to learn:
1. Basic Windows Software to work on CAD software
2. Hands on to Delcam Crispin CAD software
3. 2D digitization of manually obtained designing standards etc
4. Upper & Lining Pattern development by CAD

Syllabus:

Practical Exercises on the followings :-

1. Knowledge of computer operating system – XP , Professional etc.
2. Knowledge of MS Word.
4. Knowledge of MS Power Point.
5. Knowledge of Internet.
6. Knowledge of basic hardware and software requirements for CAD in shoe.
7. Introduction to CAD in shoe designing.
8. Demonstration of 2D CAD designing by audio and video clippings.
9. CAD / CAM applications in footwear industries.
10. Market availability & suitability of software packages.
11. CAD application in production control.
12. 2D digitization of standard ( any style)
15. Shoe Specification detailing through GDM.
16. Skiving, Stitching, Perforation, Edge Treatments etc.
## SEMESTER – V

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<td>Final Project (Minor)</td>
<td>BLT -593</td>
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**Course Objective:**
To apply the concept of Market survey, Material selection and Designing to start process to work on project related to making of Footwear /Leather /Leather Goods to enable students to think about starting of their own venture related to their selected project

**Course Outcomes:**
The students will be able to learn:
1. Market survey & range building
2. Material selection related to selected project
3. Designing & pattern cutting of Selected Innovative F/w

**Syllabus:**

*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.**
### SEMESTER – VI

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<td>Entrepreneurship &amp; Industry Establishment</td>
<td>BLT -601</td>
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**Course Objective:**
To introduce the concept of Entrepreneurship to Motivate students to start their own venture

**Course Outcomes:**
- Basic knowledge of entrepreneurship & its principles
- Design Thinking approaches for selected opportunity
- Understanding customers & its selection techniques
- Business models

**Syllabus:**

**UNIT – I: Self & Opportunity Discovery**
Entrepreneurship as a career, Concept of Flow, Learning Styles & Entrepreneurial Competencies Principles of Effectuation: Bird in Hand, Affordable Loss, Crazy Quilt, Lemonade, Pilot in Plane, Different Entrepreneurial styles and their identification

15 Marks

**UNIT – II: Design Thinking**
Identification of problems worth solving, Concept of Design thinking & market assessment of selected business opportunity

20 Marks

**UNIT – III: Customer & Solution**
Identification of Customer & Consumer, Different Market types, Customer Segmentation, Niche Marketing, Value Proposition Canvas

20 Marks

**UNIT – IV: Business Models**
Introduction to Business Models, The Lean Approach, Building Solution Demo, Minimum Viable Product

20 Marks

**BOOKS RECOMMENDED:**

1. EDI, Faculty Development Programme Manual
2. Wadhwani Foundation NEN, www.wfglobal.org
SEMESTER – VI

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<td>Foot Comfort</td>
<td>BLT -602</td>
<td>04  -- 02</td>
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**Course Objective:**
To introduce the concept of Comfortability in footwear through last selection, design, material selection and technology

**Course Outcomes:**
The students will be able to learn:
1. Role of last development in providing foot comfort
2. Role of design in foot comfort
3. Relation of materials in footwear comfortability
4. Role of Different shoe construction technologies in Comfort

**Syllabus:**

**UNIT – I**
**Foot Comfort.**
Classification of Foot Comfort.
General & Technical Parameters for Foot Comfort.
Forces & Pressures on Foot Comfort.

15 Marks

**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 Marks

**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 Marks

**UNIT – IV**
**Shoe Engineering in Foot Comfort.**
The effect of different shoe constructions in Foot Comfort.
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 Marks

**BOOKS RECOMMENDED:**

## SEMESTER – VI

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<tr>
<td>Sports Shoe Technology</td>
<td>BLT -603</td>
<td>04</td>
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### Course Objective:
To introduce the understanding of Sport shoes keeping in view its huge potential & enhanced market share

### Course Outcomes:
The students will be able to learn:
1. Different categories of athletic F/w & their special requirements
2. Biomechanical Aspects of designing a sport shoe
3. Construction & material requirement of different categories of sport shoe

### Syllabus:

#### 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.
Branding in sports shoes.

15 Marks

#### UNIT – II
**Biomechanical Aspects of Running & Design for Sports Shoes**
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.
Importance of Biomechanical Designed sports shoes.
Development of Last for specific sports and its different parameters.
Biomechanical footwear design & fitting for athletic footwear.

20 Marks

#### UNIT – III
**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 Marks

#### UNIT – IV
**Specific requirement for Different Sports Footwear.**

20 Marks

### BOOKS RECOMMENDED:
1. The Sport Shoe: A history from Field to Fashion by Thomas Turner
SEMESTER – VI

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<tr>
<td>Leather Goods Merchandising</td>
<td>BLT -605</td>
<td>04 --</td>
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**Course Objective:**
To introduce the concept of Goods Merchandising to make students more inclined towards entrepreneurship

**Course Outcomes:**
The students will be able to learn:
1. Fashion Forecasting
2. Merchandising, its classification, techniques
3. Buying & Retail supply chain
4. Visual merchandising and space management

**Syllabus:**

**UNIT – I**  
**Fashion Forecasting:**
Introduction to Leather Fashion Forecasting,  
Market & Consumer Research technique in forecasting.  

15 Marks

**UNIT – II**  
**Introduction to Leather Products Merchandising:**
Meaning of Merchandising, Classification of Merchandising,  
Major Areas of Merchandise Management, Role and Responsibilities of merchandisers.  
Technique & Management of Leather Accessories Merchandising.  

20 Marks

**UNIT – III**  
**Leather Products Buying, Retail Industry & Retail Supply Chain:**
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.  
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.  

20 Marks

**UNIT – V**  
**Visual Merchandising and Space Management:**
Meaning and objectives of Visual Merchandising,  
Concept of Space Management, Role of IT in Space Management, Concept of Planogram.  

20 Marks

**BOOKS RECOMMENDED:**
1. In Fashion: From Runway to Retail, Everything You Need to Know to Break Into the Fashion Industry by Annemarie Iverson.
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<td>Footwear Production Technology Lab</td>
<td>BLT-691</td>
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**Course Objective:**
To apply the knowledge of Footwear making & Designing to make 02 self designed footwear (any design & style) to let student ready for a more creative project.

**Course Outcomes:**
The students will be able to learn, revise & apply:
1. Different footwear making concept
2. Different footwear designing concept

**Syllabus:**
The students will be asked to make 02 pairs of self designed (Any design & Style) Footwear by applying their knowledge of Footwear manufacturing and Footwear designing to prepare them for their more creative final project, which may act as a minimum viable product for on their journey to Entrepreneurship.
SEMESTER – VI

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<tr>
<td>Computer Application &amp; 3D CAD Lab</td>
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**Course Objective:**
To introduce concept of 3D Computer Aided Designing for F/w to make students ready to get employability as CAD designer in F/w industry as per the advanced industrial needs.

**Course Outcomes:**
The students will be able to learn:
1. Hands on to Delcam Crispin 3D CAD software
2. Direct Designing of Scanned Last
3. Transfer of 2D design to 3D
4. Transfer to 3 D design to 2D and pattern cutting by plotter cutter

**Syllabus:**

*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
# SEMESTER – VI

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<tr>
<td>Final Project (Major)</td>
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**Course Objective:**
To apply the knowledge of Footwear/Goods/Leather making, material selection, Designing, Costing and applying creativity to make a project output to enable students to think about starting of their own venture related to their selected project

**Course Outcomes:**
The students will be able to learn & apply:
1. Market survey, Material Selection & Costing procedure
2. Making of 2 pcs of their innovation selected project
3. Writing of report in form of PPR and factory setup

**Practical Exercises on the followings :-**

i. **Theory**

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.