



# **SYLLABUS**

## **DIPLOMA IN LEATHER TECHNOLOGY**

**2015-2016**

**M - SCHEME**

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**DIRECTORATE OF TECHNICAL EDUCATION  
GOVERNMENT OF TAMILNADU**

## **DIPLOMA IN LEATHER TECHNOLOGY**

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## DIPLOMA COURSES IN ENGINEERING/TECHNOLOGY

### (SEMESTER SYSTEM)

(Implemented from 2015- 2016)

#### M – SCHEME

#### REGULATIONS\*

\* *Applicable to the Diploma Courses other than Diploma in Hotel Management & Catering Technology and the Diploma Courses offered through MGR Film Institute, Chennai.*

#### 1. Description of the Course:

##### a. Full Time (3 years)

The Course for the full Time Diploma in Engineering shall extend over a period of three academic years, consisting of 6 semesters\* and the First Year is common to all Engineering Branches.

##### b. Sandwich (3½ years)

The Course for the Diploma in Engineering (sandwich) shall extend over a period of three and half academic years, consisting of 7 semesters\* and the First Year is common to all Engineering Branches. The subjects of three years full time diploma course being regrouped for academic convenience.

During 4<sup>th</sup> and/or during 7<sup>th</sup> semester the students undergo industrial training for six months/ one year. Industrial training examination will be conducted after completion of every 6 months of industrial training

##### c. Part Time (4 years)

The course for the diploma in Engineering shall extend over a period of 4 academic years containing of 8 semesters\*, the subjects of 3 year full time diploma courses being regrouped for academic convenience.

\* Each Semester will have 15 weeks duration of study with 35 hrs. /Week for Regular Diploma Programme and 18hrs/ week (21 hrs. / Week I year) for Part-Time Diploma Programmes.

The Curriculum for all the 6 Semesters of Diploma courses (Engineering & Special Diploma Courses viz. Textile Technology, Leather Technology, Printing Technology, Chemical Technology etc.) have been revised and revised curriculum is applicable for the candidates admitted from 2015 – 2016 academic year onwards.

## 2. Condition for Admission:

Condition for admission to the diploma courses shall be required to have passed in

The S.S.L.C Examination of the Board of Secondary Education, TamilNadu.

(Or)

The Anglo Indian High School Examination with eligibility for Higher Secondary Course in TamilNadu.

(Or)

The Matriculation Examination of Tamil Nadu.

(Or)

Any other Examination recognized as equivalent to the above by the Board of Secondary Education, TamilNadu.

Note: In addition, at the time of admission the candidate will have to satisfy certain minimum requirements, which may be prescribed from time to time.

## 3. Admission to Second year (Lateral Entry):

A pass in HSC ( Academic ) or ( Vocational ) courses mentioned in the Higher Secondary Schools in TamilNadu affiliated to the TamilNadu Higher Secondary Board with eligibility for university Courses of study or equivalent examination, & Should have studied the following subjects.

| Sl. No | Courses                                      | H.Sc Academic                                                                              | H.Sc Vocational                                                                                                                      |                                                                                                                                                                                      |
|--------|----------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |                                              | Subjects Studied                                                                           | Subjects Studied                                                                                                                     |                                                                                                                                                                                      |
|        |                                              |                                                                                            | Related subjects                                                                                                                     | Vocational subjects                                                                                                                                                                  |
| 1.     | All the Regular and Sandwich Diploma Courses | Maths, Physics & Chemistry                                                                 | Maths / Physics / Chemistry                                                                                                          | Related Vocational Subjects Theory & Practical                                                                                                                                       |
| 2.     | Diploma course in Modern Office Practice     | English & Accountancy<br>English & Elements of Economics<br>English & Elements of Commerce | English & Accountancy,<br>English & Elements of Economics,<br>English & Management Principles & Techniques,<br>English & Typewriting | Accountancy & Auditing, Banking, Business Management, Co-operative Management, International Trade, Marketing & Salesmanship, Insurance & Material Management, Office Secretaryship. |

- For the diploma Courses related with Engineering/Technology, the related / equivalent subjects prescribed along with Practical may also be taken for arriving the eligibility.
- Branch will be allotted according to merit through counseling by the respective Principal as per communal reservation.
- For admission to the Textile Technology, Leather Technology, Printing Technology, Chemical Technology and Modern Office Practice Diploma courses the candidates studied the related subjects will be given first preference.
- *Candidates who have studied Commerce Subjects are not eligible for Engineering Diploma Courses.*

**4. Age Limit: No Age limit.**

**5. Medium of Instruction: English**

**6. Eligibility for the Award of Diploma:**

No candidate shall be eligible for the Diploma unless he/she has undergone the prescribed course of study for a period of not less than 3 academic years in any institution affiliated to the State Board of Technical Education and Training, TamilNadu, when joined in First Year and two years if joined under Lateral Entry scheme in the second year and passed the prescribed examination.

The minimum and maximum period for completion of Diploma Courses are as given below:

| Diploma Course           | Minimum Period | Maximum Period |
|--------------------------|----------------|----------------|
| Full Time                | 3 Years        | 6 Years        |
| Full Time(Lateral Entry) | 2 Years        | 5 Years        |
| Sandwich                 | 3½ Years       | 6½ Years       |
| Part Time                | 4 Years        | 7 Years        |

**7. Subjects of Study and Curriculum outline:**

The subjects of study shall be in accordance with the syllabus prescribed from time to time, both in theory and practical. The curriculum outline is given in Annexure - I

**8. Examinations:**

Board Examinations in all subjects of all the semesters under the scheme of examinations will be conducted at the end of each semester.

The Internal assessment marks for all the subjects will be awarded on the basis of continuous internal assessment earned during the semester concerned. For each subject 25 marks are allotted for internal assessment and 75 marks are allotted for Board Examination.

## 9. Continuous Internal Assessment:

### A . For Theory Subjects:

The Internal Assessment marks for a total of 25 marks, which are to be distributed as follows:

#### i. Subject Attendance

**5 Marks**

(Award of marks for subject attendance to each subject theory/practical will as per the range given below)

|            |   |         |
|------------|---|---------|
| 80% - 83%  | } | 1 Mark  |
| 84% - 87%  |   | 2 Marks |
| 88% - 91%  |   | 3 Marks |
| 92% - 95%  |   | 4 Marks |
| 96% - 100% |   | 5 Marks |

#### ii) Test #

**10 Marks**

2 Tests each of 2 hours duration for a total of 50 marks are to be conducted. Out of which the best one will be taken and the marks to be reduced to: 05 marks

The Test – III is to be the Model test covering all the five units and the marks so obtained will be reduced to : 05 marks

**Total 10 marks**

| TEST     | UNITS                                                                                                             | WHEN TO CONDUCT              | MARKS | DURATION |
|----------|-------------------------------------------------------------------------------------------------------------------|------------------------------|-------|----------|
| Test I   | Unit – I & II                                                                                                     | End of 6 <sup>th</sup> week  | 50    | 2 Hrs    |
| Test II  | Unit – III & IV                                                                                                   | End of 12 <sup>th</sup> week | 50    | 2 Hrs    |
| Test III | <b>Model Examination - Compulsory</b><br>Covering all the 5 Units.<br>(Board Examination-question paper-pattern). | End of 15 <sup>th</sup> week | 75    | 3 Hrs    |

# - From the Academic year 2015-2016 onwards.

## Question Paper Pattern for the Periodical Test :( Test - I & Test- II)

### With no choice:

|                        |                        |                 |
|------------------------|------------------------|-----------------|
| PART A type questions: | 4 Questions X 2 mark   | ... .. 8 marks  |
| PART B type questions: | 4 Questions X 3 marks  | ... .. 12 marks |
| PART C type questions: | 3 Questions X 10 marks | ... .. 30 marks |
|                        |                        | -----           |
|                        | <b>Total</b>           | <b>50 marks</b> |
|                        |                        | -----           |

### iii) Assignment

**10 Marks**

For each subject Three Assignments are to be given each for 20 marks and the average marks scored should be reduced for 10 marks

All Test Papers and assignment notebooks after getting the signature with date from the students must be kept in the safe custody in the Department for verification and audit. It should be preserved for 2 Semesters and produced to the flying squad and the inspection team at the time of inspection/verification.

### B. For Practical Subjects:

The internal assessment mark for a total of 25 marks which are to be distributed as follows:-

|    |                                                                        |                   |
|----|------------------------------------------------------------------------|-------------------|
| a) | Attendance                                                             | : <b>5 Marks</b>  |
|    | (Award of marks as same as Theory subjects)                            |                   |
| b) | Procedure/ observation and tabulation/<br>Other Practical related Work | : <b>10 Marks</b> |
| c) | Record writing                                                         | : <b>10 Marks</b> |
|    |                                                                        | -----             |
|    | <b>TOTAL</b>                                                           | : <b>25 Marks</b> |
|    |                                                                        | -----             |

- *All the Experiments/exercises indicated in the syllabus should be completed and the same to be given for final board examinations.*
- The Record for every completed exercise should be submitted in the subsequent Practical classes and marks should be awarded for 20 for each exercise as per the above allocation.
- At the end of the Semester, the average marks of all the exercises should be calculated for 20 marks and the marks awarded for attendance is to be added to arrive at the internal assessment mark for Practical. (20+5=25 marks)
- The students have to submit the duly signed bonafide record note book/file during the Practical Board Examinations.

- All the marks awarded for assignment, Test and attendance should be entered in the Personal Log Book of the staff, who is handling the subject. This is applicable to both Theory and Practical subjects.

#### 10. Life and Employability Skill Practical:

The Life and Employability Skill Practical with more emphasis is being introduced in IV Semester for Circuit Branches and in V Semester for other branches of Engineering.

Much Stress is given to increase the employability of the students:

Internal assessment Mark ..... **25 Marks**

#### 11. Project Work:

The students of all the Diploma Programmes (**except Diploma in Modern Office Practice**) have to do a Project Work as part of the Curriculum and in partial fulfillment for the award of Diploma by the State Board of Technical Education and Training, Tamilnadu. In order to encourage students to do worthwhile and innovative projects, every year prizes are awarded for the best three projects i.e. institution wise, region wise and state wise. **The Project work must be reviewed twice in the same semester.**

##### a) Internal assessment mark for Project Work & Viva Voce:

|                   |     |                                                                  |
|-------------------|-----|------------------------------------------------------------------|
| Project Review I  | ... | <b>10 marks</b>                                                  |
| Project Review II | ... | <b>10 marks</b>                                                  |
| Attendance        | ... | <b>05 marks</b> (award of marks same as theory subjects pattern) |
| Total             | ... | <b>25 marks</b>                                                  |

Proper record to be maintained for the two Project Reviews, and It should be preserved for 2 Semesters and produced to the flying squad and the inspection team at the time of inspection/verification.

##### b) Allocation of Mark for Project Work & Viva Voce in Board

###### Examination:

|                                    |     |                 |
|------------------------------------|-----|-----------------|
| Viva Voce                          | ... | <b>30 marks</b> |
| Marks for Report Preparation, Demo | ... | <b>35 marks</b> |
| Total                              |     | <b>65 marks</b> |

##### c) Written Test Mark (from 2 topics for 30 minutes duration): \$

|                           |                         |                  |
|---------------------------|-------------------------|------------------|
| i) Environment Management | 2 questions X 2 ½ marks | <b>= 5 marks</b> |
| ii) Disaster Management   | 2 questions X 2 ½ marks | <b>= 5 marks</b> |
|                           |                         | <b>10marks</b>   |

\$ - Selection of Questions should be from Question Bank, by the External Examiner.

No choice need be given to the candidates.

|                                                           |           |                 |
|-----------------------------------------------------------|-----------|-----------------|
| Project Work & Viva Voce in Board Examination             | --        | <b>65 Marks</b> |
| Written Test Mark (from 2 topics for 30 minutes duration) | --        | <b>10 Marks</b> |
| <b>TOTAL</b>                                              | <b>--</b> | <b>75 Marks</b> |

**A neatly prepared PROJECT REPORT as per the format has to be submitted by individual during the Project Work & Viva Voce Board examination.**

## **12. Scheme of Examinations:**

The Scheme of examinations for subjects is given in **Annexure - II**.

## **13. Criteria for Pass:**

1. No candidate shall be eligible for the award of Diploma unless he/she has undergone the prescribed course of study successfully in an institution approved by AICTE and affiliated to the State Board of Technical Education & Training, Tamil Nadu and pass all the subjects prescribed in the curriculum.
2. A candidate shall be declared to have passed the examination in a subject if he/she secures not less than *40% in theory subjects* and *50% in practical subject* out of the total prescribed maximum marks including both the internal assessment and the Board Examination marks put together, subject to the condition that he/she secures at least a minimum of *30 marks out of 75 marks in the Board's Theory examinations and a minimum of 35 marks out of 75 marks in the Board Practical Examinations.*

## **14. Classification of successful candidates:**

Classification of candidates who will pass out the final examinations from April 2018 onwards (Joined in first year in 2015-2016) will be done as specified below.

### **First Class with Superlative Distinction:**

A candidate will be declared to have passed in **First Class with Superlative Distinction** if he/she secures not less than 75% of the marks in all the subjects and passes all the semesters in the first appearance itself and passes all subjects within the stipulated period of study 3/ 3½/ 4 years (Full Time/Sandwich/Part Time) without any break in study.

**First Class with Distinction:**

A candidate will be declared to have passed in **First Class with Distinction** if he/she secures not less than 75% of the aggregate of marks in all the semesters put together and passes all the semesters except the I and II semesters in the first appearance itself and passes all the subjects within the stipulated period of study 3/ 3½/ 4 years (Full Time/Sandwich/Part Time) without any break in study.

**First Class:**

A candidate will be declared to have passed in **First Class** if he/she secures not less than 60% of the aggregate marks in all semesters put together and passes all the subjects within the stipulated period of study 3/ 3½ / 4 years (Full Time/Sandwich/Part Time) without any break in study.

**Second Class:**

All other successful candidates will be declared to have passed in **Second Class**.

The above mentioned classifications are also applicable for the Sandwich / Part-Time students who pass out Final Examination from October 2018 /April 2019 onwards (both joined in First Year in 2015-2016)

**15. Duration of a period in the Class Time Table:**

The duration of each period of instruction is 1 hour and the total period of instruction hours excluding interval and Lunch break in a day should be uniformly maintained as 7 hours corresponding to 7 periods of instruction (Theory & Practical).

**16. Seminar:**

For seminar the total seminar 15 hours(15 weeks x 1hour) should be distributed equally to total theory subject per semester(i.e 15 hours divided by 3/4 subject). A topic from subject or current scenario is given to students. During the seminar hour students have to present the paper and submit seminar material to the respective staff member, who is handling the subject. It should be preserved for 2 Semesters and produced to the flying squad and the inspection team at the time of inspection/verification.

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## ANNEXURE - I

### CURRICULUM OUTLINE

#### THIRD SEMESTER

| Subject Code | SUBJECT                                 | HOURS PER WEEK |                    |                 |             |
|--------------|-----------------------------------------|----------------|--------------------|-----------------|-------------|
|              |                                         | Theory Hours   | Tutorial / Drawing | Practical hours | Total Hours |
| 39031        | Applied Leather Chemistry               | 5              | --                 | --              | 5           |
| 39032        | Basics of Leather Manufacture           | 5              | --                 | --              | 5           |
| 39033        | Theory of Pre tanning and Tanning       | 4              | --                 | --              | 4           |
| 39034        | Process of Heavy Leather Manufacture    | 4              | --                 | --              | 4           |
| 39035        | Pre tanning Chemicals Testing Practical | --             | 1                  | 3               | 4           |
| 39036        | Pre tanning process Practical           | --             | 1                  | 3               | 4           |
| 39037        | Heavy Leather manufacture Practical     | --             | 1                  | 3               | 4           |
| 30001        | Computer Application Practical*         | -              | -                  | 4               | 4           |
| Seminar      |                                         | 1              | --                 | --              | 1           |
| <b>TOTAL</b> |                                         | 19             | 3                  | 13              | <b>35</b>   |

#### FOURTH SEMESTER

| Subject Code | SUBJECT                                    | HOURS PER WEEK |                    |                 |             |
|--------------|--------------------------------------------|----------------|--------------------|-----------------|-------------|
|              |                                            | Theory Hours   | Tutorial / Drawing | Practical hours | Total Hours |
| 39041        | Theory of Post tanning and Finishing       | 5              | --                 | --              | 5           |
| 39042        | Process of light leather manufacture       | 5              | --                 | --              | 5           |
| 39043        | Introduction to Leather Products Making    | 4              | --                 | --              | 4           |
| 39044        | Safety in Leather Industry                 | 4              | --                 | --              | 4           |
| 39045        | Light Leather Manufacture practical        | -              | 1                  | 5               | 6           |
| 39046        | Leather machines basic operation practical | -              | 1                  | 5               | 6           |
| 30002        | Life and Employability skill Practical*    | -              | -                  | 4               | 4           |
| Seminar      |                                            | 1              | -                  | -               | 1           |
| <b>TOTAL</b> |                                            | 19             | 2                  | 14              | <b>35</b>   |

## CURRICULUM OUTLINE

### FIFTH SEMESTER

Period of in plant training is from - 1st May to 15<sup>th</sup> September (19-weeks)

| Subject Code | SUBJECT                                 | HOURS PER WEEK |                    |                 |             |
|--------------|-----------------------------------------|----------------|--------------------|-----------------|-------------|
|              |                                         | Theory Hours   | Tutorial / Drawing | Practical hours | Total Hours |
| 39092        | Industrial Training Report & Assessment | --             | --                 | --              | --          |
| <b>TOTAL</b> |                                         | --             | --                 | --              | --          |

### SIXTH SEMESTER

| Subject Code | SUBJECT                                       | HOURS PER WEEK |                    |                 |             |
|--------------|-----------------------------------------------|----------------|--------------------|-----------------|-------------|
|              |                                               | Theory Hours   | Tutorial / Drawing | Practical hours | Total Hours |
| 39061        | Leather Chemicals & Auxiliaries               | 5              | --                 | --              | 5           |
| 39062        | Theory of Leather testing                     | 5              | --                 | --              | 5           |
| 39063        | Tannery Effluent Treatment & Waste Management | 4              | --                 | --              | 4           |
| 39064        | Leather Product Fabrication                   | 4              | --                 | --              | 4           |
| 39065        | Chemical testing of Leather practical         | -              | 1                  | 5               | 6           |
| 39066        | Leather finishing practical                   | -              | 1                  | 3               | 4           |
| 39067        | Leather Product Fabrication practical         | -              | 1                  | 5               | 6           |
| Seminar      |                                               | 1              | -                  | -               | 1           |
| <b>TOTAL</b> |                                               | 19             | 3                  | 13              | <b>35</b>   |

**SEVENTH SEMESTER**

| Subject Code | SUBJECT                                     | HOURS PER WEEK |                    |                 |             |
|--------------|---------------------------------------------|----------------|--------------------|-----------------|-------------|
|              |                                             | Theory Hours   | Tutorial / Drawing | Practical hours | Total Hours |
| 39071        | Industrial Management & Entrepreneurship    | 4              | --                 | --              | 4           |
| 39072        | Footwear fabrication Technology             | 5              | --                 | --              | 5           |
| 39073        | Plant layout and leather machines           | 5              | --                 | --              | 5           |
| 39074        | Footwear Fabrication Practical              | -              | 1                  | 5               | 6           |
| 39075        | Physical testing practical                  | -              | 1                  | 3               | 4           |
| 39076        | Plant layout and leather machines Practical | -              | 1                  | 5               | 6           |
| 39077        | Project Work                                | -              | -                  | 4               | 4           |
| Seminar      |                                             | 1              | -                  | -               | 1           |
| <b>TOTAL</b> |                                             | 15             | 3                  | 17              | <b>35</b>   |

**ANNEXURE – II**  
**SCHEME OF THE EXAMINATION**

**THIRD SEMESTER**

| Subject Code | SUBJECT                                 | Examination Marks         |                   |            | Minimum for pass<br>Duration of Exam<br>Hours |   |
|--------------|-----------------------------------------|---------------------------|-------------------|------------|-----------------------------------------------|---|
|              |                                         | Internal assessment Marks | Board Exam. Marks | Total Mark |                                               |   |
| 39031        | Applied Leather Chemistry               | 25                        | 75                | 100        | 40                                            | 3 |
| 39032        | Basics of Leather Manufacture           | 25                        | 75                | 100        | 40                                            | 3 |
| 39033        | Theory of Pre tanning and Tanning       | 25                        | 75                | 100        | 40                                            | 3 |
| 39034        | Process of Heavy Leather Manufacture    | 25                        | 75                | 100        | 40                                            | 3 |
| 39035        | Pre tanning Chemicals Testing Practical | 25                        | 75                | 100        | 50                                            | 3 |
| 39036        | Pre tanning process Practical           | 25                        | 75                | 100        | 50                                            | 3 |
| 39037        | Heavy Leather manufacture Practical     | 25                        | 75                | 100        | 50                                            | 3 |
| 30001        | Computer Application Practical*         | 25                        | 75                | 100        | 50                                            | 3 |
|              |                                         | <b>200</b>                | <b>600</b>        | <b>800</b> |                                               |   |

**FOURTH SEMESTER**

| Subject Code | SUBJECT                                    | Examination Marks         |                   |            | Minimum for pass<br>Duration of Exam<br>Hours |   |
|--------------|--------------------------------------------|---------------------------|-------------------|------------|-----------------------------------------------|---|
|              |                                            | Internal assessment Marks | Board Exam. Marks | Total Mark |                                               |   |
| 39041        | Theory of Post tanning and Finishing       | 25                        | 75                | 100        | 40                                            | 3 |
| 39042        | Process of light leather manufacture       | 25                        | 75                | 100        | 40                                            | 3 |
| 39043        | Introduction to Leather Products Making    | 25                        | 75                | 100        | 40                                            | 3 |
| 39044        | Safety in Leather Industry                 | 25                        | 75                | 100        | 40                                            | 3 |
| 39045        | Light Leather Manufacture practical        | 25                        | 75                | 100        | 50                                            | 3 |
| 39046        | Leather machines basic operation practical | 25                        | 75                | 100        | 50                                            | 3 |
| 30002        | Life and Employability skill Practical*    | 25                        | 75                | 100        | 50                                            | 3 |
|              |                                            | <b>175</b>                | <b>525</b>        | <b>700</b> |                                               |   |

## SCHEME OF THE EXAMINATION

### FIFTH SEMESTER

| Subject Code | SUBJECT                                 | Examination Marks         |                   |            | Minimum for pass | Duration of Exam Hours |
|--------------|-----------------------------------------|---------------------------|-------------------|------------|------------------|------------------------|
|              |                                         | Internal assessment Marks | Board Exam. Marks | Total Mark |                  |                        |
| 39092        | Industrial Training Report & Assessment | 25                        | 75                | 100        | 50               | 3                      |
|              |                                         | <b>25</b>                 | <b>75</b>         | <b>100</b> |                  |                        |

### SIXTH SEMESTER

| Subject Code | SUBJECT                                       | Examination Marks         |                   |            | Minimum for pass | Duration of Exam Hours |
|--------------|-----------------------------------------------|---------------------------|-------------------|------------|------------------|------------------------|
|              |                                               | Internal assessment Marks | Board Exam. Marks | Total Mark |                  |                        |
| 39061        | Leather Chemicals & Auxiliaries               | 25                        | 75                | 100        | 40               | 3                      |
| 39062        | Theory of Leather testing                     | 25                        | 75                | 100        | 40               | 3                      |
| 39063        | Tannery Effluent Treatment & Waste Management | 25                        | 75                | 100        | 40               | 3                      |
| 39064        | Leather Product Fabrication                   | 25                        | 75                | 100        | 40               | 3                      |
| 39065        | Chemical testing of Leather practical         | 25                        | 75                | 100        | 50               | 3                      |
| 39066        | Leather finishing practical                   | 25                        | 75                | 100        | 50               | 3                      |
| 39067        | Leather Product Fabrication practical         | 25                        | 75                | 100        | 50               | 3                      |
| <b>TOTAL</b> |                                               | <b>175</b>                | <b>525</b>        | <b>700</b> |                  |                        |

## SCHEME OF THE EXAMINATION

### SEVENTH SEMESTER

| Subject Code | SUBJECT                                     | Examination Marks         |                  |            | Minimum for pass | Duration of Exam Hours |
|--------------|---------------------------------------------|---------------------------|------------------|------------|------------------|------------------------|
|              |                                             | Internal assessment Marks | Board Exam Marks | Total Mark |                  |                        |
| 39071        | Industrial Management & Entrepreneurship    | 25                        | 75               | 100        | 40               | 3                      |
| 39072        | Footwear fabrication Technology             | 25                        | 75               | 100        | 40               | 3                      |
| 39073        | Plant layout and leather machines           | 25                        | 75               | 100        | 40               | 3                      |
| 39074        | Footwear Fabrication Practical              | 25                        | 75               | 100        | 50               | 3                      |
| 39075        | Physical testing practical                  | 25                        | 75               | 100        | 50               | 3                      |
| 39076        | Plant layout and leather machines Practical | 25                        | 75               | 100        | 50               | 3                      |
| 39077        | Project Work                                | 25                        | 75               | 100        | 50               | 3                      |
| <b>TOTAL</b> |                                             | <b>175</b>                | <b>525</b>       | <b>700</b> |                  |                        |

## Board Examination - Question paper pattern

### Common for all theory subjects

Time: 3 Hrs

Max. Marks: 75

**PART A** - (1 to 8) 5 Questions are to be answered out of 8 questions for 2 marks each. (Question No. 8 will be the compulsory question and can be asked from any one of the units) (From each unit maximum of two 2 marks questions alone can be asked)

**PART B** - (9 to 16) 5 Questions are to be answered out of 8 questions for 3 marks each. (Question No. 16 will be the compulsory question and can be asked from any one of the units) (From each unit maximum of two 3 marks questions alone can be asked)

**PART C** - (17 to 21) Five Questions will be in the Either OR Pattern. Students have to answer these five questions. Each question carries 10 marks. (Based on the discretion of the question setter, he/she can ask two five mark questions (with sub division A & sub division B) instead of one ten marks question if required)



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**II YEAR**

**M – SCHEME**

**III SEMESTER**

**2015 - 2016**

**APPLIED LEATHER CHEMISTRY**

**CURRICULAM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**  
**M-SCHEME**  
 (Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
 Course Code : 2101  
 Subject Code : **39031**  
 Semester : III Semester  
 Subject Title : APPLIED LEATHER CHEMISTRY

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title             | Instructions |                 | Examination         |                   |       |          |
|---------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                           | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| APPLIED LEATHER CHEMISTRY | 5 Hrs        | 75 Hrs          | Internal Assessment | Board Examination | Total |          |
|                           |              |                 | 25                  | 75                | 100   | 3 Hrs    |

**APPLIED LEATHER CHEMISTRY - 39031**  
**DETAILED SYLLABUS**

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                                                                                                                      | Hours |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Proteins –their classification –Chemical constitution of proteins – properties of protein-test of proteins – hydrolysis of proteins – polypeptide – structure of proteins – denaturation of proteins- uses of proteins.<br><br>Amino acids – General properties of amino acids -- collagen – amino acids of collagen – Iso-electric point -swelling in acid solution – neutral salt effect – reactive groups of collagen .             | 13    |
| II              | Enzymes - enzymes of the skin – chemistry of enzymes - enzymes in leather processing- enzymes in the removal of hair, flesh, natural fat and fiber opening through the use of enzymes. Types of enzymes – proteolytic enzymes – their classification –reactive groups of proteolytic enzymes and their functions.                                                                                                                      | 13    |
| III             | Aromatic compounds - Differences between Aliphatic and Aromatic Compounds. Preparation, Properties and uses of Benzene, Nitrobenzene, Aniline, and Phenol. Types of Alcohol - Primary Secondary and tertiary alcohol - differences - Functional Groups and the characteristic properties of alcohol, Aldehyde, Ketones Acids, Esters, Ethers and Amines. Preparation, Properties and uses of Formic acid, Acetic Acid, and Oxalic Acid | 13    |
| IV              | Analysis of Water - Types of Water - Hardness of Water - Water Softening method Temporary and Permanent Hardness - Magnesia Hardness - Chloride Content - Sulphate Content - Iron Estimation - Analysis of Salt - Lime and sodium Sulphide.                                                                                                                                                                                            | 13    |
| V               | Analysis of deliming salts - Analysis of Commercial Bate - Analysis of soak liquor lime liquor and pickle liquor - Analysis of Vegetable Tanning Materials and extracts - Qualitative & Quantitative analysis of Vegetable Tanning Materials - Analysis of formaldehyde.                                                                                                                                                               | 13    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10    |

**Reference Book :**

1. Organic Chemistry - VI Edition - R.T. Morrison and R.N. Boyd Prentice Hall Inc(1966) USA.
2. Physical Chemistry - Kund and Jain, S. Chand and Company, Delhi.
3. Organic Chemistry by I.L. Final - Vol-I
4. Inorganic Chemistry by B.S. Bhal & G.D. Sharma.
5. Analytical Chemistry of Leather Manufacture by P.K. Sarkar, Indian Leather Technologist Association, Calcutta



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M – SCHEME**

**III-SEMESTER**

**2015 - 2016**

**BASICS OF LEATHER MANUFACTURE**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39032**  
. Semester : III Semester  
Subject Title : BASICS OF LEATHER MANUFACTURE

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                 | Instructions |                 | Examination         |                   |       |          |
|-------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                               | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| BASICS OF LEATHER MANUFACTURE | 5 Hrs        | 75 Hrs          | Internal Assessment | Board Examination | Total |          |
|                               |              |                 | 25                  | 75                | 100   | 3 Hrs    |

## BASICS OF LEATHER MANUFACTURE - 39032

### DETAILED SYLLABUS

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                         | Hours |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Live stock population –Classification & Availability of Hides & Skins - Defects in hides and skins - Flaying of animals – Assortment and Grading of raw Hides & Skins - cow, buff, goat and sheep.                                                                                                        | 13    |
| II              | Histological characteristics , Structure & Chemical constituents of Hides and Skins -- Chemistry and principles involved in curing process- Preservation Techniques - Principles involved in preservations - short term preservation techniques- Grain pattern of hides and skins- Conventional & Exotic. | 13    |
| III             | Chemistry and Principles of different pretanning process like - Soaking - Liming - Deliming - Bating - Pickling - Depickling and degreasing - Mechanical operations-Paddle, drum, Fleshing & unhairing                                                                                                    | 13    |
| IV              | Tanning - objects of Tanning - Various type of tanning materials - Vegetable Tanning - Chrome Tanning - Alum and Aldehyde Tanning - Oil Tanning.                                                                                                                                                          | 13    |
| V               | Post tanning processes objects and methods - Retanning - Neutralization, dyeing fat liquoring and Finishing - Mechanical operations-Samming, Setting, shaving, staking, Togglng, buffing & Glazing.                                                                                                       | 13    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                           | 10    |

#### Reference Book :

1. Theory and Practice of Leather Manufacture by K.T. Sarkar, Ajoy Sorcor, Chennai.
2. Koteswara Rao. C and Olivannan M.S Lecture notes on dyeing and finishing of leathers, Chennai.
3. Introduction to the principles of Leather Manufacture - S.S. Dutta , Indian Leather Technologist Association, Culcutta.
4. Practical aspects of the manufacture of upper Leather - Jyotirmay Dey, Indian Leather Technologist Association, Culcutta.



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M – SCHEME**

**2015 - 2016**

[www.binnls.com](http://www.binnls.com)

**III -SEMESTER**

**THEORY OF PRE TANNING AND TANNING**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39033**  
Semester : III Semester  
Subject Title : THEORY OF PRETANNING AND TANNING

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                   | Instructions |                 | Examination         |                   |       |          |
|---------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                 | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| THEORY OF PRETANNING AND TANNNG | 4 Hrs        | 60 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                 |              |                 | 25                  | 75                | 100   |          |

**THEORY OF PRETANNING AND TANNING - 39033**  
**DETAILED SYLLABUS**

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                                                                                        | Hours |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Curing - principles of curing - Salt stain - redheat formation - salt less or less salt curing use of bio-cides .Principles of soaking – various methods of soaking - use of wetting agents and other auxiliaries in soaking process – Liming - Chemistry of unhairing - Swelling of collagen-osmotic swelling – lytrophic swelling - enzymatic unhairing – Sharpening agents.                           | 10    |
| II              | Deliming - Chemistry of deliming –Different methods of deliming and comparison - Bating - use of enzymes in bating – commercial bates - factors influencing the bating process – Pickling - chemistry of pickling -Salt free pickling system – de-pickling - degreasing – solvent free eco-friendly degreasing system.                                                                                   | 10    |
| III             | Vegetable Tannins - Occurrence and classification - Chemistry of Hydrolysable Tannins - Chemistry of Condensed Tannins - Study of Tanning Materials like Avaram, Konnam, Wattle, Babul, Myrobalan, Quebracho etc. Manufacture of Vegetable tanning extracts - Factors involved in Vegetable Tanning - Non tannins and their effect on the physical properties of leather -Mechanism of vegetable tannage | 10    |
| IV              | Chemistry of Chromium complexes - Preparation of Chromium liquors - Werner's co-ordination theory of Chromium complexes - Basicity - Olation, Oxalation and aggregation - Charge characteristic - Effect of the addition of masking salts - Effect of PH, concentration, Nature of Complex, Salt and Temperature –High chrome exhaust aids - Mechanism of Chrome Tannage.                                | 10    |
| V               | Alum Tanning - Chemistry of aluminium Salts - Theory and Mechanism of alum tanning - Chemistry and mechanism of Zirconium - Chemistry of Tanning Characteristics of Silicates and Phosphates - Theory and mechanism of organic Tannage viz. - Formaldehyde - Oil Tannages.                                                                                                                               | 10    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                                                                                          | 10    |

**Reference Book :**

1. Chemistry of Tanning Process - by K.H. Gustavson Academic Press Newyork.
2. Introduction to the Principles of Leather Manufacture by S.S. Dutta - Indian Leather Technologist Association, Calcutta.
3. Theory and Practice of Leather Manufacture by K.T. Sarkar, Ajoy Sorcar, Madras.
4. Asian Productivity Organisation - Lecture Notes on Leather



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

[www.binils.com](http://www.binils.com)

**III SEMESTER**

**PROCESS OF HEAVY LEATHER MANUFACTURE**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**L-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39034**  
Semester : IV Semester  
Subject Title : PROCESS OF HEAVY LEATHER MANUFACTURE

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                        | Instructions |                 | Examination         |                   |       |          |
|--------------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                      | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| PROCESS OF HEAVY LEATHER MANUFACTURE | 4Hrs         | 60 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                      |              |                 | 25                  | 75                | 100   | 3 Hrs    |

## PROCESS OF HEAVY LEATHER MANUFACTURE - 39034

### DETAILED SYLLABUS

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                                      | Hours |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Materials for heavy leather manufacturing - Principles of different methods of pretanning techniques adopted in Heavy Leather Production - Soaking - Liming - Deliming - Bating - Pickling - Depickling and degreasing - General Practice in the manufacture of E.I. Leathers - General Practice in Chrome Tanning - Manufacture of Wet blue Leathers. | 10    |
| II              | Manufacture of Sole Leather - Vegetable Sole Leather - Chrome Sole Leather - Vegetable & Chrome flexible soles - Methods & Criteria of Water Proofing of Sole Leather - Defects in Sole Leather                                                                                                                                                        | 10    |
| III             | Manufacture of Harness and Saddlery Leathers - Leather for Luggage and automobile - Upholstry Leathers - Insoles - Welting Leathers - Case Hides - Khattai Leathers - Russet Leathers                                                                                                                                                                  | 10    |
| IV              | Properties and Manufacturing methods of Belting Leathers - Chrome and Vegetable belting leathers - Case Leathers - Pickers -Picking Band Leathers - Industrial gloving leathers, Wicket Keeper and Batting Gloves - Production of Parchments and their uses.                                                                                           | 10    |
| V               | Hydraulic and mechanical leathers - cup and pump leathers - Leather Washers - Oil Seal Leathers - Impregnation, methods of Hydraulic and pneumatic leathers - Sports Goods Leathers - Cricket Ball - Hockey Ball and Foot Ball Leathers                                                                                                                | 10    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                                        | 10    |

#### Reference Book :

1. A Practical Guide to heavy Leather Processing - Choichi Ogivaria - Fuel and Leather Research Center Karachi, 1980.
2. Practical Leather technology by T.C. Thorstenson, E. Krieger - Publishing Co., Malabar, Floride 1993.
3. Central Leather Research Institute - Process Bullietions.
4. The manufacture of Sole and other heavy Leathers Humphreyes G.H.W and Jones - Pergamon Press.



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M- SCHEME**

**2015 - 2016**

**III SEMESTER**

**PRE TANNING CHEMICALS TESTING  
PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

## STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

### M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39035**  
Semester : III Semester  
Subject Title : PRE TANNING CHEMICALS TESTING LAB

### TEACHING AND SCHEME OF EXAMINATION:

No of weeks per semester: 15 weeks

| Subject Title                       | Instructions |                 | Examination         |                   |       |          |
|-------------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                     | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| LEATHER<br>CHEMICALS<br>TESTING LAB | 4 Hrs        | 60 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                     |              |                 | 25                  | 75                | 100   |          |

### **RATIONALE:**

In Diploma level engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

### **GUIDELINES:**

- All the Eight experiments given in the list of experiments should be completed and given for the end semester practical examination.
- In order to develop best skills in handling Instruments/Equipment and taking readings in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

### **ALLOCATION OF MARKS**

|                      |          |
|----------------------|----------|
| Procedure Writing    | 20 marks |
| Experiment           | 40 marks |
| Calculation & Result | 10 marks |
| Viva Voce            | 05 marks |
| <hr/>                |          |
| Total                | 75 Marks |

### **DETAILED SYLLABUS**

Contents: PRACTICAL

1. Determination of Hardness ,Chloride ,Sulphate and iron content in a sample of water
2. Determination of Moisture Content & % Purity of Salt in a Commercial Common Salt.
3. Determination of Available lime & Total bases in a Commercial Lime.
4. Determination of % Purity of Sulphide in a Commercially fused Sodium Sulphide.
5. Determination of Lime & Sulphide present in used lime liquor.
6. Analysis of Deliming agents.
7. Determination of Acid & Salt Content of pickled liquor.
8. Determination of Presence of formaldehyde.



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

**III SEMESTER**

**PRE TANNING PROCESS PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

## STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

### M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39036**  
Semester : III Semester  
Subject Title : PRE TANNING PROCESS PRACTICAL

#### **TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                       | Instructions |                 | Examination            |                      |       |          |
|-------------------------------------|--------------|-----------------|------------------------|----------------------|-------|----------|
|                                     | Hours /Week  | Hours /Semester | Marks                  |                      |       | Duration |
| PRE TANNING<br>PROCESS<br>PRACTICAL | 4 Hrs        | 60 Hrs          | Internal<br>Assessment | Board<br>Examination | Total | 3 Hrs    |
|                                     |              |                 | 25                     | 75                   | 100   |          |

#### **RATIONALE:**

In Diploma level Engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

#### **GUIDELINES:**

- All the Eight exercise given in the list of exercise should be completed and given for the end semester practical examination.
- In order to develop best skills in handling machines/Equipment and taking readings in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

### **ALLOCATION OF MARKS**

|                   |          |
|-------------------|----------|
| Procedure Writing | 20 marks |
| Processing        | 30 marks |
| Result            | 20 marks |
| Viva Voce         | 05 marks |
| <hr/>             |          |
| Total             | 75 Marks |

### **DETAILED SYLLABUS**

Contents: PRACTICAL

1. Assortment of Raw hides & skins
2. Manufacture of wet blue leathers from sheep Skins.
3. Manufacture of wet blue leathers from Goat skins.
4. Manufacture of wet blue leathers from Cow hides.
5. Manufacture of wet blue leathers from Buff hide.
6. Manufacture of E I leathers from sheep skins.
7. Manufacture of E I leathers from Goat skins.
8. Manufacture of Terracotta leathers from Cow and Buff cal



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

**III SEMESTER**

**HEAVY LEATHER MANUFACTURE  
PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

# STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

## M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39037**  
Semester : III Semester  
Subject Title : HEAVY LEATHER MANUFACTURE PRACTICAL

### TEACHING AND SCHEME OF EXAMINATION:

No of weeks per semester: 15 weeks

| Subject Title                       | Instructions |                 | Examination         |                   |       |          |
|-------------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                     | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| HEAVY LEATHER MANUFACTURE PRACTICAL | 4Hrs         | 60 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                     |              |                 | 25                  | 75                | 100   |          |

### **RATIONALE:**

In Diploma level Engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

### **GUIDELINES:**

- All the Eight exercise given in the list of exercise should be completed and given for the end semester practical examination.
- In order to develop best skills in handling machines/Equipment and taking readings in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

## ALLOCATION OF MARKS

|                   |          |
|-------------------|----------|
| Procedure Writing | 20 marks |
| Processing        | 30 marks |
| Result            | 20 marks |
| Viva Voce         | 05 marks |
| <hr/>             |          |
| Total             | 75 Marks |

## DETAILED SYLLABUS

Contents: Practical

1. Assortment of raw Hides & Skins.
2. Manufacture of Vegetable Tanned Sole Leathers by pit method
3. Manufacture of Vegetable Tanned Sole Leathers by rapid tanning method.
4. Manufacture of Chrome & Waxed Chrome Sole Leathers.
5. Manufacture of Water Proof Sole Leathers.
6. Manufacture of Harness and Saddlery Leathers.
7. Manufacture of Sports Goods Leathers - Cricket Ball, Hockey Ball and Foot Ball Leathers.
8. Industrial Gloving Leathers



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

**www.binils.com**

**III SEMESTER**

**COMPUTER APPLICATIONS PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.**

**M- SCHEME**

(Implemented from the academic year 2016-2017 onwards)

Course Name : For All Branches

Subject Code : 30001

Semester : III

Subject title : COMPUTER APPLICATIONS PRACTICAL

**TEACHING & SCHEME OF EXAMINATION:**

No. of weeks per Semester: 15 Weeks

| Course                                | Instruction    |                    | Examination            |                      |       |          |
|---------------------------------------|----------------|--------------------|------------------------|----------------------|-------|----------|
|                                       |                |                    | Max.                   |                      |       | Duration |
|                                       | Hours/<br>week | Hours/<br>Semester | Internal<br>Assessment | Board<br>Examination | Total |          |
| COMPUTER<br>APPLICATIONS<br>PRACTICAL | 4Hrs           | 60 Hrs             | 25                     | 75                   | 100   | 3Hrs     |

**RATIONALE:**

The application of Computer knowledge is essential the students of all disciplines of Engineering in addition to their respective branch of study. The Computer Application Practical course facilitates the necessary knowledge and skills regarding creating, working and maintaining the documents and presentation of documents with audio visual effects in a computer and produces necessary skills in E- Learning and Chatting tools..

**OBJECTIVES:**

On completion of the following exercises, the students will be able to

- Use the GUI operating systems
- Familiarize and customize the desktop
- Use the different facilities available in the word processor
- Prepare Power Point presentation with different formats
- Expose E-learning tools and chatting tools
- Analyze the datasheet
- Create and manipulate the database
- Create different types of charts
- Prepare PowerPoint presentation
- Understand Internet concepts and usage of e-mail

**GUIDELINES:**

- All the experiments given in the list of experiments should be completed and all the experiments should include for the end semester practical examination.
- The computer systems should be 1:1 ratio for practical classes

**SYLLABUS  
LAB EXERCISES  
SECTION – A**

**GRAPHICAL OPERATING SYSTEM**

Introduction to GUI OS; Features and various versions of GUI OS & its use; Working with GUI OS; My Computer & Recycle bin ; Desktop, Icons and Explorer; Screen description & working styles of GUI OS; Dialog Boxes & Toolbars; Working with Files & Folders; simple operations like copy, delete, moving of files and folders from one drive to another, Shortcuts & Autostart; Accessories and Windows Settings using Control Panel- setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists; Installing and Uninstalling new Hardware & Software program on your computer - Copying in CD/DVD settings – Recording Audio files.

**Exercises**

1.
  - a. Installing screen saver and change the monitor resolution by 1280X960
  - b. Setting wall papers
  - c. Creating, moving, deleting and renaming a folder
  - d. Copy, paste and cut a folder/file
  - e. Displaying the properties for a file or folder
2.
  - a. Restoring files and folders from Recycle bin
  - b. Creating short cuts for folder/file
  - c. Finding a file or folder by name
  - d. Selecting and moving two or more files/folders using mouse
  - e. Sorting folders/files.

**WORD PROCESSING**

Introduction to Word Processing – Examples- Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header footer deleting, moving, replace, editing text in document. Saving a document, spell checker.

Printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height width of row or column. Editing, deleting Rows, columns in table. Borders, shading, Templates, wizards, drawing objects, mail merge.

**Exercises**

3. Create the following table and perform the operations given below

| DAYS | 1                   | 2        | 3        | 4     | 5                  | 6     | 7     | 8   |
|------|---------------------|----------|----------|-------|--------------------|-------|-------|-----|
| MON  | ←TEST→              |          | A: JPP   |       |                    | CA    | RDBMS | TUT |
|      |                     |          | B:RDBMS  |       |                    |       |       |     |
| TUE  | CA                  | OOP      | CN       | RDBMS | A: RDBMS           |       |       |     |
|      |                     |          |          |       | B: JPP             |       |       |     |
| WED  | CN                  | RDBMS    | OOP      | RDBMS | COMMUNICATION<br>N |       | CN    | CA  |
| THU  | OOP                 | A: JPP   |          |       | CA                 | RDBMS | CN    | OOP |
|      |                     | B: RDBMS |          |       |                    |       |       |     |
| FRI  | COMMUNICATION<br>ON |          | A: RDBMS |       | OOP                | CN    | RDBMS | CA  |
|      |                     |          | B: JPP   |       |                    |       |       |     |
| SAT  | OOPS                | RDBMS    | CN       | CA    | -----              |       |       |     |

4. Create a standard covering letter and use mail merge to generate the customized letters for applying to a job in various organizations. Also, create a database and generate labels for the applying organizations.
5. Create a news letter of three pages with two columns text. The first page contains some formatting bullets and numbers. Set the document background colour and add 'confidential' as the watermark. Give the document a title which should be displayed in the header. The header/ footer of the first page should be different from other two pages. Also, add author name and date/ time in the header. The footer should have the page number.

## SPREADSHEET

Introduction to Analysis Package – Examples - Concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options.

## Exercises

6. Create a result sheet containing Candidate's Register No., Name, Marks for six subjects. Calculate the total and result. The result must be calculated as below and failed candidates should be turned to red.

Result is Distinction if Total  $\geq 70\%$

First Class if Total  $\geq 60\%$  and  $< 70\%$

Second Class if Total  $\geq 50\%$  and  $< 60\%$

Pass if Total  $\geq 35\%$  and  $< 50\%$

Fail otherwise

Create a separate table based on class by using auto filter feature.

7. Create a table of records with columns as Name and Donation Amount. Donation amount should be formatted with two decimal places. There should be at least twenty records in the table. Create a conditional format to highlight the highest donation with blue color and lowest donation with red colour. The table should have a heading.
8. Create line and bar chart to highlight the sales of the company for three different periods for the following data.

**SALES BAR CHART**

| Period | Product1 | Product2 | Product3 | Total |
|--------|----------|----------|----------|-------|
| JAN    | 35       | 40       | 50       | 125   |
| FEB    | 46       | 56       | 40       | 142   |
| MAR    | 70       | 50       | 40       | 160   |

## **SECTION – B**

### **DATABASE**

Introduction – Menus – Tool bar – Create – Edit – Save – Data types – Insert – Delete – Update – View – Sorting and filtering – Queries – Report – Page setup – Print.

#### **Exercises**

9. Create Database to maintain at least 10 addresses of your class mates with the following constraints
  - Roll no. should be the primary key.
  - Name should be not null
10. create a students table with the following fields: Sr.No, Reg. No, Name, Marks in 5 subjects. Calculate total and percentage of 10 students. Perform the following queries.
  - To find the details of distinction student
  - To find the details of first class students
  - To find the details of second class students
11. Design a report for the above exercise to print the consolidated result sheet and mark card for the student.

### **PRESENTATION**

Introduction - Opening new presentation, Parts of PowerPoint window – Opening -Saving and closing presentations - Features of PowerPoint, Background design, Word art, Clip art, Drawings, 3D settings - Animations, Sound, Views, types of views - Inserting and deleting slides, arranging slides, slides show, rehearsal, setup show, custom show - Creating custom

presentations, action setting, auto content wizard, working with auto content wizard

### **Exercises**

12. Make a marketing presentation of any consumer product with at least 10 slides.

Use different customized animation effects on pictures and clip art on any four of the ten slides.

13. Create a Presentation about our institution or any subject with different slide transition with sound effect.

### **INTERNET**

---

Introduction – Getting acquainted with Internet Connection - Browsers – Website URL - Open a website – Net Browsing - Email: Creating E-mail id – Sending , receiving and deleting E-mail - Email with Attachments – CC and BCC - Chatting – Creating Group mail - Google docs – Search Engines – Searching topics .

**Most Popular Social Networking Sites :** History – Features – Services – Usage of Face book , Twitter and Linkdln.

Transferring data through wifi / bluetooth among different devices.

**Introduction to cybercrime** – Software Piracy – Viruses – Antivirus Software

### **Exercises**

14. Create an e-mail id and perform the following

- Write an e-mail inviting your friends to your Birthday Party.
- Make your own signature and add it to the e-mail message.
- Add a word attachment of the venue route
- Send the e-mail to at least 5 of your friends.

15. Create a presentation on Google docs. Ask your friend to review it and comment on it. Use “Discussion” option for your discussions on the presentation.

## Hardware and Software Requirements

### Hardware Requirements:

- Computers – 36Nos
  - Intel Core i3 Processor
  - 500 GB Hard Disk, 2 MB RAM
  - 14” Monitor
- Projector – 1 Nos
- Laser Printer – 1 No
- Internet Connection – Minimum of 512 KB

### Software Requirement

- Any GUI Operating System
- Open Source Software / MS- Office

#### 1. SemesterEndExamination–75 Marks

| Content                                         | Max.Marks     |
|-------------------------------------------------|---------------|
| Writing Procedure – One Question from Section A | 15            |
| Demonstration                                   | 15            |
| Results with Printout                           | 5             |
| Writing Procedure – One Question from Section B | 15            |
| Demonstration                                   | 15            |
| Results with Printout                           | 5             |
| Viva voce                                       | 5             |
| Total                                           | <b>75MARK</b> |



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

[www.binils.com](http://www.binils.com)

**IV - SEMESTER**

**THEORY OF POST TANNING & FINISHING**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39041**  
Semester : IV Semester  
Subject Title : **THEORY OF POST TANNING AND FINISHING**

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                        | Instructions |                 | Examination         |                   |       |          |
|--------------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                      | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| THEORY OF POST TANNING AND FINISHING | 5Hrs         | 75 Hrs          | Internal Assessment | Board Examination | Total | 3 Hrs    |
|                                      |              |                 | 25                  | 75                | 100   |          |

## THEORY OF POST TANNING AND FINISHING - 39041

### DETAILED SYLLABUS

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                                                                         | Hours |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Principles of Retanning – Principles of combination tannages - Chemistry and mechanism of combination tannages .<br>Principle of Neutralization - Objectives - Effects of Various Neutralizing Agents - Degree of Neutralization.<br>Semi-chroming – unit operations in the manufacture of semi-chrome leathers – stripping Souring – bleaching –object and necessity of each operations. | 13    |
| II              | Dyes - Definition - Classification of dyes - based on their chemical nature - based on their application - their properties -Theory of colours - Primary and complimentary colours - Blending of dyes - Practical aspects of Leather Dyeing - Pollution free dyeing - Benzidine & toxic arylamine free dyes - Theory and mechanism of dyeing                                              | 13    |
| III             | Fat liquors - Emulsions - Principles of fat liquoring process - Various type of fatliquors - their properties and application study - Practical aspects of Various fatliquoring systems - Factors controlling the fat liquoring operation - Mechanism of fat liquoring                                                                                                                    | 13    |
| IV              | Principles of Leather finishing - Classification of finishes based on their effect - Leather finishing material - Pigments - Binders - Plasticizers - Finishing auxiliaries etc. - their application-Finishing formulation - Lacquer - Lacquer emulsions - Chemistry of Polyurethane lacquer and finishes - their properties – compact finishes.                                          | 13    |
| V               | Drying – principles involved in leather drying – various techniques of drying leathers –Effect of Mechanical operations in post tanning – staking, toggling ,buffing, embossing, etc.                                                                                                                                                                                                     | 13    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                                                                           | 10    |

#### Reference Book :

1. Chemistry of Tanning Process - by K.H. Gustavson Academic Press Newyork.
2. Introduction to the Principles of Leather Manufacture by S.S. Dutta - Indian Leather Technologist Association, Calcutta.
3. Theory and Practice of Leather Manufacture by K.T. Sarkar, Ajoy Sorcar, Madras.
4. Asian Productivity Organisation - Lecture Notes on Leather.



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME  
2015 - 2016**

#### **IV - SEMESTER**

#### **PROCESS OF LIGHT LEATHER MANUFACTURE**

#### **CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39042**  
Semester : IV Semester  
Subject Title : **PROCESS OF LIGHT LEATHER MANUFACTURE**

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                        | Instructions |                 | Examination         |                   |       |          |
|--------------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                      | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| PROCESS OF LIGHT LEATHER MANUFACTURE | 5 Hrs        | 75 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                      |              |                 | 25                  | 75                | 100   | 3 Hrs    |

## PROCESS OF LIGHT LEATHER MANUFACTURE -39042

### DETAILED SYLLABUS

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                                      | Hours |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Materials for light leather manufacture- Pretanning Techniques adopted in various light leather production - Processing of Wet blue leathers and E I leathers.                                                                                                                                                                                         | 13    |
| II              | Unit operations in full chrome and full veg leathers-Object and necessity of combination tannages – processing of semi- chrome and chrome Retan leathers                                                                                                                                                                                               | 13    |
| III             | Types of process techniques involved in upper and lining leather manufacture – Process and properties of - Glazed kids - corrected grain leathers - lining leathers - Burnish leathers –Dry milled upper leathers- Oil pull up leathers - Split leathers.                                                                                              | 13    |
| IV              | Production and properties of full chrome and semi-chrome Suede garment Leathers - Water proof Suede Leathers - Nappalan Leathers - Nappa leathers - Shoe suedes from Skins - Gloving leather - Chamois leather - Exotic leathers - Dressing of Furskins - Nubuck leathers.                                                                             | 13    |
| V               | Various finishing techniques involved in production of Light leather - upgradation techniques for light leather production - Transfer foil technique - Roller coating - Screen Printing - Block printing - Tie and Dye leathers - Lamination Techniques - Two tone techniques - patent finish – Metallic finish - Grading and quality control measures | 13    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                                        | 10    |

#### Reference Book :

1. The manufacture of Upper Leathers by D.H.Tuck, Tropical Products Institute, London, 1981.
2. Gloving, Clothing and Special Leathers by P.S. Briggs - Tropical Products Institute, London, 1981.
3. Modern Practice in retanning, dyeing and finishing of Leather by K.T. Sarkar, Chennai, 1996.
4. CLRI Pocess bulletins.



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M- SCHEME**

**2015 - 2016**

**IV - SEMESTER**

**INTRODUCTION TO LEATHER  
PRODUCTS MAKING**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39043**  
Semester : III Semester  
Subject Title : Introduction to Leather products making

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                           | Instructions |                 | Examination         |                   |       |          |
|-----------------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                         | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| Introduction to Leather products making | 4 Hrs        | 60 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                         |              |                 | 25                  | 75                | 100   |          |

**INTRODUCTION TO LEATHER PRODUCTS MAKING - 39043**  
**DETAILED SYLLABUS**

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                | Hours |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Basics concepts of Design and Patterns for Leather products-Different types of pattern for leather products making-Pattern Grading concepts of different leather products-Pattern nesting concepts –CAD for pattern making                                                                                                       | 10    |
| II              | Tools used for leather products making-Material requirements for leather products making-Selection of leather for leather products-Common defects in leather, Different type of Leathers, Fabric material, lining material, reinforcement material and synthetics-Threads and Adhesives-Needle-Accessories for leather products. | 10    |
| III             | Cutting methods-Principles involved in clicking the various materials-Leather, fabrics and synthetics-comparison between hand and machine cutting-Advanced cutting methods.                                                                                                                                                      | 10    |
| IV              | Various unit operations viz. Splitting, Skiving, cementing, folding, Edge treatments, Edge creasing, stamping etc.-Various types of sewing machines-Flat bed, cylinder bed and special type of machines-Types of seams-Types of stitches.                                                                                        | 10    |
| V               | Classification of leather goods-Basic styles of footwear-various components of shoe-Introduction to leather garments-Variety components of leather garments.                                                                                                                                                                     | 10    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                  | 10    |

**Reference Book :**

1. Manual of Shoe making by R.G. Miller - Clarks Ltd., Publications, 1989.
2. Text Book of Footwear Manufacture by J.H. Thornton - The National Trade Press Ltd., London, 1970.
3. "Know Your Footwear" by B. Venkatappaiah \_NICLAI Publications.
4. The Complete Hand Book of Leather Crafting by Jame O. Garmes - Robert E. Krieger Publishing Co., Malabar Florida.
5. How to sew Leathers Suede by G. Philips W. Schewbke - Macmillan, New York 1979



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M- SCHEME**

**2015 - 2016**

#### **IV SEMESTER**

**SAFETY IN LEATHER INDUSTRY**

**CURRICULUM DEVELOPMENT CENTRE**

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **29044**  
Semester : III Semester  
Subject Title : SAFETY IN LEATHER INDUSTRY

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title              | Instructions |                 | Examination         |                   |       |          |
|----------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                            | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| SAFETY IN LEATHER INDUSTRY | 4 Hrs        | 60 Hrs          | Internal Assessment | Board Examination | Total |          |
|                            |              |                 | 25                  | 75                | 100   |          |

## SAFETY IN LEATHER INDUSTRY - 39034

### DETAILED SYLLABUS

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                                                                       | Hours |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Safety in leather Industries, need for safety & health - environment and productivity triangle –Hazard classification – Occupational Health and safety in leather processing - Chemical poisoning - skin afflictions - Bronchitis-Carcinogens-Hazards of chemicals used in leather processing.                                                                                          | 10    |
| II              | Storage instruction of chemicals – handling and disposal of chemicals in leather industry-Manual handling of materials-Personal protection and hygiene- Personal protective equipments -goggles- Gloves- mask.                                                                                                                                                                          | 10    |
| III             | Management of emergency situations- Basic first Aid –Fires- safety hazards of machinery –machine tools and electrical installations – hazard prevention and safeguarding of machinery(guards, machine controls, ergonomics)-Role of preventive maintenance                                                                                                                              | 10    |
| IV              | Hazard prevention - Risk assessment - prevention and control measures (active and passive) - management of changes - emergency preparedness and response - procurement (tools, equipment, plants, services, contractors -Performance monitoring and measurements - hazard prevention measures - ambient working environment - work related injuries, ill health, diseases and incidents | 10    |
| V               | Promoting safety & health practices at the workplace(training, safety and warning signs)Role and responsibilities of manager, supervisors and workers                                                                                                                                                                                                                                   | 10    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                                                                         | 10    |

#### Reference Book:

1. Jeannie manager stellmann, encyclopaedia of Occupational safety & health, 4th edition, International labour office, Geneva 1999.
2. .J.Bulijan,A Sahasranaman,J Hannak,Occupational Safety and health Aspects of Leather Manufacture, 1<sup>st</sup> edition, United Nations Industrial development Organization,Chennai-1999.
3. CLRI,Safety Manual on Leather Processing,1<sup>st</sup> edition, Central Leather Research Institute,Chennai.1999



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

**IV SEMESTER**

**LIGHT LEATHER MANUFACTURE PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

## STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

### M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39045**  
Semester : IV Semester  
Subject Title : **LIGHT LEATHER MANUFACTURE PRACTICAL**

#### **TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                             | Instructions |                 | Examination            |                      |       |          |
|-------------------------------------------|--------------|-----------------|------------------------|----------------------|-------|----------|
|                                           | Hours /Week  | Hours /Semester | Marks                  |                      |       | Duration |
| LIGHT LEATHER<br>MANUFACTURE<br>PRACTICAL | 6 Hrs        | 90 Hrs          | Internal<br>Assessment | Board<br>Examination | Total | 5 Hrs    |
|                                           |              |                 | 25                     | 75                   | 100   |          |

#### **RATIONALE:**

In Diploma level Engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

#### **GUIDELINES:**

- All the Eight exercise given in the list of exercises should be completed and given for the end semester practical examination.
- In order to develop best skills in handling machines/Equipment and taking readings in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

### **ALLOCATION OF MARKS**

|                   |          |
|-------------------|----------|
| Procedure Writing | 10 marks |
| Observation       | 30 marks |
| Result            | 30 marks |
| Viva Voce         | 05 marks |
| <hr/>             |          |
| Total             | 75 Marks |

### **DETAILED SYLLABUS**

Contents: PRACTICAL

1. Manufacture of Glaze kid leathers.
2. Manufacture of Suede upper leathers.
3. Manufacture of Suede garment leathers
4. Manufacture of Burnish leathers.
5. Manufacture of Nubuck leathers.
6. Manufacture of Cow softy upper leathers.
7. Manufacture of Shrunk grain leathers.
8. Manufacture of grain garment leathers.
9. Manufacture of Lining leathers.
10. Manufacture of Hair on Tanning leathers.



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M- SCHEME**

**2015 – 2016**

**IV SEMESTER**

**LEATHER MACHINES BASIC OPERATION  
PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

## STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

### M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **49046**  
Semester : IV Semester  
Subject Title : LEATHER MACHINES BASIC OPERATION PRACTICAL

### TEACHING AND SCHEME OF EXAMINATION:

No of weeks per semester: 15 weeks

| Subject Title                              | Instructions |                 | Examination         |                   |       |          |
|--------------------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                            | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| LEATHER MACHINES BASIC OPERATION PRACTICAL | 6 Hrs        | 90 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                            |              |                 | 25                  | 75                | 100   | 3 Hrs    |

### **RATIONALE:**

In Diploma level engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

### **GUIDELINES:**

- All the Eleven exercise given in the list of exercise should be completed and given for the end semester practical examination.
- In order to develop best skills in handling machines and taking readings in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single exercise question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

### **ALLOCATION OF MARKS**

|                    |          |
|--------------------|----------|
| Procedure Writing  | 10 marks |
| Operation skill    | 40 marks |
| Speed & perfection | 20 marks |
| Viva Voce          | 05 marks |
| <hr/>              |          |
| Total              | 75 Marks |

### **DETAILED SYLLABUS**

Contents: PRACTICAL

1. Study of various Tanning machines -
2. Practice in Drums and Paddles operation
3. Practice in fleshing machine operation
4. Practice in Samming machine operation.
5. Practice in Setting machine operation.
6. Practice in Shaving machine operation.
7. Practice in Staking machine operation
8. Practice in Buffing machine operation.
9. Practice in Glazing machine operation.
10. Practice in setting of spray Guns.
11. Practice in Embossing machine operation.



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

[www.binils.com](http://www.binils.com)

**IV SEMESTER**

**LIFE AND EMPLOYABILITY SKILLS PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**DIPLOMA IN ENGINEERING – SYLLABUS – M Scheme**

(Being implemented from the Academic Year 2016-2017 onwards)

Course Name : **All Branches of Diploma in Engineering and Technology and Special Programmes**

Subject Code : **30002**

Semester : **IV**

Subject Title : **LIFE AND EMPLOYABILITY SKILLS PRACTICAL**

**Teaching and Scheme of Examination:**

**No. of Weeks per Semester: 15 Weeks**

| Subject                       | Instruction    |                    | Examination            |                      |       |          |
|-------------------------------|----------------|--------------------|------------------------|----------------------|-------|----------|
|                               | Hours/<br>Week | Hours/<br>Semester | Marks                  |                      |       | Duration |
|                               |                |                    | Internal<br>assessment | Board<br>Examination | Total |          |
| Life and Employability Skills | 4 Hours        | 60 Hours           | 25                     | 75                   | 100   | 3 Hours  |

**Topics and Allocation of Hours:**

| Sl. No. | Section                   | No. of Hours |
|---------|---------------------------|--------------|
| 1       | Part – A<br>Communication | 30           |
| 2       | Part – B                  | 20           |

|              |                                                                                                                          |           |
|--------------|--------------------------------------------------------------------------------------------------------------------------|-----------|
|              | Entrepreneurship, Project Preparation, Productivity, Occupational Safety, Health, Hazard, Quality Tools & Labour Welfare |           |
| <b>3</b>     | <b>Part – C</b><br>Environment, Global Warming, Pollution                                                                | <b>10</b> |
| <b>TOTAL</b> |                                                                                                                          | <b>60</b> |

#### **RATIONALE**

Against the backdrop of the needs of the Industries, as well as based on fulfilling the expectations of the Industries, the Diploma Level students have to be trained directly and indirectly in toning up their competency levels. Proficiency in Communication only, equips them with confidence and capacity to cope with the employment. Hence, there is a necessity to focus on these in the curriculum. At the end of the Course, the student is better equipped to express himself in oral and written communication effectively.

#### **SPECIFIC INSTRUCTIONAL OBJECTIVES**

**1. Emphasize and Enhance Speaking Skills**

**2. Increase Ability to Express Views & Opinions**

**3. Develop and Enhance Employability Skills**

**4. Induce Entrepreneurship and Plan for the Future**

**5. Expose & Induce Life Skills for Effective Managerial Ability**

## LIFE AND EMPLOYABILITY SKILLS PRACTICAL

### SYLLABUS

| Unit | Topics                                                                                                               | Activity                                                                                                                                                                                                                               | Hours |
|------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I    | Communication, Listening, Training, Facing Interviews, Behavioural Skills                                            | -- instant sentence making<br>– say expressions/phrases--<br>self- introduction/another<br>higher official in company<br>– describe/explain product<br>– frame questions based on<br>patterns<br>– make sentences based on<br>patterns | 30    |
| II   | Entrepreneurship, Project Preparation, Marketing Analysis, Support & Procurement                                     | -- prepare an outline of a<br>project to obtain loan from<br>bank in becoming an<br>entrepreneur<br>– prepare a resume                                                                                                                 | 10    |
| III  | Productivity – comparison with developed countries, Quality Tools, Circles, Consciousness, Management, House Keeping | -- search in the website<br>-- prepare a presentation<br>– discuss & interact                                                                                                                                                          | 05    |
| IV   | Occupational Safety, Health Hazard, Accident & Safety, First-Aid, Labour Welfare Legislation, Welfare Acts           | -- search in the website<br>-- prepare a presentation<br>– discuss & interact                                                                                                                                                          | 05    |

|          |                                               |                                                                                                         |           |
|----------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------|
| <b>V</b> | <b>Environment, Global Warming, Pollution</b> | -- taking down notes / hints –<br>answering questions<br><br>-- fill in blanks the exact words<br>heard | <b>10</b> |
|----------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------|

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## LEARNING STRUCTURE

100 Marks

- Focus more on Speaking & Listening Skills
- Attention less on Reading & Writing Skills
- Apply the skills in fulfilling the Objectives on Focused Topics

|                                                                       |                 |
|-----------------------------------------------------------------------|-----------------|
| <b>a) Listening</b>                                                   | <b>25 Marks</b> |
| 1. Deductive Reasoning Skills (taking down notes/hints)               | 10              |
| 2. Cognitive Skills (answering questions)                             | 10              |
| 3. Retention Skills (filling in blanks with exact words heard)        | 05              |
| <b>b) Speaking Extempore/ Prepared</b>                                | <b>30 Marks</b> |
| 1. Personality/Psychological Skills (instant sentence making)         | 05              |
| 2. Pleasing & Amiable Skills (say in phrases/expressions)             | 05              |
| 3. Assertive Skills (introducing oneself/others)                      | 05              |
| 4. Expressive Skills (describe/explain things)                        | 05              |
| 5. Fluency/Compatibility Skills (dialogue)                            | 05              |
| 6. Leadership/Team Spirit Skills (group discussion)                   | 05              |
| <b>c) Writing &amp; Reading</b>                                       | <b>20 Marks</b> |
| 1. Creative & Reasoning Skills (frame questions on patterns)          | 05              |
| 2. Creative & Composing Skills (make sentences on patterns)           | 05              |
| 3. Attitude & Aim Skills (prepare resume)                             | 05              |
| 4. Entrepreneurship Skills (prepare outline of a project)             | 05              |
| <b>d) Continuous Assessment (Internal Marks)</b>                      | <b>25 Marks</b> |
| (search,read, write down, speak, listen, interact & discuss)          |                 |
| 1. Cognitive Skills (Google search on focused topics)                 |                 |
| 2. Presentation Skills& Interactive Skills (after listening, discuss) |                 |
| <b>Note down and present in the Record Note on any 5 topics</b>       | <b>10 Marks</b> |
| <b>Other activities recorded in the Record note</b>                   | <b>10 Marks</b> |
| <b>Attendance</b>                                                     | <b>05 Marks</b> |
| <b>INTERNAL MARKS</b>                                                 | <b>25 MARKS</b> |
| <b>EXTERNAL MARKS AT END EXAMINATION</b>                              | <b>75 MARKS</b> |

## MODEL QUESTION

Time: 3 Hours

Maximum Marks: 75

### A. LISTENING

25 Marks

1. Listen to the content and take down notes/hints 10
2. Listen to the content and answer the following questions. 10
3. Listen to the content and fill in the blanks the exact words heard. 05

### B. SPEAKING

30 Marks

1. Say in a sentence instantly on hearing the word(5 words, one after another). 05
2. Say any five expressions commonly used in communication. 05
3. Imagine, a consultant has come to your department.  
Introduce him to your subordinates. 05
4. Explain/describe the product you are about to launch in the market. 05
5. Speak with your immediate boss about the progress you have made. 05
6. Discuss within the group on the topic of focus in the syllabus. 05

### C. WRITING & READING

20 Marks

1. Frame new questions from the pattern given by changing sets of words with your own. 05

|    |       |     |                  |                  |
|----|-------|-----|------------------|------------------|
| a. | When  | do  | you              | return?          |
| b. | How   | is  | his performance? |                  |
| c. | Where | has | the manager      | gone?            |
| d. | What  | is  | the progress     | today?           |
| e. | Why   | are | the machines     | not functioning? |

2. Make sentences from the pattern given by changing sets of words with your own. 05

|    |                 |          |                  |                 |                |
|----|-----------------|----------|------------------|-----------------|----------------|
| a. | The workers     | are      | on strike        |                 |                |
| b. | The labourers   | are paid | well             | in this factory |                |
| c. | There           | is       | a rest room      | for the workers |                |
| d. | These           | are      | the new products | launched        | by our company |
| e. | Almost everyone | come     | to the company   | on motorbikes   |                |

3. Prepare a resume for the post of Department Manager. 05

4. Prepare an outline of a project to obtain a loan. (Provide headings and subheadings) 05

-----

### I. Guidelines for setting the question paper:

#### A. LISTENING :

ONLY TOPICS related to  
POLLUTION /  
ENVIRONMENT /  
GLOBAL WARMING are to be taken.  
These topics are common for all the three types of evaluation.

#### B. SPEAKING :

1. WORDS of common usage
2. Fragments – expression of politeness, courtesy, cordiality
3. Introduce yourself as an engineer with designation or  
Introduce the official visiting your company/department
4. Describe/Explain the product/machine/department
5. Dialogue must be with someone in the place of work.
6. Group of six/eight  
Discuss the focused topic prescribed in syllabus

### C. WRITING & READING:

1. Provide five different structures.

Students are to substitute at least one with some other word/words

2. Provide five different structures.

Students are to substitute at least one with some other word/words

3. Provide some post related to industries.

4. Outline of the project (skeleton/structure)

Only the various headings and subheadings  
Content is not needed

### II. Guidelines for recording the material on the Focused Topics in the Record note.

Write in the record note, **on any five topics**, from the list of topics given below. **10 Marks**  
(5 topics x 10 marks = 50 marks. Thus, the **Average of 5 topics is 10 Marks**)

1. Productivity in Industries – Comparison with developed countries
2. Quality Tools, Quality Circles and Quality Consciousness
3. Effective Management
4. House Keeping in Industries
5. Occupational Safety and Hazard
6. Occupational Accident and First Aid
7. Labour Welfare Legislations
8. Labour Welfare Acts and Rights
9. Entrepreneurship
10. Marketing Analysis, Support and Procurement

#### LABORATORY REQUIREMENT:

1. An echo-free room
2. Necessary furniture and comfortable chairs
3. A minimum of two Computers with internet access
4. A minimum of two different English dailies
5. A minimum of Three Mikes with and without cords
6. Colour Television (minimum size – 29")
7. DVD/VCD Player with Home Theatre speakers
8. Smart board
9. Projector

#### Suggested Reading:

1. Production and Operations Management by S.N. Chary, TMH
2. Essentials of Management by Koontz & Weihrich, TMH
3. Modern Production / Operations Management by E.S. Buffa and R.K. Sarin, John Wiley & Sons
4. Production Systems: Planning, Analysis and Control by J.L. Riggs, 3rd ed., Wiley.
5. Productions and Operations Management by A. Muhlemann, J. Oakland and K. Lockyer,

Macmillan

6. Operations Research - An Introduction by H.A.Taha, Prentice Hall of India
7. Operations Research by J.K.Sharma, Macmillan
8. Business Correspondence & Report Writing by R.C. Sharma and K.Mohan, TMH
9. How to prepare for Group Discussion & Interview (With Audio Cassette) by Prasad, TMH
10. Spoken English – A self-learning guide to conversation practice (with Cassette)
11. Introduction to Environmental Engineering by Mackenzie, L. Davis and A. David, Cornwell, McGrawHill, 3rd Ed.
12. Environmental Engineering by Peary, Rowe and Tchobanoglous, McGrawHill
13. Total Quality Management – An Introductory Text by Paul James, Prentice Hall
14. Quality Control and Applications by Housen&Ghose
15. Industrial Engineering Management by O.P. Khanna

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## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

**V SEMESTER**

**INDUSTRIAL TRAINING REPORT &  
ASSESSMENT**

**CURRICULUM DEVELOPMENT CENTRE**

# STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

## M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39092**  
Semester : V Semester  
Subject Title : INDUSTRIAL TRAINING REPORT & ASSESSMENT

### TEACHING AND SCHEME OF EXAMINATION:

Period of in plant training is from - 1st May to 15<sup>th</sup> September (19-weeks)

| Subject Title                                 | Instructions |                 | Examination            |                      |       |          |
|-----------------------------------------------|--------------|-----------------|------------------------|----------------------|-------|----------|
|                                               | Hours /Week  | Hours /Semester | Marks                  |                      |       | Duration |
| INDUSTRIAL<br>TRAINING REPORT<br>& ASSESSMENT | 35 Hrs       | 665 Hrs         | Internal<br>Assessment | Board<br>Examination | Total | 3 Hrs    |
|                                               |              |                 | 25                     | 75                   | 100   |          |

### ALLOCATION OF MARKS

|                      |          |
|----------------------|----------|
| Report Writing       | 30 marks |
| Viva Voce Assessment | 45 marks |
| <hr/>                |          |
| Total                | 75 Marks |



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015- 2016**

**VI SEMESTER**

**LEATHER CHEMICALS AND AUXILIARIES**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39061**  
Semester : VI Semester  
Subject Title : **LEATHER CHEMICALS AND AUXILIARIES**

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                           | Instructions |                 | Examination            |                      |       |          |
|-----------------------------------------|--------------|-----------------|------------------------|----------------------|-------|----------|
|                                         | Hours /Week  | Hours /Semester | Marks                  |                      |       | Duration |
| LEATHER<br>CHEMICALS AND<br>AUXILLARIES | 5Hrs         | 75 Hrs          | Internal<br>Assessment | Board<br>Examination | Total |          |
|                                         |              |                 | 25                     | 75                   | 100   | 3 Hrs    |

## LEATHER CHEMICALS AND AUXILIARIES --39061

### DETAILED SYLLABUS

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Hours |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Acids , Bases and salts for leather manufacture - General manufacturing methods of pre tanning chemicals-salt, lime, sodium hydroxide. Sodium carbonate, ammonium chloride, ammonium sulphates etc...Enzymes - preparation of enzyme based unhairing agents and bating agents - Evaluation and quality control.                                                                                                                                                                                                                            | 13    |
| II              | Chrome and vegetable Tanning extracts preparation - Syntans - their classification - Sulphonation of Naphthalene - Phenol, Naphthols, Phenol-formaldehyde condensation reactions and Novalac - Amino resins, P.U. and acrylic resins - Unit operations in syntan manufacture - Properties of syntans .                                                                                                                                                                                                                                     | 13    |
| III             | Theory of Leather Lubrication, composition of fat liquors, Chemical classification natural and synthetic oils, Sulphation, Sulphonation, Sulphitation reactions of oils, Sulpho chlorination, esterification, phosphorylation reactions of fat liquor preparation - Stability of emulsions, grain and particle sizes of emulsions - criteria for choice of oil formulation for fat liquors.                                                                                                                                                | 13    |
| IV              | Introduction to the Chemistry and technology of dye manufacture - Chemistry and application of dyeing auxiliaries such as dye-leveling agents - dye penetrating agents - dye dispersing agents and dye fixatives. Classification of pigments, chemistry and methods of preparation of pigments - Properties required of pigments.                                                                                                                                                                                                          | 13    |
| V               | Polymers for Leather Processing - Concepts of a macromolecule, natural and synthetic polymers - method of polymerization - bulk, solution, emulsion and suspension polymerization Chemical classification of binders, acrylic, protein polyurethane - Introduction to manufacturing of binder formulations - Chemistry and preparation of nitro-cellulose, lacquers, lacquer emulsion, coloured lacquers - Chemistry of polyurethane lacquers, binders and finishes their properties - Types of surface feel modifiers and matting agents. | 13    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 10    |

#### Reference Book :

1. Acrylics and their uses in Leather Manufacture by Rajadurai S and Kulasekaran S. C.L.R.I. Publication.
2. The Leather Industry Kothari's Desk Book Series S. Sadulla - H.C. Kothari Group Publication Division. Chennai.



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015- 2016**

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**VI SEMESTER**

**THEORY OF LEATHER TESTING**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39062**  
Semester : VI Semester  
Subject Title : **THEORY OF LEATHER TESTING**

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title             | Instructions |                 | Examination         |                   |       |          |
|---------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                           | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| THEORY OF LEATHER TESTING | 5 Hrs        | 75 Hrs          | Internal Assessment | Board Examination | Total |          |
|                           |              |                 | 25                  | 75                | 100   | 3 Hrs    |

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## THEORY OF LEATHER TESTING -39062

### DETAILED SYLLABUS

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Hours |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Introduction to DIN & BIS Norms - Sampling position for chemical testing - Analysis of Chrome Liquor - Acid combined with chromium- Chromium content in the liquor - Percentage Basicity - Analysis of chrome Tanned Leather for various characteristics.                                                                                                                                                                                                                                                                                                                                                                                         | 13    |
| II              | Analysis of Vegetable tanning materials and extracts - Qualitative and Quantitative analysis of vegetable tanning materials - Chemical analysis of Vegetable tanned leathers for various characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                          | 13    |
| III             | Analysis of formaldehyde Tanned Leather and determination of Percentage purity of formaldehyde.<br>Analysis of Oils and Fats - Theory of saturation and unsaturation - Determination of Iodine Value - Saponification value - Acid Value - Analysis of commercial fat liquors - Fat content of the fat liquor. Methods to determine the B.O.D & C.O.D Value in Tannery Effluents                                                                                                                                                                                                                                                                  | 13    |
| IV              | Study & Setting up of a microscope - Slide preparation - Anatomical Study of Hides and Skins - Hair and Wool - Grain pattern of Hides and Skins, Fiber Structural changes that takes place during pre tanning - Tanning and Post Tanning Process - microscopical assessment of sole Leather.<br>Fundamental of Bacteriology - Preparation of various culture media - Sterilization - Inoculation - morphological characteristic of Bacteria - Staining of Bacteria and classification - Bio-chemical properties of Bacteria - Bacterial count. Damage caused by Moulds to tan liquor and to leathers - Moulds and their difference from Bacteria. | 13    |
| V               | Physical Testing - Sampling and conditioning - Physical tests to be conducted on various type of leathers viz. Tensile, Stitch tear, Tongue tear strength Stretchiness - Grain crack and Bursting strength - Compressibility - and Resilience test - Hydro thermal Stability, Abrasion resistance - Water proofness - Flexural Endurance test - Light fastness - Rub fastness test - Real and apparent Density - Air and Water vapour permeability etc.                                                                                                                                                                                           | 13    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 10    |

#### Reference Book :

1. Technological controls in Leather Manufacture by S. Bangaraswamy C.L.R.I. Publications 1984.
2. "Official methods of analysis" Society of Leather Technologists and Chemists U.K.1981.
3. Analytical Chemistry of Leather Manufacture by P.K. Sarkar - Indian Leather Technologist Association, Calcutta.
4. An introduction to the Principles of Physical Testing of Leather by S.S. Dutta - Indian Leather Technologist Association, Calcutta.



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

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**VI SEMESTER**

### **TANNERY EFFLUENT TREATMENT AND WASTE MANAGEMENT**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39063**  
Semester : VI Semester  
Subject Title : **TANNERY EFFLUENT TREATMENT AND WASTE MANAGEMENT**

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                                   | Instructions |                 | Examination         |                   |       |          |
|-------------------------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                                 | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| TANNERY EFFLUENT TREATMENT AND WASTE MANAGEMENT | 4 Hrs        | 60 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                                 |              |                 | 25                  | 75                | 100   |          |

## TANNERY EFFLUENT TREATMENT AND WASTE MANAGEMENT - 39063

### DETAILED SYLLABUS

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                                                                                                         | Hours |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Sources of Water - Hardness of Water - Effect of Hard Water - Water Softening methods - Suitability of water for tannery use - Recovery and reuse of water in tanning industry.<br>Types of tannery effluents - characteristics of effluent from Beam House Process, Tan yard process and finishing yard process - Suspended solids - Dissolved Solids - B.O.D & C.O.D - Specification for discharge of treated effluent. | 10    |
| II              | Methods of treatment - Principles and General methods of Primary and Secondary treatments - Waste Water drainage and Collection Systems in Tanneries - Removal of Suspended solids by sedimentation, coagulation, flocculation and filtration - Lagoon treatment - aeration system - trickling filter.                                                                                                                    | 10    |
| III             | Types of Tannery by products - their nature and composition - Present methods of collection and utilization - Recovery of Salt from salted Hides and Skins - its treatment and reuse - Utilization studies on limed fleshing and trimmings - Leather shaving and trimmings into Glue and Gelatin - Leather Boards.                                                                                                        | 10    |
| IV              | Solid Waste Management – Characterisation of Solid Waste – Sludge disposal and Management – Mechanical operations – Bio-energy from solid waste.<br>Liquid waste management – Minimisation of chemical and water consumption in Leather Processing – Chrome recovery and reuse techniques- Cost evaluation for E.T.P/C.E.T.P.                                                                                             | 10    |
| V               | Animal by products and availability - Collection, handling and preservation methods - bones, intestines, glands, blood, Collagen and its application in food , cosmetic and medical fields.<br>Protein meals from animal by products including fallen animals and their significance in live stock feeds - Processing of blood and their utilization - Processing of hair and their utilities.                            | 10    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                                                                                                           | 10    |

#### Reference Book :

1. Waste Water Engineering - Treatment, Disposal, Reuse by Metiralf and Eddy - Inc. Tata Mc Graw Hill Publishing Co. Ltd, New Delhi.
2. Fundamentals of Pollution control for the Leather industry - Thomes C. Thortensen.
3. Mahendra Kumar, 'Hand Book of rural Technology for the processing of animal by-products - F.A.O Agricultural Services Bulletin 79.
4. Divakar S. - Animal Blood - Processing and Utilization, Food and Agriculture Organisation Rome 1978.



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M- SCHEME**

**2015 - 2016**

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**VI SEMESTER**

**LEATHER PRODUCTS FABRICATION**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39064**  
Semester : VI Semester  
Subject Title : **LEATHER PRODUCTS FABRICATION**

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                     | Instructions |                 | Examination            |                      |       |          |
|-----------------------------------|--------------|-----------------|------------------------|----------------------|-------|----------|
|                                   | Hours /Week  | Hours /Semester | Marks                  |                      |       | Duration |
| LEATHER<br>PRODUCT<br>FABRICATION | 4 Hrs        | 60 Hrs          | Internal<br>Assessment | Board<br>Examination | Total |          |
|                                   |              |                 | 25                     | 75                   | 100   | 3 Hrs    |

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## LEATHER PRODUCT FABRICATION - 39064

### DETAILED SYLLABUS

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                                                                                                                | Hours |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Basic concepts of Design and Patterns for Leather goods – Classification of leather products-tools and materials requirements for leather product fabrication-Selection of leather for various leather goods & garments making-Accessories for leather goods & garments.                                                                                                                                                         | 10    |
| II              | Various Construction for leather goods viz.- Cut edge construction - Folded Edge construction – Stitch and turn Edge construction - Butted Edge Construction - Mixed Edge Construction - Thong Edge Construction- Moulded Edge Construction- Binding Edge Construction.                                                                                                                                                          | 10    |
| III             | Types of leather goods-study related to the unit operations in manufacture of coin purse, Gents wallet, Gents belt ,suitcase, school Bag, watch straps and ladies handbag-Finishing techniques and materials – packing techniques and materials                                                                                                                                                                                  | 10    |
| IV              | Types of Leather Garments-Various Parts of Leather Garments- - Measurement chart for men's, women's and children's - Various unit operations like fusing, marking, panel matching, cementing , folding , collar preparation, pocket preparation, lining preparation ,finishing – Special treatments- Study related to manufacture of gent's garments, ladies garments, waist garments and unlined garments-Finishing and packing | 10    |
| V               | Quality control aspects in leather goods making-Product costing for different leather goods and inventory management-Project estimation for medium Scale Leather goods Production.- Quality control aspects in leather garments making-Product costing for different leather garments and inventory management- Project estimation for medium Scale Leather garments Production.                                                 | 10    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10    |

#### Reference Book :

1. Manual of Shoe making by R.G. Miller - Clarks Ltd., Publications, 1989.
2. Text Book of Footwear Manufacture by J.H. Thornton - The National Trade Press Ltd., London, 1970.
3. "Know Your Footwear" by B. Venkatappaiah \_NICLAI Publications.
4. The Complete Hand Book of Leather Crafting by Jame O. Garmes - Robert E. Krieger Publishing Co., Malabar Florida.
5. How to sew Leathers Suede by G. Philips W. Schewbke - Macmillan, New York 1979



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

**VI-SEMESTER**

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**CHEMICAL TESTING OF LEATHER PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**  
**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39065**  
Semester : VI Semester  
Subject Title : **CHEMICAL TESTING OF LEATHER PRACTICAL**

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                         | Instructions |                 | Examination         |                   |       |          |
|---------------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                       | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| CHEMICAL TESTING OF LEATHER PRACTICAL | 6 Hrs        | 90 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                       |              |                 | 25                  | 75                | 100   | 5 Hrs    |

**RATIONALE:**

In Diploma level engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

**GUIDELINES:**

- All the eleven experiments given in the list of experiments should be completed and given for the end semester practical examination.
- In order to develop best skills in handling Instruments/Equipment and taking readings in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

### **ALLOCATION OF MARKS**

|                      |          |
|----------------------|----------|
| Procedure Writing    | 20 marks |
| Experiments          | 30 marks |
| Observation          | 10 marks |
| Calculation & Result | 10 marks |
| Viva Voce            | 05 marks |
| <hr/>                |          |
| Total                | 75 Marks |

### **DETAILED SYLLABUS**

Contents: PRACTICAL

#### **CHEMICAL TESTING OF LEATHER**

- 1) Sampling position of Leather for chemical testing of Leather.
- 2) Analysis of a Liquor/Extracts
  - a) Moisture
  - b)  $\text{Cr}_2\text{O}_3$  Content
  - c) Acid Combined with Chromium
  - d) Basicity
  - e) pH of Chrome liquor
- 3) Qualitative and Quantitative analysis of Vegetable Tanning Materials.
- 4) Determination of Acid Value Saponification Value and Iodine Value of oil.
- 5) Analysis of Various Type of Leather for Moisture content
- 6) Analysis of Various Type of Leather for Solvent Extractable
- 7) Analysis of Various Type of Leather for water soluble matters
- 8) Analysis of Various Type of Leather for nitrogen & hide substance
- 9) Analysis of Various Type of Leather for  $\text{Cr}_2\text{O}_3$
- 10) Analysis of Various Type of Leather for  $\text{Al}_2\text{O}_3$
- 11) Analysis of Tannin and Non Tannin of Vegetable Tanned Leathers



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

[www.binils.com](http://www.binils.com)

**LEATHER FINISHING PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

## STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

### M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39066**  
Semester : VI Semester  
Subject Title : **LEATHER FINISHING PRACTICAL**

#### **TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title               | Instructions |                 | Examination         |                   |       |          |
|-----------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                             | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| LEATHER FINISHING PRACTICAL | 4 Hrs        | 60 Hrs          | Internal Assessment | Board Examination | Total | 5 Hrs    |
|                             |              |                 | 25                  | 75                | 100   |          |

#### **RATIONALE:**

In Diploma level Engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

#### **GUIDELINES:**

- All the Ten experiments given in the list of experiments should be completed and given for the end semester practical examination.
- In order to develop best skills in handling Instruments/Equipment and taking readings in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

### **ALLOCATION OF MARKS**

|                            |          |
|----------------------------|----------|
| Procedure Writing          | 10 marks |
| Sketch/ diagram with parts | 10 marks |
| Product manufacturing      | 30 marks |
| Finishing                  | 20 marks |
| Viva -Voce                 | 05 marks |
| <hr/>                      |          |
| Total                      | 75 Marks |

### **DETAILED SYLLABUS**

Contents: PRACTICAL

1. Practice on Resin finish.
2. Practice on aniline finish
3. Practice on semi-aniline finish
4. Practice on Protein finish.
5. Practice on burnish finish.
6. Practice on Oil pull up finish
7. Practice on Antique finish.
8. Practice on metallic finish.
9. Practice on Transfer foil finish
10. Practice on Crunch finish.



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

**VI-SEMESTER**

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**LEATHER PRODUCT FABRICATION PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

## STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

### M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39067**  
Semester : VI Semester  
Subject Title : **LEATHER PRODUCT FABRICATION PRACTICAL**

#### TEACHING AND SCHEME OF EXAMINATION:

No of weeks per semester: 14 weeks

| Subject Title                                  | Instructions |                 | Examination            |                      |       |          |
|------------------------------------------------|--------------|-----------------|------------------------|----------------------|-------|----------|
|                                                | Hours /Week  | Hours /Semester | Marks                  |                      |       | Duration |
| LEATHER<br>PRODUCT<br>FABRICATION<br>PRACTICAL | 6 Hrs        | 90 Hrs          | Internal<br>Assessment | Board<br>Examination | Total |          |
|                                                |              |                 | 25                     | 75                   | 100   | 5 Hrs    |

#### **RATIONALE:**

In Diploma level Engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

#### **GUIDELINES:**

- All the Ten exercise given in the list of exercise should be completed and given for the end semester practical examination.
- In order to develop best skills in handling machine/Tools/Equipment in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

### **ALLOCATION OF MARKS**

|                   |          |
|-------------------|----------|
| Procedure Writing | 15marks  |
| Pattern making    | 15 marks |
| Product making    | 40 marks |
| Viva -Voce        | 05 marks |
| <hr/>             |          |
| Total             | 75 Marks |

### **DETAILED SYLLABUS**

Contents: PRACTICAL

1. Study, description and use of tools - - Designing and Pattern cutting of different type of Leather Goods viz. Gents Wallet. Coin Pouch, Ladies Handbag etc.
2. Identification and grading of Leathers - Practice on cutting, Skiving by hand, machine Skiving machine stitching, Stamping, Edge creasing, Riveting, Eye - Letting etc.
3. Study of Sewing machine - Flat bed - Cylinder bed - Post bed - Skiving machine - their parts and its function.
4. Pattern cutting and manufacture of any one type of gents leather garment.
5. Pattern cutting and manufacture of any one type of ladies leather garment.
6. Manufacture of key cases,
7. Manufacture of Coin purses
8. Manufacture of Wallets
9. Manufacture of Cash Bag.
10. Manufacture of Belt.



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M- SCHEME**

**2015 - 2016**

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**INDUSTRIAL MANAGEMENT & ENTREPRENEURSHIP**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39071**  
Semester : VI I Semester  
Subject Title : **INDUSTRIAL MANAGEMENT & ENTREPRENEURSHIP**

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                                  | Instructions |                 | Examination            |                      |       |          |
|------------------------------------------------|--------------|-----------------|------------------------|----------------------|-------|----------|
|                                                | Hours /Week  | Hours /Semester | Marks                  |                      |       | Duration |
| INDUSTRIAL<br>MANAGEMENT &<br>ENTREPRENEURSHIP | 4 Hrs        | 60 Hrs          | Internal<br>Assessment | Board<br>Examination | Total |          |
|                                                |              |                 | 25                     | 75                   | 100   | 3 Hrs    |

## **INDUSTRIAL MANAGEMENT & ENTREPRENEURSHIP -39071**

### **DETAILED SYLLABUS**

Contents: Theory

| <b>Unit</b>                | <b>Name of the Topic</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Hours</b> |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>I</b>                   | Definition of Management - development of Management - Scientific Management and its principles - Function of Management - planning - organising - directing - staffing - co-ordination - controlling - communication - motivation.<br>Individual ownership - Partnership - Joint Stock Company - cooperative enterprises - public sector undertaking - corporate framework - share holders - board of directors - committees.<br>Financial needs of business - methods and sources of raising Finance - Financial Institution - Role of Government Agencies - like TIIC, SIDCO, IDBI, NSIC, BANKS etc., | 10           |
| <b>II</b>                  | Investment costs and cost estimation - Time Value of Money - Capital Cost and depreciation - Estimation of capital cost - Manufacturing cost and working capital - Invested capital and Profitability - Fixed and Variable cost – semi-variable cost - Direct and Indirect cost - Breakeven analysis - Break Even Point (B.E.P) - Related to Leather Sector. Estimates of investment, Costing and Feasibility reports - Price Quotations like F.O.B., C.I.F. etc., Bill of lading - letter of credit - Export Promotion etc.                                                                             | 10           |
| <b>III</b>                 | Material sourcing - Marketing - Product Research - Market research - Brand building - Export - Import guidelines and trade issues - Global trade in Leather - Inter Country comparison of strength and weaknesses at Market place - WTO and related issues influencing leather. TQM Concepts - ISO and related certification methods - Measures for Leather Sector.                                                                                                                                                                                                                                      | 10           |
| <b>IV</b>                  | Corporate Social Responsibility and complaints –Project report preparation for setting up of leather units -Promoting safety & health practices at the work place-personal protection and hygiene                                                                                                                                                                                                                                                                                                                                                                                                        | 10           |
| <b>V</b>                   | Enterprise Resource Planning (ERP) for leather and products sector – Computer application in production planning and control - Inventory and Production Scheduling and Optimisation – Computer application in material management – Computer based Marketing information system- Electronic data transfer                                                                                                                                                                                                                                                                                                | 10           |
| <b>TEST &amp; REVISION</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 10           |

#### **Reference Book :**

- 1 .M.C. Shukla - Business Organisation and Management - Sultan Chand & Sons.
2. Industrial Administration and Management by J. Batty - Publishers E.L.B.S.
3. Industrial Engineering and Management Science by T.R. Banga- Khanna Publishers
4. CLRI Safety Manual on Leather Processing, 1<sup>st</sup> Edition, CLRI, Chennai-25,1999



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015- 2016**

**VII SEMESTER**

**FOOTWEAR FABRICATION TECHNOLOGY**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39072**  
Semester : VII Semester  
Subject Title : FOOTWEAR FABRICATION TECHNOLOGY

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                         | Instructions |                 | Examination            |                      |       |          |
|---------------------------------------|--------------|-----------------|------------------------|----------------------|-------|----------|
|                                       | Hours /Week  | Hours /Semester | Marks                  |                      |       | Duration |
| FOOTWEAR<br>FABRICATION<br>TECHNOLOGY | 5 Hrs        | 75 Hrs          | Internal<br>Assessment | Board<br>Examination | Total |          |
|                                       |              |                 | 25                     | 75                   | 100   | 3 Hrs    |

## FOOTWEAR FABRICATION TECHNOLOGY – 39072

### DETAILED SYLLABUS

Contents: Theory

| Unit            | Name of the Topic                                                                                                                                                                                                                                                                                                                  | Hours |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I               | Foot anatomy – Arches of foot -Foot parameters-Foot injury-foot deformity-Last for footwear making–sizing systems-English sizing system- European Sizing system –Basic styles of footwear.                                                                                                                                         | 13    |
| II              | Basic concepts of Design and Patterns for footwear- Mean forme extraction from last -Extraction of upper standards – Style line marking – Pattern extraction-Pattern Grading – CAD for footwear design.-selection of leather for footwear making-footwear components-Reinforcement materials-Insoles-Shanks-Soling materials..etc. | 13    |
| III             | Pre closing operations- clicking - Splitting, Skiving, cementing, Folding, Edge treatments, etc.-Various treatment of upper closing-closing operation-Types of seams-Principle and process of drafting-Types of lasting-Advanced lasting techniques.                                                                               | 13    |
| IV              | Types of footwear construction viz. Cemented ,Good year welted,Veldschoten,stoblet,Moccasin and moulded shoes etc-Process and sequence of operations in cementing construction –Basic footwear machines-Lasting machines, Moulding machines & finishing machines.                                                                  | 13    |
| V               | Finishing techniques –Bottoming finishing-shoe Dressing-Materials used in finishing department –Packing –Quality control aspects in footwear making-line management-Product costing & Inventory management- Project estimation for medium scale shoe production.                                                                   | 13    |
| TEST & REVISION |                                                                                                                                                                                                                                                                                                                                    | 10    |

#### Reference Book :

1. Manual of Shoe making by R.G. Miller - Clarks Ltd., Publications, 1989.
2. Text Book of Footwear Manufacture by J.H. Thornton - The National Trade Press Ltd., London, 1970.
3. "Know Your Footwear" by B. Venkatappaiah \_NICLAI Publications.
4. The Complete Hand Book of footwear making – Ganguly,



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

**VII SEMESTER**

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**PLANT LAYOUT & LEATHER MACHINES**

**CURRICULUM DEVELOPMENT CENTRE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**M-SCHEME**

**(Implements from the Academic year 2015-2016 onwards)**

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39073**  
Semester : VII Semester  
Subject Title : **PLANT LAYOUT AND LEATHER MACHINES**

**TEACHING AND SCHEME OF EXAMINATION:**

No of weeks per semester: 15 weeks

| Subject Title                           | Instructions |                 | Examination            |                      |       |          |
|-----------------------------------------|--------------|-----------------|------------------------|----------------------|-------|----------|
|                                         | Hours /Week  | Hours /Semester | Marks                  |                      |       | Duration |
| PLANT LAYOUT<br>AND LEATHER<br>MACHINES | 5 Hrs        | 75 Hrs          | Internal<br>Assessment | Board<br>Examination | Total |          |
|                                         |              |                 | 25                     | 75                   | 100   | 3 Hrs    |

## PLANT LAYOUT AND LEATHER MACHINES - 39073

### DETAILED SYLLABUS

Contents: Theory

| Unit | Name of the Topic                                                                                                                                                                                                                                                                                                                                                                                                                    | Hours |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I    | Introduction - Location of Tannery - selection of site - Infrastructural facilities required - reasons for selecting site on the basis of different process.<br>Ground plan and size of Tannery - Layout of different sections - Construction of the Tannery- Construction of pit.- Provision for sewage and channels - Planning for good ventilation, Lighting etc - Provision of water line for the process-Pumps for water supply | 13    |
| II   | Study of Hydraulic & Pneumatic pressure - Transmission of motion and power in Belt drive - Different types of Belt drive - Velocity Ratio - Slipping of belts - Power transmitted by belts - Reversing motion by belts - Fast and Loose pulleys.<br>Rope drive, chain drive, Gear drive - Reduction gear - Clutch mechanism - conversion of Rotary motion to reciprocating motion - Fly wheel - Connecting rod.                      | 13    |
| III  | Tannery Machines - Designing of various Drums, Paddles, Sizes of Drum and Paddle- Maintenance and Repair.<br>Working of various Processing Machines such as unhairing, Fleshing, Setting, Reversible Setting, Splitting, Shaving Machines etc. - General Maintenance and repair - Specification                                                                                                                                      | 13    |
| IV   | Finishing Machines in Tannery; such as Staking (Slocomb and Vibratory) - Buffing Machine (Throat Type - Through Feed) - Glazing machine(Level bed, Inclined bed) - Hydraulic Embossing press - Spraying Machine - Hand Spray - Auto Spray - Vacuum Drier - Pin Wheel Measuring machine, digital measuring machine – Sketches and working principles - General Maintenance - Specification.                                           | 13    |
| V    | Energy optimization – process control by automation –process control system for controlled chemical addition and ph control - Role of computers in leather Process controls – application of process design engineering concepts to leather processing . Occupational health and safety measures for tanneries.                                                                                                                      | 13    |

#### Reference Book :

1. "Leather Technician's Hand Book by J.H. Sharphouse, Leather Producers Association Northampton - 1995.
2. "Practical Leather Technology" by T.C. Thorstenson - Krieger Publishing Company, Malabar, Florida 1993.
3. Automatic Spraying Machines for Leather Production their operation and Maintenance by S.N. Price, Shoe Trades Publishing Company, Cambridge MA.



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

**VII SEMESTER**

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**FOOTWEAR FABRICATION PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

# STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

## M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39074**  
Semester : VII Semester  
Subject Title : FOOTWEAR FABRICATION PRACTICAL

### TEACHING AND SCHEME OF EXAMINATION:

No of weeks per semester: 15 weeks

| Subject Title                  | Instructions |                 | Examination         |                   |       |          |
|--------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| FOOTWEAR FABRICATION PRACTICAL | 6 Hrs        | 90 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                |              |                 | 25                  | 75                | 100   |          |

### **RATIONALE:**

In Diploma level engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

### **GUIDELINES:**

- All the Eight exercise given in the list of exercise should be completed and given for the end semester practical examination.
- In order to develop best skills in handling machines/Equipment in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

### **ALLOCATION OF MARKS**

|                            |          |
|----------------------------|----------|
| Procedure Writing          | 10 marks |
| Sketch/ diagram with parts | 10 marks |
| Product making             | 40 marks |
| Finishing                  | 10 marks |
| Viva -Voce                 | 05 marks |
| <hr/>                      |          |
| Total                      | 75 Marks |

### **DETAILED SYLLABUS**

Contents: PRACTICAL

1. Mean forme extraction from last.
2. Upper standard extraction from mean forme.
3. Style line marking practice.
4. Practice on shoe upper manufacture.
5. Manufacture of sandal/Chapels.
6. Manufacture of Derby shoes.
7. Manufacture of Oxford shoes.
8. Manufacture of Court shoes



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M- SCHEME**

**2015 - 2016**

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### **VII SEMESTER**

#### **PHYSICAL TESTING PRACTICAL**

### **CURRICULUM DEVELOPMENT CENTRE**

# STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

## M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39075**  
Semester : VII Semester  
Subject Title : **PHYSICAL TESTING PRACTICAL**

### TEACHING AND SCHEME OF EXAMINATION:

No of weeks per semester: 15 weeks

| Subject Title              | Instructions |                 | Examination         |                   |       |          |
|----------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                            | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| PHYSICAL TESTING PRACTICAL | 4 Hrs        | 60 Hrs          | Internal Assessment | Board Examination | Total |          |
|                            |              |                 | 25                  | 75                | 100   |          |

### **RATIONALE:**

In Diploma level engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

### **GUIDELINES:**

- All the Fourteen exercise given in the list of exercises should be completed and given for the end semester practical examination.
- In order to develop best skills in handling Instruments/Equipment and taking readings in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

### **ALLOCATION OF MARKS**

|                      |                |
|----------------------|----------------|
| Procedure Writing    | 20 marks       |
| Testing /Analysis    | 25 marks       |
| Calculation & Result | 25 marks       |
| Viva Voce            | 05 marks       |
| Total                | <hr/> 75 Marks |

### **DETAILED SYLLABUS**

Contents: PRACTICAL

1. Sampling position of Leather for Physical testing of Leathers
2. Tensile Strength and Elongation at break
3. Tongue tear Strength
4. Stich tear Strength.
5. Grain crack & bursting test
6. Water absorption test.
7. Water Proofness test.
8. Apparent Density.
9. Shrinkage Temperature.
- 10 Abrasion resistance.
11. Lastometer.
- 12 Compressibility & Resilience test.
- 13 Flexural Endurance Test.
- 14 Air permeability.



**DIRECTORATE OF TECHNICAL EDUCATION**

**DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

**VII SEMESTER**

**PLANT LAYOUT AND LEATHER MACHINES PRACTICAL**

**CURRICULUM DEVELOPMENT CENTRE**

# STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

## M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39076**  
Semester : VII Semester  
Subject Title : **PLANT LAYOUT AND LEATHER MACHINES PRACTICAL**

### TEACHING AND SCHEME OF EXAMINATION:

No of weeks per semester: 15 weeks

| Subject Title                               | Instructions |                 | Examination         |                   |       |          |
|---------------------------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                                             | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| PLANT LAYOUT AND LEATHER MACHINES PRACTICAL | 6 Hrs        | 90 Hrs          | Internal Assessment | Board Examination | Total |          |
|                                             |              |                 | 25                  | 75                | 100   |          |

### **RATIONALE:**

In Diploma level engineering education skill development plays a vital role. The skill development can be achieved by on hand experience in handling various instruments, apparatus and equipment. This is accomplished by doing engineering related experiments in practical classes in various laboratories.

### **GUIDELINES:**

- All the Eight experiments given in the list of experiments should be completed and given for the end semester practical examination.
- In order to develop best skills in handling Instruments/Equipment and taking readings in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

### **ALLOCATION OF MARKS**

|                                      |      |
|--------------------------------------|------|
| Layout                               | - 15 |
| Machine Parts                        | - 15 |
| Working and description              | - 10 |
| Diagram, Maintenance & Specification | - 30 |
| Viva-voce                            | - 5  |
| Total                                | -75  |

### **DETAILED SYLLABUS**

#### **Contents: PRACTICAL**

- I. Preparation of Tannery Layout to the scale - Preparation of estimation for waterline, - working knowledge of various Tanning machines and their components. Preparation and drawing of simple sketches of Tanning machinery - Knowledge of component assembly of the tanning machines and their alignment - Identifying the defects.
- II. Study of components of various Tanning machines - Study of Alignment of rollers, cylinders of the Tanning machinery - Identifying the defects in splitting machine - Preparation and maintenance chart for all the tanning machinery indicating their components.
- III. Study of alignment of bearing, Bushes and various drives of the Tanning machinery - Checking up their working - Identifying the defects.
- IV. General verification and check up of all electrical installations like motor, starter, switch, etc. - Identifying their defects.
- V. General check up of all drives utilized in Tanning machinery - Belt drive, Gear drive - Checking up shaft alignment, etc. - Verification of RPM of machines and stroke length of machines.
- VI. Study of spraying unit and measuring machine
- VII. General safety precautions and preventive methods to be utilized in Tannery.

#### **Tannery Machines (Study and Sketches)**

Paddles, Drums, Unhairing machine - Fleshing machine - Spitting machine - Shaving machine - Setting machine - Staking machine - Buffing machine - Glazing machine - Spray unit - measuring machine.



## **DIRECTORATE OF TECHNICAL EDUCATION**

### **DIPLOMA IN LEATHER TECHNOLOGY**

**M - SCHEME**

**2015 - 2016**

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**VII SEMESTER**

**PROJECT WORK**

**CURRICULUM DEVELOPMENT CENTRE**

## STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

### M-SCHEME

(Implements from the Academic year 2015-2016 onwards)

Course Name : DIPLOMA IN LEATHER TECHNOLOGY (SW)  
Course Code : 2101  
Subject Code : **39077**  
Semester : VII Semester  
Subject Title : **PROJECT WORK**

#### TEACHING AND SCHEME OF EXAMINATION:

No of weeks per semester: 15 weeks

| Subject Title           | Instructions |                 | Examination         |                   |       |          |
|-------------------------|--------------|-----------------|---------------------|-------------------|-------|----------|
|                         | Hours /Week  | Hours /Semester | Marks               |                   |       | Duration |
| PROJECT WORK ASSESSMENT | 4 Hrs        | 60 Hrs          | Internal Assessment | Board Examination | Total |          |
|                         |              |                 | 25                  | 75                | 100   | --       |

#### EVALUATION FOR BOARD EXAMINATION:

| Details of Mark allocation                                                                                                                                                                                                                                                                                                                                                      | Max Marks |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Marks for Report Preparation, Demo, Viva-voce                                                                                                                                                                                                                                                                                                                                   | 65        |
| Marks for answers of 4 questions which is to be set by the external examiner from the given question bank consisting of questions in the following two topics Disaster Management and Environmental Management. Out of four questions two questions to appear from each of the above topics i.e. 2 questions x 2 topics = 4 questions<br><br>4 questions x 2 ½ marks = 10 Marks | 10        |
| <b>Total</b>                                                                                                                                                                                                                                                                                                                                                                    | <b>75</b> |

### DETAILED SYLLABUS

#### ENVIRONMENTAL & DISASTER MANAGEMENT

##### 1. ENVIRONMENTAL MANAGEMENT

Introduction – Environmental Ethics – Assessment of Socio Economic Impact – Environmental Audit – Mitigation of adverse impact on Environment – Importance of Pollution Control – Types of Industries and Industrial Pollution.

Solid waste management – Characteristics of Industrial wastes – Methods of Collection, transfer and disposal of solid wastes – Converting waste to energy – Hazardous waste management Treatment technologies.

Waste water management – Characteristics of Industrial effluents – Treatment and disposal methods – Pollution of water sources and effects on human health.

Air pollution management – Sources and effects – Dispersion of air pollutants – Air pollution control methods – Air quality management.

Noise pollution management – Effects of noise on people – Noise control methods.

## **2. DISASTER MANAGEMENT**

Introduction – Disasters due to natural calamities such as Earthquake, Rain, Flood, Hurricane, Cyclones etc – Man made Disasters – Crisis due to fires, accidents, strikes etc – Loss of property and life..

Disaster Mitigation measures – Causes for major disasters – Risk Identification – Hazard Zones – Selection of sites for Industries and residential buildings – Minimum distances from Sea – Orientation of Buildings – Stability of Structures – Fire escapes in buildings - Cyclone shelters – Warning systems.

Disaster Management – Preparedness, Response, Recovery – Arrangements to be made in the industries / factories and buildings – Mobilization of Emergency Services - Search and Rescue operations – First Aids – Transportation of affected people – Hospital facilities – Fire fighting arrangements – Communication systems – Restoration of Power supply – Getting assistance of neighbors / Other organizations in Recovery and Rebuilding works – Financial commitments – Compensations to be paid – Insurances – Rehabilitation.

### **LIST OF QUESTIONS**

#### **1. ENVIRONMENTAL MANAGEMENT**

1. What is the responsibility of an Engineer-in-charge of an Industry with respect to Public Health?
2. Define Environmental Ethic.
3. How Industries play their role in polluting the environment?
4. What is the necessity of pollution control? What are all the different organizations you know, which deal with pollution control?
5. List out the different types of pollutions caused by a Chemical / Textile / Leather / Automobile / Cement factory.
6. What is meant by Hazardous waste?

7. Define Industrial waste management.
8. Differentiate between garbage, rubbish, refuse and trash based on their composition and source.
9. Explain briefly how the quantity of solid waste generated in an industry could be reduced.
10. What are the objectives of treatments of solid wastes before disposal?
11. What are the different methods of disposal of solid wastes?
12. Explain how the principle of recycling could be applied in the process of waste minimization.
13. Define the term 'Environmental Waste Audit'.
14. List and discuss the factors pertinent to the selection of landfill site.
15. Explain the purpose of daily cover in a sanitary landfill and state the minimum desirable depth of daily cover.
16. Describe any two methods of converting waste into energy.
17. What actions, a local body such as a municipality could take when the agency appointed for collecting and disposing the solid wastes fails to do the work continuously for number of days?
18. Write a note on Characteristics of hazardous waste.
19. What is the difference between municipal and industrial effluent ?
20. List few of the undesirable parameters / pollutants anticipated in the effluents from oil refinery industry / thermal power plants / textile industries / woolen mills / dye industries / electroplating industries / cement plants / leather industries (any two may be asked)
21. Explain briefly the process of Equalization and Neutralization of waste water of varying characteristics discharged from an Industry.
22. Explain briefly the Physical treatments "Sedimentation" and "Floatation" processes in the waste water treatment.
23. Explain briefly when and how chemical / biological treatments are given to the waste water.
24. List the four common advanced waste water treatment processes and the pollutants they remove.
25. Describe refractory organics and the method used to remove them from the effluent.
26. Explain biological nitrification and de-nitrification.
27. Describe the basic approaches to land treatment of Industrial Effluent.
28. Describe the locations for the ultimate disposal of sludge and the treatment steps needed prior to ultimate disposal.
29. List any five Industries, which act as the major sources for Hazardous Air Pollutants.
30. List out the names of any three hazardous air pollutants and their effects on human health.
31. Explain the influence of moisture, temperature and sunlight on the severity of air pollution effects on materials.
32. Differentiate between acute and chronic health effects from Air pollution.
33. Define the term Acid rain and explain how it occurs.

34. Discuss briefly the causes for global warming and its consequences
35. Suggest suitable Air pollution control devices for a few pollutants and sources.
36. Explain how evaporative emissions and exhaust emissions are commonly controlled.
37. What are the harmful elements present in the automobile smokes? How their presence could be controlled?
38. What is the Advantage of Ozone layer in the atmosphere? State few reasons for its destruction.
39. Explain the mechanism by which hearing damage occurs.
40. List any five effects of noise other than hearing damage.
41. Explain why impulsive noise is more dangerous than steady state noise.
42. Explain briefly the Source – Path – Receiver concept of Noise control.
43. Where silencers or mufflers are used ? Explain how they reduce the noise.
44. Describe two techniques to protect the receiver from hearing loss when design / redress for noise control fail.
45. What are the problems faced by the people residing along the side of a railway track and near to an Airport? What provisions could be made in their houses to reduce the problem?

## **2. DISASTER MANAGEMENT**

1. What is meant by Disaster Management? What are the different stages of Disaster management?
2. Differentiate Natural Disasters and Man made Disasters with examples.
3. Describe the necessity of Risk identification and Assessment Surveys while planning a project.
4. What is Disasters recovery and what does it mean to an Industry?
5. What are the factors to be considered while planning the rebuilding works after a major disaster due to flood / cyclone / earthquake? (Any one may be asked)
6. List out the public emergency services available in the state, which could be approached for help during a natural disaster.
7. Specify the role played by an Engineer in the process of Disaster management.
8. What is the cause for Earthquakes? How they are measured? Which parts of India are more vulnerable for frequent earthquakes?
9. What was the cause for the Tsunami 2004 which inflicted heavy loss to life and property along the coast of Tamilnadu ? Specify its epicenter and magnitude.
10. Specify the Earthquake Hazard Zones in which the following towns of Tamilnadu lie: (a) Chennai (b) Nagapattinam (c) Coimbatore (d) Madurai (e) Salem.
11. Which parts of India are experiencing frequent natural calamities such as (a) heavy rain fall (b) huge losses due to floods (c) severe cyclones
12. Define basic wind speed. What will be the peak wind speed in (a) Very high damage risk zone – A, (b) High damage risk zone, (c) Low damage risk zone.

13. Specify the minimum distance from the Sea shore and minimum height above the mean sea level, desirable for the location of buildings.
14. Explain how the topography of the site plays a role in the disasters caused by floods and cyclones.
15. Explain how the shape and orientation of buildings could reduce the damages due to cyclones.
16. What is a cyclone shelter ? When and where it is provided ? What are its requirements ?
17. What Precautionary measures have to be taken by the authorities before opening a dam for discharging the excess water into a canal/river ?
18. What are the causes for fire accidents ? Specify the remedial measures to be taken in buildings to avoid fire accidents.
19. What is a fire escape in multistoried buildings ? What are its requirements ?
20. How the inmates of a multistory building are to be evacuated in the event of a fire/Chemical spill/Toxic Air Situation/ Terrorist attack, (any one may be asked).
21. Describe different fire fighting arrangements to be provided in an Industry.
22. Explain the necessity of disaster warning systems in Industries.
23. Explain how rescue operations have to be carried out in the case of collapse of buildings due to earthquake / blast / Cyclone / flood.
24. What are the necessary steps to be taken to avoid dangerous epidemics after a flood disaster?
25. What relief works that have to be carried out to save the lives of workers when the factory area is suddenly affected by a dangerous gas leak / sudden flooding ?
26. What are the difficulties faced by an Industry when there is a sudden power failure? How such a situation could be managed?
27. What are the difficulties faced by the Management when there is a group clash between the workers? How such a situation could be managed?
28. What will be the problems faced by the management of an Industry when a worker dies because of the failure of a mechanical device due to poor maintenance? How to manage such a situation ?
29. What precautionary measures have to be taken to avoid accidents to labourers in the Industry in a workshop / during handling of dangerous Chemicals / during construction of buildings / during the building maintenance works.
30. Explain the necessity of medical care facilities in an Industry / Project site.
31. Explain the necessity of proper training to the employees of Industries dealing with hazardous products, to act during disasters.
32. What type of disaster is expected in coal mines, cotton mills, Oil refineries, ship yards and gas plants?
33. What is meant by Emergency Plan Rehearsal? What are the advantages of such Rehearsals?
34. What action you will take when your employees could not reach the factory site because of continuous strike by Public Transport workers?

35. What immediate actions you will initiate when the quarters of your factory workers are suddenly flooded due to the breach in a nearby lake / dam, during heavy rain?
36. What steps you will take to avoid a break down when the workers union of your Industry have given a strike notice?
37. List out few possible crisis in an organization caused by its workers? What could be the part of the middle level officials in managing such crisis?
38. What types of warning systems are available to alert the people in the case of predicted disasters, such as floods, cyclone etc.
39. Explain the necessity of Team work in the crisis management in an Industry / Local body.
40. What factors are to be considered while fixing compensation to the workers in the case of severe accidents causing disability / death to them?
41. Explain the legal / financial problems the management has to face if safety measures taken by them are found to be inadequate.
42. Describe the importance of insurance to men and machinery of an Industry dealing with dangerous jobs.
43. What precautions have to be taken while storing explosives in a match/ fire crackers factory?
44. What are the arrangements required for emergency rescue works in the case of Atomic Power Plants?
45. Why residential quarters are not constructed nearer to Atomic Power Plants?

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**DIPLOMA IN LEATHER TECHNOLOGY (SAND-WICH)**

**ALTERNATE SUBJECTS IN THE NEW SYLLABUS (M- SCHEME)**

The following are the alternate subjects in the M-Scheme corresponding to the subjects in the old syllabus (L-Scheme) of Diploma in Leather Technology Course.

**III SEMESTER W. E. F OCT '16**

| S.No  | L SCHEME                                   | S.No  | M SCHEME                                                   |
|-------|--------------------------------------------|-------|------------------------------------------------------------|
|       | SUBJECTS                                   |       | SUBJECTS                                                   |
| 29031 | Applied Leather Chemistry                  | 39031 | Applied Leather Chemistry                                  |
| 29032 | Basics of Leather Manufacture              | 39032 | Basics of Leather Manufacture                              |
| 29033 | Theory of Pre tanning and Tanning          | 39033 | Theory of Pre tanning and Tanning                          |
| 29034 | Safety in Leather Industry                 | 39044 | Safety in Leather Industry (W.E.F. AP '17)                 |
| 29035 | Leather Chemicals Testing Practical        | 39035 | Pre tanning Chemicals Testing Practical                    |
| 29036 | Pre tanning process Practical              | 39036 | Pre tanning process practical                              |
| 29037 | Leather machines basic operation practical | 39046 | Leather machines basic operation practical (W.E.F. AP '17) |
| 20001 | Computer Application Practical*            | 30001 | Computer Application Practical*                            |

**IV SEMESTER (W.E.F. APR '17)**

| S.No  | L SCHEME                                   | S.No  | M SCHEME                             |
|-------|--------------------------------------------|-------|--------------------------------------|
|       | SUBJECTS                                   |       | SUBJECTS                             |
| 29041 | Process of Heavy Leather Manufacture       | 39034 | Process of Heavy Leather Manufacture |
| 29042 | Heavy Leather manufacture Practical        | 39037 | Heavy Leather manufacture Practical  |
| 29043 | Industrial Training Report & Assessment -1 | --    | No Alternate                         |

**V SEMESTER (W.E.F. OCT '17)**

| S.No  | L SCHEME                                    | S.No  | M SCHEME                                                    |
|-------|---------------------------------------------|-------|-------------------------------------------------------------|
|       | SUBJECTS                                    |       | SUBJECTS                                                    |
| 29051 | Theory of Post tanning and Finishing        | 39041 | Theory of Post tanning and Finishing                        |
| 29052 | Process of light leather manufacture        | 39042 | Process of light leather manufacture                        |
| 29053 | Plant layout and leather machines           | 39073 | Plant layout and leather machines(W.E.F. OC '18)            |
| 29054 | Footwear fabrication Technology             | 39072 | Footwear fabrication Technology(W.E.F. OC '18)              |
| 29055 | Light Leather Manufacture practical         | 39045 | Light Leather Manufacture practical                         |
| 29056 | Plant layout and leather machines Practical | 39076 | Plant layout and leather machines Practical (W.E.F. OC '18) |
| 29057 | Footwear Fabrication Practical              | 39074 | Footwear Fabrication Practical (W.E.F. OC '18)              |
| 20002 | Communication and life skill Practical*     | 30002 | Life and Employability skill Practical*                     |

**VI SEMESTER (W.E.F. APR '18)**

| S.No  | L SCHEME                                      | S.No  | M SCHEME                                      |
|-------|-----------------------------------------------|-------|-----------------------------------------------|
|       | SUBJECTS                                      |       | SUBJECTS                                      |
| 29061 | Leather Chemicals & Auxiliaries               | 39061 | Leather Chemicals & Auxiliaries               |
| 29062 | Theory of Leather testing                     | 39062 | Theory of Leather testing                     |
| 29063 | Tannery Effluent Treatment & Waste Management | 39063 | Tannery Effluent Treatment & Waste Management |
| 29064 | Leather Product Fabrication                   | 39064 | Leather Product Fabrication                   |
| 29065 | Chemical testing of Leather practical         | 39065 | Chemical testing of Leather practical         |
| 29066 | Leather finishing practical                   | 39066 | Leather finishing practical                   |
| 29067 | Leather Product Fabrication practical         | 39067 | Leather Product Fabrication practical         |
| 29068 | Project Work                                  | 39077 | Project Work                                  |

**VII SEMESTER (W.E.F. OCT '18)**

| S.No  | L SCHEME                                    | S.No  | M SCHEME                                 |
|-------|---------------------------------------------|-------|------------------------------------------|
|       | SUBJECTS                                    |       | SUBJECTS                                 |
| 29071 | Industrial Management & Entrepreneurship    | 39071 | Industrial Management & Entrepreneurship |
| 29072 | Physical testing practical                  | 39075 | Physical testing practical               |
| 29092 | Industrial Training Report & Assessment -II | 39092 | Industrial Training Report & Assessment  |