CURRICULAR STRUCTURE OF DIPLOMA IN LEATHER GOODS TECHNOLOGY

WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION & VOCATIONAL EDUCATION AND SKILL DEVELOPMENT

SECOND SEMESTER

S.L No	Course Category	Code	Course Title	Hours Per Week			Total Contact Hours/ Week	Credits	Marks	EXAMINATION SCHEME			
										External Assessment	Internal Assessment		
				L	T	P				End Semester Examination	Mid Semester Test	Quizzes/ Viva Voce/ Assignment	Class Attendance
THEORETICAL SUBJECTS													
1.	Basic Science	BS102	Mathematics-II	3	1	0	4	4	100	60	20	10	10
2.	Basic Science	BS104	Applied Physics-II	2	1	0	3	3	100	60	20	10	10
3.	Engg. Science	ES102	Introduction to IT Systems	2	0	0	2	3	100	60	20	10	10
4.	Engg. Science	LGTPC201	Basic Engineering for Leather Goods	2	1	0	3	3	100	60	20	10	10
5	Engg. Science	LGTPC202	Material Science for Leather Goods-I	2	1	0	3	3	100	60	20	10	10
PRACTICAL SUBJECTS													

S.L No	Course Category	Code	Course Title	Hours Per Week			Total Contact Hours/ Week	Credits	Marks	Continuous Assessment			End Semester Assessment	
										Class Assignments	Class Performance	Class Attendance	Assignment on Grand Viva day	Viva Voce (Before board of Examiners)
				L	T	P								

6.	Basic Science	BS106	Applied Physics- II Lab	0	0	2	2	1	100	30	20	10	20	20
7.	Engg. Science	ES108	Introduction to IT Systems Lab	0	0	4	4	2	100	30	20	10	20	20
8.	Engg. Science	LGTPC203	Basic Engineering for Leather Goods Lab	0	0	2	2	1	100	30	20	10	20	20
9.	Engg. Science	LGTPC204	Material Science for Leather Goods-I Lab	0	0	2	2	1	100	30	20	10	20	20
10	Audit	AU302	Indian Constitution	2	0	0	2	0	100	30	20	10	20	20
TOTAL				**13**	**04**	**10**	**27**	20	**1000**					

Syllabus of Mathematics-II

Course Title:	Engineering Mathematics-II
Course Code:	BS102/M-II
Number of Credits:	4(L: 3+T: 1) P: 0
Pre-Requisites:	Knowledge of the basic Co-ordinate Geometry, Statistics & Differential calculus
Total Contact Hours:	60 hrs.

Aim: Mathematics is the backbone of engineering students. The curriculum of mathematics has undergone changes from time to time in accordance with the need of engineering branches. The syllabus has been designed in keeping view the emerging needs of all categories of students. Great emphasis has been given on the application of various contents. This course will develop analytical abilities to make exact calculations and provide a continuing educational base for the students.

Course Objectives: After the completion of the course, the students will be able to
i) apply the knowledge of Cramer's rule and matrix inversion for finding the solutions of Linear Simultaneous Equations.
ii) apply the equations of a straight line, circle, conic section in solving the practical problems.
iii) apply the various techniques of evaluating integration and various methods of finding complete primitive of ordinary differential equations of 1^{st} order and second order for solving engineering problems.
iv) use the concept of partial differentiation in solving physical problems.
v) analyze the Statistics and Probability in a real situation.

Unit-1

Determinants & Matrices **10 Hours**

1.1 Determinant: **4**
1.1.1 Definition and expansion of determinants of order 2 & 3. Minors and cofactors
1.1.2 Elementary properties of Determinants (statements only) & simple problems
1.1.3 Chios Method for 4^{th} order determinant
1.1.4 Solution of linear simultaneous equations (up to 3 unknowns) by Cramer's Rule.

1.2 Matrix:
1.2.1 Definition of Matrix and its order. **6**
1.2.2 Different types of Matrices.(rectangular, square, row, column, upper triangular, lower triangular, diagonal, scalar, identity, null)
1.2.3 Equality of two matrices
1.2.4 Addition, subtraction, multiplication of a matrix by a scalar and multiplication of two matrices
1.2.5 Transpose of a matrix, symmetric & skew symmetric matrices, simple problems
1.2.6 Singular & non-singular matrices, adjoint and inverse of a matrix of order 3

Syllabus of Mathematics-II

Unit-2

Co-ordinate Geometry (only 2-dimension) **13 Hours**

2.1 Coordinate System **3**
2.1.1 Cartesian & Polar Coordinate system & their relations.
2.1.2 Distance between two points, internal & external division of a line segment & simple problems.
2.1.3 Area of a triangle and condition of collinearity.

2.2 Straight Line **4**
2.2.1 Gradient (slope) of a straight line
2.2.2 Equations of straight line in various standard forms (no proof) (slope-intercept form, slope-point form, intercept form, two point form) & simple problems
2.2.3 Angle between two straight lines- conditions of parallelism and perpendicularity & simple problems
2.2.4 Perpendicular distance from a given point to a line, perpendicular distance between two parallel lines

2.3 Circle: **2**
2.3.1 Equation of a circle - centre-radius form, diameter form, simple problems
2.3.2 General equation of a circle and its centre and radius. Simple problems

2.4 Conic Section: **4**
2.4.1 Definition of conic section, vertex, axis, eccentricity, focus, directrix, latus rectum & problem
2.4.2 Standard equations of parabola and ellipse, simple problems

Unit-3

Integral Calculus **15 Hours**

3.1 Indefinite integral **8**
3.1.1 Definition of Integration as inverse process of differentiation.
3.1.2 Rules for integrations (sum, difference, scalar multiple)
3.1.3 Integration of standard functions
3.1.4 Integration by substitution
3.1.5 Integration by parts
3.1.6 Integration by partial fraction

3.2 Definite Integral **7**
3.2.1 Definition of definite integral & simple problems
3.2.2 Properties of definite integral with simple problems.
3.2. Application of definite integral -i) area of bounded region ii) Volume and surface area of solid generated by revolving an area about x and y-axis

Syllabus of Mathematics-II

Unit-4

Ordinary Differential Equation **10 Hours**

4.1 Definition of ordinary differential equation, order & degree. **1**
4.2 Solution of Differential equation of First order and first degree **5**
4.2.1 Separation of Variables
4.2.2 Homogeneous type
4.2.3 Exact type
4.2.4 Linear type

4.3 **Solution of Linear Second order Differential equations with constant coefficients** **4**
4.3.1 Complementary Functions (C.F)
4.3.2 Particular Integral for polynomial function, e^{ax}, $\sin ax$ and $\cos ax$, [$F(-a^2) \neq 0$], $e^{ax}V$ where V is a polynomial function. Simple problem.

Unit-5

Partial Differentiation **3 Hours**

5.1 Definition & meaning of partial derivative.
5.2 Evaluation of partial derivatives.
5.3 Definition & examples of homogeneous functions.
5.3 Euler's theorem (1st order) on Homogeneous functions for 2 variables (without proof). Problems.

Unit-6

Statistics & Probability **9 Hours**

6.1 Statistics **5**
6.1.1 Definition & examples of frequency distribution.
6.1.2 Measure of Central Tendency (mean, median, mode) for ungrouped and grouped frequency distribution.
6.1.3 Measures of dispersion-Standard deviation, Simple problems

6.2 Probability **4**
6.2.1 Definition of random experiment, sample space, event, occurrence of events & types of events (eg. Impossible, Mutually exclusive, Exhaustive, Equally likely)
6.2.2 Classical definition of probability, simple problems

Syllabus of Mathematics-II

Examination Scheme:

A. Semester Examination pattern of 60 marks:

1. Objective questions- 20 marks (1 mark for each question), (At least 5 questions from each **Group**)
2. Subjective questions- 40 marks (At least one question of 10 marks from each **Group**)

- **Group- A** contains Unit-1 & Unit-2 (At least 20 marks); **Group-B** contains Unit-3 (At least 20 marks); **Group-C** contains Unit-4 (At least 20 marks) , **Group-D** contains Unit-5 & Unit-6 (At least 20 marks)

N.B.- Student will answer objective type questions of 20 marks and for subjective questions of 40 marks, taking one question from each **group** of the above four **groups**.

B. For the internal Assessment 40 marks:

1. Class Test Examination/Internal Examination: 20 marks; choose best two out of three Class Test Examinations/ Internal Examinations
2. Class Attendance: 10 marks
3. Viva/ Quiz/Presentation/Assignment/Project/Report etc.: 10 marks

Text Books & Reference –

1. Higher Engineering Mathematics, B. S. Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics, Konch & Dey, Bhagabati Publication
3. Numerical Analysis, N. Islam, Academic Press
5. Introduction to Integral Calculus, rohde, Jain, Poddar,Ghosh, Wiley
6. Higher Algebra: Abstract And Linear, SK Mapa, Sarat Book House
7. Analytic Geometry Two & Three Dimensional and Vector Analysis, R. M. Khan, New Central Book Agency
8. Probability & Statistics for Engineers, Richard A. Jonson, Prentice Hall of India
9. An Introduction to Differential Equations, Ghosh, Maity, New Central Books Agency
10. Higher Engineering Mathematics, B. S. Grewal, Khanna Publishers, New Delhi
11. Engineering Mathematics, A. Sarkar, Naba Publication
12. Engineering Mathematics, Konch & Dey, Bhagabati Publication
13. Engineering Mathematics, Babu Ram, Pearson
14. Diploma Engineering Mathematics, B. K. Paul, U.N.Dhar & Sons
15. Engineering Mathematics, V. Sundaram, R. Balasubramanian, K.A. Lakshminarayanan, Vikas Publishing House.
16. Web portal: https://www.ndl.gov.in/homestudy/science
https://ncertbooks.ncert.gov.in/login
https://epathshala.nic.in//
https://webscte.co.in/
https://en.wikipedia.org/wiki/
https://openlibrary.org/
https://www.youtube.com/
http://content.inflibnet.ac.in/
https://doabooks.org/
https://www.oapen.org/home
http://www.gutenberg.org/
17. Apps in Google Play Store: National Digital Library
e-Granthalaya
NSDC eBook Reader: Kaushal ePustakalaya
ePathshala
IGNOU e-content

----------End----------

Sem-II(Theory), Applied Physics –II

Course Code	:	BS104
Course Title	:	Applied Physics –II
Number of Credits	:	3 (L: 2, T: 1,P: 0)
Prerequisites	:	High School Level Physics
Course- Category	:	BS

Course Objectives

Applied Physics aims to give an understanding of this world both by observation and by prediction of the way in which objects behave. Concrete use of physical principles and analysis in various fields of engineering and technology are given prominence in the course content. The course will help the diploma engineers to apply the basic concepts and principles to solve broad- based engineering problems and to understand different technology based applications.

Course Content

Unit -1: Wave motion and its applications

Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc. study of vibrations of cantilever and determination of its time period, Free, **damped and forced** vibrations with examples.

Wave motion, transverse and longitudinal waves with examples (Sound and light waves) definitions of wave velocity, frequency and wave length and their relationship, equation of a plane progressive wave. Principle of superposition of waves and beat formation.

Acoustics of buildings- reverberation, reverberation time, methods to control reverberation time , noise, coefficient of absorption of sound, Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic.

Unit – 2: Optics

Basic optical laws: reflection and refraction, refractive index, Images and image formation by thin lenses, lens & lens maker's formula, (no deduction) power of lens, magnification simple numerical problems. Total internal reflection, Critical angle and conditions for total internal reflection, applications of total internal reflection in optical fiber:

Optical Instruments; simple and compound microscope, astronomical telescope (refracting, Ray Diagram and formula for magnification). Interference and diffraction of light (Qualitative ideas only).

Unit – 3: Electrostatics

Coulombs law, unit of charge, Electric field, Electric lines of force and their properties, Electric flux, Electric potential and potential difference, Gauss law (statement only) Application of Gauss law to find electric field due to a charged sphere.

Capacitor and its working, types of capacitors, Capacitance and its units. Capacitance of a parallel plate capacitor (formula only), Series and parallel combination of capacitors formula (related numerical problems), dielectric and its effect on capacitance, dielectric break down.

Unit – 4: Current Electricity

Electric Current and its units, Direct and alternating current, resistance and its units, Specific resistance, Conductance, Specific conductance, Series and parallel combination of resistances. Factors affecting resistance of a wire, carbon resistance and colour coding.

Ohm's law, Kirchhoff's laws, Wheatstone bridge, Carrey Foster Bridge and its applications, Concept of terminal potential difference and Electro motive force (EMF)

Heating effect of current, Electric power, electric energy and its units (related numerical problems)

Thermoelectric effect: Seebeck &Peltier effects.

Unit -5: Electromagnetism

Magnetic field and its origin, units

Lorentz force (force on moving charge in magnetic field).Biot- Savart law, Application to **Straight** Conductor & circular loop; concept of magnetic dipole. Force on current carrying conductor, Torque on rectangular coil placed magnetic field concept of electromagnetic induction, Faraday's Laws, Moving coil galvanometer; principle, construction and working, Conversion of a galvanometer into ammeter and voltmeter.

Types of magnetic materials; dia, para and ferromagnetic with their properties.

Unit-6: Semiconductor Physics

Energy bands in solids, Types of materials (insulator, semi-conductor, conductor), intrinsic and extrinsic semiconductors, p-n junction, junction diode and V-I characteristics, Diode as rectifier- half wave and full wave rectifier (Centre taped) & circuit symbol.

Transistor, Block diagram types (pnp and npn)& circuit symbol, transistor as an amplifier CE mode (Circuit diagram and concept).

Photocells, Solar cells and LED working principle and engineering application.

Unit-7: Modern Physics

Bohr's atom model and concept energy levels, ionization and excitation potentials, X-rays, Production (Coolidge tube) continuous and characteristic-X-rays, soft and hard X-rays, and use,

Laser: spontaneous and stimulated emission; Laser light; He-Ne laser elementary characteristics, applications of lasers.

Fiber Optics: Introduction to optical fibers, mechanism of light propagation, applications.

Nanoscience and nanotechnology (Introduction only).

Reference books:

1. Text books of Physics for Class XI & XII (Part I & II); N.C.E.R.T., Delhi.
2. Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi
3. Concepts in Physics by HC verma, Vol.I & II, Bharti Bhawan Ltd. New Delhi
4. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
5. Modern approach to Applied Physics-I and II, AS Vasudeva, Modern Publisers.
6. A Textbook of Optics, N Subramanyam, Brij Lal,MN Avahanulu, S Chand and Company Ltd.
7. Introduction to Fiber optics, Ajoy Ghatak and K Thyagarajan, Cambridge University Press India Pvt. Ltd, New Delhi.
8. Nanoscience and Nanotechnology, KK Choudhury, narosa Publishing House, Pvt. Ltd. New Delhi.
9. Nanotechnology: Importance and Applications, M.H. Fulekar, IK International Publishing House Pvt. Ltd., New Delhi

Course Title :	Introduction to IT Systems Theory
Course Code	ES 102
Number of Credits :	2 (L: 2, T: 0, P: 0)
Prerequisites	NIL
Course Category	ES
Course code : General	Semester : SECOND
Duration : 16 weeks	Maximum Marks : 100
Teaching Scheme	Examination Scheme
Theory : - 2 hrs/week	Continuous Internal Assessment : 20 Marks
Tutorial: - 1 hr/week	Attendance, Assignment & Quiz : - 20 Marks
Practical : NIL	End Semester Examination : 60 Marks
Aim:	Develop basic concept of Computer Science

Course Objectives:: This course is intended to make new students comfortable with computing environment - Learning basic computer skills, Learning basic application software tools, Understanding Computer Hardware, Cyber security awareness.

Course Content:

Contents (Theory)	Hrs./Unit	Marks
UNIT 1:	10	28

Basic Internet skills: Understanding browser, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals.

Number system and codes: Binary, octal, hexadecimal and decimal Number systems and their inter conversion, BCD numbers (8421-2421), gray code, excess–3 code, cyclic code, code conversion, ASCII, EBCDIC codes. Binary addition and subtraction, signed and unsigned binary numbers, 1's and 2's complement representation. 2. Boolean Algebra: Basic logic circuits: Logic gates (AND, OR, NOT, NAND, NOR, Ex-OR, ExNOR and their truth tables,), Universal Gates, Laws of Boolean algebra, De-Morgan's theorem

General understanding of various computer hardware components – CPU, Memory(types), Display(modern), Keyboard, Mouse, HDD, SSD and

other Peripheral Devices.
Types of software

UNIT 2:	**10**	28

Overview of Operating Systems

- **What is an OS**
- **Brief history.**

Background and Basics

- **Computer System review**
- **Types of OS**
- **Architecture**
- **Basic Oss**
- **Batch**
- **Multi-programmed batch**
- **Timesharing**
- **Computer System Structures**
- **Operating System Structures**

UNIT 3:	**2**	8

Algorithm and Flowcharts

- **Algorithm**
- **Definition**
- **Characteristics**

Advantages and disadvantages

- **Flowchart**
- **Definition**
- **Define symbols of flowchart**
- **Advantages and disadvantages**

Examples

UNIT 3:	**7**	20

HTML 5: • HTML – Introduction • HTML – Elements • HTML – Tags • HTML – Text • HTML – Formatting • HTML – Pre • HTML – Attributes • HTML – Font • HTML – Text Links • HTML – Comments • HTML – Lists • HTML – Images • HTML – Image Links • HTML – Tables • HTML – Bgcolor • HTML – Color Codes • HTML – Color Chart • HTML – Background • Web Forms • HTML – Forms • HTML – Input • HTML – Text Fields • Hidden Fields • HTML – Password • HTML – Reset • HTML – Submit • HTML – Checkboxes • HTML – Radio • HTML – Select • HTML – Hidden Fields • HTML – Upload • HTML – Textarea • Special Tags • HTML – Body • HTML – Meta • HTML – Style • HTML – Div • HTML – Layouts • HTML – Frames • Formatting Tags • HTML – Bold • HTML – Paragraphs • HTML – Headings • HTML – Line Breaks

CSS: CSS Introduction • CSS Syntax • CSS Id & Class • CSS How CSS Styling • Styling Backgrounds • Styling Text • Styling Fonts • Styling Links • Styling Lists • Styling Tables CSS Box Model • CSS Border • CSS Outline • CSS Margin• CSS Display • CSS Positioning • CSS Floating • CSS Navigation Bar • CSS Image Gallery • CSS Image Opacity • CSS Align **JavaScript: Introduction • JavaScript Overview • JavaScript Syntax • Type of JavaScript • Embedding Script In HTML File • Variable Operators • Arithmetic • Logical • Comparison • Assignment • Conditional Conditional Statement & Looping Statement • If • If. Else • Switch • While • Do/while**		
UNIT 5:	**3**	16
(Network Utilities and devices tools/project) **1: Introduction to Computer Security Chapter** **2: Networks and Internet (DoS Tools & Techniques – Tracert, Visual Route)** **3: Cyber Stalking, Fraud, and Abuse** **4: Denial of Service Attacks (Scanning – WireShark)** **5: Malware Chapter 6: Techniques Used by Hackers.**		
Reference Book		
1. Computer Fundamentals by Goel, Pearson; **2. Computer Architecture and Maintenance. By - Dr. Sachin Publisher - Shroff Publisher;** **3. Introduction to Computer Science, ITL Education Solutions Limited, Pearson.** **4. FUNDAMENTALS OF COMPUTERS by E Balagurusamy. McGraw Hill Education;** **5. Express Learning - Computer Fundamentals and Programming, By Ashok Kamthane/ITL ESL. Pearson;**		
Course outcomes: **At the end of the course student will be able to comfortably work on computer, install and configure OS, assemble a PC and connect it to external devices, basic design of web page, protect information and computers from basic abuses/attacks.**		

SEM-II(LAB), Applied Physics II Lab

Course Code	:	BS106
Course Tittle	:	Applied Physics II Lab
Number of Credits	:	1 (L:0, T:0, P:2)
Prerequisites	:	NIL
Course Category	:	BS

Course Objectives:

Concrete use of physical principles and analysis in various fields of engineering and technology is very prominence. The course aims to supplement the factual knowledge gained in the lecture by first hand manipulation of apparatus. This will develop scientific temper and help to apply the basic concepts and principles in solving engineering and technology based problems. In addition, students get necessary confidence in handling equipment and thus learn various skills in measurement.

List of Practicals/Activites: (To perform minimum 8 Practicals)

1. To determine and verify the time period of **oscillation of** a cantilever.
2. To verify laws of refraction (Snell's law) using a glass slab.
3. To determine focal length and magnifying power of a convex lens by **u-v method**.
4. To verify Ohm's law by plotting graph between current and potential difference.

5.a.To verify laws of resistances in series by P.O.box.

5.b. To verify laws of resistances in parallel by using Ammeter and Volt meter.

6.To verify Kirchhoff's law using electrical circuits.

7.To find resistance of a galvanometer by half deflection method.

8.To convert a galvanometer into an ammeter.

9.To convert a galvanometer into a voltmeter.

10.To verify inverse square law of radiations using a photo-electric cell.

11. To draw V-I characteristics of a semiconductor diode (Ge, Si) and determine its knee voltage.
12. To study the dependence of capacitance of a parallel plate capacitor on various factors and determine **the** permittivity of air at a place.

Recommended Books:

1. Text Books of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi
2. Comprehensive Practical Physics, Vol-I & II, JN Jaiswal, Laxmi Publication(P)Ltd., New Delhi
3. Practical Physics by C.L. Arora, S. Chand & Company Ltd.

Course Title : Introduction to IT Systems Lab	
Course Code	NIL, should be doing ES102 in parallel
Number of Credits :	2 (L:, T: 0, P: 3)
Prerequisites	NIL
Course Category	ES
Course code : General	Semester : SECOND
Duration : 16 weeks	Maximum Marks : 100
Teaching Scheme	Examination Scheme
	Continuous Internal Assessment: 40 Marks
	Attendance, Assignment & Quiz : - 20 Marks
Practical : 4 hrs/week	End Semester Examination: 40 Marks
Aim:	Develop basic concept of Computer Science
1 Browser features, browsing, using various search engines, writing search queries	
2 Visit various e-governance/Digital India portals, understand their features, services offered	
3 COMPUTER FUNDAMENDALS Computer and operating system-fundamentals of computer-components of computer system-Input and Output Devices-Memory handling-Storage devices	
4 Read Wikipedia pages on computer hardware components, look at those components in lab, identify them, recognise various ports/interfaces and related cables, etc.	
5 Install Linux and Windows operating system on identified lab machines, explore various options, do it multiple times	
6 Connect various peripherals (printer, scanner, etc.) to computer, explore various features of peripheral and their device driver software.	
7 Practice HTML commands with CSS try them with various values, make your basic own Webpage	
8 MS Excel	
Apply Custom Formats and Layouts	A Learner is able to apply skills in Advanced Excel, is able to – • Format Cells, • Apply Custom Values and predefined Formats • Apply Borders, • Design Borders • Custom Formatting
Create advanced formulas	A Learner is able to Use Simple and Advanced Formulas like – • Nested if, • Reference formulas like –

	• lookup, vlookup, hlookup, • count formula with conditions • Index, Match, • Conditional Loops, etc
Use Scenarios	A Learner is able to seek use Goal Seek function, alter scenarios and values in a cell to reach a goal.
Create Advanced Charts	A Learner can tell where to use what type of charts, and obtain graphical Charts in various scenarios 3D-Graphs, Bar Charts, Pie Chart, Histograms, Line Graph, Sparklines, trend, etc.
Pivot tables & charts	A Learner is able to Apply • Pivot Tables, • Design Pivot Table, • Customize Values,
Manage and Share Workbooks	A Learner is able to Share Workbook Online, email, save on cloud, edit it Online in Google Sheets, Add Collaborators etc.
9 MS PowerPoint	
Create a Power Point presentation using slide template. **Create a Power Point presentation using animation.** **Create a Power Point presentation using transition** **Create a Power Point Presentation with Adding movie and sound.** **Create a Power Point Presentation with Adding tables and chart etc.** **Changing slide colour scheme in presentation.** **Viewing the presentation using slide navigator.** **Create, Save, Run and Print the Power Point Presentation.**	
10	
Create and share files/folders in Google drive **Create and share Google docs.** **Create and share Google sheets.** **Create and share Google Forms.** **Create and share Google slides.**	
Course outcomes: **At the end of the course student will be able to comfortably work on computer, install and configure OS, assemble a PC and connect it to external devices, write documents, create worksheets, prepare presentations, web pages, protect information and computers from basic abuses/attacks.**	
Reference Book	
1. My Office 2016, Pearson **2. Head First Excel : A Brain-Friendly Guide. Publisher: Shroff/O'Reilly** **3. My Excel 2016, Pearson**	

Name of the Course: Diploma in LEATHER GOODS TECHNOLOGY		
Course Title: Basic Engineering for Leather Goods	**Course code :** LGTPC201	
Number of Credit: 3	**Semester: SECOND**	
Teaching Scheme	**Examination Scheme**	
Duration: 15 weeks	**Maximum Marks: 100**	
Theory : - 2 hrs/week	Mid. Sem. Tests	20 Marks
Tutorial: -1 hrs/week	Quizzes, Viva-voce, Assignments	10 Marks
Practical: NIL	Class Attendance	10 Marks
Total Contact Hours: 45 Hours	**End Semester Examination**	60 Marks

Prerequisite: Basic knowledge of Leather Goods Engg. Workshop Practice

Aim: To develop concepts among the students about machinery, work process and component manufacturing.

Course Objective:

1. Introduce students about Anatomy of leather handbag
2. To understand different stages of accessories production
3. To discuss trend research
4. To explain material and fitting as per trend research
5. To study hand tools and machinery required to develop it
6. To describe needle classification, adhesive, seam skiving
7. To develop the sequence to different bags small component
8. To illustrate different stages in PPT presentation

Course Content :

Content (Theory)		Module	Hrs./Unit
Unit:1	**Process and Planning for Leather Handbag/small goods manufacturing Process** • Anatomy of The Handbag/Accessories (Types of handles, Closer, Pockets, Binding, etc.) • Designing/conceptualizing leather Handbag/small goods • What is Trend Research? And its incorporation • Developing Prototypes and checking the concept feasibility. • Choosing Leather (origin & finishes) as raw material. • Storing the Raw Materials • Leather Coloring/ dying • Pattern Cutting • Raw material Cutting • Preparing and assembling • Hand Stitching • Fastening hardware's • Finishing	Module 1	6

	• Packing and Dispatch • Feedback and rectifications		
Unit: 2	Machines and equipment. Introduction to Machines and equipment • Safety measures • Tools • Bench layout • Types of machine: (Flatbed single needle m/c, Post bed single needle m/c, Flat bed double needle m/c, Post bed double needle m/c, Skiving m/c, Leather splitting m/c Cylinder arm, heavy duty m/c, Zig-zag m/c) • M/C parts & functions • Shuttle & feed types • Maintenance		6
Unit: 3	Introduction to Needles • Needle, needle parts • Needle System • Different types of needle (size & point) • M/C re-timing - hook/needle bar Introductions to Threads • Classification of threads • Threads uses in Leather Goods Construction • Basic operational skill (top threading, bottom threading, bobbin rewinding	Module 2	3
Unit: 4	Adhesives, Reinforcements • Definition of Adhesive • Types of Adhesives Reinforcements • Other Chemicals		3
Unit: 5	Introduction to various Construction Techniques • Skiving • Seams • Edges • Bindings and Piping • Adhesives application • Reinforcements uses • Decorative stitches	Module 3	6
Unit-6	Different Components of Bags • Different types of pockets (Plain pocket, Zipper pocket, Invisible zipper pocket) • Gusset Pocket, Flap pocket,		6

	• Different types of handle and trim techniques.		
Assignments	Prepare a hard-copy & Power Point presentation of all Closing operations with the help of respective diagrams.		15
Total			**45**

Examination Scheme of ESE (End Semester Examination)

	Question Type	**Question to be set**	**Questions to be answered**	**Marks**
Theoretical	**MCQ-type questions are carrying one mark.**	**15**	**10**	**10**
	Short answer-type questions carrying one mark.	**15**	**10**	**10**
	Subjective-type questions carrying two marks.	**10**	**6**	**12**
	Subjective-type questions carrying six marks.	**9 (3 each from each of 3 modules)**	**3**	**18**
TOTAL				**60**

Pass Criterion: Students have to obtain at least **40% marks** individually both in Internal assessment and end semester exams to pass.

References:

1. Manual-of-Leather-goods CLRI publication
2. Manual-of-Leather-garments CLRI publication
3. **INTRODUCTION TO SEWING AND SEWING MACHINES by** Deepak Choudhary. , K. Louis, Chandra Shekhar , Sanjeev Kumar Mishra.
4. Comprehensive footwear technology by S.N.Ganguly
5. Bag-Design-by-Fashionary

Course outcomes:

Upon completion of this course, students should be able to:

1. Understand Anatomy of leather handbag
2. Divide the bags into components
3. Understand trend research
4. Explain material and fitting as per trend research
5. Identify the machine and material requirements for making component.
6. Explain needle classification, adhesive, seam skiving
7. Develop the sequence to different bags small component
8. Illustrate different stages in PPT presentation

Name of the Course: Diploma in LEATHER GOODS TECHNOLOGY		
Course Title: Material Science for Leather Goods- I	**Course code :** LGTPC202	
Number of Credit: 3	**Semester: SECOND**	
Teaching Scheme	**Examination Scheme**	
Duration: 15 weeks	**Maximum Marks: 100**	
Theory : - 2 hrs/week	Mid. Sem. Tests	20 Marks
Tutorial: -1 hrs/week	Quizzes, Viva-voce, Assignments	10 Marks
Practical: NIL	Class Attendance	10 Marks
Total Contact Hours: 45 Hours	**End Semester Examination**	60 Marks

Prerequisite: NIL

Aim : The Module gives an overview of material required in leather goods industry, the principles and theory of leather manufacturing, leather finishing, different types non leather material and their properties.

Course Objective:

1. To develop understanding of different types of leather.
2. To describe tanning and finishing process.
3. To explain the ability to identify leather defects
4. To describe leather grading, selection, and identification techniques.
5. To aware students about different types of Non leather upper, Lining, reinforcement and fittings
6. To demonstrate Material quality checking (non destructive)
7. Prepare students so that they can make material swatch card, defects charts

Course Content :

	Content (Theory)	Module	Hrs./Unit
Unit:1	**Introduction to Leather** GENERAL INFORMATION ABOUT RAW HIDES AND SKINS Chemical constituents of hides & skins; Brief study of various fibrous & non- fibrous protein; Preservation Techniques – Principles involved in preservation techniques, short-term preservation techniques, Defects in hides & skins, Properties of raw hides & skins. PRE TANNING PROCESS Principles involved in Soaking, Liming, Deliming, Bating, Pickling, Depickling & Degreasing. TANNING PROCESS Various types of Tanning materials, Principles involved in Vegetable & Cr Tanning, General properties & Differences	Module 1	9

	between Vegetable & Chrome Tanning, Combination Tannage. POST TANNING AND FINISHING PROCESS Principles involved in Neutralization, Dyeing and Fat Liquoring-Various Drying techniques and Crusting operations; General classification of Leather Finishes.		
Unit: 2	CLASSIFICATION OF LEATHER BRIEF KNOWLEDGE ABOUT CHARACTERISTICS OF LEATHER FOR LEATHER GOODS, categories (Grading /sorting specially for leather goods and garments.) Leather Selection, Identification of leather by look and feel • PDM • NDM • DDDM, • Nappa, • Antique, • Hair on, • Crunch, • Crackle, • VT, • Cr-free leather • Wash, • Hunter or Oil Pull up • Suede, • Nubuck, • Burnish	Module 2	6
Unit: 3	Introduction to Non-Leather / Synthetic upper i) PU/ PVC ii) Fabric iii) Green leather iv) Artificial leather (i) Made of fruit pulp (ii) Cactus leather (iii) Apple leather (iv) Mango leather Vegan leather		6
Unit: 4	Introduction to • Reinforcing Material • Different type of Lining used in Leather Goods • Fitting,	Module 3	6

	• Adhesive Reinforcement		
Unit: 5	Introduction to Material checking- (Nondestructive)- Check points like understanding of different key points of identify correct material. ➢ Leather checkpoints – Thickness, looseness, surface touch, surface crack, defects, colour ➢ Non leather checkpoints- Width, thickness, visible colour difference		6
Assignments	1. Develop swatch card for leather upper. 2. Develop swatch card for lining. 3. Develop swatch card for fittings. 4. Develop swatch card for reinforcement. 5. Develop material spec sheet of a bag from a real bag. 6. Make material defects chart and nondestructive test report.		12
Total			**45**

Examination Scheme of ESE (End Semester Examination)

	Question Type	**Question to be set**	**Questions to be answered**	**Marks**
Theoretical	**MCQ-type questions are carrying one mark.**	**15**	**10**	**10**
	Short answer-type questions carrying one mark.	**15**	**10**	**10**
	Subjective-type questions carrying two marks.	**10**	**6**	**12**
	Subjective-type questions carrying six marks.	**9 (3 each from each of 3 modules)**	**3**	**18**
TOTAL				**60**

Pass Criterion: Students have to obtain at least **40% marks** individually both in Internal assessment and end semester exams to pass.

REFERENCE MATERIALS

1. “Introduction to the Principles of Leather Manufacture” (4th Edition) by Prof. S.S. Dutta. ILTA, Kolkata Publications.
2. “Theory & Practice of Leather Manufacture” by K.T. Sarkar. K.T. Sarkar (1965).
3. Bag-Design-by-Fashionary
4. Manual-of-Leather-goods CLRI publication
5. Fabric for Fashion, The Complete Guide Natural and man-made fibers by Clive Hallett and Amanda Johnston

Course Outcomes:

Upon completion of this course, students should be able to:

1. Understand different types of leather.
2. Discuss tanning and finishing process.
3. Explain the ability to identify leather defects
4. Identify material defects.
5. Demonstrate leather grading, selection, and identification techniques.
6. Interpret Material quality checking (non destructive)
7. Apply knowledge to cretate material swatch card, defects charts of different body , lining, and fitting material

Name of the Course: Diploma in LEATHER GOODS TECHNOLOGY		
Course Title: Basic Engineering for Leather Goods Lab	**Course code :** LGTPC203	
Number of Credit : 1	**Semester : SECOND**	
Teaching Scheme	**Examination Scheme**	
Duration : 15 weeks	**Maximum Marks : 100**	
Theory : - NIL	Continuous Internal Assessment	50 Marks
Tutorial: - NIL	Attendance	10 Marks
Practical : 2 hrs/week		
Total Contact Hours: 30 Hours	**End Semester Examination**	40 Marks

Instructions: Group size for workshop should be formed in such a way that each student of a group can use sewing machine independently to work in the sewing machine properly .

Prerequisite: Sewing machine operational knowledge

Aim : The Module develops the skill of operating the machine, seam constructions, and assembling panels using different seams. Different types of components, pockets, straps, belt. The subject also introduces various handcrafted techniques, materials & processes and encourages exploration & application of different materials in combination with leather. The emphasis is on adaptation of techniques to fashion products.

Course Objective:

1. Introduce students about leather goods component manufacturing concept
2. To understand the functional knowledge on each machine used here.
3. To study various construction
4. To discuss different types of tools used in this process.
5. To explain different types of techniques used to prepare components.
6. To describe different pockets, flap and handle used here
7. To develop pattern of quilting, gather, pleats etc.
8. Prepare students so that they can identify defects of components and solve it

Content :

	Assignments /Practical	Hrs./Unit
Unit -1	**Machines and equipment.** Introduction to various Construction Techniques • Skiving • Seams • Edges • Bindings and Piping • Adhesives application • Reinforcements • Decorative stitches	9
Unit -2	**Introduction to various styles of leather accessories and their component.** • Quilting Technique, • Construction of Trapunto (Soft, Hard, and Corded), • Construction of Gathers	9

	• Construction Pleating • Embroidery on Body Material • Surface Embellishment.	
Unit -3	**Construction of different Components of Bags** • Construction of different types of pockets (Plain pocket, Zipper pocket, Invisible zipper pocket) • Single pen holder Double- pen holder, Gusset Pocket, Flap pocket, • Exploring different types of handle and trim techniques .	12
Total		30

Examination Scheme (End Semester Assessment)

	Assessment type	Marks
Practical/Sessional	**Assignment on the day of Viva-voce**	**20**
	Viva-voce	**20**
Total		**40**

Pass Criterion: Students have to obtain at least **40% marks** individually both in Internal assessment and end semester exams to pass.

Reference Book:

1. Manual-of-Leather-goods CLRI publication
2. Manual-of-Leather-garments CLRI publication
3. **INTRODUCTION TO SEWING AND SEWING MACHINES by** Deepak Choudhary. , K. Louis, Chandra Shekhar , Sanjeev Kumar Mishra.

Course Outcomes:

Upon completion of this course, students should be able to

1) Understand the functional knowledge on each machine used here.
2) Operate the machine,
3) Illustrate various construction
4) Demonstrate different types of tools used in this process.
5) Explain different types of techniques used to prepare components.
6) Understand different pockets, flap and handle used here
7) Develop pattern of quilting, gather, pleats etc.
8) Prepare students so that they can make different types of components, pockets, straps, belt.
9) Identify defects of components and solve it

Name of the Course: Diploma in LEATHER GOODS TECHNOLOGY		
Course Title: Material Science for Leather Goods-I Lab	**Course code :** LGTPC204	
Number of Credit : 1	**Semester : SECOND**	
Teaching Scheme	**Examination Scheme**	
Duration : 15 weeks	**Maximum Marks : 100**	
Theory : - NIL	Continuous Internal Assessment	50 Marks
Tutorial: - NIL	Attendance	10 Marks
Practical : 2 hrs/week		
Total Contact Hours: 30 Hours	**End Semester Examination**	40 Marks

Prerequisite: Concept/skills in drawing and sketching. Students should be familiarized with Computer environment.

1. **Aim :** The Module gives an overview of material texture development and material quality checking. It is to provide the participants with the knowledge of material texture development

Course Objective:

1. Introduce students about different types of leather pattern
2. To understand type dye techniques, kalamkari work, terracotta work, mandala work etc.
3. To develop the ability of artwork using color.
4. To demonstrate woven, knitted, puffer, patch work and embossed pattern
5. To provide the participants with the knowledge and to impart the skills and techniques necessary for identification of leather goods material.
6. To identify defects of material
7. To develop the ability to check Material quality by nondestructive test.

Content :

	Assignments /Practical	Hrs./Unit
Unit 1:	Pattern texture development: a. Development of Oven Pattern b. Development of Knitted pattern c. Development of puffer pattern d. Development of embossed/ debossed pattern e. Development of patch work f. Development of Brogue pattern g. Development of embroidery work	12
Unit 2:	Color Artwork development by a. Tie dye technique b. Batik Work c. Different traditional painting d. Kalamkari Work , Mandala Art e. Santi-Niketan Work	12
Unit 3:	Introduction to Material checking- (Nondestructive)- Different key points to identify correct material (Leather) a. Thickness,	6

	b. looseness, c. surface touch, d. surface crack, e. defects, f. colour g. Colour Fastness Non leather checkpoints- f. Width, g. thickness, visible colour difference	
Total		30

Examination Scheme (End Semester Assessment)		
Practical/Sessional	**Assessment type**	**Marks**
	Assignment on the day of Viva-voce	**20**
	Viva-voce	**20**
Total		**40**

Pass Criterion: Students have to obtain at least **40% marks** individually both in Internal assessment and end semester exams to pass.

Reference Books:

1. Manual-of-Leather-goods CLRI publication
2. Manual-of-Leather-garments CLRI publication
3. Fabric for Fashion, The Complete Guide Natural and man-made fibers by Clive Hallett and Amanda Johnston
4. Fabric for Fashion, The Complete Guide Natural and man-made fibers by Clive Hallett and Amanda Johnston

Course Outcomes:

Upon completion of this course, students should be able to:

1) Understand different types of leather pattern
2) Understand type dye techniques, kalamkari work, terracotta work, mandala work etc.
3) Develop the ability of artwork using color.
4) Demonstrate woven, knitted, puffer, patch work and embossed pattern
5) Identify leather goods material.
6) Identify defects of material
7) Develop the ability to check Material quality by nondestructive test.
8) Check color fastness, looseness, thickness, finish film peel up strength etc. of leather.

Curriculum for Diploma Courses in Engineering & Technology

Course code	**:**	**AU102**
Course Title	**:**	**Environmental Science**
Number of credits	**:**	**0(noncredit) L-2,T-0,P-0**
Prerequisites	**:**	**Madhyamik /10th pass**
Course category	**:**	**AU**

Course Objectives:

Technicians working in the industries or elsewhere essentially require the knowledge of environmental science so as to enable them to work and produce most efficient, economical and eco-friendly finished products.

- Solve various engineering problems applying knowledge of ecosystem to produce eco-friendly products.
- Use relevant air and noise control method to solve domestic and industrial problems.
- Use relevant water and soil control method to solve domestic and industrial problems.
- To recognize relevant energy sources required for domestic and industrial applications.
- Solve local solid and e-waste problems.

Course Content:
Prerequisite: Madhyamik/10th pass

Content		Hrs./Unit	Marks
Unit-1 **Ecosystem**	1.1 Structure of ecosystem, Biotic & Abiotic components. 1.2 Food chain and food web. 1.3 Aquatic (Lentic and Lotic) and terrestrial ecosystem, 1.4 Carbon, Nitrogen, Sulfur and Phosphorus cycle.	**3**	
Unit-2 Air and Noise Pollution	2.1Definition of pollution and pollutant 2.2 Air Pollution: Sources (Natural and manmade) 2.3 Air Pollutants: Particulate pollutants (PM10 &PM2.5) –effects on Environment & lives and control (Bag filter, Cyclone separator, Electrostatic precipitator, Scrubber) Gaseous Pollutants- effects on Environment & lives and control (Absorption, Adsorption and Catalytic converter), NationalAmbient Air Quality Standards	**6**	

	2.4 Environmental Issue: Global warming, Green House effect, Ozone layer depletion and Acid rain (Elementary idea only). 2.4 Noise Pollution: Sources, Unit& measuring devices, Effects, Prevention, Noise level of various zone as per Noise pollution (Regulation and control) rules 2000		
Unit-3 Water and Soil **Pollution**	3.1 Water Pollution**:** Sources 3.2 Water Pollutants: Characteristics (Turbidity, pH, Total dissolved solid, Total suspended solid, Total solid, Fe,As and Fluoride, DO, BOD, COD - definition only), BIS water quality standard, Flow diagram of drinking water treatment. 3.3 Wastewater Treatment: Primary (elementary idea of coagulation-flocculation and sedimentation) Secondary treatment (elementary idea of Activated Sludge treatment, Trickling filter and Bio-reactor), Tertiary treatment (Elementary idea of Membrane Separation Technology and Reverse osmosis), General standards for Discharge of Environmental Pollutants (Part – A only). 3.4 Soil pollution: Causes (excessive use of fertilizer, pesticides and insecticides), Effects on Environment and lives.	**7**	
Unit-4 Renewable sources of Energy	4.1 Solar Energy: Basics of solar energy, elementary idea of Solar pond, Solar water heater, Solar drier, Solar stills. 4.2 Biomass: Overview of Biomass as energy source. Flow diagram of Biogas production, storage and utilization of biogas. 4.3 Wind Energy: Elementary ideaof wind energy & environmental benefits. 4.4 Other Energy Sources: Basic idea of Tidal energy, Geothermal energy.	**6**	

Unit-5 Solid Waste Management, ISO-14000 &Environmental Management	5.1 Municipal Solid Waste, Bio-medical waste and E-waste – Sources, characteristics, effects and method to manage like 4R (Reduce, Reuse, Recycle & Recover) principles, Composting, Sanitary landfill, Incineration. 5.2 Air(Prevention &Control of pollution) Act, Water (Prevention &Control of pollution) Act. 5.3 Role of Central and State Pollution Control Board and Bureau of Indian Standard 5.4 Basic idea of Carbon Credit, Carbon Footprint. 5.5 ISO 14000: Salient feature only.	**6**	

References:

a) Suggested Learning Resources:

Books:

1. A text book of Environmental Studies- Dr. D.K. Asthana and Dr. Meera Asthana, S Chand publishers
2. Ecology and Environmental Studies- Santosh Kumar Garg, Khanna publishing house
3. A text book of Environmental Chemistry and Pollution Control- Dr. S.S. Dara and Dr. D.D. Mishra, S Chand publishers
4. A text book of Environmental studies for undergraduate courses-ErachBharucha,Universities press(India) Pvt.Ltd.
5. Environmental Science- Dr. Y K Singh, New Age International Publication
6. Fundamentals of Renewable energy sources – N S Rathore, Chetan B Khobragade andAsnaniBhawana, Himanshu Publication
7. Renewable energy sources and emerging technologies – D.P.Kothari, K.C.Singal, and Rakesh Ranjan, PHI Learning Pvt. Ltd.
8. Environmental Pollution Control and Engineering-C.S.Rao, New Age International Publication
9. Environmental Chemistry – A.K.De, New Age International Publication
10. Air Pollution – M N Rao and H V N Rao, Tata McGraw Hill
11. Basic Environmental Engineering & Elementary Biology – Dr M N Patra and R K Singha, Aryan Publishing House

b) Open source software and Website address:

1) www.eco.prayer.org
2) www.teriin.org
3) www.cpcp.nic.in
4) www.indiaenvironmentportal.org.in
5) www.conserve-energy-future.com

Teachers should use the following strategies to archive the various outcomes of the course

- Different methods of teaching and media to be used to attain classroom attention
- Massive open online courses (MOOCs) may be used to teach various topics/subtopics.
- 15-20% of the topics which are relatively simpler of descriptive in nature should be given to the students for self learning and assess the development of competency through classroom presentation.
- Micro-project may be given to group of students for hand on experience.
- Encouraging students to visit to sites such as industry and research establishment around the institute.

Course outcomes

At the end of the course student will be able to

1. Understand the ecosystem and terminology and solve various engineering problems applying ecosystem knowledge to produce eco-friendly product
2. Understand the suitable air, extent of noise pollution and control measures and acts.
3. Understand the water and soil pollution and control measures and acts.
4. Understand different renewable energy resources and efficient process of harvesting.
5. Understand solid waste management,ISO 14000 & Environmental Management

****

Above syllabus is recommended by the syllabus subcommittee on the basis of resolution taken by the members being present in the meeting held on 14/03/2020 at North Calcutta Polytechnic, Kolkata.

Members' present-

i. Dr. SailendraNath Mandal ---Expert
ii. Dr. Ujjval Bhattacharyya --- Member
iii. Dr. Supriyo Mukherjee ---- Member
iv. Prolay Roy --- Convener