PUNJAB BOARD OF TECHNICAL EDUCATION

21-A, Kashmir Block Allama Iqbal Town, Lahore

www.pbte.edu.pkTel # 042-99260273 email: rnd.pbte@gmail.com

SAY NO TO CORRUPTION

No: PBTE/R&D/2026/24 Dated: 28--01-2026

NOTIFICATION

In pursuance of the NAVTTC Notification No. (D.G) (SS&C)/2021-QD-1 dated 26.11.2025, it is notified that the revised curriculum of the DAE in Footwear Technology (03 Years) has been approved by National Vocational & Technical Training Commission (NAVTTC) for its implementation in all institutes affiliated with PBTE.

The implementation of said technolog shall apply on the students who shall be registered for academic session 2026-27 and onward. Punjab Board of Technical Education shall conduct the examination of the said technologies w.e.f. 1st Annual Examination 2027. However, the candidates who were registered in the old course of DAE in Footwear Technology (03 Years) will avail the prescribed chances. Soft copy of the curricula of the said technolog may be downloaded from the website of PBTE i.e. www.pbte.edu.pk/textbooks.html.

SECRETARY

CC to:

1- PS to Chairperson PBTE, Lahore.
2- PA to Secretary PBTE, Lahore.
3- PA to Controller of Examinations PBTE, Lahore.
4- PA to DG Academics TEVTA, Lahore.
5- PA to DG Operations TEVTA, Lahore.
6- The Principals concerned.
7- Deputy Controller of Examinations (Conduct) PBTE, Lahore
8- Deputy Controller of Examinations (Secrecy) PBTE, Lahore.
9- System Analyst PBTE, Lahore.
10-Assistant Controller of Examinations (Technical) PBTE, Lahore.
11-Assistant Controller of Examinations (Conduct) PBTE, Lahore.
12-Assistant Controller of Examinations (Secrecy) PBTE, Lahore.
13-Assistant Controller of Examinations (P&P-I) PBTE, Lahore.
14-Assistant Controller of Examinations (P&P-II) PBTE, Lahore.
15-Assistant Secretary (Recognition) PBTE, Lahore.
16-IPS PBTE, Lahore.
17-IOW PBTE, Lahore.
18-Web Administrator PBTE, Lahore to upload on website of PBTE.
19-Notification File.

CURRICULUM

FOR

DIPLOMA OF ASSOCIATE ENGINEER (DAE)

IN

FOOTWEAR TECHNOLOGY

(3-Year Course)

REVISED Oct. 2025

CURRICULUM SALIENT

Qualification Title	3-Year Diploma of Associate Engineer (DAE) in FOOTWEAR Technology
Qualification Stream	Technical
Duration of Course	3 Years (Annual System)
Total Training Credit Hours	70
Entry Level	Entry Level Matric with Science.
Annual Intake	As approved by the respective TEVTA
Methodology	Theory 40% ; Practical 60%
Instructional Medium	Urdu / English

CURRICULUM DELIVERY STRUCTURE

1st Year

	Curriculum Delivery	Co Curricula Activities / Vacations	Revision	Final Test	Total
Week	1-32	33-48	49-50	51-52	52
	32	16	02	02	

2nd Year

	Curriculum Delivery	Co Curricula Activities / Vacations	Revision	Final Test	Total
Week	1-32	33-48	49-50	51-52	52
	32	16	02	02	

3rd Year

	Curriculum Delivery	Co Curricula Activities / Vacations	Revision	Final Test	Total
Week	1-32	33-48	49-50	51-52	52
	32	16	02	02	

Scheme of Studies
D.A.E. Footwear Technology, Revised, July, 2025
1st Year

Code		Subjects	T	P	C
GEN	111	Islamiat & Pak- Studies	1	0	1
ENG	112	English	2	0	2
MATH	113	Applied Mathematics	3	0	3
PHY	122	Applied Physics	1	3	2
CH	112	Applied Chemistry	1	3	2
COMP	142	Computer Application	1	3	2
FTW	113	Design & Pattern Engineering-I	2	3	3
FTW	123	Footwear Production Technology-I	2	3	3
FTW	134	Drawing & Fashion Designing	2	6	4
TTQ/Civic	111	Tarjumat-ul-Quran / Civics	1	0	1
TOTAL			**16**	**21**	**23**

2nd Year

Code		Subject	T	P	C
GEN	211	Islamiat & Pak Studies	1	0	1
PHY	212	Applied Physics/Applied Mechanics	1	3	2
MATH	212	Applied Mathematics-II	2	0	2
MGM	262	Business Communication & Soft Skills	2	0	2
CIT	293	Computer Graphic Designing	1	6	3
FTW	224	Design & Pattern Engineering-II	2	6	4
FTW	233	Footwear Production Technology-II	2	3	3
FTW	242	Grading of Shoe Components	1	3	2
FTW	253	Footwear Materials and Testing	2	3	3
TTQ /Civic	211	Tarjumat-ul-Quran / Civics	1	0	1
TOTAL			**15**	**24**	**23**

3rd Year

Code		Subject	T	P	C
GEN	311	Islamiat & Pak Studies	1	0	1
FTW	313	Design & Pattern Engineering-III	2	3	3
FTW	303	Footwear Production Technology-III	2	3	3
FTW	333	Footwear CAD/CAM Technology	2	3	3
FTW	343	Principals of Leather Manufacturing	2	3	3
FTW	353	Leather Goods Pattern Making & Manufacturing	2	3	3
FTW	363	Quality Control & Merchandising	2	3	3
FTW	373	Entrepreneurship & E-Commerce	2	3	3
FTW	392	Final Project	0	6	2
TOTAL			**15**	**27**	**24**

اسلامیات/مطالعہ پاکستان

حصہ اول	اسلامیات	Gen III	ٹی	پی	سی
			1	0	1

حصہ دوم مطالعہ پاکستان

موضوعات حصہ اول اسلامیات سال اول

کل وقت: 20 گھنٹے

کتاب و سنت

قرآن مجید

1- تعارف قرآن مجید 2- نزول قرآن 3- مکی و مدنی سورتوں کی خصوصیات 4- وحی کی اقسام 3

5- پندرہ منتخب آیات معہ ترجمہ

1- لن تنالوا البر حتی تنفقوا مما تحبون

2- واعتصموا بحبل الله جمیعا ولا تفرقوا

3- ولا یجرمنکم شنان قوم علی ان لا تعدلوا

4- ان الله یامرکم ان تودوا الامانات الی اهلها

5- ان الله یامر بالعدل والاحسان

6- ان الصلوة تنهی عن الفحشاء والمنکر

7- لقد کان لکم فی رسول الله اسوة حسنة

8- ان اکرمکم عند الله اتقاکم

9- وما اتاکم الرسول فخذوه ومانهاکم عنه فانتهو

10- واوفوبالعهد

11- وعاشروهن بالمعروف

14- وقولوا قولا سدیدا

15- ان الدین عند الله الاسلام

(ب) **سنت**

1- **سنت کی اہمیت**

1- انما الاعمال بالنیات

2- انما بعث لاتمم مکارم الاخلاق

3- لایومن احدکم حتی یحب الا خیہ ما یحب لنفسہ

4- المسلم من سلم المسلمون من لسانہ ویدہ

5- قل امنت باللہ ثم استقم

6- خیرکم خیرکم لا ھلہ

7- سباب المسلم فسوق وقتالہ کفر

8- المومن اخوالمومن

9- کل المسلم علی المسلم حرام دمہ ومالہ وعرضہ

10- آیۃ المنافق ثلاثۃ اذا حدث کذب واذا اوتمن خان واذا وعد اخلف

2- **دین اسلام** (5)

2.1 اسلام کے بنیادی عقائد کی وضاحت اور انسان کی انفرادی واجتماعی زندگی پران کے اثرات

1- توحید

2- رسالت

3- آخرت

4- ملائکہ

5- آسمانی کتب

2.2 **عبادات** (5)

1- نماز 2- روزہ 3- حج 4- زکوۃ

مندرجہ بالا عبادات کی اہمیت وفضیلت، حکمتیں اور انسان کی انفرادی ومعاشرتی زندگی پر اس کے اثرات

حصہ اول

حصہ اسلامیات

تدریسی مقاصد

1- قرآن مجید

4- دین اسلام

عمومی مقصد۔ دین اسلام کے بنیادی عقائد اور عبادات کے بارے میں جان سکے اور بیان کر سکے

خصوصی مقاصد:

- ☆ لفظ دین اسلام کے لغوی اور اصطلاحی معنی بیان کر سکے۔
- ☆ اسلام کے بنیادی عقائد کی اہمیت بیان کر سکے۔
- ☆ اسلام کے بنیادی عقائد کے انسان کی انفرادی و اجتماعی زندگی پر پڑنے والے اثرات بیان کر سکے
- ☆ عبادت کے لفظی و اصطلاحی معنی بیان کر سکے۔
- ☆ عقیدے اور عبادت کا فرق بیان کر سکے۔
- ☆ عبادات (نماز، روزہ، حج، زکوٰۃ) کے فوری احکامات اور انسانی زندگی پر ان کے اثرات بیان کر سکے
- ☆ اسلامی عقائد و عبادات کے مطابق اپنی زندگی ڈھال کر ایک اچھا مسلمان بن سکے۔

نصاب اخلاقیات سال اول

تدریسی مقاصد

عمومی مقصد۔ اعلیٰ اخلاق کی وجہ سے ملکی ترقی میں قا کر سکے۔

خصوصی مقاصد۔ طالب علم اس قابل ہوگا کہ:

- موضوعات کا مطلب بیان کر سکے۔
- عملی زندگی سے مثالوں کی نشاندہی کر سکے۔
- اپنی شخصیت اور معاشرے پر موضوعات کے مثبت اثرات پیدا کرنے کے طریقے بیان کر سکے
- دیانت داری کی اہمیت بیان کر سکے۔
- وفاداری کی اہمیت بیان کر سکے۔
- نظم وضبط کی افادیت بیان کر سکے۔
- صدق بیان کی ضرورت بیان کر سکے۔
- حوصلہ مندی کے فوائد بیان کر سکے
- وقت کی پابندی کے فوائد بیان کر سکے
- صفائی اور باہمی اعتماد سے حسن کارکردگی کو بیان کر سکے
- مصلحت کے فوائد بیان کر سکے

مطالعہ پاکستان

حصہ دوم

تدریسی مقاصد۔ حریت فکر:

عمومی مقصد۔ طالب علم یہ جان لے کہ اسلام میں اور مسلمان قوم میں آزادی فکر کی کیا اہمیت ہے۔

خصوصی مقاصد:

- حریت فکر کا معنی و مفہوم بیان کر سکے۔
- آزادی فکر کی اہمیت بیان کر سکے۔
- خصوصاً اسلام میں آزادی اظہار رائے کی اہمیت بیان کر سکے۔
- ذہنی غلامی کے قومی سطح پر نقصانات بیان کر سکے۔
- جسمانی غلامی کے قومی سطح پر نقصانات بیان کر سکے۔

نظریہ پاکستان

عمومی مقصد۔ نظریہ پاکستان (دین اسلام) سے پوری طرح واقف ہو جائے

خصوصی مقاصد:

- نظریہ کی تعریف بیان کر سکے اور اس کی وضاحت کر سکے۔
- نظریہ پاکستان کی تعریف کر سکے اور اس کا مفہوم بیان کر سکے۔
- علامہ اقبال اور قائداعظم کے فرمودات کی روشنی میں [illegible] بیان کر سکے۔

نظریہ پاکستان کا تاریخی پہلو

عمومی مقصد۔ نظریہ پاکستان کے تاریخی پس منظر سے واقفیت حاصل کر سکے۔

خصوصی مقاصد۔ محمد بن قاسم کے بارے میں بیان کر سکے۔

نصاب سال اول Gen III

حصہ دوم مطالعہ پاکستان کل وقت:12 گھنٹے

موضوعات

- حریت فکر

مسلمان قوم میں آزادی فکر کی تاریخ۔ مسلمانوں میں سیاسی آزادی کی اہمیت اور ضرورت۔ ذہنی وجسمانی غلامی کے نقصانات

- نظریہ پاکستان

قیام پاکستان کی اساس (دین اسلام) قیام پاکستان کی غرض و غایت۔ نظریہ پاکستان کی وضاحت۔ نظریہ پاکستان علامہ اقبال اور قائداعظم کے ارشادات کی روشنی میں

- نظریہ پاکستان کا تاریخی پہلو

محمد بن قاسم کی آمد۔ مجدد الف ثانی اور شاہ ولی اللہ کی تبلیغ [illegible]، سید احمد شہید کی تحریک مجاہدین

- تعلیمی تحریکیں

علی گڑھ۔ ندوۃ العلماء۔ دیوبند۔ مدرسۃ الاسلام (سندھ) اسلامیہ کالج (پشاور) انجمن حمایت اسلام (لاہور)

- محمد بن قاسم کے ہندوستان پر حملہ کی وجہ بیان کر سکے
- محمد بن قاسم کے ہندوستان پر حملہ کے اثرات بیان کر سکے
- وہ بیان کر سکے کہ ہندوستان میں ہندو مسلم دو قومی نظریہ کا نکتہ آغاز کیا ہے۔
- مجدد الف ثانی کی علمی خدمات بیان کر سکے
- شاہ ولی اللہ کی علمی خدمات بیان کر سکے
- مجدد الف ثانی اور شاہ ولی اللہ نے جو تبلیغ دین اور مسلمانوں میں سیاسی شعور پیدا کیا اسے بیان کر سکے۔

علمی تحریکیں

عمومی مقصد۔

- برصغیر کی علمی تحریکوں سے آگاہی حاصل ہو سکے

خصوصی مقاصد

- علی گڑھ۔ دیوبند۔ ندوۃ العلماء۔ مدرسۃ الاسلام۔ اسلامیہ کالج۔ انجمن حمایت اسلام نے تعلیم کے ذریعہ جو سیاسی شعور مسلمانوں میں پیدا کیا اسے بیان کر سکے۔
- آزادی ہند کے سلسلہ میں تحریک مجاہدین کی خدمات بیان کر سکے۔

Tarjumat-ul-Quran / Civics-II

TTQ-111 / Civic-111; **Tarjumat-ul-Quran / Civics**

T	P	C
1	0	1

Total Contact Hours:

Theory: **32**

Practical: **0**

Note: Syllabi for this subject would be as per BISEs/General education, developed by Punjab Curriculum TextBook Board (PCTB)

Eng-112 ENGLISH

Total contact hours

Theory	64	T	P	C
Practical	0	2	0	2

AIMS At the end of the course, the students will be equipped with cognitive skill to enable them to present facts in a systematic and logical manner to meet the language demands of dynamic field of commerce and industry for functional day-to-day use and will inculcate skills of reading, writing and comprehension.

COURSE CONTENTS

ENGLISH PAPER "A"

1. PROSE/TEXT **16 hrs**

1.1 First eight essays of Intermediate. English Book-II

2. CLOZE TEST **4 hrs**

1.2 A passage comprising 50-100 words will be selected from the text. Every 11thword or any word for that matter will be omitted. The number of missing word will range between 5-10. The chosen word may or may not be the one used in the text, but it should be an appropriate word.

ENGLISH PAPER "B"

3. GRAMMAR **26 hrs**

3.1 Sentence Structure.
3.2 Tenses.
3.3 Parts of speech.
3.4 Punctuation,
3.5 Change of Narration.
3.6 One word for several
3.7 Words often confused

4. COMPOSITION **8 hrs**

4.1 Letters/Messages
4.2 Job application letter
4.3 For character certificate/for grant of scholarship
4.4 Telegrams, Cablegrams and Radiograms, Telexes, Facsimiles
4.5 Essay writing
4.6 Technical Education, Science and Our life, Computers,
Environmental Pollution, Duties of a Student. **4 hrs**

5. TRANSLATION **6 hrs**

5.1 Translation from Urdu into English.
For Foreign Students: A paragraph or a dialogue.

RECOMMENDED BOOKS

1. Intermediate English Book-II.
2. An English Grammar and Composition of Intermediate Level.
3. A Hand Book of English Students by Gatherer

Eng-112 ENGLISH

INSTRUCTIONAL OBJECTIVES

PAPER-A

1. DEMONSTRATE BETTER READING, COMPREHENSION AND VOCABULARY

1.1 Manipulate, skimming and scanning of the text.
1.2 Identify new ideas.
1.3 Reproduce facts, characters in own words
1.4 Write summary of stories

2. UNDERSTAND FACTS OF THE TEXT

2.1 Rewrite words to fill in the blanks recalling the text.
2.2 Use own words to fill in the blanks.

PAPER-B

3. APPLY THE RULES OF GRAMMAR IN WRITING AND SPEAKING

3.1 Use rules of grammar to construct meaningful sentences containing a subjectand a predicate.
3.2 State classification of time, i.e. present, past and future and use verb tensecorrectly in different forms to denote relevant time.
3.3 Identify function words and content words.
3.4 Use marks of punctuation to make sense clear.
3.5 ' Relate what a person says in direct and indirect forms.
3.6 Compose his writings.
3.7 Distinguish between confusing words.

4. APPLY THE CONCEPTS OF COMPOSITION WRITING TO PRACTICALSITUATIONS

4.1 Use concept to construct applications for employment, for character certificate,for grant of scholarship.
4.2 Define and write telegrams, cablegrams and radiograms, telexes, facsimiles
4.3 Describe steps of a good composition writing.
4.4 Describe features of a good composition.
4.5 Describe methods of composition writing.
4.6 Use these concepts to organize facts and describe them systematically inpractical situation;

5. APPLIES RULES OF TRANSLATION

5.1 Describe confusion.
5.2 Describe rules of translation.
5.3 Use rules of translation from Urdu to English in simple paragraph andsentences.

Math-113 APPLIED MATHEMATICS

Total contact hours	96	**T**	**P**	**C**
Theory		3	0	3

Pre-requisite: Must have completed a course of Elective Mathematics at Matric level.

AIMS After completing the course the students will be able to

1. Solve problems of Algebra, Trigonometry, vectors. Menstruation, Matrices and Determinants.
2. Develop skill, mathematical attitudes and logical perception in the use of mathematical instruments as required in the technological fields.
3. Acquire mathematical clarity and insight in the solution of technical problems.

COURSE CONTENTS

1 QUADRATIC EQUATIONS **6 Hrs**

1.1 StandardForm
1.2 Solution
1.3 Nature of roots
1.4 Sum &Productof roots
1 .5 Formation
1.6 Problems

2 ARITHMETIC PROGRESSION AND SERIES **3Hrs**

2.1 Sequence
2.2 Series
2.3 nth term
2.4 Sum of the first n terms
2.5 Means
2.6 Problems

3 GEOMETRIC PROGRESSION AND SERIES **3Hrs**

3.1 nth term
3:2 sum of the first n terms
3.3 Means
3.4 Infinite Geometric progression
3.5 Problems

4 BINOMIAL THEOREM **6 Hrs**

4.1 Factorials
4.2 Binomial Expression
4.3 Binomial Co-efficient
4.4 Statement
4.5 The General Term
4.6 The Binomial Series.
4.7 Problems

5 PARTIAL FRACTIONS **6 Hrs**

5.1 Introduction
5.2 Linear Distinct Factors Case I
5.3 Linear Repeated FactorsCase II
5.4 Quadratic Distinct Factors Case III

5.5 Quadratic Repeated Factors Case IV
5.6 Problems

6 FUNDAMENTALS OF TRIGONOMETRY 6 Hrs
6.1 Angles
6.2 Quadrants
6.3 Measurements of Angles
6.4 Relation between Sexagesimal& circular system
6.5 Relation between Length of a Circular Arc & the Radian Measure of its centralAngle
6.6 Problems

7 TRIGONOMETRIC FUNCTIONS AND RATIOS 6 Hrs
7.1 trigonometric functions of any angle
7.2 Signs of trigonometric Functions
7.3 Trigonometric Ratios of particular Angles
7.4 Fundamental Identities
7.5 Problems

8 GENERAL INDENTITIES 6 Hrs
8.1 The Fundamental Law
8.2 Deductions
8.3 Sum & Difference Formulae
8.4 Double Angle Identities
8.5 Half Angle Identities
8.6 Conversion of sum or difference to products
8.7 Problems

9 SOLUTION OF TRIANGLES 6 Hrs
9.1 The law of Sines
9.2 The law of Cosines
9.3 Measurement of Heights & Distances
9.4 Problems

10 MENSURATION OF SOLIDS 30 Hrs
10.1 Review of regular plane figures and Simpson's Rule
10.2 Prisms
10.3 Cylinders
10.4 Pyramids
10.5 Cones
10.6 Frusta
10.7 Spheres

11 VECTORS 9 Hrs
11.1 Sealers & Vectors
11.2 Addition & Subtraction
11.3 The unit Vectors I, j, k
11.4 Direction Cosines
11.5 Sealer or Dot Product
11.6 Deductions
11.7 Dot product in terms of orthogonal components
11.8 Deductions
11.9 Analytic Expression for a x b.
11.10 Problems.

12 MATRICES AND DETERMINANTS 9 Hrs

12.1 Definition of Matrix
12.2 Rows & Columns
12.3 Order of a Matrix
12.4 Algebra of Matrices
12.5 Determinants
12.6 Properties of Determinants
12.7 Solution of Linear Equations
12.8 Problems

REFERENCE BOOKS

1. GhulamYasinMinhas - Technical Mathematics Vol-I, IlmiKitabKhana Lahore.
2. Prof. Riazali Khan - Polytechnic Mathematic Series Vol I & II, Majeed Sons, Faisalabad
3. Prof. Sana UllahBhatti - A Text Book of Algebra and Trigonometry, Punjab Text Book Board, Lahore.

Math-113 APPLIED MATHEMATICS-I

INSTRUCTIONAL OBJECTIVES

1 USE DIFFERENT METHODS FOR THE SOLUTION OF QUADRATIC EQUATIONS

1.1 Define a standard quadratic equation.
1.2 Use methods of factorization and method of completing the square for solvingthe equations.
1.3 Derive quadratic formula.
1.4 Write expression for the discriminant
1.5 Explain nature of the roots of a quadratic equation.
1.6 Calculate sum and product of the roots.
1.7 Form a quadratic equation from the given roots.
1.8 Solve problems involving quadratic equations.

2 UNDERSTAND APPLY CONCEPT OF ARITHMETIC PROGRESSION AND SERIES

2.1 Define an Arithmetic sequence and a series
2.2 Derive formula for the nth term of an A.P.
2.3 Explain Arithmetic Mean between two given numbers
2.4 Insert n Arithmetic means between two numbers
2.5 Derive formulas for summation of an Arithmetic series
2.6 Solve problems on Arithmetic Progression and Series

3 UNDERSTAND GEOMETRIC PROGRESSION AND SERIES

3.1 Define a geometric sequence and a series.
3.2 Derive formula for nth term of a G.P.
3.3 Explain geometric mean between two numbers.
3.4 Insert n geometric means between two numbers.
3.5 Derive a formula for the summation of geometric Series.
3.6 Deduce a formula for the summation of an infinite G.P.
3.7 Solve problems using these formulas.

4 EXPAND AND EXTRACT ROOTS OF A BINOMIAL

4.1 State binomial theorem for positive integral index.
4.2 Explain binomial coefficients: (n,0), (n,1)……..(n,r),…….(n,n)
4.3 Derive expression for the general term.
4.4 Calculate the specified terms.
4.5 Expand a binomial of a given index. -
4.6 Extract the specified roots
4.7 Compute the approximate value to a given decimal place.
4.8 Solve problems involving binomials.

5 RESOLVE A SINGLE FRACTIONINTO PARTIALFRACTIONS USINGDIFFERENT METHODS.

5.1 Define a partial fraction, a proper and an improper fraction.
5.2 Explain all the four types of partial fractions.
5.3 Set up equivalent partial fractions for each type.
5.4 Explain the methods for finding constants involved.
5.5 Resolve a single fraction into partial fractions.
5.6 Solve problems involving all the four types.

6 UNDERSTAND SYSTEMS OF MEASUREMENT OF ANGLES.

6.1 Define angles and the related terms.

6.2 Illustrate the generation of angle.
6.3 Explain sexagesimal and circular systems for the measurement of angles
6.4 Derive the relationship between radian and degree.
6.5 Convert radians to degrees and vice versa.
6.6 Derive a formula for the circular measure of a central angle.
6.7 Use this formula for solving problems.

7 APPLY BASIC CONCEPTS AND PRINCIPLES OF TRIGONOMETRIC FUNCTIONS

7.1 Define the basic trigonometric functions/ratios of an angle as ratios of the sides of a right triangle.
7.2 Derive fundamental identities.
7.3 Find trigonometric ratios of particular angles.
7.4 Draw the graph of trigonometric functions.
7.5 Solve problems involving trigonometric functions.

8 USE TRIGONOMETRIC IDENTITIES IN SOLVING TECHNOLOGICAL PROBLEMS

8.1 List fundamental identities
8.2 Prove the fundamental law
8.3 Deduce important results
8.4 Derive-sum and difference formulas
8.5 Establish half angle, double angle & triple angle formulas
8.6 Convert sum or difference into product& vice versa
8.7 Solve problems

9 USE CONCEPTS, PROPERTIES AND LAWS OF TRIGONOMETRIC FUNCTIONS FOR SOLVING TRIANGLES

9.1 Define angle of elevation and angle of depression.
9.2 Prove the law of sins and the law of cosines.
9.3 Explain elements of a triangle.
9.4 Solve triangles and the problems involving heights and distances.

10 USE PRINCIPLES OF MENSTRUATION IN FINDING SURFACES, VOLUMEAND WEIGHTS OF SOLIDS.

10.1 Define menstruation of plane and solid figures
10.2 List formulas for perimeters & areas of plane figure.
10.3 Define pyramid and cone.
10.4 Define frusta of pyramid and cone.
10.5 Define a sphere and a shell.
10.6 Calculate the total surface and volume of each type of solid.
10.7 Compute weight of solids.
10.8 Solve problems of these solids.

11. USE THE CONCEPT AND PRINCIPLES OF VECTORS IN SOLVING TECHNOLOGICAL PROBLEMS.

11.1 Define vector quantity.
11.2 Explain addition and subtraction of vector
11.3 Illustrate unit vectors I, j, k.
11.4 Express a vector in the component form.
11.5 Explain magnitude, unit vector, directionconsines of a vector.
11.6 Derive analytic expression for dot product and cross product of two vector.
11.7 Deduce conditions of perpendicularly and parallelism of two vectors.
11.8 Solve problems

12. USE THE CONCEPT OF MATRICES & DETERMINANTS IN SOLVING TECHNOLOGICAL PROBLEMS

12.1 Define a matrix and a determinant.
12.2 List types of matrices.
12.3 Define transpose, ad joint and inverse of a matrix.
12.4 State properties of determinants.
12.5 Explain basic concepts.
12.6 Explain algebra of matrices.
12.7 Solve linear equation by matrices.
12.8 Explain the solution of a determinant.
12.9 Use Crammers Rule for solving linear equations

Phy-122 APPLIED PHYSICS

Total Contact Hours

Theory	32	**T**	**P**	**C**
Practical	96	1	3	2

AIMS: The students will be able to understand the fundamental principles and concept of physics, use these to solve problems in practical situations/technical courses and understand concepts to learn advance physics/technical courses,

COURSE CONTENTS

1 MEASUREMENTS. 2 Hrs

1.1 Fundamental units and derived units
1.2 Systems of measurement and S.I. units
1.3 Concept of dimensions, dimensional formula
1.4 Conversion from one system to another
1.5 Significant figures

2. SCALARS AND VECTORS. 4 Hrs

2.1 Revision of head to tail rule
2.2 Laws of parallelogram, triangle and polygon of forces
2.3 Resolution of a vector
2.4 Addition of vectors by rectangular components
2.5 Multiplication of two vectors, dot product and cross product

3. MOTION 4 Hours

3.1 Review of laws and equations of motion
3.2 Law of conservation of momentum
3.3 Angular motion
3.4 Relation between linear and angular motion
3.5 Centripetal acceleration and force
3.6 Equations of angular motion

4. TORQUE, EQUILIBRIUM AND ROTATIONAL INERTIA

4.1 Torque
4.2 Centre of gravity and centre of mass
4.3 Equilibrium and its conditions
4.4 Torque and angular acceleration
4.5 Rotational inertia

5. WAVE MOTION 5 Hrs

5.1 Review Hooke's law of elasticity,
5.2 Motion under an elastic restoring force.
5.3 Characteristics of simple harmonic motion
5.4 S.H.M. and circular motion
5.5 Simple pendulum
5.6 Wave form of S.H.M.
5.7 Resonance
5.8 Transverse vibration of a stretched string

6. SOUND **5 Hrs**

6.1 Longitudinal waves
6.2 Intensity, loudness, pitch and quality of sound
6.3 Units of Intensity of level and frequency response of ear
6.4 Interference of sound waves silence zones, beats
6.5 Acoustics
6.6 Doppler effect

7. LIGHT **5 Hrs**

7.1 Review laws of reflection and refraction
7.2 Image formation by mirrors and lenses
7.3 Optical instruments
7.4 Wave theory of light
7.5 Interference, diffraction, polarization of light waves
7.6 Applications of polarization in sunglasses, optical activity and stress analysis

8. OPTICAL FIBER **2 Hrs**

8.1 Optical communication and problems
8.2. Review total internal reflection and critical angle
8.3 Structure of optical fiber
8.4 Fiber material and manufacture
8.5 Optical fiber - uses.

9. LASERS **3 Hrs**

9.1 Corpuscular theory of light
9.2 Emission and absorption of light
9.3 Stimulated absorption and emission of light
9.4 Laser principle
9.5 Structure and working of lasers
9.6 Types of lasers with brief description.
9.7 Applications (basic concepts)
9.8 Material processing
9.9 Laser welding
9.10 Laser assisted machining
9.11 Micro machining
9.12 Drilling scribing and marking
9.13 Printing
9.14 Lasers in medicine

RECOMMENDED BOOKS

1. TahirHussain, Fundamentals of Physics Vol-I and II
2. FaridKhawaja, Fundamentals of Physics Vol-I and II
3. Wells and Slusher, Schaum's Series Physics.
4. Nelkon and Oyborn, Advanced Level Practical Physics
5. MehboobIlahi Malik and Inam-ul-Haq, Practical Physics
6. Wilson, Lasers - Principles and applications
7. M. Aslam Khan and M. AkramSandhu, Experimental Physics Note Book

Phy-122 APPLIED PHYSICS

INSTRUCTIONAL OBJECTIVES

1 USE CONCEPTS OF MEASUREMENT TO PRACTICAL SITUATIONS AND TECHNOLOGICAL PROBLEMS

1. 1 Write dimensional formulae for physical quantities
1.2 Derive units using dimensional equations
1.3 Convert a measurement from one system to another
1.4 Use concepts of measurement and significant figures in problem solving.

2 USE CONCEPTS OF SCALARS AND VECTORS IN SOLVING PROBLEMS INVOLVING THESE CONCEPTS

2.1 Explain laws of parallelogram, triangle and polygon offorces
2.2 Describe method of resolution of a vector into components
2.3 Describe method of addition of vectors by rectangular components
2.4 Differentiate between dot product and cross product of vectors
2.5 Use the concepts in solving problems involving addition resolution and multiplication of vectors

3 USE THE LAW OF CONSERVATION OF MOMENTUM AND CONCEPTS OF ANGULAR MOTION TO PRACTICAL SITUATIONS

3.1 Use law of conservation' of momentum to practical/technological problems
3.2 Explain relation between linear and angular motion
3.3 Use concepts and equations of angular motion to solve relevant technological problems

4 USE CONCEPTS OF TORQUE, EQUILIBRIUM AND ROTATIONAL INERTIA TO PRACTICAL SITUATION/PROBLEMS

4.1 Explain Torque
4.2 Distinguish between Centre of gravity and centre of mass
4.3 Explain rotational Equilibrium, and its conditions
4.4 Explain. Rotational Inertia giving examples
4.5 Use the above concepts in solving technological problems.

5 USE CONCEPTS OR WAVE MOTION IN SOLVING RELEVANT PROBLEMS

5.1 Explain Hooke's Law of Elasticity
5.2 Derive formula for Motion under an elastic restoring force
5.3 Derive formulae for simple harmonic motion and simple pendulum
5.4 Explain wave form with reference to S.H.M. and circular motion
5.5 Explain Resonance
5.6 Explain Transverse vibration of a stretched 'string
5.7 Use the above concepts and formulae of S.H.M. to solve relevant problems.

6 UNDERSTAND concepts OF SOUND

6.1 Describe longitudinal wave and its propagation
6.2 Explain the concepts: Intensity, loudness, pitch and quality of sound
6.3 Explain units of Intensity of level and frequency response of ear
6.4 Explain phenomena of silence zones, beats
6.5 Explain Acoustics of buildings.
6.6 Explain Doppler Effect giving mathematical expressions.

7 USE THE CONCEPTS OF GEOMETRICAL OPTICS TO MIRRORS AND LENSES

7.1 Explain laws of reflection and refraction

7.2 Use mirror formula to solve problems

7.3 Use the concepts of image formation by mirrors and lenses to describe working of optical instruments, e.g. microscopes, telescopes, camera and sextant.

8 UNDERSTAND WAVE THEORY OF LIGHT

8.1 Explain wave theory of light

8.2 Explain phenomena of interference, diffraction, polarization of light waves

8.3 Describe uses of polarization given in the course contents.

9 UNDERSTAND THE STRUCTURE, WORKING AND USES OF OPTICAL FIBER

9.1 Explain the structure of the Optical Fiber

9.2 Explain its principle of working

9.3 Describe use of optical fiber in industry and medicine.

Phy-122 APPLIED PHYSICS

LIST OF PRACTICALS

1. Draw graphs representing the functions:

a) $y=mx$ for $m=0, 0.5, 1, 2$

b) $y=x^2$

c) $y = l/x$

2. Find the volume of a given solid cylinder using vernier calipers.
3. Find the area of cross-section of the given wire using micrometer screw gauge.
4. Prove that force is directly proportional to (a) mass, (b) acceleration, using fletchers trolley
5. Verify law of parallelogram of forces using Grave-sands apparatus.
6. Verify law of triangle of forces and Lami's theorem
7. Determine the weight of a given body using
   a) Law of parallelogram of forces
   b) Law of triangle of forces
   c) Lami's theorem
8. Verify law of polygon of forces using Grave-sands apparatus.
9. Locate the position and magnitude of resultant of like parallel forces.
10. Determine the resultant of two unlike parallel forces.

II. Find the weight of a given body using principle ofmoments.

12. Locate the centre of gravity of regular and irregular shaped bodies.
13. Find Young's Modules of Elasticity of a metallic wire.
14. Verify Hooke's Law using helical spring.
15. Study of frequency of stretched string with length.
16. Study of variation of frequency of stretched string with tension.
17. Study resonance of air columnin resonance tube and find velocity of sound.
18. Find the frequency of the given tuning fork using resonance tube.
19. Find velocity of sound in rod by Kundt's tube

20, Verify rectilinear propagation of light and study shadow formation.

21. Study effect of rotation of plane mirror on reflection.
22. Compare the refractive indices of given glass slabs.
23. Find focal length of concave mirror by locating centre of curvature.
24. Find focal length of concave mirror by object and image method
25. Find focal length of concave mirror with converging lens.
26. Find refractive index of glass by apparent depth.
27. Find refractive index of glass by spectrometer.
28. Find focal length of converging lens by plane mirror.
29. Find focal length of converging lens by displacement method.
30. Find focal length of diverging lens using converging lens.
31. Find focal length of diverging lens using concave mirror.
32. Find angular magnification of an astronomical telescope.
33. Find angular magnification of a simple microscope (Magnifying Glass)
34. Find angular magnification of a compound microscope.
35. Study working and structure of camera.
36. Study working and structure of sextant.
37. Compare the different scales of temperature and verify the conversion formula.
38. Determine the specific heat of lead shots.
39. Find the coefficient of linear expansion of a metallic rod.
40. Find the heat of fusion of ice.
41. Find the heat of vaporization.
42. Determine relative humidity using hygrometer:

Ch-112 APPLIED CHEMISTRY

T	P	C
1	3	2

Total Contact Hours

Theory **32**
Practical **96**

Pre-requisite: The student must have studied the subject of elective chemistry at Secondary, school level.

AIMSAfter studying this course a student will be able to;

1. Understand the significance and role of chemistry in the development of modern technology.
2. Become acquainted with the basic principles of chemistry as applied in the study of relevant Technology.
3. Know the scientific methods for production, properties and use of materials of industrial & .technological significance.
4. Gains skill for the efficient conduct of practical's in a Chemistry lab.

COURSE CONTENTS

1 INTRODUCTION AND FUNDAMENTAL CONCEPTS 2 Hrs

1.1 Orientation with reference to this technology
1.2 Terms used & units of measurements in the study of chemistry
1.3 Chemical Reactions & their types

2 ATOMIC STRUCTURE 2 Hrs

2.1 Sub-atomic particles
2.2 Architecture of atoms of elements, Atomic No. & Atomic Weight
2.3 The periodic classification of elements periodic law
2.4 General characteristics of a period and group

3 CHEMICAL BOND 2 Hrs

3.1 Nature of chemical Bond
3.2 Electrovalent bond with examples
3.3 Covalent Bond (Polar and Non-polar, sigma & Pi Bonds with examples
3.4 Co-ordinate Bond with examples

4 WATER 2 Hrs

4.1 Chemical nature and properties.
4.2 Impurities
4.3 Hardness of water (types, causes & removal)
4.4 Scales of measuring hardness (Degrees Clark
4.5 Boiler feed water, scales & treatment
4.6 Sea-water desalination, sewage treatment

5 ACIDS, BASES AND SALTS 2 Hrs

5.1 Definitions with examples
5.2 Properties, their strength, basicity & Acidity
5.3 Salts and their classification with examples
5.4 pH-value and scale

6 OXIDATION & REDUCTION 2 Hrs

6.1 The process, definition& examples

6.2 Oxidizing and reducing agents
6.3 Oxides and their classifications

7 NUCLEAR CHEMISTRY 2 Hrs
7.1 Introduction
7.2 Radioactivity (alpha, beta and gamma rays)
7.3 Half life process
7.4 Nuclear reaction & transformation of elements

8 CEMENT 2 Hrs
8.1 Introduction
8.2 Composition and manufacture
8.3 Chemistry of setting and hardening
8.4 Special purpose cements

9 GLASS 2 Hrs
9.1 Composition and raw material
9.2 Manufacture
9.3 Varieties and uses

10 PLASTICS AND POLYMERS 2 Hrs
10.1 Introduction and importance
10.2 Classification
10.3 Manufacture
10.4 Properties and uses

11 PAINTS, VARNISHES AND DISTEMPER 2 Hrs
11.1 Introduction
11.2 Constituents
11.3 Preparation and uses

12 CORROSION 2 Hrs
12.1 Introduction with causes
12.2 Types of corrosion
12.3 Rusting of iron
12.4 Protective measures against-corrosion

13 REFRACTORY MATERIALS AND ABRASIVE 2 Hrs
13.1 Introduction to Refractories
13.2 Classification of Refractories
13.3 Properties and Uses
13.4 Introduction to Abrasives
13.5 Artificial and Natural Abrasives and their uses

14 ALLOYS 2 Hrs
14.1 Introduction with need
14.2 Preparation and Properties
14.3 Some Important alloys and their composition
14.4 Uses

15 FUELS AND COMBUSTION 2 Hrs
15.1 Introduction of fuels

15.2 Classification of fuels
15.3 Combustion
15.4 Numerical Problems of Combustion

16 LUBRICANTS **1 Hr**

16.1 Introduction.
16.2 Classification.
16.3 Properties of lubricants.
16.4 Selection of lubricants:

17 POLLUTION **1 Hr**

17.1 The problem and its dangers.
17.2 Causes of pollution.
17.3 Remedies to combat the hazards of pollution.

BOOKS RECOMMENDED

1. Text Book of Intermediate Chemistry (I & II)
2. Ilmi Applied Science by Sh. Atta Muhammad
3. Polytechnic Chemistry by J. N. Reedy Tata McGraw Hill (New Delhi)
4. Chemistry for Engineers by P.C. Jain (New Delhi, India)

Ch-112 APPLIED CHEMISTRY

INSTRUCTIONAL OBJECTIVES

1 UNDERSTAND THE SCOPE, SIGNIFICANCE AND FUNDAMENTAL ROLE OF THE SUBJECT

1.1 Define chemistry and its important terms
1.2 State the units of measurements in the study of chemistry
1.3 Write chemical formula of common compounds
1.4 Describe types of chemical reactions with examples

2 UNDERSTAND THE STRUCTURE OF ATOMS AND ARRANGEMENT OF SUB ATOMIC PARTICLES IN THE ARCHITECTURE OF ATOMS

2.1 Define atom.
2.2 State the periodic law of elements.
2.3 Describe the fundamental sub atomic particles
2.4 Distinguish between atomic ho. and mass no.; isotopes and isobars
2.5 Explain the arrangements of electrons in different shells and sub energy levels
2.6 Explain the grouping and placing of ^elements' in the periodic table

3 UNDERSTAND THE NATURE OF CHEMICAL LBOUND

3.1 Define chemical bond
3.2 Describe the nature of chemical bond
3.3 Differentiate .between electrovalent an^ covalent bonding
3.4 Explain the formation of polar and non polar, sigma and pi-bond with examples
3.5 Describe the nature of coordinate bond with examples

4 UNDERSTAND THE CHEMICAL NATURE OF WATER

4.1 Describe the chemical nature of water with its formula
4.2 Describe the general impurities present in water
4.3 Explain the causes and methods to removing hardness of water
4.4 Express hardness .in different units like mg/Iiter, p.p.m, degrees Clark and degrees French
4.5 Describe the formation and nature of scales in boiler feed water
4.6 Explain the method for the treatment of scales
4.7 Explain the sewage treatment and desalination of sea water

5 UNDERSTAND THE NATURE OF ACIDS, BASES AND SALTS

5.1 Define acids, bases and salts with examples
5.2 State general properties of acids and bases
5.3 Differentiate between acidity and basicity and use the related terms
5.4 Define salts, state their classification with examples
5.5 Explain p-H value of solution and pH scale

6 UNDERSTAND THE PROCESS OF OXIDATION AND REDUCTION

6.1 Define oxidation
6.2 Explain the oxidation process with examples
6.3 Define reduction
6.4 Explain reduction process with examples
6.5 Define oxidizing and reducing-agents and give it least six examples of each
6.6 Define oxides
6.7 Classify the oxides and give example

7 UNDERSTAND THE FUNDAMENTALS OF NUCLEAR CHEMISTRY

7.1 Define nuclear chemistry and radio activity
7.2 Differentiate between alphas, Beta and Gamma particles
7.3 Explain hall-life process
7.4 Explain at least six nuclei reactions resulting in the transformation of some elements
7.5" State important uses of isotopes

8 UNDERSTAND THE MANUFACTURE, SETTING AND HARDENING CEMENT

8.1 Define port land cement and give its composition
8.2 Describe the method of manufacture
8.3 Describe the chemistry of setting and hardening of cement
8.4 Distinguish between ordinary and special purpose cement

9 UNDERSTAND THE PROCESS OF MANUFACTURE OF GLASS.

9.1 Define glass
9.2 Describe its composition and raw materials
9.3 Describe the manufacture of glass
9.4 explain its varieties and uses

10 UNDERSTAND THE NATURE AND IMPORTANCE OF PLASTICS POLYMERS

10.1. Define plastics and polymers
10.2 Explain the mechanism of polymerization
10.3 Describe the preparation and uses of some plastics/polymers

11 KNOW THE.CHEMISTRY OF PAINTS, VARNISHES AND DISTEMPERS

11.1 Define paints, varnishes and distemper
11.2 State composition of each
11.3 State methods of preparation of each and their uses

12 UNDERSTAND THE PROCESS OF CORROSION WITH ITS CAUSES AND TYPES

12.1 Define corrosion
12.2 Describe different types of corrosion
12.3 State the causes of corrosion
12.4 Explain the process of rusting of iron
J2.5 Describe methods to prevent/control corrosion

13 UNDERSTAND THE NATURE OF REFRACTORY MATERIALS AND ABRASIVE

13.1 Define refractory materials
13.2 Classify refractory materials
13.3 Describe properties and uses of refractories
13.4 Define abrasive.
13.5 Classify natural and artificial abrasives
13.6 Describe uses of abrasives

14 UNDERSTAND THE NATURE AND IMPORTANCE OF ALLOYS

14.1 Define alloy
14.2 Describe different methods for the preparation of alloys
14.3 Describe important properties of alloys
14 4 Enlist some important alloys with their composition, properties and uses

15 UNDERSTAND THE NATURE OF FUELS AND THEIR COMBUSTION

15.1 Define fuels
15.2 Classify fuels and make distinction of solid, liquid & gaseous fuels

15.3 Describe important Fuels
15.4 Explain combustion
15.5 Calculate air quantities in combustion, gases

16 UNDERSTAND THE NATURE OF LUBRICANTS.

16.1 Define a lubricant
16.2 Explain the uses of lubricants
16.3 Classify lubricants and cite examples
16.4 State important properties of oils, greases and solid lubricants
16.5 State the criteria for the selection of lubricant tor, particular purpose/job

17 UNDERSTAND THENATURE OF POLLUTION

17.1 Define Pollution (air. water, food)
17.2 Describe the causes of environmental pollution.
17.3 Enlist some common pollutants.
17.4 Explain methods to prevent pollution

CH-112 APPLIED CHEMISTRY 96 Hours

1. To introduce the common apparatus, glassware and chemical reagents used in the chemistry lab.
2. To purify a chemical substance by crystallization.
3. To separate a mixture of sand and salt.
4. To find the melting point of substance.
5. To find the pH of a solution with pH paper.
6. To separate a mixture of inks by chromatography.
7. To determine the co-efficient of viscosity of benzene with the help of Ostwald vasomotor.
8. To find the surface tension of a liquid with a stalagmometer.
9. To perform electrolysis of water to produce Hydrogen and Oxygen.
10. To determine the chemical equivalent of copper by electrolysis of Cu SO.
11. To get introduction with the scheme of analysis of salts for basic radicals.
12. To analyse 1st group radicals (Ag^{+} - Pb^{++} - Hg^{+}).
13. To make practice for detection 1st group radicals.
14. To get introduction with the scheme of II group radicals.
15. To detect and confirm II-A radicals (hg^{++}, Pb^{++++}, Cu^{+}, Cd^{++}, Bi^{+++}).
16. To detect and confirm II-B radicals Sn^{+++}, Sb^{+++}, As^{+++}).
17. To get introduction with the scheme of III group radicals (Fe^{+++} - Al^{+++}, Cr^{+++})
18. To detect and confirm Fe^{+++}, Al^{+++} and Cr^{+++}.
19. To get introduction with he scheme of IV group radicals.
20. To detect and confirm An^{++} and Mn^{++} radicals of IV group.
21. To detect and conform Co^{++} and Ni^{++} radicals of IV group.
22. To get introduction with the Acid Radical Scheme.
23. To detect dilute acid group.
24. To detect and confirm CO''_3 and HCO'_3 radicals.
25. To get introduction with the methods/apparatus of conducting volumetric estimations.
26. To prepare standard solution of a substance.
27. To find the strength of a given alkali solution.
28. To estimate HCO'_3 contents in water.
29. To find out the %age composition of a mixture solution of KNO_3 and KOH volumetrically.
30. To find the amount of chloride ions (Cl') in water volumetrically.

COMP-142 COMPUTER APPLICATIONS

Total Contact Hours		T	P	C
Theory:	32 Hrs	1	3	2
Practical:	96 Hrs			

Pre-requisites: None

AIMS: This subject will enable the student to be familiar with the fundamental concepts of Computer Science. He will also learn MS-Windows, MS-Office, and Internet to elementary level.

Course Contents:

1. ELECTRONIC DATA PROCESSING (E.D.P.) 6 Hrs

1.1 Basic Terms of Computer Science Data & its, types, Information, Hardware, Software
1.2 Computer & its types
1.3 Block diagram of a computer system
1.4 BIT, Byte, RAM & ROM
1.5 Input &Output devices
1.6 Secondary storage devices
1.7 Types of Software
1.8 Programming Languages
1.9 Applications of computer in different fields
1.10 Application in Engineering, Education & Business

2,MS-WINDOWS 2 Hrs

2.1 Introduction to Windows
2.2 Loading & Shut down process
2.3 Introduction to Desktop items (Creation of Icons, Shortcut, Folder & modify Taskbar)
2.4 Desktop properties
2.5 Use of Control Panel
2.6 Searching a document

3.MS-OFFICE (MS-WORD) 8 Hrs

3.1 Introduction to MS-Office
3.2 Introduction to MS-Word & its Screen
3.3 Create a new document
3.4 Editing & formatting the text
3.5 Saving & Opening a document
3.6 Page setup (Set the Margins & Paper)
3.7 Spell Check & Grammar
3.8 Paragraph Alignment
3.9 Inserting Page numbers, Symbols, Text box & Picture in the document
3.10 Use the different Format menu drop down commands(Drop Cap, Change Case, Bullet & Numbering and Border & Shading)
3.11 Insert the 'Table and it's Editing
3.12 Printing the document
3.13 Saving a document file as PDF format

4.MS-OFFICE (MS-EXCEL) 9 Hrs

4.1 Introduction to MS-Excel & its Screen
4.2 Entering data & apply formulas in worksheet
4.3 Editing & Formatting the Cells, Row & Colum
4.4 Insert Graphs in sheet

4.5 Page setup, Print Preview & Printing
4.6 Types & Categories of Charts

5.MS. OFFICE (MS-POWER POINT) 4 Hrs

5.1 Introduction to MS-Power point
5.2 Creating a, presentation
5.3 Editing & formatting a text box
5.4 Adding pictures & colors to a slide
5.5 Making slide shows
5.6 Slide Transition

6.INTERNET & E-MAIL 3Hrs

6.1 Introduction to Internet & browser window
6.2 Searching, Saving and Print a page from internet
6.3 Creating, Reading & Sending E-Mail
6.4 Explain some advance features over the internet and search engines

COMP-142 COMPUTER APPLICATIONS

Instructional Objectives:

1. UNDERSTAND ELECTRONIC DATA PROCESSING (E.D.P)

1.1. Describe Basic Terms of Computer Science. Data& its Types, Information, Hardware, Software
1.2. Explain Computer & its types
1.3. Explain Block diagram of a computer system
1.4. State the terms such as BIT, Byte, RAM & ROM
1.5. Identify Input & Output devices
1.6. Describe Secondary Storage devices
1.7. Explain Types of Software
1.8. Introduction to Programming Language
1.9. Explain Applications of computer in different fields
1.10. Application in Engineering, Education & Business

2. UNDERSTAND MS-WINDOWS

2.1 Explain Introduction to Windows
2.2 Describe Loading & Shut down process
2.3 Explain Introduction to Desktop items(Creation of Icons, Shortcut, Folder & modify Taskbar)
2.4 Explain Desktop properties
2.5 Describe Use' of Control Panel (add/remove program, time & date, mouse and create user account)
2.6 Explain the method of searching a document

3. UNDERSTAND MS-OFFICE (MS-WORD)

3.1 Explain Introduction to MS-Office
3.2 Describe -Introduction to MS-Word & its Screen
3.3 Describe create a new document
3.4 Explain Editing & formatting the text
3.5 Describe saving & Opening a document
3.6 Explain Page setup, (Set the Margins & Paper)
3.7 Describe Spell Check & Grammar
3.8 Explain Paragraph Alignment
3.9 Explain Inserting Page numbers, Symbols, Text box & Picture in the document
3.10 Describe Use the different Format menu drop down commands(Drop Cap, Change Case, Bullet &Numbering and Border & Shading)
3.11 Explain Insert the Table and its Editing and modifying
3.12 Describe printing the document
3.13 Describe the method of file saving as a PDF Format

4. UNDERSTAND MS-OFFICE (MS-EXCEL)

4.1 Explain Introduction to MS-Excel & its Screen
4.2 Describe Entering data & apply formulas in worksheet
4.3 Describe Editing &Formatting the, Cells, Row & Column
4.4 Explain Insert Graphs in sheet
4.5 Describe Page setup, Print preview & Printing
4.6 Explain in details formulas for sum, subtract, multiply, divide, average
4.7 Explain in details the types of charts e.g pie chart, bar chart

5. UNDERSTAND MS-OFFICE (MS-POWER POINT)

5.1 Describe Introduction to MS-Power point
5.2 Explain creating a presentation

5.3 Describe Editing & formatting a text box
5.4 Explain Adding pictures & colors to a slide
5.5 Describe Making slide shows
5.6 Explain Slide Transitions

6. UNDERSTAND INTERNET &E-MAIL

6.1 Explain Introduction to Internet and browser window
6.2 Explain Searching, Saving and Print a page from internet
6.3 Describe Creating, Reading & Sending E-Mail and attachments
6.4 Explain some advance features over the internet and how to search topics on different search engines

Recommended Textbooks:

1. **Bible Microsoft Office 2007 by John Walkenbach**
2. **Bible Microsoft Excel 2007 by John Walkenbach**
3. **Bible Microsoft PowerPoint 2007 by John Walkenbach**

COMP-142 COMPUTER APPLICATIONS 96 Hours

List of Practical:

Identify key board, mouse, CPU, disk drives, disks, monitor, and printer and **3Hrs**

MS WINDOWS XP **12 Hrs**

1.1 Practice of loading and shutdown of operating system
1.2 Creating items (icons, shortcut, folders etc) and modifying taskbar
1.3 Changing of wallpaper, screensaver, and resolution
1.4 Practice of control panel items (add/remove, time and date,mouse, and create user account)

MS OFFICE (MS-WORD) **27 Hrs**

1.5 Identifying the MS Word Screen and its menu
1.6 Practice of create a new document, saving and re-opening it fromthe location and spell check & grammar
1.7 Practice of Page Formatting (Borders, Character Spacing, Paragraph,Bullets& Numberings and Fonts)
1.8 Practice of different tool bars like standard, format& drawing tool bars
1.9 Practice of Insert pictures, clipart, and shapes
1.10 Practice of header and footer
1.11 Practice of insert table and also format of table
1.12 Practice of page setup, set the page margins, and printing documents

MS OFFICE (MS-EXCEL) **27 Hrs**

1.13 Identifying the MS EXCEL Screen and its menu
1.14 Practice of create a new sheet, saving and re-opening it from thelocation and spell check
1.15 Practice of insert and delete of row and columns (format of cell)
1.16 Practice of entering data and formulas in worksheet(Add, Subtract, Multiplying, and Divide & Average)
1.17 Repeating practical serial number04
1.18 Practice of insert chart and its types
1.19 Practice of page setup, set the page margins, and printing

MS OFFICE (MS-POWER POINT) **15 Hrs**

1.20 Identifying the MS POWER POINT Screen and its menu
1.21 Practice of create a new presentation and save
1.22 Practice of open saves presentations
1.23 Practice of inset picture and videos

INTERNET & E-MAIL **12 Hrs**

1.24 Identifying internet explorer
1.25 Practice of searching data from any search engine
1.26 Practice of create an E-Mail account and how to send and receivemails, download attachments

FTW-113 Design & Pattern Engineering-I

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Develop an in-depth understanding of design principles, aesthetics, and technical specifications in product development.
- Create accurate and innovative patterns for manufacturing, especially in footwear, apparel, and leather goods.
- Enhance practical skills in manual and digital pattern-making tools for industrial applications.
- Handle problems of pattern development and prototyping.
- Enhance efficient design thinking

Course Contents

1. Fundamentals of Shoe Designing **16Hrs**

1.1 Introduction of Footwear
1.2 Parts of a Shoe
1.3 Tools and equipment for shoe designing
1.4 Basic footwear styles
1.5 Edge techniques
1.6 Decoration

2. Foot and Measurement **16Hrs**

2.1.The shape of foot
2.2.The bones and joint of foot
2.3.Pressure distribution during the working
2.4.Foot skeleton
2.5.Foot arches
2.6.Foot print
2.7.Fracture of the foot
2.8.Measurement of foot

3. Fundamental of the Last and measurement **16Hrs**

3.1 Anatomical Aspects of last
3.2 Parts of last
3.3 Type of last
3.4 Last dimension and measurement
3.5 Insole pattern design
3.6 Production and grading of last
3.7 Last profile

4. Mean form making **16Hrs**

4.1 Introduction of Mean Form

4.2 Different methods of mean form making
4.3 Tape method
4.4 Fish bone method
4.5 Vacuum method

Recommended Books

1. J.A.JLuijten, P.W.JVelden- Design, Pattern Engineering and Grading of Footwear Vol.1 & 2, TNO Leather & Shoe Research Institute
2. R.G.Miller- Manual of Shoe Making, Clarks Limited
3. Muazzam Mahmood Mansoor "Pattern Engineering of Shoe Components" Technical Education & Vocational Training Authority, Punjab

Instructional Objectives

1. Fundamentals of Shoe Designing

1.1 Define the various types of footwear and their parts
1.2 Define the label and all key parts of a shoe
1.3 Define use basic tools and equipment used in shoe designing
1.4 Explain classify common footwear styles
1.5 Explain and demonstrate techniques such as folding, skiving, painting, and binding to finish shoe edges
1.6 Explain basic decoration techniques (punching, stitching, lacing, embroidery, color application)

2. Foot and Measurement

2.1 Define and describe the general shapes of the human foot.
2.2 Describe the major joints of the foot and their allocation.
2.3 Describe the analyze how pressure is distributed across different parts of the Foot
2.4 Describe the label and bones of the foot (tarsals, metatarsals, phalanges)
2.5 Define the three main arches of the foot
2.6 Define interpret different types of footprints
2.7 Describe the recognize common types of foot fractures,
2.8 Define accurate foot measurements (length, width, arch height)

3. Fundamental of the Last and measurement

3.1 Explain the anatomical features of the human foot that influence last design
3.2 Describe the main components of a shoe last
3.3 Explain classify various types of lasts
3.4 Explain measure and record key last dimensions
3.5 Describe the design an accurate insole pattern based on the last
3.6 Describe the process of last production
3.7 Define Interpret the side, top, and bottom profiles of a last

4. Mean form making

4.1 Define the concept of mean form **i**n shoe last and pattern making
4.2 Describe various methods used to create the mean form of a shoe last
4.3 Describe the tape method of mean form making by accurately covering the last
4.4 Describe and apply the fish bone method of mean form making by drawing central axis and perpendicular lines on the last
4.5 Explain and demonstrate the vacuum forming method of creating a mean form using a plastic sheet and vacuum equipment

List of Practical: 96. Hours

1. Draw a sketch of shoe with parts
2. Draw of foot skeleton
3. Draw a plain foot print of 90° and 45°
4. Draw a foot & locate the different girths
5. Make a last sketch with parts name
6. Make insole by plan foot method
7. Make insole by dr. Shade method
8. Make last profile
9. Prepare a mean form by using the tape method on last
10. Prepare a mean form by using the Paper method on last
11. Prepare inside and outside of the design and paste on drawing paper

FTW-123 Footwear Production Technology -I

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Understand basic concepts, processes, and machinery involved in footwear components Cutting process.
- Develop technical understanding of materials, tools, and production techniques used in the initial stages of footwear production.
- Perform practical work in industrial footwear settings by building a foundation in standard production methods.
- Identify, analyze, and improve production workflow for quality and efficiency.

Course Contents

1-Introdution to Cutting **8Hrs**

1.1. Explain cutting
1.2. Type of cutting
1.3. Importance of cutting
1.4. Measurements in cutting
1.5. Cutting safety rules and parameters
1.6. Costing in cutting

2-Cutting in footwear industry **12Hrs**

2.1 Explain footwear cutting
2.2 Importance of cutting in footwear technology
2.3 Types of cutting in footwear
2.4 Material importance and cost control
2.5 Material directions
2.6 Footwear part and directions
2.7 Rules of cutting in footwear industry
2.8 Utilization of waste materials
2.9 Safety equipment and usage

3-Leather cutting **12Hrs**

3.1 Upper leather cutting
3.2 Lining leather cutting
3.3 Leather selection
3.4 Shoe parts and leather placement
3.5 Faults and defects in leather
3.6 Utilization of small leather pieces and its value
3.7 Sole Leather cutting
3.8 Leather storage

4-Non Leather cutting **8Hrs**

4.1 Upper Cutting
4.2 Lining Cutting

4.3 Bakar Cutting
4.4 Other miscellaneous Material cutting

5-Duties of a Cutter **12Hrs**

5.1. Receiving of work ticket
5.2. Basic allowance
5.3. Inspection of material received
5.4. Pair wise cutting
5.5. Size marking
5.6. Record of work done
5.7. Knowledge of Material Quality
5.8. Must be literate
5.9. Eyesight 6x6

6-Miscellaneous Process in cutting Department **12Hrs**

6.1. Skiving
6.2. Splitting
6.3. Embossing & Engraving
6.4. Stamping & Numbering
6.5. Upper marking
6.6. Upper printing
6.7. Edge treatments
6.8. Quality Control in cutting department

Recommended Books

1. J.A.JLuijten, P.W.JVelden- Principles of Shoe Designing Vol.1 & 2, TNO Leather & Shoe Research Institute
2. Muazzam Mahmood Mansoor “Principles of Upper Leather Cutting & Stitching” Technical Education & Vocational Training Authority, Punjab.

Instructional Objectives

1. Introduction of cutting

1.1 Explain cutting and describe its basic purpose in the manufacturing process, particularly in footwear or garments industries.

1.2 Describe various types of cutting methods, including manual, die, clicking, laser, and computerized cutting

1.3 Explain the importance of cutting in the overall production process, focusing on material utilization, accuracy, and product quality

1.4 Demonstrate of measurement techniques used in cutting, including the ability to take accurate measurements using standard tools

1.5 Apply safety rules and parameters in cutting operations, including proper handling of tools, use of personal protective equipment, and maintaining a safe work environment

1.6 Analyze the role of cutting in production costing, and suggest ways to minimize cost through improved cutting efficiency

2. Cutting in footwear industry

2.1 Define footwear cutting and describe its fundamental role in the footwear manufacturing process

2.2 Explain the importance of cutting in footwear technology, with product quality, material utilization, and production efficiency

2.3 Differentiate between various types of cutting methods used in the footwear industry

2.4 Discuss the significance of material selection in footwear cutting Process and analyze how proper material planning contributes to cost control

2.5 Define the material direction (grain, stretch) and explain its influence on strength, appearance, and performance of the final product

2.6 Describe the Recognize key footwear parts (vamp, quarter, tongue, counter) and relate their cutting direction and placement to product durability and fitting

2.7 Define standard rules of cutting used in the footwear industry to ensure quality, safety, and minimal material waste

2.8 Describe techniques for waste material utilization and propose strategies for reducing and reusing offcuts effectively

2.9 Define the cutting safety equipment and demonstrate proper usage to maintain a safe working environment

3. Leather cutting

3.1 Explain the process of upper leather cutting and understand its role

3.2 Describe the methods and importance of lining leather cutting for comfort and durability in footwear

3.3 Demonstrate the ability to select leather types based on quality, thickness, flexibility, and appearance

3.4 Explain shoe parts and explain how proper leather placement contributes to material efficiency and product quality

3.5 Evaluate common leather faults and defects before cutting

3.6 Explain the importance of utilizing small leather pieces, and suggest practical applications to reduce material wastage

3.7 Define the procedure for sole leather cutting

3.8 Describe proper methods of leather storage to maintain quality, prevent damage, and ensure readiness for cutting operations

4. Non Leather Cutting

4.1 Explain the process of upper cutting using non-leather materials such as synthetic fabrics, mesh, PU, or textiles, and understand their handling techniques

4.2 Describe the methods of lining cutting with non-leather materials, focusing on comfort, breathability, and material properties

4.3 Explain the characteristics of Bakar and apply correct cutting methods suited to its structure and usage in footwear components

4.4 Describe the cutting techniques for other miscellaneous materials such as foam, reinforcements materials or Velcro used in footwear making

5. Duties of a cutter

5.1 Describe the procedure for receiving the work ticket to begin the cutting task correctly

5.2 Explain the concept of basic allowance and its role in footwear material cutting

5.3 Inspect incoming materials for quality and defects before cutting, ensuring only approved materials are used

5.4 Demonstrate the method of pair-wise cutting to maintain uniformity

5.5 Apply appropriate size marking techniques on cut pieces to ensure correct identification and assembly in the production

5.6 Maintain an accurate and up-to-date record of work done for traceability and production monitoring

5.7 Identify and assess material quality standards required in the cutting process to produce durable and defect free products

5.8 Recognize the basic literacy in interpreting work tickets, size markings, and production notes

5.9 Recognize the importance of having 6/6 eyesight to perform precise and accurate cutting operations

6. Miscellaneous Process in cutting Department

6.1 Define the process of skiving and its purpose for better folding and stitching

6.2 Explain the process of splitting and identify its role in achieving uniform thickness in various footwear components

6.3 Define the techniques of embossing and engraving, and their role in design and branding

6.4 Explain the methods of stamping and numbering, and their relevance for product tracking, size identification, and quality assurance

6.5 Demonstrate proper upper marking techniques for accurate component placement and assembly during upper stitching

6.6 Describe different upper printing techniques used for decorative or branding purposes in footwear production

6.7 Define various edge treatment methods applied to cut components for smoothness, appearance, and durability

6.8 Describe the quality control in the cutting department, and apply key inspection points to ensure defect-free output

List of Practical: 96. Hours

1. Perform the paper of Skin printing for hand cutting
2. Perform the synthetic material with cutting knife for hand Cutting Exercises (05 different exercises)
3. Perform the leather material with cutting knife for Cutting Exercises (05 different exercises)
4. Operate the cutting machine manually for Exercises in Press Cutting
5. Operate the cutting machine manually for Hydraulic Press Cutting
6. Operate the cutting machine manually for Pneumatic Press Cutting
7. Operate the cutting machine manually for Electric Press Cutting
8. Operate the cutting machine manually for Swing beam Clicking Press cutting
9. Operate the cutting machine manually for Travel Head Clicking Press cutting
10. Perform the leather on press Cutting for Real Leather Press Cutting
11. Skive the leather material on Skiving machine
12. Split the leather material on Splitting machine

FTW-134 Drawing & Fashion Designing

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**192**	**2**	**6**	**4**

Learning Outcome

The students will be able to:

- Understand the different methods and techniques of traditional and digital drawing.
- Shading, light, and shadow techniques to create realistic artwork.
- Differentiate between drawing and sketching in terms of tools, techniques, and purposes.
- Understand and apply the core elements and principles of design (line, shape, balance, emphasis, rhythm, unity, etc.) in their compositions.
- Create and present a basic design portfolio showcasing original work using appropriate design processes and techniques.
- Explain key fashion concepts, types, and cycles, and connect them with cultural and societal influences.
- Illustrate fashion ideas through basic fashion illustrations and apply forecasting concepts in design planning.
- Apply elements of design (point, line, shape, form, space, color, texture, value).
- Recognize and describe traditional Pakistani fashion and footwear styles (e.g., Khussa, Peshawari chappal).

Course Contents

1: Introduction of Drawing 12Hrs

1.1. Introduction of Drawing
1.2. Types of drawing
1.3. History of Drawing
1.4. Drawing Methods/Techniques
1.5. Shading Techniques for Drawing
1.6. Importance of light & shadow in drawing
1.7. Introduction to basic digital drawing tools (e.g., stylus, tablets, and mobile apps)

2: Fundamentals of Drawing 16Hrs

2.1. Drawing Tools
2.2. Importance of line work
2.3. Importance of Perspective and Proportion
2.4. Use/Application of Drawing in different fields
2.5. Use/Application of sketching in different fields
2.6. Difference between drawing and sketching
2.7. Gesture drawing and dynamic sketching exercises

3: Introduction of Design 8Hrs

3.1. Introduction of Design
3.2. Design Disciplines
3.3. Methods of Designing

3.4. Types of Design
3.5. Introduction to portfolio development and presentation

4: Fundamentals and Principles of Design 8Hrs

4.1. Point
4.2. Lines
4.3. Shapes
4.4. Form
4.5. Space
4.6. Color
4.7. Texture
4.8. Value
4.9. Balance
4.10. Proportion
4.11. Perspective
4.12. Emphasis
4.13. Movement
4.14. Pattern
4.15. Repetition
4.16. Rhythm
4.17. Variety
4.18. Harmony
4.19. Unity
4.20. Sustainability and ethics in design

5: Introduction of Fashion & Cutting 20Hrs

5.1. Introduction of Fashion
5.2. Types of Fashion
5.3. Introduction of Fashion Designing
5.4. Define Fashion illustrations
5.5. What is fashion forecasting
5.6. Explain forecasting in fashion
5.7. What is fashion cycle
5.8. What does fashion say about culture?
5.9. Traditional fashion adaptation
5.10. Introduction of Cutting
5.11. Types of Cutting
5.12. Overview of traditional Pakistani footwear (e.g Khussa, Peshawari chappal

Recommended Books

1. Anna Kiper – *Fashion Illustration: Inspiration and Technique*, David & Charles
2. John Hopkins – *Basics Fashion Design: Fashion Drawing*, Bloomsbury
3. Wucius Wong – *Principles of Form and Design*, Wiley
4. Steven Faerm – *Fashion Design Course: Principles, Practice, and Techniques*, Barron's
5. *(Optional)* Susan Lazear – *Adobe Illustrator for Fashion Design*, Pearson

Instructional Objectives

1. Introduction of Drawing

1.1 Describe the basic concept and significance of drawing in visual arts.
1.2 Identify and differentiate various types of drawings.
1.3 Summarize the historical development of drawing as an artistic expression.
1.4 Demonstrate understanding of traditional drawing methods and techniques.
1.5 Apply basic shading techniques to add depth and dimension in sketches.
1.6 Analyze the role of light and shadow in enhancing visual representation.
1.7 Identify basic digital drawing tools (e.g., stylus, tablets, mobile apps) and explain their use in modern artwork**.**

2.Fundamentals of Drawing

2.1 Select appropriate drawing tools for different styles and techniques.
2.2 Explain the significance of line quality and its expressive potential.
2.3 Understand and apply principles of perspective and proportion in drawing.
2.4 Discuss practical applications of drawing in fields such as architecture, fashion, and product design.
2.5 Explain the use of sketching in creative ideation and planning.
2.6 Differentiate between drawing and sketching in terms of purpose and execution.
2.7 Practice gesture drawing and dynamic sketching to improve speed and expression.

3. Introduction of Design

3.1 Define design and understand its role in problem-solving and creativity.
3.2 Identify various design disciplines (e.g., graphic, fashion, industrial, interior).
3.3 Understand basic methods used in the design process.
3.4 Classify different types of design based on function and form.
3.5 Explain the process of creating a design portfolio and the principles of effective presentation**.**

4. Fundamentals and Principles of Design

4.1 Understand and apply elements of design (point, line, shape, form, space, color, texture, value).
4.2 Comprehend design principles (balance, proportion, emphasis, unity, rhythm, etc.).
4.3 Integrate multiple design principles to create visually balanced and meaningful compositions.
4.4 Recognize the importance of sustainability and ethics in the design process.

5. Introduction of Fashion & Cutting

5.1 Define fashion and understand its cultural and social relevance.
5.2 Identify types of fashion (e.g., haute couture, streetwear, traditional).
5.3 Explain the fundamentals of fashion designing.
5.4 Describe fashion illustration and its role in design communication.
5.5 Understand the concept of fashion forecasting and its industry impact.
5.6 Explain the fashion cycle and its influence on trends.
5.7 Analyze the relationship between fashion and culture.
5.8 Discuss the importance of traditional fashion in contemporary design.
5.9 Define and describe the cutting process in garment and footwear production.
5.10 Identify types of cutting techniques used in fashion.
5.11 Recognize and appreciate traditional Pakistani footwear styles (e.g., Khussa, Peshawari Chappal).

List of Practical: 192. Hours

1) Drawing Exercises

- Improve line quality
- Practice basic shading techniques
- Use geometric tools for line, shape, and texture exercises
- Compose balanced designs using drawing elements
- Develop texture understanding

2) Color Theory

- Create color wheels (primary, secondary, tertiary)
- Explore complementary, monochromatic, and neutral palettes
- Build value scales

3) Creative Sketching of Objects

- Sketch 10 different still-life objects using measurements
- Draw 10 different fashionable shoe styles using observational methods

4) Human Foot & Picture Sketching

- Draw 20 different sketches of human feet from references to develop tone and proportion

5) Footwear Illustration

- Draw 10 different human feet styles
- Draw 10 different boot types
- Illustrate shoes: Oxford, Derby, Long Boot
- Sketch different ladies' fashion shoes

6) Optional

- Create a mini portfolio of illustrated designs (5–10 shoes with notes)

GEN-201

اسلامیات/مطالعہ پاکستان

نصاب سال دوئم

حصہ اول اسلامیات

حصہ دوئم مطالعہ پاکستان

سی	پی	ٹی
1	0	1

کل وقت 20 گھنٹے:

موضوعات:

1۔ سورۃ المومنون ایک تا گیارہ آیات کا ترجمہ مع تشریح

2۔ دس منتخب احادیث مع ترجمہ وتشریح

() خیر کم من تعلم القرآن و علمه

() لا ایمان لمن لا امانته له ولا دین لا من لا اعهد له

() و یاکم و الظن ان الظن اکرب الحدیث

() من احدث فی امرنا هذا ما لیس منه فهورد

() من حمل علینا السلاح فلیس منا

() انا و کافل الیتیم فی الجنه

() لا ضرور و لا ضرار فی السلام

() کلکم راع و کلکم راع و کلکم مسول عن رعیته

3۔ سیرۃ طیبہ

() مکی زندگی۔ ولادت۔ بعثت۔ ہجرت

() مدنی زندگی۔ مواخات۔ میثاق مدینہ۔ فتح مکہ (اسباب ونتائج)

4۔ حضور ﷺ بحیثیت

() خطبہ حجۃ الوداع۔ انسانی حقوق کا اعلامیہ/حقوق انسانی پالیسی 2018

() معلم کامل۔ سربراہ خاندان

5۔ اسلامی معاشرہ

نظام تعلیم اور اس کے مقاصد۔ عدل وانصاف۔ امر بالمعروف۔ نہی عن المنکر۔ انسانی حقوق کا معاشرتی اور معاشی ترقی میں کردار

جہاد۔ کسب حلال۔ مسجد (اہمیت وفضیلت)

6۔ اسلامی ریاست کی تعریف۔ اسلامی ریاست کی خصوصیات۔ اسلامی حکومت کے فرائض۔ اسلامی طرز حکومت۔

() حضور ﷺ کی بطور سربراہ بیان کر سکے

حضور ﷺ بحیثیت

() خطبہ حجۃ الوداع ۔انسانی حقوق کا اعلامیہ رحقوق انسانی پالیسی 2018 کے بارے جان سکے

اسلامی معاشرہ:

عمومی مقاصد: اسلامی معاشرہ کی خصوصیات سے آگاہی حاصل کر سکے

خصوصی مقاصد:

() اسلامی معاشرہ کا معنی ومفہوم کر سکے

() اسلامی معاشرہ کی امتیازی خصوصیات بیان کر سکے

() اسلامی معاشرہ میں عدل واحسان کی اہمیت بیان کر سکے

() تبلیغ کے لغوی معنی بیان کر سکے

() تبلیغ کی اہمیت اور ضرورت بیان کر سکے

() جہاد کے لفظی واصطلاحی معنی بیان کر سکے

() جہاد کی اہمیت بیان کر سکے

() جہاد اور قتل میں فرق بیان کر سکے

() جہاد کی مختلف اقسام بیان کر سکے

() لفظ مسجد کی تعریف بیان کر سکے

() مسجد کی سابقہ حیثیت کو بحال کرنے کے بارے میں اقدامات کو مان سکے

() انسانی حقوق کی معاشی اور معاشرتی ترقی میں اہمیت اور کردار بیان کر سکے

اسلامی ریاست:

عمومی مقاصد:

() اسلامی ریاست کی خصوصیات بیان کر سکے

خصوصی مقاصد:

() ریاست کی تعریف بیان کر سکے

() اسلامی ریاست میں طرز حکومت سے آگاہی حاصل کر سکے

() اسلامی ریاست کی خصوصیات بیان کر سکے

- () اسلامی ریاست کے اغراض ومقاصد بیان کر سکے
- () اسلامی ریاست کے قیام کی لیے جدوجہد کر سکے
- () حقوق آگاہی رمعلومات تک رسائی کا قانون جان سکے
- () ملازمت پیشہ خواتین کے حقوق کا تحفظ جان سکے اور
- () معاشرے میں خواتین کے حقوق کا تحفظ یقینی بنائے

نصاب مطالعہ پاکستان

سال دوئم

حصہ دوم

ٹی	پی	سی
1	0	1

کل وقت 12 گھنٹے

موضوعات:

- () دوقومی نظریہ
- () تحریک پاکستان
- () انڈین کانگریس
- () مسلم لیگ
- () تقسیم بنگال
- () میثاق لکھنو
- () تحریک خلافت
- () سندھو تحریک
- () تجاویز دہلی
- () نہرو رپورٹ
- () قائداعظم کے چودہ نکات
- () خطبہ آلہ آباد
- () انتخابات 1938 اور انتقال اقتدار
- () قرارداد پاکستان

حصہ دوم

مطالعہ پاکستان

تدریس مقاصد:

تحریک پاکستان:

عمومی مقاصد:

() قیام پاکستان کے اسباب وتحریک کو بیان کر سکے

خصوصی مقاصد:

() قومیت کے مفہوم کو بیان کر سکے

() دو قومی نظریہ کی تعریف وتوضیح کر سکے

() دوقومی نظریہ کی اہمیت بیان کر سکے

() ہندوستانی مسلمانوں کی محرومیوں کو بیان کر سکے

() قومی تشخص کو بحال رکھنے کے لیے مسلمانان ہند کی مساعی بیان کر سکے

() آزادی ہند اور قیام پاکستان علامہ اقبال اور قائداعظم کی مساعی بیان کریں

() قیام پاکستان سے مستقبل اسلامی مملکت کے قیام کے لیے مسلم عوام کی کوششوں کو بیان کر سکے

() مسلم لیگ کے قیام پاکستان کے لیے جدو جہد بیان کر سکے

(غیر مسلم طلباء کے لیے)

نصاب اخلاقیات

ٹی	پی	سی
1	0	1

سال دوم

کل وقت 20 گھنٹے

موضوعات:

معاشرتی اقدار بلحاظ ہمسایہ۔قوم۔قومی سطح۔شہری سطح۔صنعتی اداروں کی سطح۔ضروریات۔ورثہ

() حقوق وفرائض

() قوت برداشت

() قوت ارادی

() لگن وجذبہ

() وسیع النظری

() بے غرضی

() انسانی دوستی

() حفاظتی شعور

() پاس آزادی

() کامل آگاہی

() تغیرات کو قبول کرنا

() خودشناسی

() انسانی حقوق کا اعلامیہ/حقوق انسانی پالیسی 2018

() انسانی حقوق کا معاشرتی اور معاشی ترقی میں کردار

() حقوق آگاہی/معلومات تک رسائی۔ملازم پیشہ خواتین کا تحفظ

نصاب اخلاقیات

سال دوم

تدریس مقاصد:

طالب علم اخلاقیات کی اہمیت وضرورت سے آگاہ ہو سکے اور بیان کر سکے

خصوصی مقاصد: طالب علم اس قابل ہو کہ

() موضوعات کا مطلب بیان کر سکے

() عملی زندگی سے مثالوں کی نشاندہی کر سکے

() اپنی شخصیت اور معاشرے پر موضوعات کے مطابق اثرات پیدا کرنے کے طریقے بیان کر سکے

() اعلیٰ اخلاقی اقدار میں سے قوت برداشت۔قوت ارادی۔لگن وجذبہ۔وسیع النظری۔بے غرض۔انسانی دوستی شعور۔پاس آزادی۔کامل آگاہی اور خودشناسی کی اہمیت

() اخلاقیات سے متصف ہو کر قومی خدمت بہتر طور پر انجام دے سکے

() انسانی حقوق کا اعلامیہ/حقوق انسانی کی پالیسی 2018 کے بارے میں جان سکے

() انسانی حقوق کا معاشرتی اور معاشی ترقی میں اہمیت اور کردار بیان کر سکے

() حقوق اگاہی/معلومات تک رسائی کے قانون کو جان سکے

() ملازم پیشہ خواتین کا تحفظ کو اخلاقیات کا حصہ تصور کرے

Tarjumat-ul-Quran / Civics-II

TTQ-211 / Civic-211;

T	P	C
1	0	1

Total Contact Hours:

Theory: **32**
Practical: **0**

Note: Syllabi for this subject would be as per BISEs/General education, developed by Punjab Curriculum TextBook Board (PCTB)

Phy-212 APPLIED MECHANICS/APPLIED MECHANICS

Total Contact Hours		T	P	C
Theory	32 Hours	1	3	2
Practical	96 Hours			

AIMS
1. Apply the concepts of Applied Physics to understand Mechanics
2. Apply laws and principles of Mechanics in solving technological problems
3. Use the knowledge of App. Mechanics in learning advance technical courses.
4. Demonstrate efficient skill of practical work in Mechanics Lab.

COURSE CONTENTS

1. MEASUREMENTS **2 Hours**
- 1.1 Review: Dimensional formula of Equations of Motion
- 1.2 Review: Systems of measurement, S.I. Units, conversion
- 1.3 Significant Figures
- 1.4 Degree of accuracy

2. EQUILIBRIUM OF CON-CURRENT FORCES **4 Hours**
- 2.1 Concurrent forces
- 2.2 Addition and Resolution of Vectors
- 2.3 Toggle Joint, Hanging Chains
- 2.4 Roof Trusses, Cranes.
- 2.5 Framed structures

3. MOMENTS AND COUPLES: **3 Hours**
- 3.1 Principle of Moments - Review
- 3.2 Levers
- 3.3 Safety valve
- 3.4 Steel yard
- 3.5 Parallel forces, couple
- 3.6 Torque

4. EQUILIBRIUM OF NON CONCURRENT FORCES: **4 Hours**
- 4.1 Non-concurrent forces
- 4.2 Free body diagram
- 4.3 Varignon's theorem
- 4.4 Conditions of total Equilibrium (Review)
- 4.5 Ladders

5. MOMENT OF INERTIA: **4 Hours**
- 5.1 Review: Rotational Inertia
- 5.2 Moment of Inertia, Theorems
- 5.3 Moment of Inertia of symmetrical bodies
- 5.4 M.I. of Fly wheel with applications
- 5.5 Energy stored by Fly wheel

6. FRICTION: **4 Hours**
- 6.1 Review: Laws of friction
- 6.2 Motion of body along an inclined plane (up & down)
- 6.3 Rolling friction & Ball Bearings

6.4 Fluid Friction, Stokes' Law

7. WORK, ENERGY AND POWER **3 Hours**

7.1 Work-Energy relationship
7.2 Work done by variable .
7.3 Power
7.4 I.H.P, B.H.P and Efficiency
7.5 Dynamometer.

8. **TRANSMISSION OF POWER**

8.1 Belts, Ropes
8.2 Chains
8.3 Gears
8.4 Clutches, functionsand types with application.

9. MACHINES: **3 Hours**

9.1 Efficiency of machines
9.2 Inclined plane - Review
9.3 Reversibility of machines
9.4 Single purchase crab
9.5 Double purchase crab.
9.6 Worm and worm wheel.
9.7 Differential Screw Jack.
9.8 Differential Pulley, Wheel and Axle

10. VIBRATORY MOTION: **2 Hours**

10.1 S.H.M. - Review
10.2 Pendulums
10.3 Speed Governors
10.4 Helical spring
10.5 Cams
10.6 Quick return motion

11. ELASTICITY: **3 Hours**

11.1 Three Moduli of Elasticity
11.2 Loaded Beams, Types of Beam & Loads
11.3 Bending Stress
11.4 S.F & B.M diagram
11.5 Torsion and Torsional Stresses

12. Simple Mechanism

12.1 Introduction

12.2 Kinematic link or element

12.3 Kinematic pair and types

12.4 Kinematic chains and types

13. Velocity in mechanism

13.1 Introduction

13.2 Instantaneous center

13.3 Instantaneous velocity

13.4 Velocity of a link by Instantaneous center method

13.5 Relative velocity of two bodies in straight line

13.6 Velocity of a link by relative velocity method

Phy. 212 APPLIED MECHANICS/APPLIED MECHANICS

INSTRUCTIONAL OBJECTIVES

1. USE THE CONCEPTS OF MEASUREMENT IN PRACTICAL SITUATIONS/PROBLEMS

1.1 Explain Dimensional formula
1.2 Explain systems of measurement
1.3 Use concept of significant figures and degree of accuracy to solve problems

2. USE THE CONCEPT OF ADDITION AND RESOLUTION OF VECTORS TO PROBLEMS ON EQUILIBRIUM INVOLVING CONCURRENT FORCES

2.1 Describe concurrent forces
2.2 Explain resolution of vectors
2.3 Use the analytical method of addition of vectors for solving problems.
2.4 Use the graphical method of addition of vectors for solving problems.
2.5 Solve problems on forces with emphasis on roof trusses, cranes simple frames and framed structures.

3. USE THE PRINCIPLE OF MOMENTS AND CONCEPT OF COUPLE TO SOLVE PROBLEMS.

3.1 Describe the principle of moments.
3.2 Use the principle of moments to solve problems on compound levers, safety valve, and steel-yard.
3.3 Describe couple and torque.
3.4 Use the concept to solve problems on torque.

4. USE THE LAWS OF TOTAL EQUILIBRIUM OF FORCES TO SOLVE PROBLEMS INVOLVING FORCES IN EQUILIBRIUM.

4.1 Distinguish between concurrent and non-concurrent forces.
4.2 Prepare a free body diagram of an object or a structure.
4.3 Explain Varignon's theorem
4.4 Explain second condition of equilibrium
4.5 Use laws of total equilibrium to solve problems on forces involving framed structure and ladders.

5. USE CONCEPTS OF MOMENT OF INERTIA TO PRACTICAL SITUATIONS AND PROBLEMS.

5.1 Explain moment of inertia.
5.2 Explain the theorems of Parallel and perpendicular Axis.
5.3 Describe the M.I. of regular bodies
5.4 Explain M.I. of Fly wheel
5.5 Explain Energy stored by Fly Wheel
5.6 Use these concepts to solve simple problems.

6. UNDERSTAND THE CONCEPTS AND LAWS OF SOLID AND FLUID FRICTION.

6.1 Define Coefficient of friction between a body placed on an inclined plane and the surface.
6.2 Explain motion of a body placed on an inclined plane
6.3 Calculate the force needed to move a body up and down an inclined plane.
6.4 Explain rolling friction and use of ball bearings.
6.5 Describe fluid friction and Stoke's law.

7. UNDERSTAND WORK, ENERGY AND POWER.

7.1 Derive work-energy relationship
7.2 Use formulae for work done by a variable force to solve problems.
7.3 Explain Power, I.H.P, B.H.P and efficiency.
7.4 Describe dynamometers.
7.5 Use the concepts to solve problems on power and work-energy

8. Understand transmission of power through ropes and belts

8.1 Describe the need for transmission of power

8.2 Describe the method of transmission of power

8.3Understand transmission of power through ropes and belts

8.4 Write formula for power transmitted through ropes and belts

8.5 Describe transmission of power through friction gears and write formula

8.6 Describe transmission of power through chains and toothed wheels/gears

8.7 Use the formula to solve/problem on transmission of power

8.8 Describe types and functions of clutches with applications

9. USE THE CONCEPTS OF MACHINES TO PRACTICAL SITUATIONS.

9.1 Explain theoretical, actual mechanical advantage and efficiency of simple machines.

9.2 Use the concept to calculate efficiency of an inclined plane.

9.3 Describe reversibility of machines.

9.4 Calculate the efficiency of:

i. Single purchase crab.

ii. Double purchase crab.

iii. Worm and worm wheel.

iv. Differential screw jack, Diff. Pulley, Wheel and Axle.

9.5 Use the formulae to solve the problems involving efficiency, M.A of the above machines.

10. USE THE CONCEPTS OF VIBRATORY MOTION TO PRACTICAL SITUATIONS.

10.1 Define vibratory motion giving examples.

10.2 Describe circular motion and its projection on diameter of the circular path.

10.3 Relate rotatory motion to simple vibratory motion.

10.4 State examples of conversion of rotatory motion to vibratory motion and vice versa.

10.5 Derive formulae for position, velocity and acceleration of a body executing S.H.M.

10.6 Use the concept of S.H.M to helical springs.

10.7 Use the concept S.H.M to solve problems on pendulum.

11. UNDERSTAND BENDING MOMENTS AND SHEARING FORCES.

11.1 Define three types of stresses and moduli of elasticity.

11.2 Describe types of beams and loads.

11.3 Explain shearing force and bending moment.

11.4 Use these concepts to calculate S.F and B.M in a given practical situation for point loads, uniformly distributed loads.

11.5 Prepare S.F and B.M diagram for loaded cantilever and simply supported beams.

11.6 Describe torsion and torsional stresses giving formula

12. Understand Simple Mechanism

12.1 Define simple mechanism

12.2 Define kinematics

12.3 Explain kinematic links or elements

12.4 Explain kinematic chains

12.5 Distinguish between types of kinematic chains

13. Understand the method of finding velocity in mechanisms

13.1 Explain relative velocity

13.2 Explain instantaneous center

13.3 Explain instantaneous velocity

13.4 Explain the method of finding velocity of a link by:

i. Relative velocity method

ii. Instantaneous center method

Phy-212 APPLIED MECHANICS//APPLIED MECHANICS

LIST OF EXPERIMENTS

1. Find the weight of the given body using Law is theorem.
2. Find unknown forces in a given set of concurrent forces in equilibrium using Grave-sands apparatus
3. Set a jib crane and analyze forces in its members
4. Set a Derrick Crane and analyze forces in its members
5. Study forces shared by each member of a Toggle Joint
6. Set a Roof Truss and find forces in its members
7. Verify Principle of Moments in a compound lever
8. Calibrate a steelyard
9. Find the Reactions at the ends of a loaded beam
10. Use reaction of beams apparatus to study resultant of parallel forces

10. Find the Moment of Inertia of a Flywheel
11. Find the angle of reaction for a wooden block placed on an inclined plane
12. Find the B.H.P. of a motor
13. Find M.A. and Efficiency of worm and worm wheel
14. Study the transmission of power through friction gears
15. Study the transmission of power through belts
16. Study the transmission of power through toothed wheels
17. Study the function of clutches
18. Find M.A. and efficiency of differential wheel and axle
19. Find the efficiency of a screw
20. Find the efficiency of a differential pulley
21. Verify Hooke's Law using Helical Spring
22. Study conversion of rotatory motion to S.H.M using S.H.M Model/apparatus
23. Study conversion of rotatory motion to vibratory motion of piston in a cylinder
24. Study the reciprocating motion
25. Study the working of cams
26. Study the quick return motion
27. Compare the Elastic constants of the given wires

28. Verify Hooke’s Law using Helical Spring

29. Find the coefficient of Rigidity of a wire using Maxewell's needle

30. Find the coefficient of rigidity of a round bar using torsion apparatus

31. Find the coefficient of Rigidity of a rectangular bar using Deflection of Beam Apparatus

32. Determine S.F. and B.M. in a loaded canti-lever (Point Loads)

33. Determine S.F. and B.M. in a simply supported Beam (Point Loads)

34. Determine S.F. and B.M. in a simply supported Beam (Point loads and uniformly distributed load)

35. Determine S.F. and B.M. in a simply supported Beam (Point loads and uniformly distributed)

36. Study working and function of link mechanism of different types

BOOKS RECOMMENDED:

1. Applied Mechanics by R.S. Khurmi
2. Applied Mechanics by A.P.S Sahihney&Prakash D. Manikpyny.
3. Applied Mechanics by Inchley and Morley
4. Theories of Machines by R.S. Khurmi and J.K. Gupta.
5. Applied Mechanics by Junarker.
6. Engineering Science Vol-I by Brown and Bryant
7. Practical Physics by MehboobIlahi Malik &Ikram-ul-Haq
8. Experimental Physics Note Book by M. Aslam Khan & M. AkramSandhu
9. Experimental Mechanics (Urdu Process) by M. AkramSandhu

MATH-212 **Applied Mathematics-II**

	T	**P**	**C**
Total Contact Hours:			
	2	0	2

Theory: 64 Hours.

Aims & Objectives:

After completing the course the students will be able to:Solve the problems of calculus and analytical Geometry.

COURSE CONTENTS:

1. FUNCTIONS & LIMITS. 4 **Hours**

1.1 Constants and variables
1.2 Functions & their types
1.3 The concept of limit
1.4 Limit of a function
1.5 Fundamental theorems on limit
1.6 Some important limits
1.7 Problems

2. DIFFERENTIATION. **4 Hours**

2.1 Increments
2.2 Different Coefficient or Derivative
2.3 Differentiation ab-initio or by first principle
2.4 Geometrical Interpretation of Differential Coefficient
2.5 Differential Coefficient of Xa, (ax + b)a
2.6 Three important rules
2.7 Problems.

3. DIFFERENTIATION OF ALGEBRIC FUNCTION.

4 Hours

3.1 Explicit function
3.2 Implicit function
3.3 Parametric forms
3.4 Problems

4. DIFFERENTATION OF TRIGNOMETRIC FUNCTION.

4 Hours

4.1 Differentional coefficient of sin x ,cos x ,tang x from first principle.
4.2 Differentional coefficient of Cosec x, Sec x, Cot x.
4.3 Differentiation of inverse trigonometric function.
4.4 Problems.

5. DIFFERENTIATION OF LOGARITHIMIC & EXPONENTIAL FUNCTION. 4 Hours

5.1 Differentiation of In x
5.2 Differentiation of log ax
5.3 Differentiation of ax

5.4 Differentiation of ex
5.5 Problems.

6. RATE OF CHANGE OF VARIABLE. 4 Hours

6.1 Increasing and decreasing function
6.2 Maxima and Minima values
6.3 Criteria for maximum and minimum values.
6.4 Method of finding maxima and minima.
6.5 Problems.

7. INTEGRATION. 8 Hours

7.1 Concept
7.2 Fundamental Formulas
7.3 Important Rules
7.4 Problems.

8. METHOD FOR INTEGRATION. 6 Hours

8.1 Integration by substitution
8.2 Integration by parts
8.3 Problems.

9. DEFINITE INTEGRALS. 6 Hours

9.1 Properties
9.2 Application to Area
9.3 Problems

10. PLANE ANALYTIC GEOMETRY & STRAIGHT LINE. 6 Hours

10.1 Coordinate System
10.2 Distance Formula
10.3 The Ratio Formulas
10.4 Inclination and slope of a line
10.5 The Slope Formula
10.6 Problems.

11. EQUATION OF STRAIGHT LINE. 6 Hours

11.1 Some Important Forms
11.2 General form
11.3 Angle formula
11.4 Parallelism and perpendicularity
11.5 Problems

12. THE EQUATION OF THE CIRCLE. 8 Hours

12.1 Standard form of equation
12.2 Central form of equation
12.3 General form of equation
12.4 Radius & coordinate of the Centre
12.5 Problems

MATH -212 APPLIED MATHEMATICS –II

INSTRUCTIONAL OBJECTIVES

1. USE THE CONCEPT OF FUNCTION AND THEIR LIMITS IN SOLVING SIMPLE PROBLEMS

1.1 Define a function
1.2 List all types of function
1.3 Explain the concept of limit and limit of a function
1.4 Explain fundamental theorem on limits
1.5 Derive some important limits
1.6 Solve simple problems on limits

2. UNDERSTAND THE CONCEPT OF DIFFERENTIAL COEFFICIENT

2.1 Derive mathematics expression for a differential coefficient.
2.2 Explain geometrical interpretation of different ional coefficient.
2.3 Differentiate a content, constant associated with a variable and the sum of finite number of function.
2.4 Solved related problems.

3. USE RULES OF DIFFERENTIAL TO SOLVE PROBLEMS OF ALGEBRIC FUNCTIONS.

3.1 Differentiate ab-initio Xn and (ax+b)n
3.2 Derive product, quotient and chain rules.
3.3 Find derivative of implicit function & explicit function.
3.4 Differentiate parametric forms; function w.r.t another function and by rationalization.
3.5 Solve problems using these formulas.

4. USE RULES OF DIFFERENTIATION TO SOLVE PROBLEMS OF ALGEBRIC FUNCTIONS.

4.1 Differentiate from first principle sin x ,cosx,tang x.
4.2 Derive formula for derivation of sec x,cosec x, cot x.
4.3 Find differential coefficient of inverse trigonometric functions.

5. USE RULES OF DIFFERENTIATION TO LOGARITHMIC AND EXPONENTIAL FUNCTIONS.

5.1 Derive formulas for differential coefficient of logarithmic and exponential functions.
5.2 Solve problems using these formulas.

6. UNDERSTAND RATE OF CHANGE OF ONE VARRIABLE WITH RESPECT TO ANOTHER.

6.1 Write expression for velocity, acceleration, and slope of a line.
6.2 Define an increasing and decreasing function, maxima and minima values, ofinflection.
6.3 Explain criteria for maxima and minima values of a function.
6.4 Solve problems involving rate of change of variables.

7. APPLY CONCEPT OF INTEGRATION IN SOLVING TECHNOLOGICALPROBLEMS

7.1 Explain the concept of integration
7.2 Write basic theorem of integration
7.3 List some important rules of integration
7.4 Derive fundamental formulas of integration
7.5 Solve problems based on these formulas /rules.

8. UNDERSTAND DIFFERENT METHODS OF INTEGRATION.

8.1 List standard formulas
8.2 Integrate a function by substitution method
8.3 Find integrals by the method of integration by parts
8.4 Solve problems using these methods.

9. UNDERSTAND THE METHOD OF SOLVING DEFENITE INTEGRALS.

9.1 Define definite integral
9.2 List properties of definite integrals using definite integrals.
9.3 Find areas under curves
9.4 Solve problems of definite integrals.

10. UNDERSTAND THE CONCEPT OF PLANE ANALYTIC GEOMETRY.

10.1 Explain the rectangular coordinate system
10.2 Locate points in different quadrants
10.3 Derive distance formula
10.4 Prove section formula
10.5 Derive slope formula
10.6 Solve problems using the above formulas.

11. USE EQUATIONS OF STRAIGHT LINE IN SOLVING PROBLEMS.

11.1 Define a straight line
11.2 State general form of equation of a straight line
11.3 Derive slope intercept and intercept forms of equations.
11.4 Derive expression for angle between two straight lines
11.5 Derives conditions of perpendicularity and parallelism lines
11.6 Solve problems involving these equations/formulas.

12. SOLVE TECHNOLOGICAL PROBLEMS USING EQUATION OF CIRCLE.

12.1 Define a circle
12.2 Describe standards, central and general forms of the equation of a circle.
12.3 Convert general forms to the central forms of equation of a circle.
12.4 Deduce formulas for the radius and the coordinates of the centre of a circle fromthe general form.
12.5 Derive equation of the circle passing through three given points.
12.6 Solve problems involving these equations

MGM-262 Business Communication & Soft Skills

Total Contact Hours

Theory	**64**	**T**	**P**	**C**
Practical	**0**	**2**	**0**	**2**

Learning Outcome

The students will be able to:

- Understand the importance of effective communication skills in business.
- Apply communication skills across different settings, purposes, and audiences to effectively communicate in modern workplace.
- Understanding basic principles of good and effective business letter and report writing in commercial and industrial fields.
- Understand their own strengths, weaknesses and emotions
- Understand the importance of time management and balance between professional goals and personal time.
- Learn the basic of interview skills and understand the principles and techniques of the skill of interviewing
- Apply the basics of work ethics in the work place

Course Contents

1. Introduction of Business Communication **7Hrs**

1.1. Meanings, Importance & Purposes of business communication
1.2. Dimensions of communication
1.3. Communication process
1.4. Basic skills of communication
1.5. Barriers of communication

2. Speaking & Presentation Skills **7Hrs**

2.1. Different Types of communication in business
2.2. Significance & Strategic Steps of Speaking
2.3. Starting and Ending conversations
2.4. Characteristics of Effective Oral Messages
2.5. Oral Presentation

3. Listening & Reading Skills **6Hrs**

3.1. Meanings & Importance of Listening Skills
3.2. Active Listening Skills
3.3. Principles of active listening
3.4. Barriers to Listening
3.5. Types of Reading Techniques
3.6. Reading Problems

4. Writing Skills **8Hrs**

4.1. Importance of Writing Skills

4.2. Types of writing
4.3. Business Letter
4.4. Parts of business letters
4.5. Types of business letters
4.6. Definition and Importance of Report
4.7. Formal and Informal Report
4.8. Report Format
4.9. Types of Reports
4.10. Report Draft

5. Soft Skills **7Hrs**

5.1. Introduction & Importance of Soft Skills
5.2. Role of Soft Skills in Personal and Professional life
5.3. Interpersonal Skills
5.4. Types of Interpersonal Skills
5.5. Intrapersonal Skills
5.6. Types of Intrapersonal skills

6. Time Management Skills **6Hrs**

6.1. Importance of Time Management
6.2. Effective Time Management
6.3. Key factors of time management

7. Interviewing Skills **6Hrs**

7.1. Significance of Interviews
7.2. Characteristics of Interviews
7.3. Types of Interviews
7.4. Interviewing Strategies

8. Work Ethics **17Hrs**

8.1. Key Elements of work Ethics
8.2. Commitment towards Quality
8.3. Conflict Resolution
8.4. Challenges towards Work Ethics
8.5. Advantages and Benefits of Work Ethics
8.6. Work Ethics in Pakistan's Industry VS Foreign Industry

Recommended Books

1. Effective Business Communication and Report Writing, Sh. Ata-ur-Rehman.
2. Business Communication Today, Bovee & Thill
3. Technical Reporting, Ulman J.N. Could JR..

Instructional Objectives

1. **Introduction of Business Communication**
   - 1.1 Understand the importance and purpose of business communication
   - 1.2 Understand the different dimensions of communication
   - 1.3 Describe communication process and its components
   - 1.4 Explain the major communication methods used in organization
   - 1.5 Identify the barriers to communication and methods of overcoming these barriers

2. **Speaking & Presentation Skills**
   - 2.1 Understand different types of communication in business
   - 2.2 Understand the process of oral communication
   - 2.3 Identify speaking situations with other peoples
   - 2.4 Identify the characteristics & strategic steps of effective speaking
   - 2.5 Identify the elements of oral presentation skills

3. **Listening & Reading Skills**
   - 3.1 Demonstrate the use of active listening skill in the oral communication process
   - 3.2 State the principles of active listening
   - 3.3 Identify skills of active listening
   - 3.4 Identify barriers to active listening
   - 3.5 Identify basic reading skills
   - 3.6 Identify major reading problems

4. **Writing Skills**
   - 4.1 Determine the importance of writing skills in business organizations
   - 4.2 Understand the need of writing the effective letters
   - 4.3 Identify the different parts of business letters
   - 4.4 Identify the different types of letters
   - 4.5 Understand the importance of report writing in business organizations
   - 4.6 Prepare a report out-line, based on subject matter and audience
   - 4.7 Determine when to use an informal or formal report presentation
   - 4.8 Identify the stages of planning a report
   - 4.9 Identify the parts of a report and choose the parts appropriate for each type of report
     Draft a report outline

5. **Soft Skills**
   - 5.1 Understand the soft skills and its importance in today's world
   - 5.2 Differentiate between interpersonal and intrapersonal skills
   - 5.3 Explain different types of interpersonal and intrapersonal skills
   - 5.4 Identify the essential interpersonal competencies to perform the job effectively
   - 5.5 Explain different factors that influences interpersonal and intrapersonal skills

6. **Time Management Skills**
   - 6.1 Understand the reality of time management
   - 6.2 Differentiate between professional goals and personal time
   - 6.3 Understand time management tools & identify key factors of time management

7. **Interview Skills**
   - 7.1 Determine the appropriate interview type for the specific work-related situation and conduct a work-related interview
   - 7.2 State the significance of interviews
   - 7.3 State the characteristics of interviews & activities in an interviewing situation
   - 7.4 Describe the types of interviews

8. **Work Ethics**

8.1 Understanding of Key Elements of work Ethics
8.2 Enhance commitment towards Quality
8.3 Handle Conflict Resolution
8.4 Analyses Challenges towards Work Ethics
8.5 Explain key advantages and Benefits of Work Ethics
8.6 Analyses Work Ethics in Pakistan's Industry VS Foreign Industry

CIT-293 Computer Graphic Designing

Total Contact Hours

Theory	**32**	**T**	**P**	**C**
Practical	**192**	**1**	**6**	**3**

This course offers a thorough introduction to graphic design, beginning with its fundamentals, history, and key tools, and exploring its applications in various fields, distinguishing between print and digital media. It delves into design elements such as line, shape, form, space, and texture, along with principles like balance, proximity, alignment, contrast, and symmetry. The curriculum covers color theory, typography, and hands-on training with Adobe Photoshop and Illustrator. The course concludes with an exploration of brand identity and logo design, including the importance of branding and creating various marketing materials.

Learning Outcomes: The students will be able to

- Understand basic concepts to graphic design, principle and elements of design
- Understand the concept of color families, color wheels, primary, secondary and tertiary colors.
- Understand fonts, font families, font types and alignment.
- Implement design concepts in Adobe Photoshop, illustrator and Canva.
- Design banners, brochures, flyers, pamphlets, billboards and packages
- Create logos keeping in view the types of logos.

COURSE OUTLINE

Contents	**Hours**

1. Introduction to Graphic Design **03 Hrs**

1.1. Graphic design
1.2. Brief History of Graphic Design
1.3. Overview of design software and tools
1.4. Application of graphic design in different field
1.5. Difference between Print Media and Digital Media

2. Design Elements & Principal **04 Hrs**

2.1. Elements of design
  2.1.1. Line (Divide, Connect, Hierarchy, Decoration)
  2.1.2. Shape (Geometric, Organic, Negative)
  2.1.3. Form
  2.1.4. Space (White, Negative, Depth)

2.1.5. Texture (Image, Surface, Pattern)

2.2. Principle of Design
- 2.2.1. Balance
- 2.2.2. Proximity
- 2.2.3. Alignment
- 2.2.4. Contrast
- 2.2.5. Symmetric Design & Asymmetric Design

3. Color Theory **04 Hrs**

3.1. Color Wheel
- 3.1.1. Primary Colors
- 3.1.2. Secondary colors
- 3.1.3. Tertiary Colors

3.2. Color Schemes & Harmony
- 3.2.1. Monochromatic
- 3.2.2. Analogous
- 3.2.3. Complimentary
- 3.2.4. Split Complimentary
- 3.2.5. Triadic
- 3.2.6. Tint
- 3.2.7. Shade
- 3.2.8. Tone

3.3. Color Models: CMYK, RGB, HSB etc

4. Typography **03 Hrs**

4.1. Fonts
4.2. Types of Fonts
4.3. Alignment of Text
4.4. Leading
4.5. Character Spacing
4.6. Kerning
4.7. Widow Orphan
4.8. Tracking

5. Adobe Photoshop **07 Hrs**

5.1. Raster Image & Canvas
5.2. Raster Files
5.3. Selection Tools
5.4. Lasso, Polygon Lasso, Magnetic Lasso
5.5. Magic wand, Quick Selection
5.6. Layers in Photoshop
5.7. Layer Styles
5.8. Clone Stamp
5.9. Healing, Patch, Content Aware Move
5.10. Painting Tools
5.11. Filters
5.12. Animation

6. **Adobe Illustrator** **07 Hrs**

6.1. Vector Image & Art board
6.2. Vector Files

6.3. Selection & Direct Selection
6.4. Color, Swatches
6.5. Vector Shapes
6.6. Working with Layers
6.7. Pen Tool
6.8. Pathfinder
6.9. Scale & Rotate Tool
6.10. Gradient Tool

7. **Brand Identity and Logo Design**
   04 Hrs
   7.1. Importance of branding
   7.2. Logo & Types of Logo
   7.3. Office Stationary
   7.4. Banner, Flyers, Pamphlet, Brochure, Billboards
   7.5. Packaging

RECOMMENDED BOOKS

1. The Visual Dictionary of Graphic Design Gavin Ambrose and Paul Haris
2. The Fundamentals of Graphic Design Gavin Ambrose and Paul Haris
3. Adobe Photoshop Classroom in a Book By Conrad Chavez
4. Adobe Illustrator Classroom in a Book By Brian Wood

INSTRUCTIONAL OBJECTIVES

1. **Introduction to Graphic Design**
   - 1.1. Define graphic design, its importance, and its role in visual communication.
   - 1.2. Explain historical evolution of graphic design, Cave Paintings, Egyptian Civilization (1st Generation), Hieroglyphs, invention of paper in china, printing in Europe, first decorative firm and first advertising agency
   - 1.3. Describe the key software and tools used in graphic design. Adobe family, CANVA and FIGMA
   - 1.4. Explain various fields where graphic design is applied and explain its significance in each field
   - 1.5. Distinguish between print and digital media, including their characteristics and applications.

2. **Design Elements & Principal**
   - 2.1. Explain Elements of design
     - 2.1.1. Explain importance of lines in design including connecting, divide, decoration and hierarchy.
     - 2.1.2. Differentiate between geometric, organic and negative shapes.
     - 2.1.3. Explain the concept of form and its use in creating three dimensional effects.
     - 2.1.4. Explain the use and importance of white, negative space and depth.
     - 2.1.5. Explain texture and differentiate between image, surface and pattern texture.
   - 2.2. Explain Principle of Design
     - 2.2.1. Define Balance with example.
     - 2.2.2. Define Proximity with example.
     - 2.2.3. Explain different alignments, left, right center and justify.
     - 2.2.4. Define Contrast with example.
     - 2.2.5. Define Symmetric & Asymmetric Design with examples

3. **Color Theory**
   - 3.1. Define Color Wheel of RGB, CMYK and RYB
     - 3.1.1. Explain Primary Colors and their role in color mixing.
     - 3.1.2. Explain Secondary colors and their creation from primary colors.
     - 3.1.3. How Tertiary Colors are formed by mixing primary and secondary colors.
   - 3.2. Explain Color Schemes and color associations
     - 3.2.1. Explain Monochromatic schemes and how they are formed.
     - 3.2.2. Explain Analogous schemes and how they are created from color wheels.
     - 3.2.3. Explain Complimentary schemes and how they are created from color wheels.
     - 3.2.4. Explain Split Complimentary schemes and how they are created from color wheels
     - 3.2.5. Explain Triadic schemes and how they are created from color wheels
     - 3.2.6. Define Tint
     - 3.2.7. Define Shade
     - 3.2.8. Define Tone
   - 3.3. Explain and differentiate between CMYK, RGB and HSB colors.

4. **Typography**
   - 4.1. Explain different font styles and their usage.

4.2. Differentiate between Serif, Sans-Serif, Script and decorative fonts and where they are used.
4.3. Explain vertical and horizontal alignments. Explain nine alignments like top left, top center etc.
4.4. Define Leading and its importance in reading.
4.5. Define Character Spacing and its effect on visual appeal.
4.6. Define Kerning and why fonts with bad kerning are not recommended.
4.7. Define Widow and Orphan in document
4.8. Define Tracking

5. Adobe Photoshop

5.1. Explain raster images. What is canvas?
5.2. Explain raster files and extensions of raster files.
5.3. Define Selection Tools
5.4. Define Lasso, Polygon Lasso, Magnetic Lasso
5.5. Define Magic wand, Quick Selection
5.6. Explain layers in Photoshop and its importance while creating .psd files
5.7. Explain Layer Styles. Shadows, Glow, Gradient etc.
5.8. What is Clone Stamp and where it is used.
5.9. Define Healing, Patch, Content Aware Move.
5.10. Define Painting Tools.
5.11. Define basic filters
5.12. Define animation and its usage.

6. Adobe Illustrator

6.1. Explain vector images. What is Art-board?
6.2. Explain vector files and extensions of vector files.
6.3. Define Selection & Direct Selection tools and differentiate between them
6.4. Explain Color spectrum, Swatches, and color guide.
6.5. Define vector shapes e.g. rectangle, polygon, hexagon etc.
6.6. How layers work and how they are different from Photoshop.
6.7. Define Pen Tool and its use in tracing.
6.8. Define Pathfinder
6.9. Define Scale & Rotate Tool
6.10. Define Gadient and basic difference from normal colors

7. **Brand Identity and Logo Design**

7.1. Explain importance of branding in graphics
7.2. Define and explain seven types of logos. Monogram/Lettermark, Word Mark, Pictorial, Abstract Mark, Mascot, Combination and Emblem Logo
7.3. Explain Office Stationary e.g. letterhead, envelop, business card and DVD cover.
7.4. Define Banner, Flyers, Pamphlet, Brochure and Billboards sizes.
7.5. Define Packaging and its importance.

LIST OF PRACTICAL

Adobe Photoshop

1. Software Installation & orientation, Move tool and Marquee Tool
2. Lasso, Polygon Lasso and Magnetic Lasso Tool
3. Quick Selection and Magic Wand Tool, Pen Tool
4. Create Typographical Text
5. Change mode of file from CMYK to RGB & vice versa Crop Tool, Eyedropper and Paint Bucket
6. Spot Healing, Healing Brush and Patch Tool
7. Background Layer, Add/Delete/Merge Layers
8. Clone Stamp Tool & pattern stamp tool
9. Removing scratches and restoring old photo.
10. Editing Face beauty using Photo tools (removing moles, pimples and wrinkles)
11. Use different Shapes in Photoshop (Rounded, Line, Ellipse etc)
12. Layer Mask, Clipping Mask,
13. Different features of layer style
14. Smudge and Sponge Tool
15. Remove background from Picture and replace the background. Crop the image to passport size.
16. Remove background from Logos and save as PNG file.
17. Use pen tool to extract any object from the picture.
18. Use Mask to create and mix image (Color and Black & White) levels, hue and saturation, curves
19. Animation using Timeline
20. Make an animated advertisement of any Famous brand.
21. Animate the object in Photoshop. Save the file as animated gif.

Adobe Illustrator

22. Software Installation & Orientation Selection Tool, Direct Selection & Pen Tool.
23. Rotate Tool &Transform Tool.
24. Type Tool: Character Formatting, Paragraph Formatting.
25. Path Finder Tool: Unite, Minus Front, Intersect, Trim and Divide.
26. Color Pattern and Swatches Tool
27. Gradient Tool
28. Design Visiting Card
29. Design Letter Head
30. Design office stationary (Visiting card, letterhead, envelop, file folder)

CANVA

31. Introduction to CANVA.
32. Creates shapes and write text
33. Design banner and pamphlets in CANVA

FTW-224 Design & Pattern Engineering-II

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**192**	**2**	**6**	**4**

Learning Outcome

The students will be able to:

- Understand the characteristics and construction techniques of Oxford, Derby, Gibson, Slip-On, Strobel, and Sneaker shoes.
- Identify fundamental principles of footwear design and apply them to create functional and aesthetic shoe styles.
- Learn to modify standard designs for fashion, orthopedic, or functional purposes.
- Understand Grading techniques for size variation and fitting adjustments.
- Apply Tools and Technologies in Pattern Making
- Create prototypes from patterns and evaluate their fit, form, and functionality.
- Develop problem-solving skills to identify design and pattern inconsistencies and suggest effective modifications.

COURSE CONTENTS

1. Pattern Engineering and Modeling of Shoe Constructions 24Hrs

1.1 Introduction to Oxford shoe style, Standard design & Pattern for men

1.2 Oxford Shoe of lining standard & Pattern

1.3 Standard design Derby & Gibson Shoe for men & Pattern

1.4 Derby & Gibson shoe of lining Standard & Pattern

1.5 Standard design & Pattern Derby Fantasy Shoe for men

1.6 Derby Fantasy Shoe of lining Standard & Pattern

1.7 Standard design & Pattern Slip On Shoe for men

1.8 Slip On Shoe of Lining Standard & Pattern

1.9 Standard design & Pattern Stroble Shoe for men

1.10 Stroble Shoe of Lining Standard & Pattern

1.11 Standard design & Pattern Sneaker Shoe for men

1.12 Sneaker Shoe of Lining Standard & Pattern

2. Pattern Engineering and Modeling of Boot constructions 24Hrs

2.1 Introduction to Oxford boot style, Standard design & Pattern for men

2.2 Producing a mean form

2.3 Standard design oxford boot for men & Pattern

2.4 Oxford boot of lining standard & Pattern

2.5 Standard design Derby boot for men & Pattern

2.6 Derby boot of lining Standard & Pattern

2.7 Standard design Chelsea boot for men

2.8 Chelsea boot of Lining standard & Pattern

3. Pattern Engineering and Modeling of Slipper & Sandal 16Hrs

3.1. Introduction to Gents Slipper style

3.2. Standard design Gents Sandal

3.3. Standard Traditional Peshawari Chapple

Recommended Books

1. H.J.PATRIC, F.B.S.I - Modern Pattern Cutting and Design, (STP) SHOE TRADERAS PUBLI
2. J.A.J Luijten, P.W.J Velden- Design, Principles of Shoe Designing Vol.1 & 2, TNO Leather & Shoe Research Institute
3. www.shoetrades.com/Foot- Introduction to Modern Footwear Technology, (STP) SHOE TRADERAS
4. Pattern cutting : Step by Step pattern for footwear by Frank G.Jones

Instructional Objectives

1. Pattern Engineering and Modeling of Shoe Constructions

1.1 Explain the standard design and pattern of a men's Oxford shoe.

1.2 Define the lining pattern for a men's Oxford shoe.

1.3 Differentiate between Derby and Gibson shoe designs and patterns for men.

1.4 Explain the standard lining patterns for Derby and Gibson shoes.

1.5 Explain the fantasy version of the Derby shoe and draft its pattern.

1.6 Define the lining standard and pattern for Derby Fantasy shoes.

1.7 Explain the design and pattern for men's Slip-On shoes.

1.8 Explain the lining standard and pattern for Slip-On shoes.

1.9 Explain the standard design and pattern for men's Strobel shoes.

1.10 Define the lining stndards and patterns for Strobel shoes.

1.11 Explain the standard design and pattern for men's Strobel Sneaker shoes.

1.12 Define the lining pattern for Sneaker shoes.

2. Pattern Engineering and Modeling of Boot Constructions

1.1 Explain the process and purpose of producing a mean form for boot construction.

1.2 Explain the standard design and pattern for a men's Oxford boot.

1.3 Define the lining standard and pattern for a men's Oxford boot.

1.4 Explain the standard design and pattern for a men's Derby boot.

1.5 Define the lining standard and pattern for a men's Derby boot.

1.6 Explain the standard design and pattern for a men's Chelsea boot.

1.7 Explain the lining standard and pattern for a men's Chelsea boot.

3. Pattern Engineering and Modeling of Slipper & Sandal

3.1.Explain the standard patterns for gents' slippers.

3.2. Explain the standard designs and patterns for gents' sandals

3.3. Explain the cultural and traditional importance of the Peshawari chappal in regional footwear design.

List of Practical: 192. Hours

1. Make a mean form for standard making by using tape method
2. Make a standard design of oxford boot (for men) pattern making & Pull over
3. Make a Standard Design Derby boot (for men) pattern making & Pull over
4. Make a Standard design Chelsea boot (for men) pattern making & Pull over
5. Make a Standard design oxford shoe (for men) pattern making & Pull over
6. Make a Standard Design Derby/Gibson Shoe (for men) pattern making & Pull over
7. Make a Standard design Derby Fantasy Shoe (for men) pattern making & Pull over
8. Make a Standard Design Slip On Shoe (for men) pattern making & Pull over
9. Make a Standard design Stroble Shoe (for men) pattern making & Pull over
10. Make a Standard design of Gents Slipper Pull Over & Pattern Making
11. Make a Standard design of Gents Sandal Pull Over & Pattern Making
12. Make a Standard design of Gents Traditional Peshawari Chappal Pull Over & Pattern Making

FTW-233 Footwear Production Technology -II

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Understand the basic concept and importance of stitching in garment and footwear production.
- Differentiate between a stitch and a seam with clear examples.
- Demonstrate knowledge of various types of stitching machines used in the industry.
- Identify the key parts of a stitching machine and explain their functions.
- Perform routine maintenance tasks such as oiling and cleaning to ensure smooth machine operation.
- Select appropriate needle types and sizes for specific fabrics and stitching tasks.
- Adjust thread tension using the bobbin case for even and secure stitching.

Course Contents

1. **Introduction of Stitching** **8Hrs**
   - 1.1 General introduction
   - 1.2 Types of Stitching
   - 1.3 Introduction of Seam
   - 1.4 Difference between Seam and Stitch

2. **Stitching Machines** **16Hrs**
   - 2.1 Introduction to the stitching machines
   - 2.2 Types of Stitching Machine
   - 2.3 Parts of Stitching Machine
   - 2.4 Oiling and cleaning the stitching machine

3. **Stitching Machine Needle** **16Hrs**
   - 3.1. Introduction of Needle
   - 3.2. Type of Needle
   - 3.3. Parts of Needle
   - 3.4. Size Number of Needle

4. **Bobbin & Bobbin Case** **24Hrs**
   - 4.1. Introduction of Bobbin
   - 4.2. Winding in the Bobbin
   - 4.3. Adjustment of Bobbin to Bobbin Case
   - 4.4. Parts of Bobbin Case
   - 4.5 Thread Tension

Recommended Books

1. R.G.Miller- Manual of Shoe Making, Clarks Limited
2. J.A.J Luijten, P.W.J Velden- Principles of Shoe Designing Vol.1 & 2, TNO Leather & Shoe Research Institute
3. J.S Harding “The Boot and Shoe Industry” SIR ISAAC PITMAN & SONS LTD, New York

Instructional Objectives

1. Introduction of Stitching

1.1 Explain the basic concept of stitching and its significance in garment/footwear/textile production.

1.2 Differentiate between various types of stitching techniques used in the industry.

1.3 Define a seam and describe its purpose in stitched products.

1.4 Distinguish clearly between a ***stitch*** and a ***seam*** with relevant examples.

2. Stitching Machines

2.1 Identify and describe different types of stitching machines used in the industry.

2.2 List the main parts of a standard stitching machine and explain their functions.

2.3 Demonstrate how to properly oil and clean stitching machines to ensure efficient operation and durability.

2.4 Develop a basic understanding of machine handling and routine maintenance.

3. Stitching Machine Needle

3.1 Explain the importance of the needle in the stitching process.

3.2 Identify various types of needles and their specific applications.

3.3 Name and describe different parts of a stitching needle.

3.4 Select the correct needle size based on the type of fabric or material used.

4. Bobbin & Bobbin Case

4.1 Understand the role of the bobbin in the lockstitch process.

4.2 Perform bobbin winding using appropriate machine settings.

4.3 Demonstrate the correct way to insert and adjust the bobbin in the bobbin case.

4.4 Identify and describe all key parts of the bobbin case.

4.5 Adjust thread tension accurately to ensure smooth and even stitching

List of Practical: 96. Hours

1. Perform stitching exercise no.1 to stitch the straight line
2. Carry out stitching exercise no.2 to stitch the half-straight line
3. Carry out stitching exercise no.3 to stitch the curved and straight line
4. Perform stitching exercise no.4 to stitch the curved line
5. Perform stitching exercise no.5 to stitch the half-round line
6. Carry out stitching exercise no.6 to stitch the full round line
7. Do stitching exercise no.7 to stitch the zigzag line
8. Do stitching exercise no.8 to stitch the circle line
9. Do stitching exercise no.9 to stitch the different shapes
10. Do stitching exercise no.10 to stitch the different shapes
11. Do exercises of Lock stitch on leather and synthetic material (5 Times)
12. Do Exercises of Chain stitch on leather and synthetic material (5 Times)
13. Do Exercises of Close seam on leather and synthetic material (5 Times)
14. Do Exercises of Silk seam on leather and synthetic material (5 Times)
15. Do Exercises of Lapped seem on leather and synthetic material (5 Times)
16. Do Exercises of Zigzag seem on leather and synthetic material (5 Times)
17. Perform Oiling the stitching machines
18. Perform Threading on the stitching machines
19. Perform Cleaning the stitching machines
20. Perform Winding the bobbin

FTW-242 Grading of Shoe Components

Total Contact Hours				
Theory	**32**	**T**	**P**	**C**
Practical	**96**	**1**	**3**	**2**

Learning Outcome

The students will be able to:

- Develop understanding of "Grading" principles for various shoe components.
- Ensure accuracy and consistency in component sizing across different shoe sizes.
- Enhance technical skills in both manual and digital grading systems for different footwear constructions.
- Differentiate international sizing systems and their impact on pattern and component adjustments during grading.

Course Contents

1. Shoe sizes and sizing system **12Hrs**

1.1 Principles of size and fit
1.2 Introduction of Sizing System
1.3 French sizing system
1.4 English sizing system
1.5 Mondo-point system
1.6 Size conversion

2. Grading of Shoe Components **4Hrs**

2.1 Introduction of Grading
2.2 Types of Grading
2.3 Method of Grading (Manual, Machine and CAD)

3. Hand Grading of Shoe Components **8Hrs**

3.1 Introduction of Hand Grading
3.2 Types of Hand Grading
3.3 Requirements of Hand grading
3.4 Hand Grading of different shoe components

4. Machine Grading of Shoe Components **8Hrs**

4.1 Introduction of Machine Grading
4.2 Part of machine grading
4.3 Requirements of machine grading
4.4 Preparation of shoe components on zinc sheet
4.5 Machine grading of different shoe components

Recommended Books

1. J.A.J Luijten, P.W.J Velden- Principles of Shoe Designing Vol.1 & 2, TNO Leather & Shoe Research Institute
2. J.A.J Luijten, P.W.J Velden- Design, Pattern Engineering and Grading of Footwear Vol.1 & 2, TNO Leather & Shoe Research InstituteJ.

Instructional Objectives

1. Shoe Sizes and Sizing System

1.1 Explain the principles of size and fit.
1.2 Describe and differentiate between various international shoe sizing systems.
1.3 Explain the origin and basic structure of the French sizing system.
1.4 Explain the origin and basic structure of the English sizing system.
1.5 Explain the origin and basic structure of the Mono-point sizing system.
1.6 Define the Convert shoe sizes across these systems.

2. Shoe Grading

2.1 Define grading in shoe manufacturing.
2.2 Describe the different types of grading.
2.3 Define basic methods of grading to adjust shoe patterns proportionally.

3. Hand Grading of Shoe Components

3.1 Explain the concept of hand grading and its importance in footwear manufacturing.
3.2 Explain the differentiate between various types of hand grading methods used in pattern adjustment.
3.3 Define the required tools and materials essential for performing accurate hand grading.
3.4 Describe the hand grading techniques to different shoe components (e.g., vamp, quarter, lining) to increase or decrease sizes.

4. Machine Grading of Shoe Components

4.1 Define machine grading and explain its significance in modern footwear production.
4.2 Define the key parts and functions of machine grading equipment.
4.3 Describe the essential requirements for performing accurate machine grading operations.
4.4 Define the preparation of shoe components on zinc sheets for grading purposes.
4.5 Explain the machine grading on various shoe components ensuring correct scaling and pattern consistency across sizes.

List of Practical: 96. Hours

1. Prepare of zinc patterns for Grading
2. Perform of zinc patterns for a court shoe.
3. Perform of zinc patterns for an Oxford shoe.
4. Make Bottom calculation of adjustment figures
5. Do Normal Machine Grading of Bottom Patterns
6. Make the Marking Patterns
7. Grade the components of different styles of shoe on French Sizing System for upper and bottom grading
8. Grade the components of different styles of boot on French Sizing System for upper and bottom grading
9. Grade the components of different styles of shoe on English Sizing System for upper and bottom grading
10. Grade the components of different styles of boot on English Sizing System for upper and bottom grading
11. Grade the components of different styles of shoe on Mondo Point Sizing System for upper and bottom grading
12. Grade the components of different styles of boot on Mondo Point Sizing System for upper and bottom grading
13. Convert the Size into diverse Conversion
14. Perform Hand Grading with compass
15. Perform Machine Grading with grading machine

FTW-253 Footwear Materials and Testing

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Identify various materials used in footwear manufacturing, including their properties and applications.
- Enhance ability to select appropriate materials based on product type, performance, and cost.
- Identify material testing methods for product safety.
- Analyze test results and ensure compliance with national and international standards.
- Identify and classify different types of footwear materials such as leather, synthetics, textiles, rubber, and polymers.
- Interpret material testing results and assess whether materials meet required specifications and standards (e.g., ISO, SATRA, ASTM).

Course Contents

1. **Synthetic Materials** **8Hrs**
   - 1.1. Introduction of synthetic material
   - 1.2. Types of synthetic material
   - 1.3. Applications of synthetic material
   - 1.4. Properties of synthetic material
   - 1.5. Difference between synthetic and leather

2. **Soling Materials** **12Hrs**
   - 2.1. Introduction to sole
   - 2.2. Sole leather
   - 2.3. Rubber soling materials
   - 2.4. Poly vinyl chloride (PVC)
   - 2.5. Thermo-plastic rubber (TPR)
   - 2.6. Polyurethane soling materials (PU)
   - 2.7. Microcellular rubber
   - 2.8. Ethylene vinyl acetate (EVA)
   - 2.9. Miscellaneous soling materials

3. **Insole materials** **8Hrs**
   - 3.1. Introduction to insole
   - 3.2. Insole leather
   - 3.3. Leather board
   - 3.4. Cellulose board

3.5. Non-woven materials
3.6. Miscellaneous insole materials

4. Adhesives **10Hrs**

4.1. Introduction of adhesive
4.2. General Principles and Methods of Adhesives
4.3. Types of Adhesive
4.4. Mechanisms of Adhesion
4.5. Applications of Adhesive
4.6. Failure of adhesion

5. Shoe Finishes and Cleaners Upper & Bottom **6Hrs**

5.1. Wax Polishes and Spray
5.2. Upper Finishes
5.3. Bottom finishes
5.4. Special dressings

6. Miscellaneous Materials **12Hrs**

6.1. Zip Fasteners
6.2. Touch and Close Fasteners
6.3. Binding Tapes
6.4. Eyelets
6.5. Buckles
6.6. Toe puff & Stiffener
6.7. Shanks
6.8. Reinforcement materials

7. International Test Methods and Their Applications **8Hrs**

7.1 Introduction to test Methods of CE, SATRA, BSI, SLTC, SDC)
7.2 Standard Values Upper material (ISO, CE, SATRA, BSI, SLTC, SDC)
7.3 Standard Values Bottom material (ISO, CE, SATRA, BSI, SLTC, SDC)
7.4 Testing of Upper Materials
7.5 Testing of Bottom Materials

Recommended Books

1. J.A.J Luijten, P.W.J Velden- Principles of Shoe Designing Vol.1 & 2, TNO Leather & Shoe Research Institute
2. Shoe material Design Guide (Wade's Place; 1st edition)
3. J.S Harding "The Boot and Shoe Industry" SIR ISAAC PITMAN & SONS LTD, New York

Instructional Objectives

1. Synthetic Materials

1.1 Define synthetic materials and their role in footwear manufacturing.
1.2 Explain the different types of synthetic materials used in the industry.
1.3 Explain the applications of synthetic materials in various shoe components.
1.4 Describe the key properties of synthetic materials.
1.5 Describe the between synthetic materials and leather in terms of structure, function, and cost.

2. Soling Materials

2.1 Explain the role and importance of soling materials in footwear construction and performance.
2.2 Describe various types of soling materials including natural and synthetic options used in the industry
2.3 Explain the characteristics, advantages, and limitations of Leather sole
2.4 Explain the characteristics and advantages Rubber soling materials
2.5 Explain the characteristics and advantages Polyvinyl Chloride (PVC)
2.6 Explain the characteristics and advantages Thermo-Plastic Rubber (TPR)
2.7 Explain the characteristics and advantages Polyurethane (PU)
2.8 Explain the characteristics and advantages Microcellular rubber
2.9 Explain the characteristics and advantages Ethylene Vinyl Acetate (EVA)
2.10 Explain the characteristics and advantages Miscellaneous soling materials

3. Insole Materials

3.1 Explain the function and importance of insole materials in the construction, comfort, and durability of footwear.
3.2 Explain the properties and advantages Insole leather of various insole materials.
3.3 Explain the properties and advantages Leather board of various insole materials.
3.4 Explain the properties and advantages Cellulose board of various insole materials.
3.5 Explain the properties and advantages Non-woven materials of various insole materials.
3.6 Explain the properties and advantages Miscellaneous insole materials of various insole materials.

4. Adhesives

4.1 Define adhesives and their importance in shoe construction.
4.2 Define the general principles and methods of applying adhesives.
4.3 Describe various types of adhesives used in footwear.
4.4 Explain the mechanisms of adhesion and bonding strength.
4.5 Explain the different applications of adhesives in shoe components.
4.6 Explain the common reasons for failure of adhesion.

5. Shoe Finishes and Cleaners (Upper & Bottom)

5.1 Explain different types of shoe finishes and cleaners.
5.2 Explain the use of wax polishes and sprays.
5.3 Explain the different techniques used for upper and bottom finishing.
5.4 Describe the role of special dressings in shoe appearance and durability.

6. Miscellaneous Materials

6.1 Describe the function and use of Touch and close fasteners in shoe design and assembly.
6.2 Describe the function and use of Binding tapes material in shoe design and assembly.

6.3 Describe the function and use of Eyelets material in shoe design and assembly.
6.4 Describe the function and use of Buckles material in shoe design and assembly.
6.5 Describe the function and use of Toe puffs and stiffeners material in shoe design and assembly.
6.6 Describe the function and use of Shanks material in shoe design and assembly.
6.7 Describe the function and use of Reinforcement materials in shoe design and assembly.

7. International Test Methods and Their Applications

7.1 Explain the international footwear testing standards (CE, SATRA, BSI, SLTC, SDC).
7.2 Explain the standard testing values for upper and bottom materials.
7.3 Explain the testing procedures for upper and bottom materials.
7.4 Explain basic knowledge to test materials for compliance with quality standards

List of Practical: 96. Total Hours

1. Carry out the whole Method of Insole Designing
2. Make practice of Sole Material Checking
3. Identify the different materials
4. Use the adhesives on different materials
5. Use the shoe finishes on shoe, boot, sandal and slippers
6. Use the shoe cleaners on shoe, boot, sandal and slippers
7. Use the toe puff and stiffeners in shoe, boot, sandal and slippers
8. Use the shanks on shoe and boot
9. Perform physical and chemical Testing of Polyvinylchloride (PVC)
10. Perform physical and chemical Testing of Thermo-plastic rubber (TPR)
11. Perform physical and chemical Testing of Polyurethane soling materials (PU)
12. Perform physical and chemical Testing of Ethylene vinyl acetate (EVA)

اسلامیات/مطالعہ پاکستان

نصاب سال سوئم

GEN 301

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حصہ اول اسلامیات

حصہ دوئم مطالعہ پاکستان

کل وقت 20 گھنٹے

موضوعات:

1۔ قرآن مجید:

سورۃ الفاتحہ، آیت الکرسی، سورۃ البقرہ کی آخری آیات از امن الرسول ﷺ تا آخر اور سورۃ اخلاق مع ترجمہ وتشریح

2۔ دس منتخب احادیث کا ترجمہ (تشریح)

() بنی الا سلام علی خمس شهادت انا الا اله الا لمر اقلم الصلوته و ایتا الزکوة و حج البیت و صوم رمضان

() الدین النصیحته

() المنشاء موتمن

() للمومن علی المومن سنت خصال یعود ماذا مرض و تژهده اذا مات و یحیبه اذا دعا

() لیسلم علیه اذا لقیه و لیثمته اذا عطس و فصیحله اذا غاب او شهد

() لا تخن من خانک

() لا یدخل الجنته قاتع

() ان الله حرم علیکم عقوق المهات و اضاعته المال

() لیسر اولا تعسر اولا تنفر

() ذاق طعم الایمان من مرضی بالله و با الا سلام دینابمجمدنبیا

() افضل الذکر لا اله الا الله

3۔ حقوق وفرائض:

حصول تعلیم بطور فرض، والدین اور اولاد کے حقوق وفرائض، ہمسایہ کے حقوق، بچوں کے حقوق، عورتوں کے حقوق، بزرگ شہریوں کے حقوق، مخنث افراد کے حقوق۔

4۔ اسلام کی اخلاقی اقدار:

صبر واستقلال، عفو ودرگزر، ایفائے عہد، اخوت، ایثار وقربانی۔

سال سوئم

حصہ اول اسلامیات

تدریس مقاصد

قرآن حکیم:

عمومی مقاصد: منتخب سورتوں اور آیات کی روشنی میں اسلام کے بنیادی مقاصد اور عبادات جان سکے

خصوصی مقاصد: طالب علم اس قابل ہو جائے گا کہ۔

سورۃ الفاتحہ، آیت لکرسی، سورۃ بقرہ کی آخری آیات ازمن الرسول سے اور سورۃ اخلاق کا ترجمہ وتشریح کر سکے

طالب علم درج ذیل کا مفہوم بیان کر سکے

- () رب العالمین صرف اللہ تعالیٰ ہے
- () اللہ رحم کرنے والا ہے
- () قیامت کے دن بادشاہی اللہ کی ہوگی
- () عبادات اور استعانت کا حقدار صرف اللہ ہے
- () طالب علم درج ذیل کا مفہوم بیان کر سکے
- () اللہ پاک ہر عیب سے پاک ہے
- () اللہ کے اسمائے حسنہ حق اور قیوم ہیں
- () تمام انبیاء پر ایمان لانا ضروری ہے
- () رسول، ملائکہ، کتب، سماویہ، پر ایمان لانا فرض ہے
- () اطاعت حقیقی صرف اللہ کے لیے ہے
- () اسلامی احکامات پر عمل کرنا امسانی بساط میں ہے
- () کفر کو اللہ کی مدد کے بغیر شکست نہیں دی جا سکتی
- () اللہ ایک ہے
- () اللہ کسی کا محتاج نہیں نہ اسکا کوئی شریک ہے

منتخب احادیث:

عمومی مقصد: احادیث کی روشنی میں اسلامی تعلیمات پر عمل پیرا ہو سکے

خصوصی مقاصد:

() احادیث کا ترجمہ بیان کر سکے

() احادیث کی تشریح کر سکے

() معاشرتی اور انفرادی زندگی میں احادیث سے رہنمائی حاصل کر سکے

حقوق و فرائض:

عمومی مقاصد:

() اسلامی معاشرے کا ایک اچھا فرد بن سکے

خصوصی مقاصد:

() والدین کے حقوق و فرائض بیان کر سکے

() ہمسائیوں کے حقوق بیان کر سکے

() بچوں کے حقوق بیان کر سکے

() عورتوں کے حقوق کی پاسداری کر سکے

() بزرگ شہریوں کے حقوق کا خیال رکھ سکے

() مخنث حضرات کے حقوق جان سکے اور ان کے حقوق کی پاسداری کر کے انہیں معاشرے کا ایک مفید فرد بنایا جا سکے

() اسلام میں حقوق و فرائض کی آگاہی کی صورت میں اپنے اندر خدمت خلق کا جذبہ پیدا کر سکے

اسلامی اقدار:

عمومی مقاصد:

() طالب علم جان سکے گا کہ تعلیم کا مقصد حسن اخلاق سے متصف ہونا ہے

خصوصی مقاصد:

() اخلاق کے معنی و مفہوم کو بیان کر سکے

() اسلام میں حسن و اخلاق کی اہمیت بیان کر سکے

() قرآن و سنت کی روشنی میں صبر و استقلال کی اہمیت بیان کر سکے

() ایفائے عہد کی اہمیت بیان کر سکے

() اخوت کے معنی و مفہوم بیان کر سکے

() اخوت اسلامی کی اہمیت بیان کر سکے

() اسلام کی اعلیٰ اقدار کو اپنا کر مثالی معاشرہ پیدا کر سکے

نصاب (سال سوئم)

GEN 301

مطالعہ پاکستان

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کل وقت 12 گھنٹے

حصہ دوئم

موضوعات:

() قیام پاکستان
() باؤنڈری کمیشن
() ریڈکلف ایوارڈ
() تقسیم بنگال
() تقسیم پنجاب
() مسئلہ مہاجرین
() ریاست کا الحاق
() ریاست جموں کشمیر
() نہری پانی کا تنازعہ
() قرارداد پاکستان
() علماء کے بائیس نکات
() 1956-1962-اور 1973 کے دساتیر کی اسلامی/انسانی حقوق کی دفعات (8 تا 28)۔
() اقلیتوں کے حقوق۔ دیگر محروم طبقات کے حقوق
() پاکستان کا محل وقوع اور اسکی جغرافیائی اہمیت۔ GSP+ کا تعارف اور عملی طریقہ کار
() قدرتی وسائل (تیل، گیس، کوئلہ)

مطالعہ پاکستان (حصہ دوئم)

قیام پاکستان

تدریس مقاصد:

عمومی مقاصد:

() قیام پاکستان کے بعد درپیش مسائل سے آگاہی حاصل کرے اور بیان کرے

خصوصی مقاصد:

() باؤنڈری کمیشن تشکیل اور اس کے فرائض بیان کر سکے

() ریڈکلف اور اس کے ایوارڈ کے بارے بیان کر سکے

() بنگال اور کلکتہ کی تقسیم کی وجوہات بیان کر سکے

() پنجاب کی تقسیم کی تفصیل بیان کر سکے

() مہاجرین کی آمد سے جو مسائل پیدا ہوئے انہیں بیان کر سکے

() ریاستوں کے الحاق کے بارے میں تفصیل بیان کر سکے

() ریاست جموں کشمیر کے بارے میں بیان کر سکے

() نہری پانی کے تنازعہ کو بیان کر سکے

() قرارداد مقاصد کی تفصیلات بیان کر سکے

() 22 علماء کے متفقہ اسلامی نکات بیان کر سکے

() 1973 کے آئین میں انسانی حقوق کی دفعات (28-8)۔اقلیتوں کے حقوق اور دیگر محروم طبقات کے حقوق کے بارے میں جان سکے

() قیام پاکستان کے بعد نفاذ اسلام کی کوششوں کو بیان کر سکے

() پاکستان کے محل وقوع اور اس کی جغرافیائی اہمیت بیان کر سکے اور GSP+ کے تعارف اور عملی طریقہ کار بیان کر سکے

() پاکستان میں قدرتی وسائل (تیل، گیس، کوئلہ) کے بارے میں بیان کر سکے

خصوصی مقاصد:

() احادیث کا ترجمہ بیان کر سکے

() احادیث کی تشریح کر سکے

() معاشرتی اور انفرادی زندگی میں احادیث سے رہنمائی حاصل کر سکے

حقوق و فرائض:

عمومی مقاصد:

() اسلامی معاشرے کا ایک اچھا فرد بن سکے

خصوصی مقاصد:

() والدین کے حقوق و فرائض بیان کر سکے

() ہمسائیوں کے حقوق بیان کر سکے

() بچوں کے حقوق بیان کر سکے

() عورتوں کے حقوق کی پاسداری کر سکے

() بزرگ شہریوں کے حقوق کا خیال رکھ سکے

() مخنث حضرات کے حقوق جان سکے اور ان کے حقوق کی پاسداری کر کے انہیں معاشرے کا ایک مفید فرد بنایا جا سکے

() اسلام میں حقوق و فرائض کی آگاہی کی صورت میں اپنے اندر خدمت خلق کا جذبہ پیدا کر سکے

اسلامی اقدار:

عمومی مقاصد:

() طالب علم جان سکے گا کہ تعلیم کا مقصد حسن اخلاق سے متصف ہونا ہے

خصوصی مقاصد:

() اخلاق کے معنی و مفہوم کو بیان کر سکے

() اسلام میں حسن و اخلاق کی اہمیت بیان کر سکے

() قرآن و سنت کی روشنی میں صبر و استقلال کی اہمیت بیان کر سکے

() ایفائے عہد کی اہمیت بیان کر سکے

() اخوت کے معنی و مفہوم بیان کر سکے

() اخوت اسلامی کی اہمیت بیان کر سکے

() اسلام کی اعلیٰ اقدار کو اپنا کر مثالی معاشرہ پیدا کر سکے

نصاب (سال سوئم)

GEN 301

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کل وقت 12 گھنٹے

مطالعہ پاکستان

حصہ دوئم

موضوعات:

() قیام پاکستان

() باؤنڈری کمیشن

() ریڈکلف ایوارڈ

() تقسیم بنگال

() تقسیم پنجاب

() مسئلہ مہاجرین

() ریاست کا الحاق

() ریاست جموں کشمیر

() نہری پانی کا تنازعہ

() قرارداد پاکستان

() علماء کے بائیس نکات

() 1956-1962-اور 1973 کے دساتیر کی اسلامی/انسانی حقوق کی دفعات (8 تا 28)۔

() اقلیتوں کے حقوق۔ دیگر محروم طبقات کے حقوق

() پاکستان کا محل وقوع اور اسکی جغرافیائی اہمیت۔ GSP+ کا تعارف اور عملی طریقہ کار

() قدرتی وسائل (تیل، گیس، کوئلہ)

غیر مسلم طلباء کے لیے

نصاب اخلاقیات (سال سوئم)

تدریس مقاصد:

عمومی مقاصد:

() ملکی ترقی کے لیے اعلیٰ اوصاف کے ساتھ بہتر طور پر ملک وملت کی خدمت کر سکے

خصوصی مقاصد: طالب علم اس قابل ہو سکے کہ

() موضوعات کا مطلب بیان کر سکے

() عملی زندگی سے مثالوں کی نشاندہی کر سکے

() موضوعات کی اہمیت بیان کر سکے

() اپنی شخصیت اور معاشرے پر موضوعات کے مطابق اثرات پیدا کرنے کے طریقے بیان کر سکے

() مثبت ذہن کے ساتھ کام کر سکے

() عدل وانصاف سے ادارہ میں، دفتر میں بہتر ماحول پیدا کر سکے

() ماحول کو اخلاقی طور پر پاکیزہ بنائے

() کارکنوں کی بہتر طور پر دل جوئی کر سکے

() کارکردگی میں اضافہ کر سکے

() باہمی احترام کی برکات سے استفادہ کر سکے

() بچوں کے حقوق بیان کر سکے

() عورتوں کے حقوق کی پاسداری کر سکے

() بزرگ شہریوں کے حقوق کا خیال رکھ سکے

() مخنث حضرات کے حقوق جان سکے اور ان کے حقوق کی پاسداری کر کے انہیں معاشرے کا ایک مفید فرد بنایا جا سکے

FTW-313 Design & Pattern Engineering-III

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Handle advance pattern development for complex footwear types (e.g., safety shoes, sports shoes, orthopedic footwear).
- Apply 3D modeling and digital pattern engineering tools to improve design precision and production speed.
- Analyze and solve real-time industry design challenges using pattern optimization techniques.
- Develop patterns of special categories: gender-specific, ergonomic, climate-appropriate, and fashion-forward products.
- Execute prototyping, testing, and refinement of advanced patterns before production.
- Collaborate on design projects that require innovative thinking and industrial application.

Course Contents

1. **Pattern Engineering and Molding of Ladies Shoe & Boot** **24Hrs**
   - 1.1. Design standard upper pattern of Ladies Court Shoe
   - 1.2. Design standard Lining pattern of Ladies court shoe
   - 1.3. Design standard upper pattern of Ladies Peep Toe Court Shoe
   - 1.4. Design standard Lining pattern of Ladies Peep Toe Court Shoe
   - 1.5. Design standard upper pattern of Ladies Sandal
   - 1.6. Design standard Lining pattern of Ladies Sandal
   - 1.7. Design standard upper pattern of Ladies Slipper
   - 1.8. Design standard Lining pattern of Ladies Slipper

2. **Pattern Engineering and Modelling of Traditional Shoe** **20Hrs**
   - 2.1 Design standard upper Pattern of Medical Shoe
   - 2.2 Design standard Lining Pattern of Medical Shoe
   - 2.3 Design standard upper Pattern of Boys School Shoe
   - 2.4 Design standard Lining Pattern of Boys School Shoe
   - 2.5 Design standard upper Pattern of Girls School Shoe
   - 2.6 Design standard lining Pattern of Girls School Shoe
   - 2.7 Design standard upper Pattern of Safety Shoe
   - 2.8 Design standard Lining Pattern of Safety Shoe

3. **Pattern Engineering and Modelling of Miscellaneous Shoe** **20Hrs**
   - 3.1 Design standard upper Pattern of Sandal

3.2 Design standard Lining Pattern of Sandal
3.3 Design standard upper Pattern of Zip Booty
3.4 Design standard Lining Pattern of Zip Booty
3.5 Design standard upper Pattern of Fashion Shoe (Creative Work)
3.6 Design standard Lining Pattern of Fashion Shoe (Creative Work)
3.7 Design standard upper Pattern of Fashion Boot (Creative Work)
3.8 Design standard Lining Pattern of Fashion Boot (Creative Work)
3.9 Design standard upper Pattern of Current Fashion designing of Shoe and Boot
3.10 Design standard Lining Pattern of Current Fashion designing of Shoe and Boot

Recommended Books

1. R.G.Miller- Manual of Shoe Making, Clarks Limited
2. J.A.J Luijten, P.W.J Velden- Design, Pattern Engineering and Grading of FootwearVol.1 & 2, TNO Leather & Shoe Research Institute.
3. www.shoetrades.com/Foot- Introduction to Modern Footwear Technology, (STP) SHOE TRADERAS PUBLI

Instructional Objectives

1. Molding and Pattern Engineering of Ladies Boot & Shoe

1.1 Explain the standard upper pattern of a Ladies Court Shoe with appropriate style lines and dimensions.
1.2 Explain the lining pattern for a Ladies Court Shoe that matches the upper accurately.
1.3 Explain the upper pattern for a Ladies Peep Toe Court Shoe with specific toe opening details.
1.4 Explain Design the matching lining pattern for a Peep Toe Court Shoe ensuring fit and comfort.
1.5 Explain the standard upper pattern for a Ladies Sandal, considering open design and strap positioning.
1.6 Explain the lining pattern for the sandal to provide proper support and finish.
1.7 Explain the standard upper pattern for a Ladies Slipper with emphasis on easy wear and foot coverage.
1.8 Explain the Design a functional and comfortable lining pattern for the slipper.

2. Modelling and Pattern Engineering of Traditional Shoe

2.1 Explain the Design a standard upper pattern for a Medical Shoe that ensures foot support and orthopedic comfort.
2.2 Define the correct lining pattern for a Medical Shoe to match the upper and enhance inner comfort.
2.3 Explain the standard upper pattern for a Boys School Shoe focusing on durability and ease of wear.
2.4 Explain the Design a matching lining pattern for a Boys School Shoe ensuring proper fit and functionality.
2.5 Explain the standard upper pattern for a Girls School Shoe with proper styling and structural balance.
2.6 Explain the lining pattern for a Girls School Shoe that complements the upper and maintains comfort.
2.7 Explain the Design a standard upper pattern for a Safety Shoe with consideration for protection, strength, and industrial use.
2.8 Explain the matching lining pattern for a Safety Shoe that supports the upper and protects the foot.

3. Modelling and Pattern Engineering of Miscellaneous Shoes

3.1 Explain the Design a standard upper pattern for Sandal **e**nsuring proper strap placement and foot coverage.
3.2 Explain the matching lining pattern for Sandal to enhance comfort and finishing.
3.3 Explain the accurate upper pattern for Zip Booty focusing on fit, style, and zip alignment.
3.4 Explain the Lining Pattern for Zip Booty that complements the upper construction.
3.5 Explain the design upper pattern for a Fashion Shoe incorporating innovative style elements.
3.6 Explain the lining pattern for the Fashion Shoe that supports its design and structure.
3.7 Explain the unique upper pattern for a Fashion Boot showcasing advanced design skills.
3.8 Explain the functional and aesthetic lining pattern for the Fashion Boot.
3.9 Explain the fashion trends to design upper patterns for modern shoes and boots.
3.10 Explain the Design lining patterns that align with th**e** latest fashion styles in footwear

List of Practical: 96. Hours

1. Make a Standard Design Ladies Coart Shoe and pattern making for manufacturing
2. Make a Standard Design Ladies Peep Toe Court Shoe and pattern making for manufacturing
3. Make a Standard Design Ladies Sandal and pattern making for manufacturing
4. Make a Standard Design Ladies Slipper and pattern making for manufacturing
5. Make a Standard Design of Medical Shoe and pattern making for manufacturing
6. Make a Standard Design of Boys School Shoe and pattern making for manufacturing
7. Make a Standard Design of Girls School Shoe and pattern making for manufacturing
8. Make a Standard Design of Safety Shoe and pattern making for manufacturing
9. Make a Standard Design of Sandal and pattern making for manufacturing
10. Make a standard design of a Fashion Shoe (Creative Work) and pattern making for manufacturing
11. Make a standard design of a Fashion Boot (Creative Work) and pattern making for manufacturing
12. Make a standard design of a Current Fashion designing of Shoe and Boot and pattern making for manufacturing

FTW-303 Footwear Production Technology -III

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Understand basic concepts, processes, and machinery involved in Lasting, Sole making, Sole Attachment and Finishing process.
- Understand advanced and specialized methods used in modern footwear production (e.g., PU direct injection, strobel, vulcanizing, etc.).
- Analyze production line balancing, layout design, and lean manufacturing techniques.
- Learn methods of cost estimation, production planning, and inventory control in footwear factories.
- Operate and manage advanced machinery and automated production lines.
- Apply modern quality management systems and productivity improvement tools.
- Analyze case studies to understand challenges and innovations in industrial footwear production.

Course Contents

1. Shoe Construction **8Hrs**

1.1. PU Pouring
1.2. Direct Injection Pouring
1.3. Direct Vulcanizing Production
1.4. Stock on
1.5. Moccasin
1.6. String Lasting

2. Upper Shaping and Back Forming **8Hrs**

2.1 Mould according last Shape
2.2 Length Pattern
2.3 Mulling
2.4 Only close article
2.5 Back forming

3. Preparation of Bottom Parts **8Hrs**

3.1 Insole Preparation
3.2 Half insole, Full insole, Double Insole shank
3.3 Socks Preparation
3.4 Sole Preparation

4. Upper Lasting **8Hrs**

4.1 Check of Last
4.2 Mulling

4.3 Hand Lasting & Manual Lasting Tool
4.4 Toe Lasting by machine
4.5 Side Lasting
4.6 Heel lasting
4.7 Heel Setting

5. Preparation of Sole Attaching **8Hrs**

5.1. Marking
5.2. Bottom Roughing
5.3. Preparation of cementing
5.4. Apply cementing
5.5. Sole & Upper Attaching
5.6. De-lasting

6. Cleaning & Finishing **8Hrs**

6.1 Remove the over cement
6.2 Edge coloring
6.3 Clean with cleaner
6.4 Buffing

7. Socks Inserting Precautions **8Hrs**

6.1 If any Nail remove
6.2 Check shoe inside/outside
6.3 Apply cementing
6.4 According to heel, half and full socks
6.5 No wrinkle in socks

8. Quality & Packing **8Hrs**

8.1.According seal sample
8.2.Paper inserting
8.3.Hand tag
8.4.Shoe packing
8.5.Quality Checking
8.6.Final inspection

Recommended Books

1. R.G.Miller- Manual of Shoe Making, Clarks Limited
2. J.S Harding “The Boot and Shoe Industry” SIR ISAAC PITMAN & SONS LTD, New York
3. Muazzam Mahmood Mansoor “Pattern Engineering of Shoe Components” Technical Education & Vocational Training Authority, Punjab

Instructional Objectives

1. Shoe Construction

1.1 Define the shoe construction techniques for PU Pouring.
1.2 Define the Direct Injection processes.
1.3 Define the Direct Vulcanizing.
1.4 Define the Stock-on techniques
1.5 Define the Moccasin
1.6 Define the String Lasting methods

2. Upper Shaping and Back Forming

2.1 Define the ability to shape the shoe upper according to last shape
2.2 Define the Prepare and use length patterns effectively.
2.3 Define the mulling and back forming operations.
2.4 Define the Close the upper article correctly.
2.5 Define the back forming processes accurate Mold upper according to the last shape.

3. Preparation of Bottom Parts

3.1 Define the prepare insole.
3.2 Explain the Prepare single, half, full, and double insoles including shank placement.
3.3 Define the Fabricate socks and soles to specification.
3.4 Define the socks, and sole parts for bottom assembly

4. Upper Lasting

4.1. Define the correct last before starting the lasting process.
4.2. Define the mulling (softening the upper) Make the material flexible for lasting.
4.3. Define the hand lasting techniques using manual tools effectively.
4.4. Define the lasting machines for toe lasting with safety and precision.
4.5. Define the side lasting, ensuring proper alignment and tightness.
4.6. Define the heel lasting to secure the back of the shoe upper to the last.
4.7. Define the accurate heel setting to maintain shape and symmetry before final assembly.

5. Preparation of Sole Attaching

5.1 Define the accurate marking on the sole and upper for alignment.
5.2 Define the bottom surface to ensure better adhesion.
5.3 Define the cement according to material and application requirements.
5.4 Define the cement evenly on sole and upper surfaces.
5.5 Define the Attach sole and upper firmly with proper positioning and pressure.
5.6 Define the de-lasting to remove the last without damaging the shoe structure.

6. Cleaning & Finishing

6.1 Define the Remove excess cement from shoe surfaces.
6.2 Define the edge coloring for aesthetic finish.
6.3 Define the Clean shoes using appropriate cleaning agents and techniques.
6.4 Define the buffing to give the shoe a polished and professional look.

7. Socks Inserting Precautions

7.1 Define the Remove any remaining nails or obstructions inside the shoe.
7.2 Define the inside and outside of the shoe for cleanliness and readiness.
7.3 Define the cement appropriately for sock insertion.
7.4 Define the full, half, or heel socks depending on the design.
7.5 Define the Ensure wrinkle-free placement of socks to maintain comfort and fit.

8. Quality & Packing

8.1 Define the Compare product quality against sealed samples.
8.2 Define the Insert protective paper for shape retention.
8.3 Define the Attach hand tags and other labeling materials.
8.4 Define the neat and secure shoe packing.
8.5 Define the Conduct thorough quality checking.
8.6 Define the Carry out final inspection before dispatch.

List of Practical: 96. Hours

1. Make the construction by stuck on process
2. Perform the back forming process
3. Make the toe Lasting by machine of Shoe and Boot
4. Make the heel Lasting by machine of Shoe and Boot
5. Make the hand Lasting of waist Shoe and Boot
6. Make the sole attaching by machine of shoe and boot
7. Make the sole pressing by machine of shoe and boot
8. Stich the sole of boots
9. Make the insole attaching by machine of shoe and boot
10. Make the practical of heat setting
11. Scour and rough the extra material of shoe and boot
12. Make the cementing of upper and sole with first and second coat
13. Spray the finishes on the shoe and boot
14. Insert the socks into shoe and boot
15. Color the edges of the sole
16. Iron on the shoe and boot
17. Apply the binders
18. Buff with machine and brush
19. Pack the manufactured footwear in the box

FTW-333 Footwear CAD/CAM Technology

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Understand comprehensive knowledge of Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM) applications in the footwear industry.
- Develop skills in digital pattern making, grading, and 3D footwear modeling.
- Enhance understanding of automated processes for improving productivity, precision, and quality in footwear manufacturing.
- Handle modern industry standards and technology-driven footwear production environments

Course Contents

1. Introduction of CAD / CAM **12Hrs**

1.1 Definition

1.2 History

1.3 Importance

1.4 Function of Computer in CAD/CAM

1.5 Role in future and Footwear Industry

2. Devices, Storage and hardware required for CAD-CAM Operation **20Hrs**

2.1 Basic requirements for operation

2.2 Devices and hardware

2.3 Input and Output

2.4 Storage Media and Devices

2.5 Storage File Systems and Management

2.6 Cloud Storage

3. Computer-Aided Pattern Engineering using CADCAM Software **24Hrs**

3.1 Digitize 2D standard/shell

3.2 Create new style lines

3.3 Line Modification

3.4 Punches

3.5 Pattern Creation

3.6 Pattern Engineering

3.7 Piece Modification on

3.8 Carry out pattern Grading

4. Privacy, Security, and Ethics **08Hrs**

4.1. Cybersecurity & threats

4.2. Online Security Measures

4.3. Ethical and Social Issues

Recommended Books

1. Muazzam Mahmood Mansoor “Pattern Engineering of Shoe Components” Technical Education & Vocational Training Authority, Punjab
2. Discovering Computers Digital Technology, Data, and Devices The Shelly Cashman Series 2018
3. Shoemaster Power Training Manual (2D & 3D pattern engineering) www.shoemaster.co.uk

Instructional Objectives

1. Introduction of CAD / CAM

1.1 Explain Introduction
1.2 Explain History
1.3 Explain Importance
1.4 Explain Function of Computer in CAD/CAM
1.5 Explain Role in future and Footwear Industry

2. Devices, Storage and hardware required for CAD-CAM operation

2.1 Explain Basic requirements for operation
2.2 Explain Devices and hardware
2.3 Explain Input and Output
2.4 Explain Storage Media and Devices
2.5 Explain Storage File Systems and Management
2.6 Explain Cloud Storage

3. Computer-Aided Pattern Engineering using CADCAM Software

3.1 Explain Digitize 2D standard/shell
3.2 Explain how to Create new style lines
3.3 Explain Line Modification
3.4 Explain Punches
3.5 Explain Pattern Creation
3.6 Explain Pattern Engineering
3.7 Explain Piece Modification
3.8 Explain how to Carry out pattern Grading

4. Privacy, Security, and Ethics

4.1 Explain Understanding common cybersecurity threats
4.2 Explain Recognizing phishing and scams
4.3 Explain Ethical and Social Issues

List of Practical: 96. Hours

1. Installation of CAD / CAM Software and arrange its toolbars
2. Demonstrate the CAD / CAM software interface and its toolbars
3. Demonstrate Digitizer and its tools/Components
4. Prepare Digitizing of Oxford Boot standard with all detail
5. Make Digitizing of Derby Boot standard with all detail
6. Prepare Digitizing of Oxford Shoe standard with all detail
7. Make Digitizing of Derby Shoe standard with all detail
8. Prepare Digitizing of Court Shoe standard with all detail
9. Make Digitizing of High Leg Boot standard with all detail
10. Prepare scanning of Bottom and upper components with all detail
11. Make scanning of Oxford Boot standard with all detail
12. Prepare scanning of Brogue shoe standard and make all its pattern with CAD software
13. Make scanning of Sneaker Shoe standard with all detail
14. Prepare scanning of Derby Shoe standard with all detail
15. Make scanning of Court Shoe standard with all detail
16. Modify the components of shoe, boot, sandal and slippers
17. Make the Marking and detail on pattern by using CAD/CAM software
18. Prepare CAD/CAM grading in French sizing system of upper and lining patterns in custom range and export all graded patterns to CAM software for cutting patterns
19. Make CAD/CAM grading in English sizing system of upper and lining patterns in custom range and export all graded patterns to CAM software for cutting patterns
20. Make CAD/CAM grading in French sizing system of sole and insole patterns in custom range and export all graded patterns to CAM software for cutting patterns
21. Make CAD/CAM grading in English sizing system of sole and insole patterns in custom range and export all graded patterns to CAM software for cutting patterns
22. Make CAD/CAM restricted grading of sandal buckle strap and export all graded patterns to CAM software for cutting and plotting
23. Load the exported file of standard/shell from CAD software into CAM software and adjust all pattern and spaces into a customize sheet for cutting and plotting
24. Make customize cutting of all patterns and save the nested arranged file
25. Digitize/Scan a 3D last and save it into CAD exportable file
26. Import a 3D last file into CAD software and flatten it
27. Import an oxford shoe 3D last into CAD software and Design a 3D oxford shoe in CAD/CAM software
28. Import a Derby shoe 3D last into CAD software and Design a 3D Derby Shoe in CAD/CAM software
29. Design a 3D Court shoe in CAD/CAM software

FTW-343 Principles of Leather Manufacturing

Total Contact Hours

Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Explain complete process flowcharts of chrome and vegetable tanning methods.
- Apply scientific principles to beam house operations such as soaking, depilation, liming, and fleshing.
- Analyze chemical and mechanical processes involved in deliming, bating, and scud removal.
- Understand the purpose and method of deliming.
- Explain pickling and its role in preserving hides before tanning.
- Adjust moisture content and thickness of leather using sammying and shaving techniques.
- Explain and perform re-chroming, neutralization, re-tanning, dyeing, and fat-liquoring steps.
- Operate drying methods (vacuum, hang), mechanical softening (molisa staking), and post-treatment steps like buffing and trimming.
- Identify materials used in finishing and perform techniques like colouring, embossing, and final packaging.
- Distinguish between various types of leather based on animal source (cow, buffalo, goat, sheep, pig, reptile) using visual and tactile cues.

Course Contents

1 General Introduction to Leather Manufacture. 8Hrs

1.1. Leather and its uses
1.2. Flow chart operation & process in chrome leather manufacture
1.3. Flow chart operation process in vegetable leather manufacture
1.4. Pre-Slaughter & post mortem defects in animal hides
1.5. Objective and Methods of curing of Raw Hides

2. Principles & Practice of beam house process 6hrs.

2.1. Soaking Objective of soaking Different Methods of Soaking
2.2. Depilation objectives & Theory of hair destruction by alkalis & sulfides Depilation by hair saving process
3.3. Liming Objectives & effects of liming on Skin components
3.4. Fleshing & pelt weight

3. Principle & Mechanism of Deliming & Baking 4Hrs

3.1 Deliming, Objectives and method
3.2 Objective of bating
3.3 Action of bating on skin components
3.4 Scud & it's removal

4. Principles & mechanism of Pickling 4Hrs

4.1.objective of pickling
4.2.Pickling Chemicals & method of Pickling
4.3.Pickling pH

5. Theory & Principles of Chrome Tanning **4Hrs**

5.1.Objectives & method of Chrome tanning

5.2.Ageing & importance of ageing in chrome tanning

6. Pre- dyeing operations **6Hrs**

6.1 Adjustment of moisture contents (Sammying)

6.2 Adjustment of thickness (Splitting Shaving)

7. Fundamentals of Crusting **8 Hrs**

7.1.Wet back

7.2.Re-chroming, objectives and procedure

7.3.Neutralization (Introduction objectives and method of neutralization)

7.4.Re-tanning (Introduction, Objectives and Method of Re-tanning)

7.5.Dyeing (introduction, Objectives and Method of dyeing)

7.6.Fat-Liquoring (Introduction, Objectives and Method of Fat-liquoring)

8. Post dyeing Operations **8Hrs**

8.1 Sammying & setting out

8.2 Vacuum drying

8.3 Hang drying

8.4 Molisa Staking

8.5 Trimming, Buffing & dedusting, measuring

9. Finishing **8Hrs**

9.1 Introduction

9.2 Need of Finishing for Upper Leather

9.3 Finishing materials (Colouring Materials, Binders and Lacquers)

9.4 Application of Finishing

9.5 Post Finishing Operations (Drying , Embossing , Selection of final Material and Measuring & Packing)

10. Identification of Leather Materials **8Hrs**

10.1. Introduction

10.2. Identification of Different Hides & Skins (Cow Leather, Buffalo Leather, Goat Skin, Sheep Skin, Pig Skin, Reptile Skin)

Recommended Books

1.Principle of Leather Manufacturing by Shahid Hamid Kazi

2. Theory and Practical of Leather Manufacturing by K. T. Sarkar

Instructional Objectives

1. General Introduction to Leather Manufacture

1.1 Explain the the basic concept, types, and uses of leather.
1.2 Explain the flowchart of chrome and vegetable tanning processes.
1.3 Explain the common pre-slaughter and post-mortem defects in hides and their impact on leather quality.
1.4 Explain the objectives and common methods used in curing raw hides for preservation.

2. Principles & Practice of Beam House Process

2.1 Describe the objectives and methods of soaking hides.
2.2 Define the theory of hair removal using alkalis and sulfides, and compare it with hair-saving techniques.
2.3 Explain the purpose and effects of liming on skin structure and composition.
2.4 Explain the fleshing process and assess its role in reducing pelt weight.

3. Principles & Mechanism of Deliming & Bating

3.1 Explain the objectives and chemical process of deliming.
3.2 Explain the purpose and biological mechanism of bating.
3.3 Describe the effect of bating on collagen and other skin components.
3.4 Explain the Recognize the process and importance of scud removal in leather processing.

4. Principles & Mechanism of Pickling

4.1 Define pickling and explain its necessity in tanning.
4.2 Define the chemicals used in pickling and describe standard pickling methods.
4.3 Define the significance of pH control during the pickling process.

5. Theory & Principles of Chrome Tanning

5.1 Explain the objectives and basic methodology of chrome tanning.
5.2 Explain the concept of ageing and its role in stabilizing chromium-bound leather.

6. Pre-Dyeing Operations

6.1 Explain the processes involved in adjusting moisture content (sammying).
6.2 Explain the techniques of splitting and shaving to achieve uniform thickness.

7. Fundamentals of Crusting

7.1 Describe the wet-back process and its importance in crusting.
7.2 Explain the objectives and procedures of re-chroming and neutralization.
7.3 Explain the goals and methods of re-tanning, dyeing, and fat-liquoring for leather enhancement.

8. Post-Dyeing Operations

8.1 Define the knowledge of post-dyeing treatments: sammying, setting out, vacuum drying, and hang drying.

8.2 Describe molisa staking, trimming, buffing, de-dusting, and final leather measurement processes.

9. Finishing

9.1 Explain the need for finishing in upper leather production.
9.2 Explain the types of finishing materials like colors, binders, and lacquers.
9.3 Explain the application techniques and post-finishing operations, including embossing, drying, and material selection.

10. Identification of Leather Materials

10.1 Explain the identification techniques for various types of animal hides and exotic skins.
10.2 Explain the Recognize and differentiate between cowhide, buffalo, goat, sheep, pigskin, and reptile skins based on texture and pattern.

List of Practical: 96.Hours

1. **Perform the following Practicals / operation (Upper Leather Manufacturing from Hide & Skin)**
   - 1.1 Inspection of hide
   - 1.2 Soaking
   - 1.3 Liming and depilation
   - 1.4 Deliming and bating
   - 1.5 Pickling
   - 1.6 Tanning
   - 1.7 Samming/ splitting/ shaving
   - 1.8 Neutralization
   - 1.9 Retaining/Dyeing/Fat liquoring
   - 1.10 Mechanical operations
   - 1.11 Finishing

FTW-353 Leather Goods Pattern Making & Manufacturing

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Apply fundamental and advanced knowledge of pattern making for leather goods such as bags, wallets, belts, and accessories.
- Develop the ability to transform design concepts into functional, feasible leather products.
- Execute hands-on skills in crafting, assembling, and finishing leather goods using appropriate tools and techniques.
- Apply creativity, precision, and industrial awareness in leather goods production.

Course Contents

1. Principle of Leather Goods **4Hrs**

1.1. Introduction to crafts / Leather goods
1.2. General requirements of crafts
1.3. Miscellaneous materials used in crafts making
1.4. Machinery and tools required for crafts making

2. Pattern Engineering of Leather Goods **24Hrs**

2.1 Drafting of different types of Leather goods especially in (Wallet, Key Chain, Belt, Mobile Cover, File Cover, Glasses Cover, Gloves)
2.2 Modeling and pattern engineering of different crafts components
2.3 Sizing of different leather goods

3. Principles of leather goods cutting and stitching **24Hrs**

3.1 Principle of cutting
3.2 Different cutting tools and methods
3.3 Principles of goods stitching
3.4 Types and requirements of stitching
3.5 Make cutting patterns (Box Board, X-Ray sheet & tin template)
3.6 Essential operations before packing

4. Introduction to Costing **12Hrs**

4.1 Introduction to Costing
4.2 Implementation of Graph paper
4.3 Direct tracing on material
4.4 Material consumption

Recommended Books

1. By Dick Anzeic - Practical Pattern Making, (STP) SHOE TRADERAS PUBLI.
2. H.J.PATRIC, F.B.S.I - Modern Pattern Cutting and Design, (STP) SHOE TRADERAS PUBLI.
3. R.G.Miller- Manual of Shoe Making, Clarks Limited.

Instructional Objectives

1. Principles of Leather Goods

1.1 Explain the concept and importance of leather crafts and goods.
1.2 Explain the general requirements for leather craft production.
1.3 Explain the List various miscellaneous materials used in leather goods manufacturing.
1.4 Explain the Recognize and describe the machinery and tools necessary for making leather crafts.

2. Pattern Engineering of Leather Goods

2.1 Explain the standard patterns for various leather goods including wallets, key chains, belts, mobile covers, file covers, glasses covers, and gloves.
2.2 Explain the modeling and pattern engineering techniques to different craft components.
2.3 Explain the the correct sizes and scaling of various leather products.

3. Principles of Leather Goods Cutting and Stitching

3.1 Explain the basic principles and importance of accurate cutting in leather goods.
3.2 Explain the and use various cutting tools and techniques effectively.
3.3 Explain the different stitching principles used in leather goods.
3.4 Describe types of stitching and their functional requirements.
3.5 Explain the cutting patterns using box board, X-ray sheets, and tin templates.
3.6 Explain the essential finishing and pre-packing operations in leather goods production.

4. Introduction to Costing

4.1 Define costing and explain its role in leather goods production.
4.2 Define the Use graph paper for cost estimation and layout planning.
4.3 Define the direct tracing on leather and substitute materials for material planning.
4.4 Define the Calculate material consumption and estimate cost-effectiveness of leather goods.

List of Practical: 96. Hours

1. Prepare the Sketching and standard making of Wallet
2. Make the Sketching and standard making of Key chain
3. Prepare the Sketching and standard making of Belt
4. Make the Sketching and standard making of Mobile Cover
5. Prepare the Sketching and standard making of File Cover
6. Make the Sketching and standard making of Glasses Cover
7. Prepare the Sketching and standard making of Gloves
8. Make the Upper Patterns of all leather goods
9. Prepare the Lining Pattern of all leather goods
10. Manufacture the Wallet
11. Manufacture the Key chain
12. Manufacture the Belt
13. Manufacture the Mobile Cover
14. Manufacture the File Cover
15. Manufacture the Glasses Cover
16. Manufacture the Gloves

FTW-363 Quality Control & Merchandising

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Understand the fundamentals of quality control and its critical role in shoe manufacturing.
- Apply tools and techniques such as check sheets, flow charts, and diagrams for quality monitoring.
- Differentiate between quality control (QC) and quality assurance (QA), and apply relevant standards.
- Interpret and implement global quality management systems and certifications (e.g., ISO, CE, SATRA).
- Interpret and implement global quality management systems and certifications (e.g., ISO, CE, SATRA).
- Evaluate and test the quality of upper and bottom shoe materials according to international standards.
- Identify and select suitable materials and auxiliaries for different footwear constructions.
- Perform essential quality assurance checks during the manufacturing process.
- Conduct raw material inspections, in-process checks, and final product quality evaluations.
- Understand the merchandising process in the footwear industry from product development to retailing.
- Prepare export documentation and coordinate effectively across teams for international orders.

Course Contents

1. **Introduction to Quality** **12Hrs**
   - 1.1 Definition of Quality Control
   - 1.2 Importance of QC in Shoe Manufacturing
   - 1.3 Applications of Quality
   - 1.4 Tools of Quality (Check Sheet,Flow Chart,Digram etc)
   - 1.5 Quality Control and Quality Assurance
   - 1.6 Quality Standards and specifications
2. **Quality standards and certification** **12Hrs**
   - 2.1. Introduction to Six sigma
   - 2.2. Quality Management System (ISO,9001,14001,22000)
   - 2.3. National and International Regulatory Buddies
   - 2.4. Standard Values Upper material (ISO, CE, SATRA, BSI, SLTC, SDC)
   - 2.5. Standard Values Bottom material (ISO, CE, SATRA,BSI, SLTC, SDC)
   - 2.6. Testing of Upper Materials
   - 2.7. Testing of Bottom Materials
3. **Materials and Other Auxiliaries** **8Hrs**
   - 3.1. Types of Materials
   - 3.2. Availability and Comparison
   - 3.3. Suitability in Footwear

3.4. Upper Types
3.5. Bottom Types

4. Quality Assurance Checks **8Hrs**

4.1. Size Measurement Checks
4.2. Needle Detection Check
4.3. Stitch Density Check
4.4. Marking Checks
4.5. Importance and quality control of Rub Fastness & Perspiration Resistance
4.6. Importance and quality control Abrasion test

5. Quality Control in Footwear Manufacturing **12Hrs**

5.1. Footwear Standards and Specifications
5.2. Raw Material Quality Inspection
5.3. In-Process Quality Control
5.4. Final Product Inspection
5.5. Quality Control Tools

6. Merchandising in Footwear Industry **12Hrs**

6.1. Introduction to Merchandising
6.2. Product Development and Sampling
6.3. Order Management
6.4. Export Documentation and Logistics
6.5. Retail Merchandising
6.6. Communication and Coordination
6.7. Market Trends and Consumer Preferences

Recommended Books

1. By Dick Anzeic - Practical Pattern Making, (STP) SHOE TRADERAS PUBLI.
2. H.J.PATRIC, F.B.S.I - Modern Pattern Cutting and Design, (STP) SHOE TRADERAS PUBLI
3. R.G.Miller- Manual of Shoe Making, Clarks Limited

Instructional Objectives

1. Introduction to Quality

1.1 Define the concept of quality control and its relevance in manufacturing.
1.2 Explain the importance of quality control (QC) in the shoe industry.
1.3 Identify different applications of quality in footwear production.
1.4 Use basic quality tools such as check sheets, flow charts, and diagrams.
1.5 Differentiate between Quality Control (QC) and Quality Assurance (QA).
1.6 Understand various quality standards and specifications used in the industry.

2. Quality Standards and Certification

2.1 Describe the Six Sigma concept and its application in quality management.
2.2 Understand and interpret various ISO standards (ISO 9001, 14001, 22000).
2.3 Recognize the roles of national and international regulatory bodies.
2.4 Identify standard values for upper materials (ISO, CE, SATRA, BSI, SLTC, SDC).
2.5 Identify standard values for bottom materials (ISO, CE, SATRA, BSI, SLTC, SDC).
2.6 Explain the procedures for testing upper and bottom materials.

3. Materials and Other Auxiliaries

3.1 Classify types of materials used in footwear manufacturing.
3.2 Compare material availability and quality.
3.3 Evaluate the suitability of materials for different footwear applications.
3.4 Distinguish between various types of upper and bottom materials.

4. Quality Assurance Checks

4.1 Conduct size measurement and fit checks.
4.2 Perform needle detection for product safety.
4.3 Check stitch density and consistency.
4.4 Perform marking and labeling inspections.
4.5 Explain and test for rub fastness and perspiration resistance.
4.6 Understand and control abrasion resistance through appropriate tests.

5. Quality Control in Footwear Manufacturing

5.1 Identify footwear standards and specifications.
5.2 Conduct raw material inspection for compliance.
5.3 Implement in-process quality control methods.
5.4 Perform final product inspections before shipment.
5.5 Utilize different tools for quality control in manufacturing processes.

6. Merchandising in Footwear Industry

6.1 Define merchandising and its role in the footwear industry.
6.2 Define Manage product development and sampling processes.
6.3 Define Handle order management efficiently.
6.4 Define export documentation and logistics.
6.5 Define the strategies in retail merchandising.
6.6 Define the Communicate and coordinate effectively with suppliers and clients.
6.7 Define Analyze market trends and consumer preferences for product planning.

List of Practical: 96. Hours

1. Perform the Stitch Tear resistance test
2. Perform the Tensile Strength test
3. Perform the Rub Fastness test
4. Perform the Adhesion of finish test
5. Perform the Flexo meter test
6. Perform the Water Proofness test
7. Perform the Light fastness test
8. Perform the pH test
9. Perform the Sole Flex test
10. Perform the Sole Abrasion test

FTW-373 Entrepreneurship & E-Commerce

Total Contact Hours				
Theory	**64**	**T**	**P**	**C**
Practical	**96**	**2**	**3**	**3**

Learning Outcome

The students will be able to:

- Understand basic concept of Entrepreneurship
- Apply techniques for generating business idea and assessing opportunities
- Understand market research and business models
- Understand the basics of establishing a business
- Create account on different online markets
- Write proposal for clients in online markets

Course Contents

1. Introduction to Entrepreneurship 08Hs

1.1. The concept of Entrepreneurship
1.2. Key terminologies of Entrepreneurship
1.3. Classification of business; difference between social and commercial business
1.4. Reasons for Entrepreneurship
1.5. Entrepreneurial motivation
1.6. Risk Taking in Entrepreneurship
1.7. Small enterprises

2. Innovation & Creativity 07 Hrs

2.1. Concept of innovation and creativity
2.2. Collective and Creative Thinking
2.3. Entrepreneurial ideas
2.4. Collective and Creative Thinking
2.5. Assessment of entrepreneurial opportunities

3. Entrepreneurial Characteristics 06Hrs

3.1. Concept of Entrepreneurial characteristics
3.2. Entrepreneurial Leadership
3.3. Self-discipline skills
3.4. Decision making skills
3.5. Principles of negotiation

4. Establishment of Enterprise 07 Hrs

4.1. Concept of Market, market size, market demand and Competition
4.2. Importance of Business location & selection of site
4.3. Legal forms of business in Pakistan
4.4. Product Strategies
4.5. Pricing Strategies

5. Management of an Enterprise 12 Hrs

5.1. Concept of hiring and firing
5.2. Different hiring techniques
5.3. Managing Supply Chain
5.4. techniques for selection of supplies

5.5. Advertisement and its importance
5.6. Different Advertisement techniques
5.7. Product Life cycle of product
5.8. Components and preparation of Business Plan

6. E-Commerce **24 Hrs**

6.1. Overview and Types of E-Commerce
6.2. Impact of E-Commerce on businesses
6.3. E-Commerce Platform
6.4. Creation of account on different platforms
6.5. Overview of product hunting and sourcing and their key considerations
6.6. Product Selection
6.7. Digital Marketing
6.8. Logistics and Supply Chain
6.9. Social Media Ethics

Recommended Books

- Knowing About Business (KAB), ILO
- Small Business and Entrepreneurship, Macmillan and Dewhurst.
- Drucker, P. and Maciariello, J, (2014). Innovation and entrepreneurship. Routledge.
- Introduction to E-Commerce, Martin Kutz
- E-Commerce Business. Technology. Society, Kenneth C. Laudon & Carol G Traver

Instructional Objectives

1. Introduction to Entrepreneurship

1.1. Define & explain the concept of Entrepreneurship and its various types
1.2. Identify and interpret the terms and elements involved in the concept of enterprise
1.3. Describe its importance in society & explanation of Social and Commercial business
1.4. Appreciate that the advancement of individual and society in general when entrepreneurship is adopted
1.5. Explain various motivational factors that entrepreneurs possess and utilize
1.6. Exhibit the skills needed to assess and evaluate a risk
1.7. Describe the outline of small enterprise elements, ideas, motivation, resources

2. Innovation & Creativity

2.1. Describe and differentiation innovation and creativity
2.2. Use a variety of strategies to promote unique ideas through group and creative thinking.
2.3. Explain the resources of business idea both internal and external
2.4. Explain Key aspects of an entrepreneurial assessment approach

3. Entrepreneurial Characteristics

3.1 Explain the various entrepreneurial characteristics
3.2 Define the leadership qualities which are essential to the success of entrepreneurs
3.3 Define the self- management skills and how they are important to be entrepreneurs
3.4 Explain the steps for decision making and rating of decision making skills
3.5 Define the rules of negotiation for resolving business issues

4.Establishment of Enterprise

4.1 Explain the procedure for assessing the market size and demand and different types of market
4.2 Explain the major factors to be considered when selecting a location for a business
4.3 Describe the basic types of business ownership and the limitation of each one
4.4 Describe the concept market & marketing, 5 "w's" of market, and differentiate between sellers and buyers' market
4.5 Define the advantages and disadvantages of using various sources of capital to start an enterprise and Explain the component of cost of product and pricing strategies

5. Management of an Enterprise

5.1 Describe the different hiring and firing methods
5.2 Explain the Job description and specification and importance of the term & conditions of services
5.3 Explain the concept of supply chain
5.4 Elaborate Characteristics of successful sales personals & Identify the various techniques of selecting a supplier
5.5 Describe the purpose and importance of advertisement
5.6 Explain the different advertisement techniques
5.7 Describe the purpose and importance of life cycle of product
5.8 Explain important components and parts included in preparation of Business Plan

6 E-Commerce

6.1 Explain E-commerce and its different types
6.2 Explain E-commerce's impact on today's business world
6.3 Explain time management tools & identify key factors of time management
6.4 Define the concept of "product hunting" and "sourcing" in e-commerce and their key considerations
6.5 Define appropriate product selection techniques for e-commerce
6.6 Describe the digital marketing
6.7 Define the social media ethics

List of Practical: 96. Hours

1. Create and Manage Account / Store on different Platform (DARAZ, Shopify and Amazon etc.)
2. Upload and manage product images
3. Add, edit, and manage products in e-commerce platform
4. Integrate a payment gateway
5. Complete a test order to understand and checkout process
6. Update order status “Pending” to “Shipped”
7. Update product stock level
8. Create a blog on an e-commerce platform
9. Add social media links to an e-commerce site

FTW-392 Final Project

Total Contact Hours				
Theory	**0**	**T**	**P**	**C**
Practical	**192**	**0**	**6**	**2**

Learning Outcome

The students will be able to:

- Develop a complete pair of gents' or ladies' shoes/boots in any selected style using creative, market-relevant, and fashionable design concepts.
- Create accurate upper and lining standards and patterns based on professional footwear construction methods and industry tolerances.
- Execute full shoe assembly from design to final finishing, including cutting, lasting, stitching, and sole attaching processes.
- Choose suitable materials (leather, synthetics, textiles, etc.) for uppers, linings, and prepare a detailed final project report that includes design inspiration, material selection rationale, pattern development steps, technical drawings, and production notes.
- Communicate and justify design and production choices effectively during the viva voce (oral defense), demonstrating critical thinking and problem-solving skills.
- Analyze the final product for comfort, durability, appearance, and alignment with market trends.

1. The Design Project & Viva

As an essential part of DAE Footwear course, each student will have to complete a project comprising of creative current fashion shoe or boot from one Gents or one Ladies complete shoe or boot including the following: -

- Making of Upper standard
- Making of Upper Patterns
- Making of lining standard
- Making of lining patterns
- Making of complete shoes for both gents and ladies in any style or materials

Project Guidelines for Footwear Development

Project Overview:

Students are required to design and develop a complete footwear article by integrating creative concepts with technical and market-driven approaches. The project must reflect a clear understanding of current fashion **ideas, themes, and trends**, and demonstrate the application of **manual and CAD/CAM-based pattern making**, **standard construction techniques**, and **quality control measures**.

Throughout the process, students will engage in:

- **Concept Development** through market research and trend forecasting
- **Idea Generation and Sketching** to visualize original footwear concepts
- **Standard and Pattern Making**, both **manual and digital (CAD/CAM)**

- **Prototype Development**, including upper and lining construction
- **Sole Attachment** and **lasted shoe finishing**
- **Costing Analysis** aligned with sales targets and marketing zones
- Application of **Quality Tools** to ensure durability, comfort, and aesthetic standards
- Consideration of **marketing and sales strategy** relevant to the target market

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Project Submission Criteria:

To successfully complete and submit the project, each student must:

1. **Follow the approved pattern** (manual and CAD/CAM versions) with precise technical specifications.
2. **Develop a fully closed footwear article** (gents or ladies) that is properly lasted, includes a firmly attached sole, and is completely finished.
3. Ensure the final product meets industry standards in **fit, functionality, aesthetics, and durability**.
4. Submit documentation including:
    - **Design sketches**
    - **Pattern development process (manual & digital)**
    - **Material and component selection**
    - **Construction methodology**
    - **Costing sheet**
    - **Target market analysis**
    - **Quality control checklist**

2. Comprehensive Final Project Report Writing

Each student is required to submit a **comprehensive Final Project Report** that documents the entire design and development process from the **initial concept and idea generation** to the **completion of the finished footwear product**.

The report should include:

- **Project Overview and Objectives**
- **Market and Trend Analysis**
- **Design Concept and Sketches**
- **Material Selection and Justification**
- **Standard and Pattern Making Procedures (Manual and CAD/CAM)**
- **Construction Techniques and Production Process**
- **Quality Control Measures**
- **Costing and Pricing Strategy**
- **Marketing and Sales Target Consideration**

This report must reflect both the **creative and technical aspects** of the project, demonstrating a clear understanding of footwear design, production workflow, and commercial viability. It should be professionally formatted, well-organized, and include relevant visuals, charts, and references where applicable.

RELEVANT QUALIFICATION OF INSTRUCTORS / TEACHERS

For Technical Subjects

- BS Fashion Designing/ BS Fine Arts / BS Product Development / Bachelor of Design (B.Des) with minimum of 1 year Industrial / Teaching experience in the related field.
- DAE Footwear with minimum of 2/-years Industrial / Teaching experience in the related field.
- Graduation with 1-Year Shoe Designing & Modelling Certificate, with minimum of 5 years Industrial / Teaching experience in the related field.

Lab. Technician

- DAE in Footwear Technology with 1-years Industrial / Teaching experience in the related field
- Intermediate with 1 Year Shoe Designing & Modelling Certificate 3-years Industrial / experience in the related field

For Subjects pertaining to Humanities / Related Studies /Management / IT

- BS / M.A (16 years or higher) degree in English, Islamiat / Pak Studies with 2 years of teaching experience
- BS / M.Sc. (16 years or higher) degree in IT / CS / SE or BS in Computer Engineering with 2-years of teaching experience
- BS / M.Sc. (16 years or higher) degree in Mathematics / Physics / Chemistry with 2-years of teaching experience
- BBA / MBA (16 years or higher) degree with 2-years of teaching experience

EMPLOYABILITY OF THE PASS-OUTS with Market designations and vertical progression

The students holding DAE qualifications in Footwear Technology can seek employment in firms/companies / industry dealing in any of the following Areas / Sectors: -

- Shoe Designers in shoe production industries
- Shoe Technicians in all Production processes
- Quality control in Footwear making
- Footwear materials marketing manager
- Shoe marketing manager
- Merchandising Manager
- Footwear relevant tools and machinery marketing
- Own Business in shoe or leather goods manufacturing
- Trainer of Footwear and leather goods related trainees
  Moreover, they can be considered also for higher study in all Graduation programs in Pakistan and abroad.

Vertical mobility for Private Industry:

→ Assistant Designer → Designer →Chief Designer →Product Development Manager
→ Production Line Supervisor→Production Supervisor→ Assistant Production Manager → Production Manager→General Manager
→ Quality Inspector →Quality Supervisor→ Assistant Quality Manager → Quality Manager
→Assistant Merchandising Manager → Merchandising Manager
→ Assistant Marketing Manager →Marketing Manager

Vertical mobility for Government Sector:

Assistant Footwear Lab Technician→ Footwear Lab Technician → Supervisor

Vertical mobility for TVET Sector:

Junior Instructor→ Instructor → Senior Instructor → Chief Instructor

List of Tools, Equipment & Machinery (for 50 students)

DAE Footwear Technology, Revised July, 2025

List of labs.

1. **Designing lab**
2. **Cutting lab**
3. **stitching lab**
4. **Lasting lab**
5. **Computer lab**
6. **CAD/CAM Lab**
7. **Tanning lab**
8. **Physical lab**
9. **Chemical lab**

- ## Designing lab:

Sr.no	Equipment's	Quantity
1.	Revolving Chair	50
2.	Table	10
3.	Scissor	50
4.	Tape dispenser	50
5.	Cutting mat	50
6.	Shoe last	50
7.	Hammer	10
8.	Punch set	10
9.	Geometry tools / set square	05
10.	Last measuring tape	02

11.	French curve and ruler	10

- **Cutting Lab:**

Sr.no	**Equipment's**	**Quantity**
1.	Chair	50
2.	Table	50
3.	Scissor	50
4.	Hand cutting knife	50
5.	Cutting mat	50
6.	Material swatch book	10
7.	Hammer	50
8.	Punch set	10
9.	Cutting board	10
10.	Clicking press	1
11.	Hydraulic press	1
12.	Laser cutting machine	1
13.	Splitting machine	1
14.	Skiving machine	2
15.	Numbering machine	1

16.	Screen printing apparatus	1
17.	Embossing machine	1
18.	Strap cutter	1
19.	Shear	1
20.	Sole splitting machine	1
21.	Stool	5
22.	Cabinet	10
23.	Zinc sheet	1000KG
24.	Insole Punching machine	1

- **Stitching Lab:**

Sr.no	**Equipment's**	**Quantity**
1.	Stool	50
2.	Table	50
3.	Scissor	50
4.	Hand cutting knife	50
5.	Measuring tape	10
6.	Hammer	50
7.	Punch set	10
8.	Strobel machine	1
09.	Brush	10
10.	L-key set	2 Set
11.	Revolving punch	5

12.	Electric iron	1
13.	Spanner kit	1
14.	Zig Zag Stitching M/C	1
15.	Single Needle Post bed M/C	20
16.	Single Needle Flatbed M/C	10
17.	Eyelet machine	1
18.	Pasting machine	1
19.	Crimping machine	1
20.	Single Needle Cylinder Arms	05
21.	Cabinet	10
22.	Blocking machine	1
23.	Auto Lock Stitch	02
24.	Binding machine	1
25.	Single Double Needle Post bed M/C	10
26.	Perforating and Slotting (Local)	01
27	Spray Cabin	01
28.	Perforating Insole	01
29.	Drill Machine	02
30.	Working Table	25
31.	Electric Grinder	02
32.	Single Sewing Old Manual	01
33.	Cutting Knives + Cutting Dies As per Model Tack Lifter	10
34.	Table	25

35.	Revolving Chair Plastic	50
36.	Cabinet + Locker+ Rack	50
37.	Filling Cabinet	50
38.	Lactometer	02
39.	Needle Top & Bottom Feed Stitching M/C	01
40.	Button Hole M/C	01
41.	Button attaching	01
42.	Electric Cutting M/C	01
43.	Safety Over Lock M/C	02
44.	Vacuum M/C (Shell Form)	01
45.	Punching &Eyeleting M/C	01
46.	Edge Upper Folding M/C	01

- **Lasting Lab**

Sr.no	**Equipment's**	**Quantity**
1.	Stool	50
2.	Table big	02
3.	Scissor	50
4.	Hand cutting knife	50
5.	Lasting plier	10
6.	Nail puller	10
7.	Hammer	10
8.	Lasting stand	10

9.	Shoe horn	10
10.	Brush	50
11.	L-key set	10
12.	Electric heater	02
13.	Rubber hammer	10
14.	Spanner kit	10
15.	Plastic hammer	10
16.	Shoe last	50
16.	Toe lasting activator	01
17.	Toe lasting M/C	01
18.	Toe shaping M/C	01
19.	Outside sole lasting M/C	01
20.	Sole Attaching	01
21.	Cabinet	01
22.	Heel lasting machine	01
23.	Sole press	01
24.	Shape farming	01
25.	Drum press	01
26.	Heat chamber	01
27.	Cold Chamber	01
28.	Sole Stitching M/C	01
29.	Ruffing M/C	01
30.	Buffing M/C	01
31.	Hand ruffing M/C	01

32.	Spray Booth with gun	01
33.	Wrinkle Chasing	01
34.	Auto Insole Back Part Terming M/C With Dust Collector	01
35.	Eyeleting M/C For Insole Shank Steel	01
36.	Toe Forming M/C Hot& Cold	01
37.	Back Forming Hot &Cold	01
38.	Toe Activator/Steam Mulling M/C	01
39.	Embossing & Printing M/C 01	01
40.	Strobling M/C Upper Insole Inter Lock 01	01
41.	Binding M/C I Needle Lock Stich 01	01
42.	Upper Forming M/C For 4Pairs Mould 01	01
43.	Roughing M/C Total Bottom 01	01
44.	Sole Roughing Dual Head 01	01
45.	Inside Sole Stitching Inter Lock 01	01
46.	Side Sole Stitching M/C 01	01
47.	01 Heating Chamber (Heat Set M/C) 01	01
48.	Sole Reactivation M/C 01 I	01
49.	Insole Forming M/C 01	01
50.	Auto Shank Board Reducing & Grooving 01	01
51.	De-Lasting	01

- **Computer lab**

Sr.no	**Equipment's**	**Quantity**

1.	Revolving Chair	50
2.	Computer Table	50
3.	Computer system	50
4.	Microsoft windows	50
5.	Microsoft office	50
6.	Color printer	01
7.	Medium duty printer	01
8.	Light duty scanner	01
9.	LCD multimedia projector	01
10.	Backup ups	01
11.	USB	05
12.	External hard drive	01
13.	Air Conditioner	4

- **CAD/CAM Lab:**

Sr.no	**Equipment's**	**Quantity**
1.	Revolving Chair	50
2.	Computer Table	50
3.	Digitizer	01
4.	CAD/CAM plotter	01
5.	3d scanner	01
6.	2d scanner A3 size	01
7.	Color printer	01

8.	Medium duty printer	01
9.	Computer system	50
10.	CAD/CAM software	50
11.	Microsoft windows	50
12.	Multimedia projector	01
13.	Backup UPS	01
14.	USB	05
15.	External hard drive	01
16.	Air Conditioner	4

- **Tanning Lab:**

Sr.no	**Equipment's**	**Quantity**
1.	Stool	50
4.	Hand cutting knife	10
5.	Indicator liming/tanning /neutralization each	02 small pack
6.	Measuring tape	02
7.	Beume meter	05
8.	Thermometer	02
9.	Measuring slender	05
10.	Wight balance	02
11.	l-key	02
12.	Hammer	10
13.	Glazing M/C	01

14.	Buffing M/C 2	01
15.	Staking Horse	01
16.	Staking Horse	01
17.	Working Table	01
18.	Air Compressor	01
19.	Experimental Drum	01

- **Physical Lab:**

Sr.no	**Equipment's**	**Quantity**
1.	Stool	50
2.	Table	
3.	Scissor	10
4.	Hand cutting knife	15
5.	Tensile strength tester M/C	01
6.	Cutting knives	10
7.	Cutting dies	20
8.	Tear strength tester M/C	01
9.	Ball test machine	01
10.	Vernier caliper	50
11.	Stop watch	10
12.	Thickness gauge	02
13.	Flex Resistance test M/C	01

14.	Adhesion Strength M/C	01
15.	Slip Resistance tester	01
16.	Sole flexing tester M/C	01
16.	Heel attachment strength tester M/C	01
17.	Water proof tester M/C	01
18.	Color fastness tester M/C	01
19.	Abrasion Resistance M/C	01
20.	Rub Fastness M/C	01
21.	Adhesion of Finish M/C	O1
22.	Flexo Meter	01
23.	Ph Test M/C	01
24.	Light Fastness M/C	01
25.	Water Profanes M/C	01

- **Chemical Lab:**

Sr.no	**Equipment's**	**Quantity**
1.	Stool	50
2.	Hand cutting knife	10
3.	Ph meter (analytical grade)	02
4.	Spectrophotometer	01
5.	Digital balance	01
6.	Soxhelt apparatus	01

7.	Soxhelt extracter	01
08.	BOD cabinet	01
09.	Water distillation unit	01
10.	Drying oven	01