DAE IN TEXTILE SPINNING TECHNOLOGY

Scheme of Studies

FIRST YEAR

			T	P	C
Gen	111	Islamiat/Pakistan Studies	1	0	1
Eng	112	English	2	0	2
Math	113	Applied Mathematics - I	3	0	3
Ch	112	Applied Chemistry	1	3	2
Phy	122	Applied Physics	1	3	2
Mech	163	Basic Engineering Drawing and CAD-I	1	6	3
TT	114(Rev.)	General Textile Technology	3	3	4
Comp	122	Computer Applications	1	3	2
ET	112	General Electricity & Electronics	1	3	2
TT	123(Rev.)	Workshop Practice	0	6	2
		(i) Metal			
		(ii) Welding			
		(iii) Wood			
		T o t a l:	**14**	**27**	**23**

SECOND YEAR

Gen	211	Islamiat/Pakistan Studies	1	0	1
Math	223	Applied Mathematics - II	3	0	3
Mgm	211	Business Communications	1	0	1
Mgm	221	Business Management & Industrial Economics	1	0	1
Phy	242	Applied Mechanics	1	3	2
TT	212(Rev.)	Textile Chemistry	1	3	2
TT	223(Rev.)	Fabric Design and Structure	2	3	3
TT	234(Rev.)	Spinning Weaving Mechanism	4	0	4
TT	243(Rev.)	Textile Calculation	3	0	3
TT	254	Textile Lab	0	12	4
		a) Spinning 0 - 6			
		b) Weaving 0 - 6			
TT	261	Technical Textile	1	0	1
		T o t a l:	**18**	**21**	**25**

THIRD YEAR

Gen	311	Islamiat/Pakistan Studies	1	0	1
Mgm	311	Industrial Management and Human Relations.	1	0	1
TT	314(Rev.)	Dyeing and Finishing	2	6	4
TT	323(Rev.)	Textile Testing and Quality Control	2	3	3
TT	332(Rev.)	Mill Engineering and Services	1	3	2
TS`	313(Rev.)	Special Project on Spinning	3	0	3
TS	323(Rev.)	Spinning Mechanism	3	0	3
TS	332(Rev.)	Cotton and Textile Yarn	2	0	2
TS	344	Spinning Lab	0	12	4
		T o t a l:	**15**	**24**	**23**

اسلامیات/مطالعہ پاکستان

		ٹی	پی	سی
حصہ اول اسلامیات	GEN III			
حصہ دوم مطالعہ پاکستان		1	0	1
موضوعات حصہ اول اسلامیات	سال اول	کل وقت: 20 گھنٹے		

کتاب و سنت

(ا) قرآن مجید

-1 تعارف قرآن مجید 2- نزول قرآن 3- مکی و مدنی سورتوں کی خصوصیات 4- وحی کی اقسام 5- پندرہ منتخب آیات مع ترجمہ

1.1 تنالوا البر حتی تنفقوا مما تحبون

1.2 واعتصموا بحبل اللّٰہ جمیعا" ولا تفرقو

1.3 ولا یجرمنکم شنان قوم علی ان لا تعدلوا

1.4 ان اللّٰہ یامرکم ان تودوا الامانات الی اھلھا

1.5 ان اللّٰہ یامر بالعدل والاحسان

1.6 ان الصلوتہ تنھی عن الفحشاء والمنکر

1.7 لقد کان لکم فی رسول اللّٰہ سوۃ حسنتہ

1.8 ان اکرمکم عند اللّٰہ اتقاکم

1.9 وما آتاکم الرسول فخرزوو مانھی عنھوا انتھوا

1.10 ولوفو بالعھد

1.11 وماشروھن بالمعروف

1.12 یمحق اللّٰہ الربوویر بی الصمدقات

1.13 واصبر علی ما اصابک

1.14 وقولو قولا سدیدا

1.15 ان الدین عند اللّٰہ السلام

(ب) سنت

-1 سنت کی اہمیت

-2 دس منتخب احادیث مع ترجمہ و تشریح

1- انما الاعمال بالنیات

2- انما بعثت لاتمم مکارم الاخلاق

3- لا یومن احدکم حتی یحب لاخیہ مایحب لنفسہ

4- المسلم من سلم المسلمون من لسانہ ویدہ

5- قل امنت باللہ ثم استقم

6- خیرکم خیرکم لاھلہ

7- سباب المسلم فسوق وقتالہ کفر

8- المومن اخو المومن

9- کل المسلم علی المسلم حرام بمعہ وماله وعرضه

10- ایتہ المنافق ثلاث اذا حدیث کذب واذا اوتمن خان واذا وعد اخلف

دین اسلام

2.1 اسلام کے بنیادی مقاصد کی وضاحت اور انسان کی انفرادی و اجتماعی زندگی پر ان کے اثرات

1- توحید

2- رسالت

3- آخرت

4- ملائکہ

5- آسمانی کتب

2.2 عبادات

1- نماز 2- روزہ 3- حج 4- زکوٰۃ

مندرجہ بالا عبادات کی اہمیت و فضیلت، مکمل اور انسان کی انفرادی و معاشرتی زندگی پر اس کے اثرات

حصہ اول

حصہ اسلامیات

تدریسی مقاصد

۱۔ قرآن مجید

عمومی مقصد: طالب علم یہ سمجھنے کے قابل ہو کہ اسلام کی تعلیمات کا اصل سرچشمہ قرآن مجید ہے

خصوصی مقاصد: طالب علم اس قابل ہو جائے گا کہ

- ☆ قرآن مجید کی تعریف کر سکے گا
- ☆ قرآن مجید کے نزول کی صورت بیان کر سکے
- ☆ قرآن مجید کی کی مدنی سورتوں کی پہچان کر سکے
- ☆ منتخب آیات کا ترجمہ و تشریح کر سکے

عمومی مقصد: یہ سمجھنے کے قابل ہو جائے گا کہ منتخب قرآنی آیات کے ذریعے اسلامی تعلیمات کا مفہوم کیا ہے

- ☆ قرآنی آیات کا ترجمہ تشریح کر سکے
- ☆ قرآنی تعلیمات کی روشنی میں اپنی اور معاشرتی اصلاح کر سکے

2۔ سنت

عمومی مقصد: طالب علم سنت نبوی کی اہمیت اور ضرورت کو اچھی طرح سمجھنے کے قابل ہو جائے گا

خصوصی مقصد:

- ☆ سنت کی تعریف بیان کر سکے
- ☆ سنت کی اہمیت و ضرورت کی وضاحت کر سکے
- ☆ سنت کی روشنی میں اسوہ حسنہ پر عمل کر سکے

3۔ منتخب احادیث نبویہ

عمومی مقصد: احادیث کی روشنی میں اخلاقی اقدار سے آگاہی حاصل کر سکے

خصوصی مقصد: احادیث کا ترجمہ و تشریح کر سکے

رسول اللہ ﷺ کے اسوۂ حسنہ کی پیروی کا جذبہ پیدا ہو سکے

دین اسلام

عمومی مقاصد: دین اسلام کے بنیادی مقاصد 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 مقاصد کی اہمیت بیان کر سکے

اسلام کے بنیادی مقاصد سے انسان کی انفرادی و اجتماعی زندگی پر پڑنے والے اثرات بیان کر سکے

عبادت کے لغظی و اصطلاحی معنی بیان کر سکے

عقیدے اور عبادت کا فرق بیان کر سکے

عبادات (نماز، روزہ، حج، زکوٰۃ) کے فوری اشکلات اور انسانی زندگی پر ان کی اثرات بیان کر سکے

اسلامی مقاصد و عبادات کے مطابق اپنی زندگی ڈھال کر ایک اچھا مسلمان بن سکے

(غیر مسلم طلباء کے لئے)

نصاب اخلاقیات سال اول GEN III

حصہ دوم مطالعہ پاکستان

ک	ع	ی
1	0	1

کل وقت-20 گھنٹے

موضوعات

اخلاقیات کی تعریف اور اہمیت

اخلاقیات کا معیار (قانون، عقل، الہی کتب)

مندرجہ ذیل اخلاق کی وضاحت

- ☆ دیانت داری
- ☆ وعدہ داری
- ☆ نظم و ضبط
- ☆ راست گوئی
- ☆ صبر و استقلال
- ☆ حوصلہ مندی
- ☆ وقت کی پابندی
- ☆ صفائی
- ☆ ایثار
- ☆ باہمی احترام
- ☆ مصلحت

نصاب اخلاقیات (سال اول)

تدریسی مقاصد

عمومی مقاصد: اعلیٰ اخلاق کی وجہ سے انکی ترقی میں کتنی قدر اضافہ کر سکے

خصوصی مقاصد: طالب اس علم سے اس قابل ہو گا 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 و ضبط 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 اختیار سے حسن کارکردگی کو بیان کر سکے
- ☆ مصلحت کے فوائد 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 - ذاتی، جماعتی اور ملکی غلامی کے متعلقات

☆ نظریہ پاکستان

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

☆ نظریہ پاکستان کا تاریخی پس منظر

محمد بن قاسم کی آمد، مجدد الف ثانی اور شاہ ولی اللہ کی تبلیغی خدمات سید احمد شہید کی تحریک مجاہدین

☆ تعلیمی تحریکیں

علی گڑھ - ندوۃ العلماء (لکھنؤ) - مدرسۃ الاسلام - (کراچی) اسلامیہ کالج (پشاور) انجمن حمایت اسلام (لاہور)

مطالعہ پاکستان (حصہ دوئم)

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 کے بیان کر سکے

☆ جسمانی غلامی قومی سطح پر نقصانات بیان کر سکے

نظریہ پاکستان

عمومی مقصد:

نظریہ پاکستان (دین اسلام) سے پوری طرح واقفیت 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 نظریہ پاکستان 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

- محمد بن قاسم کے ہندوستان پر حملہ کی وجہ بیان کر سکے
- محمد بن قاسم کے ہندوستان پر حملہ کے اثرات بیان کر سکے
- بیان کر سکے کہ ہندوستان میں ہندو مسلم دو قومی نظریہ کا نکتہ آغاز کیا ہے
- مجدد الف ثانیؒ کی علمی خدمات بیان کر سکے
- شاہ ولی اللہ کی علمی خدمات بیان کر سکے
- مجدد الف ثانیؒ اور شاہ ولی اللہ کے 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 - ندوت العلماء مدرسۃ السلام ، اسلامیہ کالج۔ انجمن حمایت اسلام نے تعلیم کے ذریعہ سیاسی شعور مسلمانوں میں پیدا کیا اسے بیان کر سکے
- آزادی ہند کے سلسلہ میں تحریک مجاہدین کی خدمات بیان کر سکے

Eng-112 ENGLISH

Total contact hours

	T	P	C
Theory	64		
Practical	0	2	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 hours**

1.1 First eight essays of Intermediate English Book-II

2 CLOZE TEST **4 hours**

2.1 A passage comprising 50-100 words will be selected from the text. Every 11th word 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 hours**

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 hours**

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 hours

5. TRANSLATION **6 hours**

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

RECOMMENDED BOOKS

1. Technical English developed by Mr. Zia Sarwar, Mr. Habib-ur –Rehman, Evaluated by Mr.Zafar Iqbal Khokhar, Mr. Zahid Zahoor, Vol - I, National Book Foundation

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 subject and a predicate.
3.2 State classification of time, i.e present, past and future and use verb tense correctly 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 PRACTICAL SITUATIONS

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 in practical 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 and sentences.

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 Standard Form
1.2 Solution
1.3 Nature of roots
1.4 Sum & Product of 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 Factors Case 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

Applied Mathematics Math-113, Developed by Nasir -ud-Din Mahmood, Sana-ullah Khan, Tahir Hameed, Evaluated by Syed Tanvir Haider, Javed Iqbal, Vol - I, National Book Foundation

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 solving the 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 TRIGONOMETRICFUNCTIONS

7.1 Define the basic trigonometric functions/ratios of an angle as ratios of the sidesof 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 TECHNOLOGICALPROBLEMS

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 SOLVINGTECHNOLOGICAL 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 OFMATRICES & 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

CH – 112 APPLIED CHEMISTRY

		T	P	C
Total Contact Hours	128			
Theory	**32 hours**	**1**	**3**	**2**
Practical	**96 hours**			

Pre-requisites: The student must have studied the subject of elective chemistry at secondary school level.

COURSE AIMS:

After 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 acquired with the basic principles of chemistry as applied in the study of relevant technology.
3. Know the scientific methods for production, and use of materials of industrial & technological significance.
4. Gains skill for the efficient conduct of Practical in a chemistry lab.

COURSE CONTENTS

1. INTRODUCTION AND FUNDAMENTAL CONCEPTS 2 Hours

Orientation with reference to this technology

Terms used & units of measurements in the study of chemistry

Chemical reactions & their types

2. ATOMIC STRUCTURE 2 Hours

Sub atomic particles

Architecture of atoms of elements. Atomic no. & atomic weight

The periodic classification of elements periodic law

General characteristics of a period and group

3. CHEMICAL BOND 2 Hours

Nature of chemical bond

Electrovalent bond with examples

Covalent bond (polar and non-polar, sigma & pie bonds with examples)

Co-ordinate bond with examples

4. WATER 2 Hours

Chemical nature and properties

Impurities

Hardness of water (types, causes and removal)

Scales of measuring hardness (degrees clark French, PPM, Mg- per liter)

Boiler feed water, scales and treatment

Sea water desalination, sewage treatment

5. ACIDS, BASES AND SALTS **2 Hours**

Definitions with examples

Properties, their strength, basicity and acidity

Salts and their classification with examples

Ph – value and scale

6. OXIDATION & REDUCTION **2 Hours**

The process, definition and examples

Oxidizing and reducing agents

Oxides and their classifications

7. NUCLEAR CHEMISTRY **2 Hours**

Introduction

Radioactivity (alpha, beta and gamma rays)

Half life process

Nuclear reaction and transformation of elements

8. CEMENT **2 Hours**

Introduction

Composition and manufacture

Chemistry of setting and hardening

Special purpose cements

9. GLASS **2 Hours**

Composition and raw material

Manufacture

Varieties and uses

10. PLASTICS AND POLYMERS **2 Hours**

Introduction and importance

Classification

Manufacture

Properties and uses

11. PAINTS, VARNISHES AND DISTEMPER **2 Hours**

Interoduction

Constituents

Preparation and use

12. CORROSION **2 Hours**

Introduction with causes

Types of corrosion

Rusting of iron

Protective measures against corrosion

13. REFRACTORY MATERIALS AND ABRASIVE **2 Hours**

Introduction to refractories

Classification of refractories

Properties and uses

Introduction to abrasives

Artificial and natural abrasives and their uses

14. ALLOYS **2 Hours**

Introduction with need

Preparation and properties

Some important alloys and their composition

Uses

15. FUELS AND COMBUSTION **2 Hours**

Introduction of fuels

Classification of fuels

Combustion

Numerical problems of combustion

16. LUBRICANTS **1 Hours**

Introduction

Classification

Properties of lubricants

Selection of lubricants

17. POLLUTION **1 Hours**

The problems and its dangers

Causes of pollution

Remedies to combat the hazards of pollution

INSTRUCTIONAL OBJECTIVES

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

Define chemistry and its important terms

State the units of measurements in the study of chemistry

Write chemical formula of common compounds

Describe types of chemical reactions with examples

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

Define atom

State the periodic law of elements

Describe the fundamentals sub atomic particles

Distinguish between atomic no. And mass no. Isotopes and isobars

Explain the arrangements of electrons in different shells and sub energy levels

Explain the grouping and placing of elements in the periodic table

3. UNDERSTAND THE NATURE OF CHEMICAL BOND

Define chemical bond

Describe the nature of chemical bond

Differentiate between electrovalent and covalent bonding

Explain the formation of polar and non polar, sigma and pi-bond with examples

Describe the nature of coordinate bond with examples

4. UNDERSTAND THE CHEMICAL NATURE OF WATER

Describe the chemical nature of water with its formula

Describe the general impurities present in water

Explain the causes and methods to removing hardness of water

Express hardness in different units like mg / liter, p.p.m, degrees clark and degrees French

Describe the formation and nature of scales in boiler feed water

Explain the method for the treatment of scales

Explain the sewage treatment and desalination of sea water

5. UNDERSTAND THE NATURE OF ACIDS, BASES AND SALTS

Define acids, bases and salts with examples

State general properties of acids and bases

Differentiate between acidity and basicity and use the related terms

Define salts, state their classification with examples

Explain p-h value of solution and ph-scale

6. UNDERSTAND THE PROGRESS OF OXIDATION AND REDUCTION

Define oxidation

Explain the oxidation process with examples

Define reduction

Explain reduction process with examples

Define oxidizing and reducing agents and give at least six examples of each

Define oxides

Classify the oxides and give examples

7. UNDERSTAND THE FUNDAMENTALS OF NUCLEAR CHEMISTRY

Define nuclear chemistry and fadio activity

Differentiate between alpha, beta and gama particles

Explain half life process

Explain at least six nuclear reactions resulting in the transformation of some elements

State important uses of isotopes

8. UNDERSTAND THE MANUFACTURE, SETTING AND HARDENING OF CEMENT

Define Portland cement and give its composition

Describe the method of manufacture

Describe the chemistry of setting and hardening of cement

Distinguish between ordinary and special purpose cement

9. UNDERSTAND THE PROCESS OF MANUFACTURE OF GLASS

Define glass

Describe its composition and raw materials

Describe the manufacture of glass

Explain its varieties and uses

10. UNDERSTAND THE NATURE AND IMPORTANCE OF PLASTIC AND POLYMERS

Define plastics and polymers

Explain the mechanism of polymerization

Describe the preparation and uses of some plastic / polymers

11. KNOW THE CHEMISTRY OF PAINTS, VARNISHES AND DISTEMPERS

Define paints, varnishes and distemper

State composition of each

State methods of preparation of each and their uses

12. UNDERSTAND THE PROCESS OF CORROSION WITH ITS CAUSES AND TYPES

Define corrosion

Describe different types of corrosion. State the causes of corrosion

Explain the process of rusting of iron

Describe methods to prevent / control corrosion

13. UNDERSTAND THE NATURE OF REFRACTORY MATERIALS ABRASIVE

Define refractory materials

Classify refractory materials

Describe properties and uses of refractory

Define abrasive

Classify natural and artificial abrasives

Describe uses of abrasives `

14. UNDERSTAND THE NATURE AND IMPORTANCE OF ALLOYS

Define alloy

Describe different methods for the preparation of alloys

Describe important properties of alloys

Enlist some important alloys with their composition, properties and uses

15. UNDERSTAND THE NATURE OF FUELS AND THEIR COMBUSTION

Define fuels

Classify fuels and make distinction of solid, liquid and gaseous fuels

Describe important fuels

Explain combustion

Calculate air quantities in combustion gases

16. UNDERSTAND THE NATURE OF LUBRICANTS

Define a lubricant

Explain the uses of lubricants

Classify lubricants and site examples

State important properties of oils, greases and solid lubricants

State the criteria for the selection of lubricant for particular purpose / job

17. UNDERSTAND THE NATURE OF POLLUTION

Define pollution (air, water, food)

Describe the causes of environmental pollution

Enlist some common pollutants

Explain methods to prevent pollution

Ch-112: APPLIED CHEMISTRY

LIST OF PRACTICALS 96 Hours

On completion of this course, the trainees will be able to;

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's 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_4.
11. Determination of Heat of Neutralization of NaOH and HCl.
12. Determination of Heat of Solution of C_2H_5OH and H_2O.
13. Determination of %age of O_2 in air.
14. Determination of %age of N_2 in air.
15. Determination of %age of CO_2 in air.
16. To get introduction with the methods/apparatus of conducting volumetric estimation.
17. To prepare standard solution of a substance.
18. To find the strength of a given alkali solution.
19. To estimate HCO_3^{-1} contents in water.
20. To estimate Cl^{-1} contents in water.
21. To estimate SO_4^{-2} contents in water.
22. To estimate total solids in water.
23. To find out the %age composition of a mixture solution of KNO_3 and KOH volumetrically.
24. To find out the amount of Na_2SO_4 and NaOH in their mixture with titration method.
25. To find the boiling point of Freon-12, or R-134a and Freon-22.
26. To find the density of Freon-12, or R 134a and Freon-22 with the help of sp. gravity bottle.
27. To prepare Ammonia gas in Laboratory and perform its tests.
28. To get introduction with the scheme of analysis of salts for basic radicals.
29. To analyse Ist group radials (Ag^{+1}, Pb^{+2}, Hg^{+1}).
30. To exercise Practice for detection of Ist group radicals.
31. To detect and confirm II-A group radicals (Hg^{+2}, Pb^{+4}, Cu^{+2}, Bi^{+3}, Cd^{+2})
32. To detect and confirm II-B group radicals (AS^{+3}, Sb^{+3}, $Sn^{+2, +4}$)

RECOMMENDED BOOKS

1. Text Book of Intermediate Chemistry (Part I and II)
2. Sh. Atta Mohammad, Ilmi Applied Science.
3. J.N. Reddy, Polytechnic Chemistry, Tata Mc-Graw Hill Co., New Delhi.
4. Qammar Iqbal, Chemistry for Engineers and Technologists.

Phy-122 APPLIED PHYSICS

Total Contact Hours

			T	P	C
Theory	:	32			
Practicals	:	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/technological courses and understand concepts to learn advance physics/technical courses.

COURSE CONTENTS

1 MEASUREMENTS. 2 Hours

- 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 Hours

- 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. 6 Hours

- 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 Hours

- 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 Hours

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 Hours

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 Hours

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 Hours

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 Tahir Hussain, Fundamentals of Physics Vol-I and II
2 Farid Khawaja, Fundamentals of Physics Vol-I and II
3 Wells and Slusher, Schaum's Series Physics .
4 Nelkon and Oyborn, Advanced Level Practical Physics
5 Mehboob Ilahi Malik and Inam-ul-Haq, Practical Physics
6 Wilson, Lasers - Principles and Applications
7 M. Aslam Khan and M. Akram Sandhu, 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 of forces
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 OF 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) $y=1/x$

2 Find the volume of a given solid cylinder using vernier callipers.

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.

11 Find the weight of a given body using principle of moments.

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 column in 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 lense 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.

Mech-163 BASIC ENGINEERING DRAWING & CAD-I

Total Contact Hours	T	P	C
Theory: 32Hrs	1	6	3
Practical: 192Hrs			

Pre-requisites: None

AIMS: At the end of this course the students will be able to understand the Fundamentals of Engineering Drawing used in the various fields of industry especially in the Mechanical Technology. The students will be familiarizing with the use of conventional drawing equipments as well as the modern techniques used for this subject. Also the will be familiarize with AutoCAD and will achieve ability to draw simple geometrical figures and two/three dimensional drawing of objects.

Detail Course Contents:

PART-A Manual Drawing 70%

1. Application of Technical Drawing **2Hrs**

1.1 Importance of Technical Drawing
1.2 Language of engineering terminology
1.3 Uses of Technical Drawing
1.4 Type of Drawing
1.5 Application of Technical drawing

2. Drafting Equipments, Construction Uses, and Care **1Hr**

2.1. Introduction and importance of drafting equipments
2.2. List of drawing equipments
2.3. Construction, uses and care of all equipment
2.4. Drafting board, Table and machine
2.5. Tee, Triangles and protractors
2.6. Instruments Box and its accessories
2.7. Drawing Pencil, their grading, sharpening and using techniques
2.8. Scale and its types

3. Types of Lines **1Hr**

3.1. Basic lines
3.2. Importance of lines
3.3. Common Types of lines
3.4. Uses and correct line weight age
3.5. Use of pencil for different lines
3.6. Application of lines
3.7. Objectives in drafting

4. Lettering **2Hrs**

4.1. Importance of a good lettering
4.2. General Proportion of lettering
4.3. Composition of letters
4.4. Guide lines
4.5. Classification of lettering
4.6. Style of letters
4.7. Lettering devices

5. Drafting Geometry **2Hrs**

5.1. Introduction to geometry, plane and solid type
5.2. Definition of terms
5.3. Different conventional shapes, surfaces and objects
5.4. Basic geometrical construction

6. Sketching and shape description **1Hr**

6.1. Introduction to sketching techniques
6.2. Techniques of sketching straight lines in different directions
6.3. Sketching circles and arcs
6.4. Sketching Ellipse
6.5. Sketching of pictorial views
6.6. Proportions in sketching

7. Engineering Curves **1Hr**

7.1. Introduction to the curve
7.2. Application of engineering curves
7.3. Cone and conic section
7.4. Spiral and Involutes
7.5. Cycloid, Epicycloids, Hypocycloid

8. Introduction to multi-view drawings **4Hrs**

8.1. Introduction to the plane and its types
8.2. Dihedral and Trihedral angles
8.3. Projection of point, lines, plane and solids
8.4. Definition and concept of multi-view drawings
8.5. Perceptual views of plan of projections
8.6. Orthographic projections
8.7. 1^{st} angle and 3^{rd} angle projection
8.8. Principal views and its arrangements
8.9. Multi-view drawings and missing lines

9. Introduction to Pictorial drawing **4Hrs**

9.1. Uses of pictorial /3D
9.2. Three types of pictorial views
9.3. Isometric sketching of rectangular block with Arcs and circles
9.4. Oblique sketching of rectangular block
9.5. One point perspective sketching of rectangular block
9.6. Two points perspective sketching of rectangular block
9.7. Preparation of pictorial drawings of simple objects

10. Basic Dimensioning **2Hrs**

10.1. Definition of dimensioning
10.2. Types of dimensioning
10.3. Elements of dimensioning
10.4. System of measurements
10.5. Dimensioning of multi view drawing
10.6. Dimensioning pictorial views
10.7. Dimensioning rules and practices
10.8. Note & specification

11. Introduction to multi-view drawings **2Hrs**

11.1. Introduction to the surface development
11.2. Role of development in Packaging Industry
11.3. Methods to develop the surfaces
11.4. Geometrical solids and development

PART- B AutoCAD Mechanical 2010 30%

12. Introduction of AutoCAD Mechanical 2010 2Hrs

12.1. User Interface
12.2. Template
12.3. Layers and Object
12.4. Mechanical Structure

13. Drawing and Edit 3Hrs

13.1. Object Snap
13.2. Drawing Command
13.3. Edit Command
13.4. Object Command

14. Layers 1Hr

14.1. Layers

15. Dimension and Symbols 2Hrs

15.1. Create Dimension
15.2. Edit Dimension
15.3. Create Symbols

16. Drawing Layout 2Hrs

16.1. Make Layout
16.2. Create Drawing Frame
16.3. Create Contents and Template

Recommended Textbooks:

1. Mechanical Drawing (12th Addition) by French. Svensen, Helsel and Urbanick
2. Drafting Fundamentals by scot. Foy, Schwendan
3. Engineering Drawing and Design 2nd addition by Cecil Jenson / Jay Helsel
4. Engineering Drawing by colinsimmous, Dennis Maguire
5. Technical Drawing by Frederik E. Alva. Henry Cecil
6. Text Book of machine Drawing by R.K. Dhawan
7. Engineer Drawing by M.B. Shah (B.C.Rana)
8. Autodesk OfficialTraining Courseware(AOTC) Volume1
9. Autodesk OfficialTraining Courseware(AOTC) Volume2

Mech-163 BASIC ENGINEERING DRAWING & CAD-I

Instructional Objectives:

1. **Know the application of Technical Drawing**
   - 1.1 Describe the technical drawing and its importance
   - 1.2 Describe the role of Inventor, Engineer, Designer, Technician, Craftsman etc.
   - 1.3 Describe the uses of drawing in manufacturing and construction fields
   - 1.4 Describe the free hand and instrumental drawing
     - 1.4.1 Explain the types of instrumental drawing
     - 1.4.2 Describe Multi-view, Pictorial and Schematic drawing
   - 1.5 Recognize the different application of technical drawing

2. **Know and use the common Drafting equipment and accessories**
   - 2.1 Explain the introduction and importance of drafting equipments
   - 2.2 Identify the different instruments used in drafting
   - 2.3 Describe the construction, uses and care of all equipments
   - 2.4 Describe the Drafting Board, Table and Drafting machine
   - 2.5 Explain the Tee, Triangles and Protractor
   - 2.6 Describe the Compasses Divider, Lengthening Bar, Attachments etc.
   - 2.7 Describe the use of pencils, their Grading and sharpening techniques
   - 2.8 Explain the scale and its different types

3. **Understand the Types of lines, correct weight age and their application in technical drawings**
   - 2.9 Describe the point, line and types of straight lines
   - 2.10 Describe the importance of lines
   - 2.11 Describe the common types of lines
   - 2.12 Identify the each line Characteristics
   - 2.13 Describe Horizontal, Vertical and inclined lines with proper grade pencil
   - 2.14 Describe each line with his correct weight
   - 2.15 Describe the objectives in drafting, Accuracy, Speed, Legibility and Neatness

4. **Applies the good lettering on a drawing**
   - 4.1. Know the importance of good lettering in Engineering drawing
   - 4.2. Know the general proportion of lettering such as normal, condensedand extended lettering
   - 4.3. Describe and Identify the composition of letters
     - 4.3.1. Perform the best spacing between letters and words
     - 4.3.2. State the size and stroke of a letter
   - 4.4. Describe the Gide lines
   - 4.5. Describe the Gothic, Roman and free hand lettering
     - **4.5.1.** Print single stroke, Double stroke lettering, Light face, Bold face lettering, Upper case, Lowe case lettering
   - 4.6. Print vertical and Inclined style of Gothic lettering
     - 4.6.1 State the proper pencil for lettering with holding techniques
     - 4.6.2 Describe the general rules for lettering
   - 4.7. Describe and use of different lettering devices such as lettering guide and lettering instrument

5. **Apply drawing skill with the aid of drawing instruments in geometrical construction**
   - 5.1 Define the concept of common terms used in Geometrical construction
   - 5.2 Explain different geometrical shapes, surfaces of objects

5.3 Bisecting a line, angles
5.4 Describe basic geometrical constructions
5.4.1 Define Triangles, Quadrilateral, Polygons
5.4.2 Name and draw the parts of circle

6. Understand sketching of circles, arcs and view of objects

1.1 Describe sketching material
1.2 State Sketching Technique of Horizontal, Vertical and inclined lines
1.3 Describe circular arc using circular line method
1.3.1 Draw a circular arc using square method
1.4 Draw an ellipse using rectangular method
1.5 Described the sketching of pictorial views
1.6 Proportions in sketching of views
6.6.1. Enlargement and Reduction

2. Know and draw the different Engineering Curves used in various mechanism

2.1 Describe the different engineering curves
2.2 Describe the application of different Engineering curves
2.3 Define cone and conic sections
7.3.1 Describe the Ellipse, Parabola & Hyperbola by different methods
2.4 Define the Archimedean Spiral and involutes
7.4.1 Define the Involutes curves of square, Triangle, Circle and Hexagon
2.5 Describe the Cycloid curves
7.5.1 Define Cycloid, Epicycloids and Hypocycloid curves

3. Understand the multi-view projections of specific object

3.1 Describe the plane and its types
3.2 Define Dihedral and Trihedral angles
3.3 Explain the projection of point, lines, plane and solids in different shapes
3.4 Define the concept of multi-view drawings
3.5 Knows Plane of projections
3.6 Know the orthographic method of projection
3.7 Explain the 1^{st} and 3^{rd} angle projections
3.8 State six principal views
3.9 Practice of multi-view projections and missing lines

4. Apply the use, types and methods of pictorial views

4.1 Describe the importance of pictorial views
4.2 State three types of pictorial drawings
4.3 Describe isometric view of rectangular blocks, arcs, circles
4.4 Describe oblique sketching of a rectangular blocks
4.5 Describe one point perceptive view of rectangular block
4.6 Describe two point perspective view of a rectangular block
4.7 Prepare/draw pictorial drawings of simple objects

5.Apply good dimensioning on multi-view and pictorial drawings

5.1 Define dimensioning
5.2 Identify the types of dimensioning
5.3 Enlist the elements of dimensioning
5.4 Identify the system of measurements
5.5 Indicate complete dimension on multi-view drawings
5.6 Indicate complete dimension on pictorial drawings
5.7 Follow the general rules of dimensioning
5.8 Indicate notes and specification or multi-view drawings

6. Know the surface development and their procedure to develop and its role in packing industry

- 6.1 Define the surface development
- 6.2 Explain the role of development in Packaging Industry
- 6.3 Describe the methods to draw the development
  - 6.3.1 Parallel line or Rectangle method
  - 6.3.2 Radial line or Triangle method
  - 6.3.3 Triangulation method
- 6.4 Define and draw the different Geometrical solids and their development

7. Introduction of AutoCAD Mechanical 2010

- 7.1 User Interface
- 7.2 Understand Template
- 7.3 Understand Layers and Object
- 7.4 Understand Mechanical Structure

8. Drawing and Edit

- 8.1 Understand the Object Snap
- 8.2 State the Drawing Command
- 8.3 Understand the Edit Command
- 8.4 Describe the Object Command

9. Layers

- 14.1. Describe the creation and modifying Layers

10. Dimension and Symbols

- 10.1 Understand createDimension
- 10.2 Understand createediting Dimension
- 10.3 UnderstandcreateSymbols

11. Drawing Layout

- 11.1 Understandcreation ofLayout
- 11.2 Understandcreation ofDrawing Frame
- 11.3 Understandcreation of Contents and Template

MECH-163 BASIC ENGINEERING DRAWING & CAD-I

List of Practical:

PART-A

1. Practice of single stroke capital vertical lettering on graph and drawing sheet
2. Practice of single stroke capital inclined lettering on graph and drawing sheet
3. Practice of single stroke capital vertical & inclined lettering
4. Double stroke lettering
5. Use of Tee-square and set squares for drawing horizontal, vertical and inclined lines
6. Use of compass, circles, half circles, radius
7. Use of Tee-square and compass for drawing of lines, centers, curves, and crossing of lines
8. Draw round corners, figure inside and outside circle
9. Construction of angles and triangles
10. Construction of quadrilaterals and circles elements
11. Construction of parallel-lines, perpendicular, bisects line, angles and equal division of lines
12. Construction of inscribe and circumscribe figures (square, triangle and hexagon)
13. Construction of pentagon by different methods
14. Construction of Hexagon, Octagon, by general and different methods
15. Construction of Tangents of circles (Inside & Outside)
16. Construction of Ellipse by four different methods
17. Construction of parabola curve by four different methods
18. Construction of hyperbola curve
19. Construction of Archimedean Spiral curve
20. Construction of involutes curve of square rectangle hexagon and circle
21. Construction of cycloid, epicycloids, and hypocycloid
22. Different types of drawing lines
23. Orthographic projection 1 and 3rd angle wooden block-1
24. Orthographic projection 1 and 3rd angle wooden block-2
25. Orthographic projection 1 and 3rd angle wooden block-3
26. Orthographic projection 1 and 3rd angle wooden block-4
27. Orthographic projection 1 and 3rd angle wooden block-5.
28. Orthographic projection and Isometric Drawing-I
29. Orthographic projection and Isometric Drawing-II
30. Orthographic projection and Oblique Drawing-I
31. Orthographic projection and Oblique Drawing-II
32. Construction of perspective drawings. (One point)
33. Construction of perspective drawings. (Two point)
34. Construction of multi view drawing of Gland
35. Construction of multi view drawing of Simple Bearing
36. Construction of multi view drawing of Open Bearing
37. Missing lines and portions on given views-I
38. Missing lines and portions on given views-II
39. Development of prism-I
40. Development of prism-II
41. Development of cylinder
42. Development of cone
43. Development of pyramid-I
44. Development of pyramid-II

PART-B

1. Starting AutoCAD Mechanical 2010
2. Title Bar, Tool Bar, Menu Bar, Browser, Status Bar, Command Line
3. Zoom, Pan, Orbit
4. Object Snap, Grid, Orthogonal
5. Layer and Object Property
6. Construction Line and Center Line
7. Save AutoCAD Mechanical 2010
8. Line and Poly line Command
9. Circle, Arc and Ellipse Command
10. Rectangular and Polygon Command
11. Dimension and Hatching
12. Text Command
13. Copy, Mirror Command
14. Offset Command
15. Move, Rotate and Scale Command
16. Trim and Extend Command
17. Join and Break Command
18. Fillet and Chamfer Command
19. Explode Command
20. Exercise of Basic Drawings
21. Exercise of Mechanical Drawings.

Mech-163 BASIC ENGINEERING DRAWING & CAD-I

Practical Objectives: PART-A

1. **Practice of single stroke capital vertical lettering on graph and drawing sheet**
   Upon completion of this activity the learner will be able to
   - 1.1 Draw the border line and title strip
   - 1.2 Construct the letters and numerals in correct shape and size using graph paper and drawing sheet
   - 1.3 Develop skill to letter in proper sequence of strokes
   - 1.4 Construct the letters and numerals in single stroke
   - 1.5 Draw guidelines and maintain spacing between letters and numerals

2. **Practice of single stroke capital inclined lettering on graph and drawing sheet**
   - 2.1 Develop the skill for border line and title strip
   - 2.2 Construct the letters and numerals in single stroke inclined at an angle of 67 ½ degree
   - 2.3 Draw guideline (horizontal and inclined) to maintain space between letters and numerals

3. **Practice of single stroke capital vertical & inclined lettering**
   - 3.1 Draw the border line and title strip
   - 3.2 Draw the parallel lines, vertical & inclined guide lines
   - 3.3 Construct the vertical and inclined letters and numerals and correct shape and size usinggraph sheets and drawing sheets
   - 3.4 Develop skills to letters in proper sequence of stroke

4. **Double stroke lettering**
   - 4.1 Draw the border line and title strip
   - 4.2 Draw the horizontal and vertical parallel lines
   - 4.3 Use smoothly Tee, set square and compass
   - 4.4 Draw the curves, semi circles and inclined lines
   - 4.5 Develop skills to double skill letters in proper shape and size
   - 4.6 Maintain the uniform thickness of letters and numerals

5. **Use of Tee-square and set squares for drawing horizontal, vertical and inclined lines**
   - 5.1 Draw the Horizontal and vertical lines
   - 5.2 Draw the inclined lines at any angle
   - 5.3 Develop the skill to construct the figures having Horizontal, vertical and inclined lines

6. **Use of compass, circles, half circles, radius**
   - 6.1 Draw the circles
   - 6.2 Draw the curves
   - 6.3 Develop the skill to construct the figures having circles, curves and different radii

7. **Use of Tee-square and compass for drawing of lines, centers, curves, and crossing of lines**
   - 7.1 Develop the skill for border line and title strip
   - 7.2 Draw the horizontal, vertical and inclined lines
   - 7.3 Develop the skill to construct the figures having circles, curves and different radii

8. **Draw round corners, figure inside and outside circle**
   - 8.1 Develop the skill for border line and title strip
   - 8.2 Draw the horizontal, vertical and inclined lines
   - 8.3 Develop the skill to construct the figures having circles, curves and different radii

9. **Construction of angles and triangles**
   - 9.1 Draw the different angles
   - 9.2 Draw the different triangles
   - 9.3 Develop the skill to use of drawing instruments

10. Construction of quadrilaterals and circles elements

10.1 Draw different types of quadrilaterals and circle elements
10.2 Develop the skill to use of drawing instruments

11. Construction of parallel-lines, perpendicular, bisects line, angles and equal division of line

1.1 Draw the lines parallel lines , arcs and triangles
1.2 Bisect the lines, angles and arcs
1.3 Develop the skill to use of drawing instruments

12. Construction of inscribe and circumscribe figures (square, triangle and hexagon)

1.1 Draw the inscribed square, triangle and hexagon
1.2 Draw the circumscribed square, triangle and hexagon
1.3 Develop the skill to use of drawing instruments

13. Construction of pentagon by different methods

13.1 Draw the pentagon by different methods
13.2 Develop the skill to use of drawing instruments
13.3 Develop the skill to divide the line in two and five equal parts

14. Construction of Hexagon, Octagon, by general and different methods

14.1 Draw the Hexagon by different methods
14.2 Draw the Octagon by different methods
14.3 Draw the polygon by general method 1
14.4 Draw the Pentagon, Hexagon, Heptagon, Octagon etc by the general method 2
14.5 Develop the skill to use of drawing instruments

15. Construction of Tangents of circles (Inside & Outside)

15.1 Draw the tangent of the circles internally and externally
15.2 Develop the skill to use of drawing instruments

16. Construction of Ellipse by four different methods

16.1 Develop the skill for border line and title strip
16.2 Construct the "Ellipse" by different methods

17. Construction of parabola curve by four different methods

17.1 Develop the skill for border line and title strip
17.2 Construct the "Parabola" by different methods

18. Construction of hyperbola curve

18.1 Draw the Hyperbola
18.2 Develop the skill to construct the curve

19. Construction of Archimedean Spiral curve

19.1 Construct the spiral
19.2 Develop the skill to construct the Archimedean Spiral curve

20. Construction of involutes curve of square rectangle hexagon and circle

20.1 Develop the skill to construct the geometrical figures and curves
20.2 Draw the involutes of circles, square, triangle and Hexagon

21. Construction of cycloid, epicycloids, and hypocycloid

21.1 Understand and draw the cycloid curves
21.2 Understand and draw the Epicycloids curves
21.3 Understand and draw the Hypocycloid curves

22. Different types of drawing lines

1.1 Draw the alphabet of lines
1.2 Identify the various lines used in engineering drawing
1.3 Draw the different grades, weight and shape of lines in mechanical engineering

drawing

23. Orthographic projection 1 and 3rd angle wooden block-1

23.1 Placement of views properly
23.2 Draw the orthographic views of simple block in first angle and third angle projection
23.3 Dimension the views

24. Orthographic projection 1 and 3rd angle wooden block-2

24.1 Draw the orthographic views of step block in first angle and third angle projections
24.2 Dimension and placement of views properly

25. Orthographic projection 1 and 3rd angle wooden block-3

25.1 Draw the orthographic views of given block in first angle and third angle projections
25.2 Understand the theory of first angle and third angle of projection
25.3 Understand the measurement on pictorial views

26. Orthographic projection 1 and 3rd angle wooden block-4

26.1 Draw the orthographic views of given block in first angle and third angle projections
26.2 Understand the dimension of views in first angle and third angle projection

27. Orthographic projection 1 and 3rd angle wooden block-5

27.1 Draw the orthographic views of given block in first angle and third angle projections
27.2 Understand the measurement on pictorial views

28. Orthographic projection and Isometric Drawing-I

28.1 Visualize multi-views and constructions of isometric drawing
28.2 Understand the steps for constructing isometric drawing
28.3 Constructing isometric drawing of simple objects

29. Orthographic projection and Isometric Drawing-II

29.1 Visualize views and select suitable direction for construction of isometric drawings
29.2 Construct isometric drawing using learned steps in previous activity
29.3 Identify the steps for isometric circles using four centre methods
29.4 Construct isometric circle in isometric drawings

30. Orthographic projection and Oblique Drawing-I

30.1 Visualize multi-views for constructions of oblique drawing
30.2 Understand the steps for constructing oblique drawing
30.3 Construct oblique drawing of simple objects

31. Orthographic projection and Oblique Drawing-II

31.1 Select view for drawing in true shape
31.2 Chose suitable angle for receding lines construct oblique drawing of objects having circular or irregular shapes

32. Construction of perspective drawings. (One point)

32.1 Understand and draw one point perspective of a simple object
32.2 Understand the Horizon, vanishing point, station point and picture plane
32.3 Understand and draw the projection lines for parallel perspective

33. Construction of perspective drawings. (Two point)

33.1 Understand and draw two point perspective of a simple object
33.2 Understand the Horizon, vanishing point, station point and picture plane
33.3 Understand and draw the projection lines for angular perspective

34. Construction of multi view drawing of Gland

34.1 Draw the three views of the gland
34.2 Understand the views detail
34.3 Show the interior detail of the object with hidden lines

35. Construction of multi view drawing of Simple Bearing

35.1 Draw the three view of simple bearing
35.2 Understand the interior constructions of simple bearing

36. Construction of multi view drawing of Open Bearing
36.1 Draw the three view of open bearing
36.2 Understand the interior constructions of open bearing

37. Missing lines and portions on given views-I
37.1 Understand the given views
37.2 Complete the missing views with the help of missing lines and views

38. Missing lines and portions on given views-II
38.1 Understand the given views
38.2 Complete the missing views with the help of missing lines and views

39. Development of prism-I
39.1 Identify prism and its terminology
39.2 Draw development of prism (Square Hexagon)

40. Development of prism-II
40.1 Identify prism and its terminology
40.2 Apply the procedure of parallel line development
40.3 Develop any right prism

41. Development of cylinder
41.1 Identify cylinder and its terminology
41.2 Develop the surface of cylinder

42. Development of cone
42.1 Identify the terminology of right cone
42.2 Develop the lateral surface of the cone

43. Development of pyramid-I
43.1 Identify the terminology of pyramid
43.2 Construct true length diagram
43.3 Develop the layout of right pyramid

44. Development of pyramid-II
44.1 Identify the terminology of pyramid
44.2 Construct true length diagram
44.3 Develop the layout of right pyramid

PART-B Auto-CAD-I

1. Starting AutoCAD Mechanical 2010
1.1 Understand starting AutoCAD Mechanical 2010

2. Title Bar, Tool Bar, Menu Bar, Browser, Status Bar, Command Line
2.1 Understand Title Bar, Tool Bar, Menu Bar, Browser, Status Bar, and Command Line

3. Zoom, Pan, Orbit
3.1 Understand Zoom, Pan, and Orbit

4. Object Snap, Grid, Orthogonal
4.1 Understand Object Snap, Grid, Orthogonal

5. Layer and Object Property
5.1 Understand Layer and Object Property

6. Construction Line and Center Line
6.1 Understand Construction Line and Center Line

7. Save AutoCAD Mechanical 2010
7.1 Understand Save AutoCAD Mechanical 2010

8. Line and Poly line Command
8.1 Perform Line and Poly line Command

9. Circle, Arc and Ellipse Command
9.1 Perform Circle, Arc and Ellipse Command

10. Rectangular and Polygon Command
10.1 Perform Rectangular and Polygon Command

11. Dimension and Hatching
11.1 Perform Dimension and Hatching

12. Text Command
12.1 Perform Text Command

13. Copy, Mirror Command
13.1 Perform Copy, Mirror Command

14. Offset Command
14.1 Perform Offset Command

15. Move, Rotate and Scale Command
15.1 Perform Move, Rotate and Scale Command

16. Trim and Extend Command
16.1 Perform Trim and Extend Command

17. Join and Break Command
17.1 Perform Join and Break Command

18. Fillet and Chamfer Command
18.1 Perform Fillet and Chamfer Command

19. Explode Command
19.1 Perform Explode Command

20. Exercise of Basic Drawings
20.1 Perform several exercises of Basic Drawings

21. Exercise of Mechanical Drawings
21.1 Perform several exercises of Mechanical Drawings

TT-114(Rev.) GENERAL TEXTILE TECHNOLOGY

T	P	C
3	3	4

TOTAL CONTACT HOURS:

Theory: 96 Hours

Practical: 32 Hours

Pre-Requisite:

1. To develop within the students necessary knowledge of the operations of textile industry.
2. To familiarize with different textile material.

TOPIC / SUB TOPIC:

1. CLASSIFICATION OF FIBERS **4 HOURS**

- 1.1 Introduction to General Textiles
- 1.2 Classification of Natural and Man Made fibers
- 1.3 Essential and desirable properties of textile fibers

2. COTTON: **9 HOURS**

- 2.1 History of cotton
- 2.2 Types of picking.
- 2.3 Varieties of cotton
- 2.4 Physical and chemical properties of cotton and uses

3. GINNING: **9 HOURS**

- 3.1 Introduction
- 3.2 Types of ginning.
- 3.3 Roller ginning.
- 3.4 Saw ginning.

4. JUTE: **3 HOURS**

- 4.1 Harvesting of jute.
- 4.2 Physical and Chemical properties of Jute and uses

5. WOOL: **6 HOURS**

- 5.1 Introduction
- 5.2 Types of wool
- 5.3 Physical and Chemical Properties of wool and uses

6. SILK: **6 HOURS**

- 6.1 Introduction.
- 6.2 Sericulture of silk.
- 6.3 Reeling and throwing of silk.
- 6.4 Physical and Chemical Properties of wool and uses

7. THE BASIC PRINCIPLES INVOLVED IN YARN: **12 HOURS**

- 7.1 Flow chart of spinning
- 7.2 Principle of Blow room.
- 7.3 Objectives of blow room.
- 7.4 Objectives of carding engine.

7.5 Objectives of Drawing frame.
7.6 Objectives of Lap former and Comber
7.7 Objectives of Roving frame.
7.8 Objectives of Ring machine.
7.9 Objectives of Winding

8. YARN NUMBERING SYSTEM: 6 HOURS

9.1 Yarn numbering.
9.2 Direct and Indirect system of numbering the yarn

9. THE BASIC PRINCIPLES INVOLVED IN FABRIC: 12 HOURS

9.1 Flow chart of weaving.
9.2 Study of weaving sections
9.3 Introduction of Knitting (Wales and courses).

10. WEAVE DESIGN: 5 HOURS

10.1 Definition of design.
10.2 Basic weaves.(Plain, Twill & Satin)

11. INTRODUCTION OF PRE-TREATMENT OF FABRIC: 6 HOURS

11.1 Flow chart of wet processing
11.2 Inspection of fabric
11.3 Shearing.
11.4 Singeing
11.5 De-sizing
11.6 Scouring
11.7 Bleaching
11.8 Mercerizing

12. DYEING: 6 HOURS

12.1 Introduction of dyeing.
12.2 Dyeing techniques, process and flow chart

13. PRINTING: 6 HOURS

13.1 Introduction of printing.
13.2 Printing techniques, process and flow chart

14. TECHNICAL TEXTILE 3 Hours

14.1 Introduction of technical textile and its application
14.2 Introduction to Non-woven textiles and its application
14.3 Introduction to textile composites and its application

REFERNCE BOOKS:

TEXTILES By Sara J. Kadolph
TEXTILES from fiber to fabric by Corbman
Hand book of technical textile Published by Textile Institute Manchester

TT-114(Rev.) GENERAL TEXTILE TECHNOLOGY

INSTRUCTION OBJECTIVES:

1. UNDERSTAND CLASSIFICATION OF FIBERS

1.1 Describe Textiles and its terms.
1.2 Draw the Flow chart of Natural and Man Made fibers
1.3 Describe essential and desirable properties of textile fibers

2. UNDERSTAND COTTON:

2.1 State history of cotton.
2.2 State the methods of cotton cultivation.
2.3 Explain the varieties of cotton.
2.4 Describe the types of picking of cotton.
2.5 Describe the physical and chemical properties of cotton and its uses.

3. UNDERSTAND THE PROCESS OF GINNING:

3.1 State the ginning process.
3.2 Explain the types of ginning processes.
3.3 Draw diagram of roller ginning machines.
3.4 Draw Diagram of saw ginning machines.
3.5 Explain working of saw ginning machine.
3.6 Explain working of roller ginning machine.

4. UNDERSTAND JUTE FIBER:

4.1 Understand jute fiber.
4.2 Explain the harvesting process of jute
4.3 Explain physical and chemical properties of jute fibers.

5. UNDERSTAND WOOL FIBRE:

5.1 Explain the uses of wool fibers.
5.2 Explain the types of wool fibers.
5.3 Explain the physical and chemical properties of wool and uses

6. UNDERSTAND SILK:

6.1 Explain physical and chemical properties of silk.
6.2 Describe the life cycle of silk worm.
6.3 Differentiate between reeling and throwing of silk.
6.4 Describe the physical and chemical properties of silk and uses.

7. UNDERSTAND YARN MANUFACTURING:

7.1 Draw the flow chart of blow room.
7.2 State the working of blow-room.
7.3 Define the objectives of blow-room.
7.4 Explain the lap formation in blow-room.
7.5 Sketch diagram of blow-room line
7.6 State the objectives of carding machine.
7.7 Sketch the diagram of carding engine.
7.8 Explain the objectives of drawing frame.
7.9 Draw a diagram of drawing frame.
7.10 State objectives of lap former.
7.11 Describe the working of lap former.

7.12 State objectives of comber frame.
7.13 Describe the working of comber
. 7.14 State objectives of roving frame.
7.15 Describe the working of roving frame.
7.16 Sketch a diagram of roving frame.
7.17 Explain modifications of roving frame.
7.18 Define the objectives of ring frame
7.19 Explain the objectives of winding.

8. UNDERSTAND YARN NUMBERING SYSTEMS:

8.1 Explain the yarn numbering system.
8.2 Define and explain direct and indirect yarn numbering systems in details.

9. UNDERSTAND FABRIC MANUFACTURING:

9.1 Draw the flow chart of weaving
9.2 Explain warping
9.3 Explain sizing
9.4 Explain drawing-in
9.5 Explain looming
9.6 Define drafting and lifting

10. UNDERSTAND WOVEN DESIGN STRUCTURE:

10.1 Define graph paper used in woven design structure.
10.2 Explain design structure.

11. UNDERSTAND PRE-TREATMENT PROCESS IN GENERAL:

11.1 Draw the flow chart of wet processing
11.2 Define inspection of fabric
11.3 Explain shearing process
11.4 Define de-sizing process
11.5 Explain scouring of cotton fabric
11.6 Explain types of bleaching.
11.7 Discuss objectives of bleaching.
11.8 Define mercerizing.

12. UNDERSTAND TO THE DYING PROCESS:

12.1 Explain dyeing process.
12.2 Enlist dyeing types
12.3 Explain dyeing techniques, printing process and flow chart

13. UNDERSTAND PRINTING PROCESSES:

13.1 Explain the printing process.
13.2 Enlist printing types.
13.3 Draw a flow chart of composite textile mill.

14. TECHNICAL TEXTILE **3 Hours**

14.1 Define and explain in detail technical textile and its application
14.2 Define and Explain non-woven textile and its application.
14.3 Define and explain textile composites and it's application

TT-114(Rev.) GENERAL TEXTILE TECHNOLOGY

Contact Hours: **Practical : 32**

LIST OF PRACTICALS:

1. Study of Cotton Lap.
2. Calculate weight per unit length of lap.
3. Familiarization with running of Card Machine.
4. Loading of Lap on Card Machine.
5. Study of Card Web.
6. Study of Card Sliver.
7. Calculate weight per unit length of sliver.
8. Familiarization with running of Drawing Frame.
9. Study of Drawing Frame Sliver.
10. Comparison between Carded Sliver and Drawn Sliver.
11. Study of warping process
12. Study of Sizing process
13. Study of Drawing-in process.
14. Familiarization with weavers knot.
15. Familiarization with loom operations.
16. Study of Counting of Healds, droppers and its types
17. Study of Counting of Reed dents.
18. Study of fabric construction
19. Desizing (Enzyme) of dry woven fabric.
20. Scouring and Bleaching of cotton fabric
21. Dyeing of cotton fabric with reactive dyes.
22. Pigment printing on cotton fabric.

Comp-122 COMPUTER APPLICATIONS

Total contact hours				
Theory	32 Hours	T	P	C
Practicals	96 Hours	1	3	2

Pre-requisite None

AIMS This subject will enable the student to be familiar with the operation of a Micro-computer. He will also learn DOS, BASIC language and word processing to elementary level.

COURSE CONTENTS

1. ELECTRONIC DATA PROCESSING (EDP) 6 Hours

1.1 Basics of computers
1.2 Classification of computers
1.3 Block diagram of a computer system
1.4 Binary number system
1.5 BIT, BYTE, RAM, ROM, EROM, EPROM
1.6 Input and output devices
1.7 Secondary storage media details
1.8 Processors and types
1.9 Using computer for system software
1.10 Using computers for application software.
1.11 Common types of software and their application.

2. DISK OPERATING SYSTEM (DOS) 6 Hours

2.1 Internal commands
2.2 External commands
2.3 Batch files
2.4 Advance features.

3. BASIC LANGUAGE 10 Hours

3.1 Introduction to high level languages
3.2 Introduction to BASIC
3.3 REM Statement
3.4 Assignment statement
3.5 Input statement
3.6 Read-Data statement
3.7 IF-THEN statement
3.8 IF-THEN Else statement
3.9 FOR-NEXT statement
3.10 DIM statement
3.11 L PRINT statement
3.12 STOP statement
3.13 END statement
3.14 Logic of a BASIC Programme
3.15 Running a BASIC Programme
3.16 Saving and Retrieving a Programme
3.17 Advance features

4. WORD PROCESSING 7 Hours

4.1 Starting word processor session
4.2 Opening a document
4.3 Saving a document
4.4 Ending word processor session (Temporarily)
4.5 Retrieving a document
4.6 Spell check
4.7 Margins and tab setting
4.8 Aligning Paragraph
4.9 Printing a document
4.10 Advance features

5. COMPUTER GRAPHIC IN BASIC **3 hours**

5.1 Graphic fundamentals
5.2 Points and lines
5.3 Dots in space
5.4 A lightening blot
5.5 Shapes
5.6 Expanding circles and rectangles

RECOMMENDED BOOKS

1. Ron S. Gottfrid, Programming with BASIC,
2. Any Word Processor Latest Release (e.g., Word, Word-Perfect etc).
3. ABC'S of DOS (latest release).
4. Judd Robbins, Mastering DOS 6.0 and 6.2

Comp-122 COMPUTER APPLICATIONS

INSTRUCTIONAL OBJECTIVES

1. UNDERSTAND ELECTRONIC DATA PROCESSING (EDP).

1.1 Describe basics of computers.
1.2 Enlist different classification of computers.
1.3 Explain block diagram of a computer system.
1.4 Describe binary number system.
1.5 State the terms used in computers such as BIT, BYTE, RAM, ROM, EROM, EPROM.
1.6 Identify input and output devices.
1.7 Describe secondary storage media.
1.8 Explain processor.
1.9 Name different types of processors.
1.10 Explain the use of computer for system software.
1.11 Explain the use of computer for application software.
1.12 Enlist common types of software and their application.
1.13 Explain various application of above softwares mentioned in 1.12

2. UNDERSTAND DISK OPERATING SYSTEM (DOS).

2.1 Explain the use of various internal command of DOS.
2.2 Explain the use of various external command of DOS.
2.3 Describe batch files.
2.4 Identify advanced features

3. UNDERSTAND BASIC LANGUAGE.

3.1 Explain high level languages.
3.2 Explain Basic language.
3.3 Describe Rem statement
3.4 Describe assignment statement
3.5 Explain Input statement
3.6 Explain Read-Data statement
3.7 Explain If-Then Statement
3.8 Explain If-then-Else Statement
3.9 Explain For-Next Statement
3.10 Explain DIM Statement
3.11 Explain LPRINT statement
3.12 Explain stop statement
3.13 Explain end Statement
3.14 Describe Logic of Basic program
3.15 Describe running a Basic Program
3.16 Describe saving & retrieving Basic Program
3.17 Describe some Advance features of Basic program

4. UNDERSTAND WORD PROCESSING SESSION

4.1. Describe word-processing
4.2 Name command to be entered on Dos-prompt to load word-processor
4.3 Identify initial screen
4.4 Describe the command to open a document

4.5 Describe the procedure for naming the document
4.6 Explain importance of giving extension to a document
4.7 Describe saving and retrieving a document
4.8 Explain importance of saving the work at regular intervals
4.9 State temporarily Ending word-processing session & document retrieval
4.10 State procedure to re-enter word processor
4.11 State procedure to re-open the document and editing
4.12 Describe spell-check facility
4.13 Describe Margins & Tab Setting
4.14 Describe to align paragraph
4.15 Describe Re-editing techniques
4.16 Describe procedure to set-up printer
4.17 Describe command for printouts
4.18 Explain multiple-copy printout procedure
4.19 Explain some advance features
4.20 Describe procedure of condensed printing
4.21 Describe procedure for change of fonts

5. UNDERSTAND PROGRAMMING INSTRUCTIONS FOR COMPUTER GRAPHIC IN BASIC LANGUAGE

5.1 Identify graphic fundamentals in basic language
5.2 Explain to draw points and lines
5.3 Explain to draw dot in space
5.4 Explain to draw lighting blot
5.5 Explain to draw shapes
5.6 Explain to draw expanding circles and rectangles

Comp-122 COMPUTER APPLICATIONS

LIST OF PRACTICALS **96 hours**

DOS

1 Identify key board, mouse, CPU, disk drives, disks, monitor & printer
2 Practice for booting up of a computer system with DOS system disk and power off system at DOS prompt
3 Practice for CLS, VER, VOL, DATE & TIME commands
4 Practice for COPY, REN commands
5 Practice for DEL, TYPE, PATH, PROMPT, COPY CON, MD, CD, RD commands
6 Practice of the practicals at S. No. 3, 4, 5
7 Practice for FORMAT command with /s, /4, /u switches
8 Practice for DISKCOPY, DISKCOMP commands
9 Practice for SCANDISK, XCOPY, DELTREE, TREE, LABEL commands
10 Practice for PRINT, UNDELETE commands
11 Practice for the practicals at S. No. 8, 9, 10, 11
12 Practice for creating a batch file

BASIC

1 Practice for loading & unloading BASIC software and identify role of function keys in Basic
2 Identify role of various keys in continuation with ALT key in BASIC programming
3 Practice for CLS, LOAD, SAVE, FILE, RENUM command by loading any existing BASIC Program
4 Practice for editing any existing BASIC Program
5 Prepare BASIC Program to display sum of two numbers using INPUTS
6 Prepare BASIC Program to display sum of two numbers using READ-DATA
7 Prepare BASIC Program to multiply two numbers
8 Prepare BASIC Program to calculate Area of Rectangle, when length and width are given
9 Prepare BASIC Program to calculate area of a circle when radius/diameter is given
10 Prepare very simple BASIC Programs using IF-THEN-ELSE and FOR-NEXT statement
11 Identify DIM statement
12 Practice for LPRINT statement for various Programs hard-copy output

WORD PROCESSING

1 Practice for loading & unloading a word processor
2 Practice for creating document & saving it
3 Practice for spell-check facility of the word-processor
4 Practice for editing an existing document
5 Practice for various word-processing Menu Options
6 Practice for printing a document
7 Practice for margin and TAB setting and document alignment
8 Practice for some advance features

ET-112 GENERAL ELECTRICITY AND ELECTRONICS

T	P	C
1	3	2

CONTACT HOURS:

Theory: 32

Practicals 96

Pre-Requisite: Engg. Physics 1st year

1. This course enables the students to understand the fundamental of electricity know the devices used for control of industrial equipments, their properties and uses. The course provide the knowledge of working principles and operation of A.C. and D.C. motors, transformers and generators, interpret connection diagrams of various electrical devices. Students will be able to observe safety rules and provide electric shock treatment.

CONTENTS:

1. FUNDMENTALS OF ELECTRICITY: 3 HOURS

1.1 Current voltage and resistance, their units.
1.2 Ohms law simple calculations.
1.3 Laws of resistance simple calculations.
1.4 Combinatin of resistances simple calculations.
1.5 Electrical and mechanical power, their conversion, units, horse power.
1.6 Heating effect of current joules law.
1.7 Electrical energy, units, energy bill.
1.8 Thermal relay.

2. FUNDAMENTALS OF ELECTRO MAGNETISM: 5 HOURS

2.1 Magnetism, units, theory of magnetism.
2.2 Permeability. Ferro magnetic materials.
2.3 Electromagnetism, fields around current carrying – conductors, coils, Fleming's right hand rule.
2.4 Force on current – carrying conductor lying in magnetic field left hand rule.
2.5 Farady's laws of electro magnetic induction, basic AC generator.
2.6 Self and mutual induction, elementary transformer.
2.7 Magnetic relays and connectors.

3. MOTORS, GENERATORS AND TRANSFORMERS 5 HOURS

3.1 Construction and working of AC and DC generators.
3.2 Construction and working of transformers, emf and current equation types.
3.3 Welding transformers, ratings.
3.4 Types and working of AC motors.
(i) 1 – Phase induction motor
(ii) 3 – Phase induction motors
3.5 Principle of Induction heating, construction, ratings of induction furnaces.

4. BATTERIES AND CELLS: 2 HOURS

4.1 Types of cells, primary, secondary.

4.2 Types of secondary cells, voltage ratings.
4.3 Charging and discharging of lead acid battery.
4.4 Precautions in handling batteries.
4.5 Alkaline batteries, ratings.

5. FUNDAMENTALS OF ELECTRONI S **4 HOURS**

5.1 Semiconductor theory, doping, P & N type materials.
5.2 PN Junction diode, potential barrier, forward and reverse bias.
5.3 Use of PN Diode as rectifier.
5.4 Half-wave, full-wave and bridge rectifiers.
5.5 Filtering.

6. TRANSISTORS: **5 HOURS**

6.1 PNP & NPN transistors, biasing, working.
6.2 Use of transistors as amplifies, gains in CE, CB and CC amplifiers.
6.3 Fieldd effect transistors, construction and uses.
6.4 Transistors as oscillators.

7. SPECIAL PURPOSE DIODES AND DEVICES: **5 HOURS**

7.1 Zener, diodes, uses, ratings.
7.2 Photodiods, uses
7.3 DIAC, uses
7.4 TRIAC, uses
7.5 Saturable core reactor

8. THYRISTORS: **3 HOURS**

8.1 UJT, working uses as oscillators.
8.2 SCR, working, uses as control devices
8.3 Phase control of SCR's.

ET-112 GENERAL ELECTRICITY AND ELECTRONICS

INSTRUCTIIONAL OBJECTIVES:

1. UNDERSTAND BASIC CONCEPTS AND LAWS OF ELECTRICITY:

1.1 Define units of current voltage and resistance.
1.2 Explain Ohm's Law.
1.3 Solves simple problems on Ohm's laws.
1.4 Substitute two of the three variables to find the third unknown in equation V = JR.
1.5 Calculate the equivalent resistances for resistors joined in series.
1.6 Calculate electrical and mechanical power and the interrelation between the two systems.
1.7 Calculate the electrical energy consumption in an installation and prepare the energy bill.
1.8 State the action of different types of thermal relays.

2. UNDERSTAND FUNDAMENTAL CONCEPT OF ELECTROMAGNETISM:

2.1 State molecular theory of magnetism
2.2 Define various units involving magnetism
2.3 State the magnetic properties of materials and permeability.
2.4 State the magnetism associate with current carrying conductors and coils.
2.5 State Flemings right hand rule.
2.6 Explain the force experienced by the current carrying conductors in magnetic fields according to Flemings right hand rule.
2.7 State Farady's laws of electro magnetic induction.
2.8 Explain the production of A.C. in a simple coil rotating in a uniform magnetic field.
2.9 State the self induction in a coil and the mutually induced voltage in a nearby coil due to fuse linkage.
2.10 Explain the working of magnetic relays and Contactors.

3. UNDERSTAND WORKING OF ELECTRIC MOTORS AND GENERATORS AND TRANSFORMERS:

3.1 State the main parts of D.C. Electric Motors and D.C. generator.
3.2 State the construction of Alternator.
3.3 State the construction of three phase induction motor and single phase induction motors.
3.4 Explain the working principal of transformers.
3.5 State various parts of a transformer.
3.6 State the emf equation of transformer and transformation ratio equation.
3.7 Explain the working of transformer specially designed for welding purpose and its settings.
3.8 Explain the working of different types of electric furnaces.
3.9 Explain the working of electric spot welding machine.

4. UNDERSTAND THE ELECTRO CHEMICAL EFFECT AND ITS APPLICATION IN VARIOUS TYPES OF BATTERIES AND CELLS:

4.1 Define the primary and secondary cells.
4.2 State different types of secondary cells and their voltage battery.
4.3 Explain the method of charging of a lead Acid battery.

4.4 Enlist the precautions in handling batteries.
4.5 State the construction of Alkaline Batteries and their ratings.

5. UNDERSTAND THE FUNDAMENTALS OF ELECTRONICS:

5.1 State the Semi conductor theory.
5.2 State how type P type and N type material is produced.
5.3 State the action of potential barrier in a P.N junction and the effect of forward and reverse bias on the junction.
5.4 Draw the circuit diagram for half wave and full wave rectifier.
5.5 Draw the Bridge Rectifier circuit with filter circuit.

6. UNDERSTAND THE WORKING OF BIPOLAR JUNCTION TRANSISTOR AND F.E.T. TRANSISTOR

6.1 State the biasing working of N.P.N. and P.N.P. type of transistor.
6.2 Draw the circuit indicating the method of biasing the NPN and PNP transistors.
6.3 Draw the different types of amplifier connections (C.E., C.B., C.C.).
6.4 State the working of field effect transistors.
6.5 Enlist the comparative properties and usage of two types of transistor (bipolar verses F.E.T.).
6.6 State the working of a transistor Oscilator and draw its circuit diagram.

7. UNDERSTAND THE WORKING OF SPECIAL PURPOSE DEVICES:

7.1 State the working of zanier diode.
7.2 Draw the connection for a practical regulated power supply.
7.3 State the working of photodiode and its uses.
7.4 State the working of DIAC and its uses.
7.5 State the working of TRIAC and its uses.
7.6 State the working of saturable core reactor and its use.

8. UNDERSTAND THE APPLICATION OF THYRISTORS IN CONTROL CIRCUITS:

8.1 Explain the working of Unijunction transistor and its use as an Oscillator.
8.2 Draw circuit of a UJT relaxation oscillator.
8.3 Explain the working of silicon controlled rectifier and its use as a control device.
8.4 Explain the phase control with the help of S.C.R. for A.C. Loads.
8.5 Draw circuits using phase control by SCR's.

ET-112 GENERAL ELECTRICITY AND ELECTRONICS

LIST OF PRACTICAL: **96 HOURS**

1. Study of electrical measuring instruments handling precautions method of connection.
2. Verification; of Ohm's law.
3. Verification of laws of combination of resistance.
4. Measurement of power by Volt-ammeter and wattmeter.
5. Measurement of energy.
6. Study of thermal and magnetic relays/Contactors.
7. Study of magnetic fields due to current-carrying conductors coils.
8. Verification of faraday's laws of electro-magnetic induction.
9. Verification of self and mutual induction.
10. Study of magnetic relays.
11. Study of AC and DC generators, voltage build-up-Excitation.
12. Study of transformers, determination of voltage ratio.
13. Study of welding transformers.
14. Starting single-phase induction motors, reversal.
15. Starting 3-phase induction motors. Reversal.
16. Connections of magnetic starters with motors.
17. Connections of 30 point (forward-stop-reverse) starters.
18. Study of Induction furnaces, their controls.
19. Study of Primary and secondary cells.
20. Charging of lead acid Batteries, safety precautions, preparation of electrolyte.
21. Study and connections of PN diodes as rectifiers.
22. Connecting PN Diode as half-wave and full-wave.
23. Connecting PN Diode as bridge Rectifiers with filter.
24. Study connections and biasing of PNP and NPN transistors.
25. Determination of current and voltage gains of CE amplifier.
26. Study and connections of zener diode as voltage regulator.
27. Study and connections of Photodiode as light sensing device.
28. Study and connections of DIAC's and TRIAC's as switch circuits.
29. Determination of intrinsic stand-off ratio of UJT.
30. Connections of UJT as relaxation Oscillator.
31. Study and connections of SCR as a power switch.
32. Study of phase control of SCR's.

RECOMMENDED BOOKS:

1. Examples of electrical Calculations by Admiralty.
2. Reed's Basic electro-technology for marine engineers. KRAAI.
3. Electrical Technology, B.L. Theraja.
4. AC & DC circuits B. Grob
5. Basic Electronics B. Grob.

TT-123(Rev.) WORKSHOP PRACTICE (METAL, WELDING, WOOD)

T	P	C
0	6	2

TOTAL CONTACT HOURS: 192 Hrs.

Theory: 0

Practicals 192 Hrs.

LIST OF PRACTICALS:

(A) METAL SHOP **32 Hours**

1. Preparation of name plate.
2. Sawing exercise.
3. Preparation of inside caliper.
4. Preparation of Bottle opener.
5. Preparation of dove-tail joint.
6. Preparation of small size Try-square.
7. Preparation of Coat hook.
8. Preparation of funnel (sheet)
9. Preparation of Pin tray (sheet).
10. Preparation of Drawer handle.
11. Preparation of bevel square.
12. Preparation of Spanner (small size).

(B) WELDING SHOP **96 Hours**

1. Describe Welding and its process
   - 1.1. Gas Welding
   - 1.2. Arc Welding
   - 1.3. Spot Welding
   - 1.4. Tig and Mig Welding
2. Flame making practice.
3. Pool making.
4. Bed making.
5. Welding Joint
   - 5.1. Butt joint.
   - 5.2. Lap joint.
   - 5.3. T. joint.
   - 5.4. Edge joint.
6. Corner Joint without filler Rod
7. Corner Joint with filler Rod
8. Brazing practice.
9. **ARC WELDING:**
   - 9.1. Arc making/current setting/polarity selection.
   - 9.2. Bed making.
   - 9.3. Butt joint.
   - 9.4. V. Butt joint.
   - 9.5. Lap joint.
   - 9.6. Corner joint.
   - 9.7. T. joint.
   - 9.8. Square corner joint.

9.9. Bevel butt joint.

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10. **FORGING:**

10.1 Forging and its processes
10.2 Describe forging and its operations
10.3 Materials costing
  10.3.1 Aluminum, Ferrous, Brass and steel alloys
  10.3.2 Pattern making
10.4 Cutting with chisel hot and cold.
10.5 Upsetting.
10.6 Twisting.
10.7 Heading.
10.8 Drawing by forging.

(C) Wood Working Shop **64 hours**

1. Safety precautions in wood working shop.
2. Using of various wood working tools
3. Planning and squaring to dimensions. (Job-1)
4. Introducing different wood working, layout and measuring tools.
5. Sawing exercise (job-2).
6. Identifying different types of handsaws and making sketches of all saws.
7. Wood chiseling.
8. Making middle half cross-lap joint. (job-3).
9. Making `mortise and tanon joint. (job-4).
10. Making dado-joint (job-5).
11. Observing wood structure.
12. Identifying and comparing soft and hard wood.
13. Boring process, making holes of different diameters in wood. (job-6)
14. Nailing and wood screwing process. (job-7+8)
15. Making dove-tail joint. (job-9)
16. Wood working projects.
17. Spirat polishing (preparing wood surface for polishing, staining and lacquering).

2nd Year

اسلامیات / مطالعہ پاکستان

نصاب (سال دوئم)	GEN 211	ٹی	پی	سی
حصہ اول اسلامیات		1	0	1
حصہ دوم مطالعہ پاکستان		کل وقت: 20 گھنٹے		

موضوعات

1- سورۃ المؤمنون ایک تا گیارہ آیات کا مع ترجمہ

2- دس منتخب احادیث مع ترجمہ و تشریح

☆ خیرکم من تعلم القرآن وعلمه

☆ لا ایمان لمن لا امانة له ولا دین لمن لا عهد له

☆ وایاکم والظن ان الظن اکذب الحدیث

☆ من احدث فی امرنا ہذا ما لیس منه فهو رد

☆ من حمل علینا السلاح فلیس منا

☆ انا وکافل الیتیم فی الجنة

☆ لا ضرر ولا ضرار فی الاسلام

☆ کلکم راع وکلکم راع وکلکم مسئول عن رعیته

3- سیرۃ طیبہ

☆ مکی زندگی۔ ولادت۔ بعثت۔ ہجرت

☆ مدنی زندگی۔ مواخات۔ میثاق مدینہ۔ فتح مکہ (اسباب و نتائج)

4- حضور ﷺ بحیثیت

☆ خطبہ حجۃ الوداع

معلم کامل، سربراہ خاندان

5- اسلامی معاشرہ

نظام تعلیم اور اس کے مقاصد۔ عدل و انصاف۔ امر بالمعروف۔ نہی عن المنکر

جہاد۔ کسب حلال۔ مسجد (اہمیت و فضیلت)

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

تدریس مقاصد

عمومی مقاصد بطالبعلم یہ جان سکے کہ آیات قرآنی کی روشنی میں مومن کے اوصاف کیا ہیں

قرآن مجید — منتخب آیات قرآنی

خصوصی مقاصد:

☆ قرآنی آیات کا ترجمہ بیان کر سکے
☆ قرآنی آیات کی تشریح کر سکے
☆ قرآنی آیات کی روشنی میں ایک مومن کے اوصاف بیان کر سکے
☆ قرآنی آیات میں بیان کردہ مومن کے اوصاف اپنے اندر پیدا کر سکے

احادیث نبویہ

☆ عمومی مقصد احادیث کی روشنی میں اسلامی اخلاقی اقدار (انفرادی و اجتماعی) سے آگاہ ہو سکے

خصوصی مقاصد:

☆ احادیث کا ترجمہ بیان کر سکے
☆ احادیث کی تشریح کر سکے
☆ احادیث کی روشنی میں اسلام کی اخلاقی اقدار کی وضاحت کر سکے
☆ ان احادیث کی دی گئی تعلیمات کے مطابق اپنی زندگی گزار سکے

سیرت طیبہ

☆ عمومی مقصد: حضور ﷺ کی سیرت طیبہ کے بارے میں جان سکے

خصوصی مقاصد:

☆ حضور ﷺ کی ابتدائی زندگی اختصار کے ساتھ بیان کر سکے
☆ حضور ﷺ کی ہجرت کا واقع بیان کر سکے
☆ حضور ﷺ کی مدنی زندگی اختصار سے بیان کر سکے
☆ حضور ﷺ کی بطور معلم خصوصیات بیان کر سکے

☆ حضور ﷺ کی بطور سربراہ خاندان بیان کر سکے

اسلامی معاشرہ

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

خصوصی مقاصد:

☆ اسلامی معاشرہ کا معنی و مفہوم بیان کر سکے

☆ اسلامی معاشرہ کی امتیازی خصوصیات بیان کر سکے

☆ اسلامی معاشرہ میں عدل و احسان کی اہمیت بیان کر سکے

☆ تبلیغ کے لغوی معنی بیان کر سکے

☆ تبلیغ کی اہمیت و ضرورت بیان کر سکے

☆ جہاد کے لفظی و اصطلاحی 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 کر سکے

مسجد کی سابقہ حیثیت کو بحال کرنے کے بارہ میں اقدامات کو بیان کر سکے

اسلامی ریاست

عمومی مقاصد: اسلامی ریاست کی خصوصیت 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 و مقاصد بیان کر سکے

☆ اسلامی ریاست کے قیام کیلئے جدوجہد کر سکے

نصاب مطالعہ پاکستان

سال دوم

حصہ دوم

ٹی	بی	سی
1	0	1

کل وقت: 12 گھنٹے

موضوعات

- ☆ دو قومی نظریہ
- ☆ تحریک پاکستان
- ☆ انڈین کانگریس
- ☆ مسلم لیگ
- ☆ تقسیم بنگال
- ☆ میثاق لکھنؤ
- ☆ تحریک خلافت
- ☆ سندھ تحریک
- ☆ تجاویز رضی
- ☆ نہرو رپورٹ
- ☆ قائداعظم کے چودہ نکات
- ☆ خطبہ الہ آباد
- ☆ انتخابات 1936 اور انتخابی منشور
- ☆ قرارداد پاکستان

حصہ دوم

مطالعہ پاکستان

تدریس مقاصد

تحریک پاکستان

عمومی مقصد: قیام پاکستان کے اسباب و محرکات کو بیان کر سکے

خصوصی مقاصد:

- ☆ قومیت کے مفہوم کو بیان کر سکے
- ☆ دو قومی نظریہ کی تعریف و توضیح کر سکے
- ☆ دو قومی نظریہ اہمیت بیان کر سکے
- ☆ ہندوستانی مسلمانوں کی محرومیوں کو بیان کر سکے
- ☆ قومی تشخص کو بحال رکھنے کے لئے مسلمانان ہند کی مساعی بیان کر سکے
- ☆ آزادی ہند اور قیام پاکستان علامہ اقبال اور قائداعظم کی مساعی بیان کر سکے
- ☆ قیام پاکستان سے مستقبل اسلامی مملکت کے قیام کے لئے مسلم عوام کی کوششوں کو بیان کر سکے
- ☆ مسلم لیگ کے قیام پاکستان کے لئے جدوجہد بیان کر سکے

(غیر مسلم طلباء کے لئے)

نصاب اخلاقیات	ٹی	پی	سی
سال دوم	1	0	1

کل وقت: 20 گھنٹے

موضوعات

معاشرتی اقدار، لحاظ، ہمسایہ، قومہ، قومی سطح، شہری سطح، صنعتی اداروں کی سطح، ضروریات، ورثہ

- ☆ حقوق و فرائض
- ☆ قوت برداشت
- ☆ قوت ارادی
- ☆ لگن و جذبہ
- ☆ وسیع النظری
- ☆ بے غرضی
- ☆ ہمسائی دوستی
- ☆ حفاظتی شعور
- ☆ پاس آزادی
- ☆ کامل اتفاق
- ☆ تغیرات کو قبول کرنا
- ☆ خود شناسی

نصاب اخلاقیات

سال دوم

تدریس مقاصد

عمومی مقاصد :

طالب علم: اخلاقیات کی اہمیت و ضرورت سے سمجھ بوجھ 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 مثبت اثرات پیدا کرنے کے طریقے بیان کر سکے

☆ اعلیٰ اخلاقی اقدار میں سے

تحمل برداشت۔ قوت ارادی۔ لگن جذبہ۔ وسیع النظری۔ بے غرضی۔ انسانی دوستی حفاظتی۔ شعور۔ پسند آزادی۔ کامل اکائی اور خود شناسی کی اہمیت بیان کر سکے

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

MATH-223 APPLIED MATHEMATICS -II

TOTAL CONTACT HOURS:

		T	P	C
Theory	**96**	**3**	**0**	**3**

Pre-Requisite: Must have completed Mathematics-I.

AIMS: The students will be able to:

1. Solve problems of Calculus and Analytic Geometry.
2. Develop mathematical skill, attitudes and logical perception in the use of mathematical instruments.
3. Apply principles of differential calculus to work out rate measures, velocity, acceleration, maxima and minima values.
4. Use principles of Integral Calculus to compute areas and volumes.
5. Acquire proficiency in solving technological problems with mathematical clarity and insight.

COURSE CONTENTS

1. FUNCTIONS AND LIMITS 6 HOURS

1.1 Constant and variable quantities.
1.2 Functions and their classification.
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 6 HOURS

2.1 Increments.
2.2 differential coefficient or derivative.
2.3 Differentiation ab-initio or by first principle.
2.4 Geometrical interpretation of differential coefficient.
2.5 Differential coefficient of X^n, $(ax+b)^n$.
2.6 Three important rules.
2.7 Problems.

3. DIFFERENTIATION OF ALGEBRAIC FUNCTIONS 9 HOURS

3.1 Explicit functions.
3.2 Implicit functions.
3.3 Parametric forms.
3.4 Problems.

4. DIFFERENTIATION OF TRIGONOMETRIC FUNCTIONS 6 HOURS

4.1 Differential coefficient of Sin x, Cos X, Tan x from first principle.
4.2 Differential coefficient of Cosec x, Sec x, Cot x.
4.3 Differentiation of inverse Trigonometric functions.
4.4 Problems.

5. DIFFERENTIATIONS OF LOGARITHMIC AND EXPONENTIAL FUNCTIONS 6 HOURS

5.1 Differentiation of In x.
5.2 Differentiation of Log a^x.
5.3 Differentiation a^x.
5.4 Differentiation e^x.
5.5 Problems.

6. RATE OF CHANGE OF VARIABLES 6 HOURS

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

7. INTEGRATION 9 HOURS

7.1 Concept.
7.2 Fundamental formulas.
7.3 Important rules.
7.4 Problems.

8. METHODS OF INTEGRATION 9 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. DIFFERENTIAL EQUATIONS 6 HOURS

10.1 Introduction.
10.2 Degree and Order.
10.3 First order differential equation.
10.4 Solution.
10.5 Problems.

11. PLANE ANALYTIC GEOMETRY AND STRAIGHT LINE 6 HOURS

11.1 Coordinate system.
11.2 Distance formula.
11.3 The ratio formula.
11.4 Inclination and slope of a line.
11.5 The slope formula.
11.6 Problems.

12. EQUATIONS OF STRAIGHT LINE 6 HOURS

12.1 Some important forms.
12.2 General form.
12.3 Angle formula.
12.4 Parallelism and perpendicularity.
12.5 Problems.

13. EQUATIONS OF CIRCLE **6 HOURS**

13.1 Standard form of equation.
13.2 Central form of equation.
13.3 General form of equation.
13.4 Radius and coordinates of the centre.
13.5 Problems.

14. STATISTICS **9 HOURS**

14.1 Concept of mean, median and mode.
14.2 Standard deviation.
14.3 Laws of probability.
14.4 Problems.

Books Recommended:

1. Thomas Finny, Calculus and Analytic Geometry.
2. Ghu lam Yasin Minhas, Technical Mathematics Vol.-II, Ilmi Kitab Khana, Lahore.
3. Prof. Riaz Ali Khan, Polytechnic Mathematic Series Vol. I & II, Majeed Sons, Faisalabad.
4. Prof. Sana UIIah Bhatti, Calculus and Analytic Geometry, Punjab Text Book Board, Lahore.

INSTRUCTIONAL OBJECTIVES

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

1.1 Define a function.
1.2 List all type of functions.
1.3 Explain the concept of limit and limit of a function.
1.4 Explain fundamental theorems on limits.
1.5 Derive some important limits.
1.6 Solve problems on limits.

2. UNDERSTAND THE CONCEPT OF DIFFERENTIAL COEFFICIENT

2.1 Derive mathematical expression for a differential coefficient.
2.2 Explain geometrical interpretation of differential coefficient.
2.3 Differentiate a constant, a constant associated with a variable and the sum of finite number of functions.
2.4 Solve related problems.

3. USE RULES OF DIFFERENTIATION TO SOLVE PROBLEMS OF ALGEBRAIC FUNCTIONS

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

4. USE RULES OF DIFFERENTIATION TO SOLVE PROBLEMS INVOLVING TRIGONOMETRIC FUNCTIONS.

4.1 Differentiate from first principle sin x, cos x, tan x.
4.2 Derive formula derivatives of sec x, cosec x, cot x.
4.3 Find differential coefficients of inverse trigonometric functions.
4.4 Solve problems based on these formulas.

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 VARIABLE WITH RESPECT TO ANOTHER

6.1 Derive formula for velocity, acceleration and scope of a line.
6.2 Define an increasing and a decreasing function, maxima and minima values, point of inflexion.
6.3 Explain criteria for maxima and minima values of a function.
6.4 Solve problems involving rate of change of variables.

7. USE RULES OF INTEGRATION IN SOLVING RELEVANT PROBLEMS.

7.1 Explain the concept of integration.
7.2 State basic theorems of integration.
7.3 List some important rules of integration.
7.4 Derive fundamental formulas of integration.

7.5 Solve problems of integration based on these rules/formulas.

8. UNDERSTAND DIFFERENT METHODS OF INTEGRATION

8.1 List standard formulas of integration.
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 METHODS OF SOLVING DEFINITE INTEGRALS

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

10. USE DIFFERENT METHODS OF INTEGRATION TO SOLVE DIFFERENTIAL EQUATIONS

10.1 Define a differential equation, its degree and order.
10.2 Explain method of separation of variables to solve differential equation of first order and first degree.
10.3 Solve differential equations of first order and first degree.

11. UNDERSTAND THE CONCEPT OF PLANE ANALYTIC GEOMETRY

11.1 Explain the rectangular coordinate system.
11.2 Locate points in different quadrants.
11.3 Derive distance formula.
11.4 Prove section formula.
11.5 Derive slope formula.
11.6 Solve problem using these formulas.

12. USE EQUATIONS OF STRAIGHT LINE IN SOLVING PROBLEMS

12.1 Define a straight line.
12.2 Write general form of equation of a straight line.
12.3 Derive slope intercept and intercept forms of equations of a straight line.
12.4 Derive expression for angle between two straight lines.
12.5 Derive conditions of perpendicularity and parallelism of two straight lines.
12.6 Solve problems involving these equations/formulas.

13. SOLVE TECHNOLOGICAL PROBLEMS USING EQUATIONS OF CIRCLE

13.1 Define a circle.
13.2 Describe standard, central and general forms of the equation of a circle.
13.3 Convert general form to the central form of equation of a circle.
13.4 Derive formula for the radius and the coordinates of the centre of a circle from the general form.
13.5 Derive equation of the circle passing through three given points.
13.6 Solve problems involving these equations.

14. UNDERSTAND THE BASIC CONCEPT OF STATISTICS

14.1 Define mean, median and mode.
14.2 Explain standard deviation.
14.3 State laws of probability.
14.4 Calculate the above mentioned quantities using the proper formula.

Mgm-211 BUSINESS COMMUNICATIONS

	T	P	C
Total CONTACT Hours	**1**	**0**	**1**
Theory 32 Hrs.			

PRE-REQUISITE: The students shall already be familiar with the language concerned.

AIMS: The course has been designed to enable the students to.

1. Develop communication skills.
2. Understand basic principles of good and effective business writing in commercial and industrial fields.
3. Develop knowledge and skill to write technical report with confidence and accuracy.

COURSE CONTENTS

1. COMMUNICATION PROCESS **6 HOURS**

- 1.1 Purposes of communication.
- 1.2 Communication process.
- 1.3 Distortions in communication.
- 1.4 Consolidation of communiqué.
- 1.5 Communication flow.
- 1.6 Communication of self-development.

2. COMMUNICATION SKILLS **6 HOURS**

- 2.1 Significance of speaking.
- 2.2 Verbal and non-verbal messages.
- 2.3 Strategic steps of speaking.
- 2.4 Characteristics of effective oral messages.
- 2.5 Communication trafficking.
- 2.6 Oral presentation.

3. QUESTIONING SKILLS **3 HOURS**

- 3.1 Nature of question.
- 3.2 Types of questions.
- 3.3 Characteristics of a good question.
- 3.4 Questioning strategy.

4. LISTENING SKILLS **5 HOURS**

- 4.1 Principles of active listening.
- 4.2 Skills of active listening.
- 4.3 Barriers to listening.
- 4.4 Reasons of poor listening.
- 4.5 Giving feedback.

5. INTERVIEWING SKILLS **3 HOURS**

- 5.1 Significance of interviews.
- 5.2 Characteristics of interviews.
- 5.3 Activities in an interviewing situation.
- 5.4 Types of interviews.
- 5.5 Interviewing strategy.

6. REPORT WRITING **3 HOURS**

6.1 Goals of report writing.
6.2 Report format.
6.3 Types of reports.
6.4 Report writing strategy.

7. READING COMPREHENSION 2 HOURS

7.1 Reading problems.
7.2 Four reading skills.

8. GROUP COMMUNICATION 4 HOURS

8.1 Purposes of conducting meetings.
8.2 Planning a meeting.
8.3 Types of meetings.
8.4 Selection of a group for meeting.
8.5 Group leadership skills.
8.6 Running a successful meeting.
8.7 Active participation techniques.

Books Recommended:

1. Sh. Ata-ur-Rehman, Effective Business Communication and Report Writing.
2. Ulman J. N. Cloud JR. Technical Reporting.

INSTRUCTIONAL OBJECTIVES

1. UNDERSTAND THE COMMUNICATION PROCESS

1.1 State the benefits of two way of communication.
1.2 Describe a model of communication process.
1.3 Explain the major communication methods used in organizations.
1.4 Identify the barriers to communication and methods to overcoming these barriers.
1.5 Identify misconceptions about communication.

2. UNDERSTAND THE PROCESS OF ORAL

2.1 Identify speaking situations with other people.
2.2 Identify the strategic steps of speaking.
2.3 Identify the characteristics of effective oral messages.
2.4 State the principles of one-way communication.
2.5 State the principles of two-way communication.
2.6 Identify the elements of oral presentation skills.
2.7 Determine the impact of non-verbal communication on oral communication.

3. DETERMINE THE USES OF QUESTIONING SKILLS TO GATHER AND CLARIFY INFORMATION IN THE ORAL COMMUNICATION PROCESS

3.1 Identify different types of questions..
3.2 Determine the purpose of each type of question and its application.
3.3 Identify the hazards to be avoided when asking questions.
3.4 Demonstrate questioning skills.

4. DEMONSTRATE THE USE OF ACTIVE LISTENING SKILLS IN THE ORAL COMMUNICATION PROCESS

4.1 State the principles of active listening.
4.2 Identify skills of active listening.
4.3 Identify barriers to active listening.
4.4 State the benefits of active listening.
4.5 Demonstrate listening skills.
4.6 Explain the importance of giving and receiving feedback.

5. DETERMINE THE APPROPRIATE INTERVIEW TYPE FOR THE SPECIFIC WORK-RELATED SITUATION AND CONDUCT A WORK RELATED INTERVIEW

5.1 State the significance of interviews.
5.2 State the characteristics of interviews.
5.3 Explain the activities in an interviewing situation.
5.4 Describe the types of interviews.
5.5 Explain the interviewing strategy.
5.6 Prepare instrument for a structured interview.

6. PREPARE A REPORT OUTLINE BASED ON SUBJECT MATTER AND AUDIENCE

6.1 Identify the different types of reports.
6.2 Determine when to use an informal or formal report presentation.
6.3 Identify the stages of planning a report.
6.4 Identify the parts of a report and chose the parts appropriate for each type of report.
6.5 Draft a report outline.

7. DEMONSTRATE READING COMPREHENSION

7.1 Identify major reading problems.
7.2 Identify basic reading skills.
7.3 State methods of previewing written material.
7.4 Identify methods of concentration when reading.
7.5 Demonstrate reading comprehension.

8. UNDERSTAND THE PRINCIPLES OF GROUP COMMUNICATION

8.1 State the purposes and characteristics of major types of meetings.
8.2 Explain responsibilities of a meeting/committee.
8.3 Identify problems likely to be faced at meeting and means to overcome these problems.
8.4 Distinguish between content and process at meetings.
8.5 Explain the key characteristics of a good group facilitator.

Mgm-211 BUSINESS COMMUNICATIONS

INSTRUCTION OBJECTIVES

1. UNDEERSTAND THE COMMUNICATION PROCESS.

1.1 State the benefits of two way communication.
1.2 Describe a model of communication process.
1.3 Explain the major communication methods used in organization.
1.4 Identify the barriers to communication and methods of overcoming these barriers.
1.5 Identify misconceptions about communication.

2, UNDERSTAND THE PROCESS OF ORAL.

2.1 Identify speaking situations with other peoples.
2.2 Identify the strategy steps of speaking.
2.3 Identify the characteristics of effective speaking.
2.4 State the principles of one-way communication.
2.5 State the principles of two-way communication.
2.6 Identify the elements of oral presentation skills.
2.7 Determine the impact of non-verbal communication on oral communication.

3. DETERMINE THE USES OF QUESTIONING SKILLS TO GATHER AND CLARIFY INFORMATION IN THE ORAL COMMUNICATION PROCESS.

3.1 Identify different types of questions.
3.2 Determine the purpose of each type of question and its application.
3.3 Identify the hazards to be avoided when asking questions.
3.4 Demonstrate questioning skills.

4. DEMONSTRATE THE USE OF ACTIVE INSTENING SKILL IN THE ORAL COMMUNICATION PROCESS.

4.1 State the principles of active listening.
4.2 Identify skills of active listening.
4.3 Identify barriers to active listening.
4.4 State the benefits of active listening.
4.5 Demonstrate listening skills.
4.6 Explain the importance of giving and receiving feed back.

5. DATERMINE THE APPROPRIATE INTERVIEW TYPE FOR THE SPECIFIC WORD RELATED SITUATION AND CONDUCT A WORK-RELATED INTERVIEW.

5.1 State the significance of interviews.
5.2 State the characteristics of interviews.
5.3 Explain the activities in an interviewing situation.
5.4 Describe the types of interviews.
5.5 Explain the interviewing strategy.
5.6 Prepare instrument for a structured interview.

6. PREPARE A REPORT OUT-LINE, BASED ON SUBJECT MATTER AND AUDIENCE.

6.1 Identify the different types of reports.
6.2 Determine when to use an informal or formal report presentation
6.3 Identify the parts of planning a report.
6.4 Identify the parts of a report and choose the parts appease for each type of report.

6.5 Draft a report outline.

7. DEMONSTRATE READING COMPREHENSION.

7.1 Identify major reading problems.
7.2 Identify basic reading skills.
7.3 State methods of previewing written material.
7.4 Identify methods of concentration when reading.
7.5 Demonstrate reading comprehension.

8. UNDERSTAND THE PRINCIPLES OF GROUP COMMUNICATIONS.

8.1 State the purpose and characteristics of major types of meeting.
8.2 Explain responsibilities of a meeting / committee.
8.3 Identify problems likely to be faced at meeting and means to overcome these problems.
8.4 Distinguish between content and process at meetings.
8.5 Explain the key characteristics of a good group facilitator

Mgm 221 BUSINESS MANAGEMENT AND INDUSTRIAL ECONOMICS

Total Contact Hours

		T	P	C
Theory	32			
Practical	0	1	0	1

AIMS The students will be able to develop management skills, get acquainted the learner with the principles of management and economic relations and develop commercial/economic approach to solve the problems in the industrial set-up.

COURSE CONTENTS

1. ECONOMICS **2 Hours**

1.1 Definition: Adam Smith, Alfred Marshall, Prof. Robins.
1.2 Nature and scope
1.3 Importance for technicians.

2. BASIC CONCEPTS OF ECONOMICS **1 Hour**

2.1 Utility
2.2 Income
2.3 Wealth
2.4 Saving
2.5 Investment
2.6 Value.

3. DEMAND AND SUPPLY. **2 Hours**

3.1 Definition of demand.
3.2 Law of demand.
3.3 Definition of supply.
3.4 Law of supply.

4. FACTORS OF PRODUCTION. **2 Hours**

4.1 Land
4.2 Labour
4.3 Capital
4.4 Organization.

5. BUSINESS ORGANIZATION. **3 Hours**

5.1 Sole proprietorship.
5.2 Partnership
5.3 Joint stock company.

6. ENTERPRENEURIAL SKILLS **4 Hours**

6.1 Preparing, planning, establishing, managing, operating and evaluating relevant resources in small business.
6.2 Business opportunities, goal setting.
6.3 Organizing, evaluating and analyzing opportunity and risk tasks.

7. SCALE OF PRODUCTION. **2 Hours**

7.1 Meaning and its determination.
7.2 Large scale production.

7.3 Small scale production.

8. ECONOMIC SYSTEM **3 Hours**

8.1 Free economic system.
8.2 Centrally planned economy.
8.3 Mixed economic system.

9. MONEY. **1 Hour**

9.1 Barter system and its inconveniences.
9.2 Definition of money and its functions.

10. BANK. **1 Hour**

10.1 Definition
10.2 Functions of a commercial bank.
10.3 Central bank and its functions.

11. CHEQUE **1 Hour**

11.1 Definition
11.2 Characteristics and kinds of cheque.
11.3 Dishonour of cheque.

12. FINANCIAL INSTITUTIONS **2 Hours**

12.1 IMF
12.2 IDBP
12.3 PIDC

13. TRADE UNION **2 Hours**

13.1 Introduction and brief history.
13.2 Objectives, merits and demerits.
13.3 Problems of industrial labour.

14. INTERNATIONAL TRADE. **2 Hours**

14.1 Introduction
14.2 Advantages and disadvantages.

15. MANAGEMENT **1 Hour**

15.1 Meaning
15.2 Functions

16. ADVERTISEMENT **2 Hours**

16.1 The concept, benefits and draw-backs.
16.2 Principal media used in business world.

17. ECONOMY OF PAKISTAN **1 Hour**

17.1 Introduction
17.2 Economic problems and remedies.

BOOKS RECOMMENDED

1. Nisar-ud-Din, Business Organization, Aziz Publisher, Lahore
2. M. Saeed Nasir,Introduction to Business, Ilmi Kitab Khana, Lahore.
3. S.M. Akhtar, An Introduction to Modern Economics, United Limited, Lahore.

Mgm-221 BUSINESS MANAGEMENT AND INDUSTRIAL ECONOMICS.

INSTRUCTIONAL OBJECTIVES

1. UNDERSTAND THE IMPORTANCE OF ECONOMICS.

1.1 State definition of economics given by Adam Smith, Alfred Marshall and Professor Robins.
1.2 Explain nature and scope of economics.
1.3 Describe importance of study of economics for technicians.

2. UNDERSTAND BASIC TERMS USED IN ECONOMICS.

2.1 Define basic terms, utility, income, wealth, saving, investment and value.
2.2 Explain the basic terms with examples

3. UNDERSTAND LAW OF DEMAND AND LAW OF SUPPLY.

3.1 Define Demand.
3.2 Explain law of demand with the help of schedule and diagram.
3.3 State assumptions and limitation of law of demand.
3.4 Define Supply.
3.5 Explain law of Supply with the help of schedule and diagram.
3.6 State assumptions and limitation of law of supply.

4. UNDERSTAND THE FACTORS OF PRODUCTION

4.1 Define the four factors of production.
4.2 Explain labour and its features.
4.3 Describe capital and its peculiarities.

5. UNDERSTAND FORMS OF BUSINESS ORGANIZATION.

5.1 Describe sole proprietorship, its merits and demerits.
5.2 Explain partnership, its advantages and disadvantages.
5.3 Describe joint stock company, its merits and demerits.
5.4 Distinguish public limited company and private limited company.

6. UNDERSTAND ENTERPRENEURIAL SKILLS

6.1 Explain preparing, planning, establishing and managing small business set up
6.2 Explain evaluating all relevant resources
6.3 Describe organizing analyzing and innovation of risk of task

7. UNDERSTAND SCALE OF PRODUCTION.

7.1 Explain scale of production and its determination.
7.2 Describe large scale production and it merits.
7.3 Explain small scale of production and its advantages and disadvantages.

8. UNDERSTAND DIFFERENT ECONOMIC SYSTEMS.

8.1 Describe free economic system and its characteristics.
8.2 Explain centrally planned economic system, its merits and demerits.
8.3 State mixed economic system and its features.

9. UNDERSTAND WHAT IS MONEY

9.1 Define money
9.2 Explain barter system and its inconveniences.
9.3 Explain functions of money.

10. UNDERSTAND BANK AND ITS FUNCTIONS.

10.1 Define bank.
10.2 Describe commercial bank and its functions.
10.3 State central bank and its functions.

11. UNDERSTAND CHEQUE AND DISHONOR OF CHEQUE.

11.1 Define cheque.
11.2 Enlist the characteristics of cheque.
11.3 Identify the kinds of cheque.
11.4 Describe the causes of dishonor of a cheque.

12. UNDERSTAND FINANCIAL INSTITUTIONS.

12.1 Explain IMF and its objectives.
12.2 Explain organisational set up and objectives of IDBP.
12.3 Explain organisational set up and objectives of PIDC.

13. UNDERSTAND TRADE UNION, ITS BACKGROUND AND FUNCTIONS.

13.1 Describe brief history of trade union.
13.2 State functions of trade union.
13.3 Explain objectives, merits and demerits of trade unions.
13.4 Enlist problems of industrial labour.

14. UNDERSTAND INTERNATIONAL TRADE.

14.1 Explain international trade.
14.2 Enlist its merits and demerits.

15. UNDERSTAND MANAGEMENT

15.1 Explain meaning of management.
15.2 Describe functions of management.
15.3 Identify the problems of business management.

16. UNDERSTAND ADVERTISEMENT.

16.1 Explain the concept of advertisement.
16.2 Enlist benefits and drawbacks of advertisement.
16.3 Describe principal media of advertisement used in business world.

17. UNDERSTAND THE ECONOMIC PROBLEMS OF PAKISTAN.

17.1 Describe economy of Pakistan.
17.2 Explain economic problems of Pakistan
17.3 Explain remedial measures for economic problems of Pakistan.
measure.

PHY-242 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 Hrs**
- 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 CONCURRENT FORCES **3 Hrs**
- 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: **2 Hrs**
- 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: **3 Hrs**
- 4.1 Non-concurrent forces
- 4.2 Free body diagram
- 4.3 Varignon's theorem
- 4.4 Conditions of total Equilibibrium.
- 4.5 Ladders

5. MOMENT OF INERTIA: **3 Hrs**
- 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: **2 Hrs**
- 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 Hrs**
- 7.1 Work-Energy relationship
- 7.2 Work done by variable force.
- 7.3 Power
- 7.4 I.H.P, B.H.P and Efficiency

7.5 Dynamometer.

8. TRANSMISSION OF POWER: 3 Hrs

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

9. MACHINES: 3 Hrs

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 Hrs

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 Hrs

11.1 Three Modulii 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: 1 Hr

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: 2 Hrs

13.1 Introduction.
13.2 Instantaneous centre.
13.3 Instantaneous velocity.
13.4 Velocity of a link by instantaneous centre method.
13.5 Relative velocity of two bodies in the straight line
13.6 Velocity of a link by relative velocity method.

PHY 242 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, 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 the 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 methods of transmission of power.
8.3 Describe 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 formulae to solve/problems on transmission of power.
8.8 Describe types and function 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 Describe speed governors, cams quick return motion.
10.6 Derive formulae for position, velocity and acceleration of a body executing S.H.M.
10.7 Use the concept of S.H.M to helical springs.
10.8 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 modulii 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 MECHANISMS.

12.1 Define simple mechanisms.
12.2 Define kinematics.
12.3 Explain kinematic link or element.

12.4 Explain kinematic chains.
12.5 Distinguish between types of kinematic chains.

13. UNDERSTAND THE METHOD OF FINDING VELOCITY IN MECHANISMS.

13.1 Explains 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-242 APPLIED MECHANICS

LIST OF EXPERIMENTS

1. Find the weight of the given body using Law of Polygon of forces.
2. Find unknown forces in a given set of concurrent forces in equilibrium using Grave-sands apparatus
3. Set a jib crane and analyse forces in its members
4. Set a Derrick Crane and analyse 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
11. Find the Moment of Inertia of a Flywheel
12. Find the angle of reaction for a wooden block placed on an inclined plane
13. Find the B.H.P. of a motor
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 wom and worm wheel
19. Find M.A. and efficiency of differential wheel and axle
20. Find the efficiency of a screw
21. Find the efficiency of a differential pulley
22. Study conversion of rotatory motion to S.H.M. using S.H.M. Model/Apparatus
23. Study conversation of rotatory motion to vibratory motion of the 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 Mehboob Ilahi Malik & Ikram-ul-Haq
8. Experimental Physics Note Book by M. Aslam Khan & M. Akram Sandhu
9. Experimental Mechanics (Urdu Process) by M. Akram Sandhu

TT-212(Rev.) TEXTILE CHEMISTRY

T	P	C
1	3	2

TOTAL CONTACT HOURS:

Theory : 32
Practical : 96

Pre-requisite: General Textile Technology.

AIMS OF SUBJECT:

In this subject, student will learn properties of natural and man fibers.

1. To become familiar with properties of natural fiber.
2. To become familiar with man made fiber.

ECONOMICS:

1. WATER **1 Hours**

1.1 Source of water.
1.2 Formula of water.
1.3 Types of water
1.4 Properties of water.

2. HARDNESS OF WATER **2Hours**

2.1 Types of hardness.
2.2 Permanent hardness.
2.3 Temporary hardness.

3. METHOD OF EXPRESSING HARDNESS OF WATER **2 Hours**

3.1 Different methods of expressing hardness of water.
3.2 Properties of hard water.
3.3 Water softening.
3.4 Water softness.

4. SOAP **1Hour**

4.1 Uses of soap on textile material and it effects.

5. INTRODUCTION TO DETERGENT **1 Hour**

5.1 Uses.
5.2 Properties and uses of detergent.

6. POLYMERIC CHEMISTRY OF CELLUCLOSIC FIBERS **6 Hours**

6.1 Structure of Natural cellulose.
6.2 Constituent of raw cotton.
6.3 Physical properties of cotton.
6.4 Chemical properties of cotton
- 6.4.1 Action of acids
- 6.4.2 Action of Alkali
- 6.4.3 Bio compatibility

7. POLYMERIC CHEMISTRY OF NATURAL PROTEIN FIBER **3 Hours**

7.1 Wool.
7.2 Silk.
7.3 Mohair.
7.4 Physical properties of protein.
7.5 Structure of protein fiber.
7.6 Chemical properties of fiber
    7.6.1 Action of acids
    7.6.2 Action of Alkali
    7.6.3 Bio compatibility

8. POLYMERIC CHEMISTRY OF VISCOSE RAYON **2 Hours**

8.1 Physical properties of viscose rayon.
8.2 Chemical properties of viscose rayon.
    8.2.1 Action of acids
    8.2.2 Action of Alkali
    8.2.3 Bio compatibility
8.3 Uses of viscose rayon (Normal and industrial).

9. POLYMERIC CHEMISTRY OF ACETATE RAYON **1 Hour**

9.1 Introduction to physical properties of acetate rayon.
9.2 Chemical properties of acetate rayon.
    9.2.1 Action of acids
    9.2.2 Action of Alkali
    9.2.3 Bio compatibility
9.3 Uses of acetate rayon (normal and industrial).

10. POLYMERIC CHEMISTRY OF CUPPROMONIUM RAYON **2 Hours**

10.1 Physical properties of cuppromonium rayon.
10.2 Uses of cuppromonium.
10.3 Industrial uses of cuppromonium rayon.

11. POLYMERIC CHEMISTRY OF POLYESTER **2 Hours**

11.1 Introduction.
11.2 Physical properties.
11.3 Manufacturing and uses.

12. POLYMERIC CHEMISTRY OF NYLON **1 Hour**

12.1 Physical properties.
12.2 Chemical properties.
    12.2.1 Action of acids
    12.2.2 Action of Alkali
    12.2.3 Bio compatibility
15.3 Uses.

13. IDENTIFICATION AND ESTMATION OF MAN MADE FIBER **4 Hours**

13.1 Natural fiber.
13.2 Regenerated fiber.
13.3 Synthetic fibers.
13.4 Preliminary Examination.
13.5 Burning Test.
13.6 Staining Test.

13.7 Solubility Test

14. ECONOMIC AND SOCIAL ASPECT OF MAN MADE FIBER 1 Hour

14.1 Impact on older fiber.
14.2 Production of synthetic fiber.
14.3 Pakistan synthetic fibers.

REFERENCE BOOKS:

1. Man Made Fiber by R.W. Moncrieff (Butter worth Scientific U.K.)
2. Production of synthetic Fibre by Vaidya (India).
3. Mechanics of Fiber Composition by Tewary (India).
4. Textile Fibers and their use by Katherine Paddock Hess
5. Fiber Science by Steven B. Warner

TT-212(Rev.) TEXTILE CHEMISTRY.

INSTRUCTIONAL OBJECTIVES:

1. UNDERSTAND WATER:
- 1.1 State source of water.
- 1.2 Describe water structure.
- 1.3 Explain properties of water.
- 1.4 Define types of water.

2. UNDERSTAND HARDNESS OF WATER:
- 2.1 Describe type of water hardness.
- 2.2 Narrate permanent hardness of water.
- 2.3 Narrate temporary hardness of water.

3. UNDERSTAND METHOD OF EXPRESSING HARDNESS OF WATER:
- 3.1 Describe methods of water softening.
- 3.2 Describe water softener.

4. UNDERSTAND SOAP:
- 4.1 Explain uses of soap on textile material and its effect.

5. UNDERSTAND DETERGENTS:
- 5.1 Explain uses of detergents.
- 5.2 Explain properties of detergents.

6. UNDERSTAND CELLULOSE FIBER:
- 6.1 State structure of natural cellulose.
- 6.2 Explain constituent of raw cotton.
- 6.3 Enlist physical properties of cotton.

7. UNDERSTAND NATURAL PROTEIN FIBER:
- **7**.1 Explain wool fiber.
- 7.2 Explain silk.
- 7.3 Describe man made fiber.
- 7.4 Explain physical properties of protein fiber.
- 7.5 Explain structure of protein fiber.

8. UNDERSTAND VISCOSE RAYON:
- 8.1 Explain chemical properties of viscose rayon.
- 8.2 Enlist uses of viscose rayon.
- 8.3 Describe industrial uses of viscose rayon.

9. UNDERSTAND ACETATE RAYON:
- 9.1 State physical properties of acetate rayon.
- 9.2 State chemical properties of acetate rayon.
- 9.3 Describe normal and industrial uses of acetate rayon.

10. UNDERSTAND CUPPROMONIUM RAYON:
- 10.1 Explain physical properties of cuppromonium rayon.
- 10.2 State uses of cuppromonium rayon.
- 10.3 Explain industrial uses.

11. UNDERSTAND POLYESTER:

11.1 Explain properties of polyester.
11.2 State uses of polyester.
11.3 Explain manufacturing polyester.

12. NYLON:

12.1 State physical properties of nylon.
12.2 State chemical properties of nylon.
12.3 State uses of nylon.

13. UNDERSTAND IDENTIFICATION AND ESTIMATION OF MAN MADE FIBER:

13.1 State identification of different natural fiber.
13.2 Perform identification of different regenerated fibers.
13.3 Perform identification of different synthetic fiber.
13.4 Describe preliminary examinations for identification of fiber.
13.5 Describe burning test for identification of fiber.
13.6 Describe staining test for identification of fiber.

14. UNDERSTAND ECONOMICAL AND SOCIAL ASPECT OF MAN MADE FIBER:

14.1 State impact on older fiber.
14.2 Discuss production of synthetic fiber.
14.3 Discuss Pakistan synthetic fiber.

TT-212(Rev.) TEXTILE CHEMISTRY

LIST OF PRACTICALS:

1. Determination of ash content of cotton and carbonization of wool. 6 Hours
2. Determination of grease in cloth or yarn. 6 Hours
3. The separation (identification and analysis) of any six blends. 18 Hours
4. Separation, identification and analysis of textile fiber and fiber blends by burning test, fiber density, microscopic examination solubility of fiber in various solvents and staining of the fiber by special dyes and reagents (about 10 experients). 12 Hours
5. Properties of cellulose and synthetic fiber: 24 Hours
   - (i) Action of cold cone alkaline solutions.
   - (ii) Degradation of cellulose & synthetics by hydrolysis.
   - (iii) Degradation of cellulose & synthetics by radiation.
6. Identification of Textile Fiber i.e. cotton, polyester viscose, wool 18 digitics. 12 Hours
7. Identification of organic cotton 12 Hours

REFERENCE BOOKS:

1. Chemical Process By Shrive.
2. Organic Chemistry By T.A. Geisman.

Book:

Organic Chemistry

TT-223(Rev.) FABRIC DESIGN AND STRUCTURE

T	P	C
2	3	3

TOTAL CONTACT HOURS:

Theory : 64
Practical : 96

Pre-requisite: Knowledge of General Textile Technology.

AIMS OF SUBJECT:

1. Knowledge of different textile weaves.
2. To analyze the given fabric sample.
3. To develop the skill in designing and its practical application in weaving of fabric.

ECONOMICS:

1. FABRIC STRUCTURE: 2 Hours

1.1 Introduction and classification of woven fabric.
1.2 Elements of woven designs.

2. PARAMETERS OF FABRIC CONSTRUCTION: 6 Hours

2.1 Warp.
2.2 Weft.
2.3 Peg plain / lifting plan.
2.4 Draft construction.
2.5 Healds and Healds wire.

3. WEAVES: 4 Hours

3.1 Plain weave
3.2 Derivatives of Plain weaves
3.3 Concept of tappet, dobby and Jacquard

4. TWILL WEAVES: 10 Hours

4.1 Angles of inclination of twill weave
4.2 Right and left hand twill
4.3 Pointed twill
4.4 Zigzag twill.
4.5 Broken twill.
4.6 Herring Bone twill

5. SATIN WEAVE AND SATEEN WEAVES: 2 Hours

8.1 Construction and uses of satin and sateen.
8.2 Simple developments.
8.3 Extension of satin weave.

6. DIAMOND DESIGN: 4 Hours

6.1 Construction and uses.
6.2 Cork screw weaves (Warp).
6.3 Soft cork weaves.

7. HONEY COMB: 4 Hours

14.1 Ordinary honey comb construction.
14.2 Brighten honey comb construction.

8. BED FORD CORD WEAVE: 4 Hours

16.1 Construction and uses.

9. COLOR AND WEAVE EFFECTS: 8 Hours

9.1 Color introduction.
9.2 Effects and knowledge.
9.3 Light theory of color.
9.4 Primary color.
9.5 Warm and cold colours.
9.6 Comparison of colour.
9.7 Modification of colour.
9.8 Combination of colour.
9.9 Spread effect.
9.10 Colour matching.

10. SPECIAL WEAVE: 4 Hours

10.1 Hucka back weave
10.2 Hounds eye weave
10.3 Crepe weave
10.4 Birds eye weave.

11. STRIPES PATTERN OF COLOUR FABRIC AND WOVEN FABRIC: 2 Hours

11.1 Importance of stripes.
11.2 How stripes are planned.
11.3 Stripes on woven fabric.

12. WEAVE ANALYSIS: 6 Hours

12.1 Method.
12.2 Objective

13. BASIC KNIT DESIGN 4 Hours

13.1 Warp Knit
13.2 Weft knit

14. KNIT DESIGN ANALYSIS 4 Hours

14.1 Methods
142 Objectives

BOOKS RECOMMENDED:

Watson's Textile Design and Colour by Grosicki.
Butterworth World Student Reprint.

TT-223(Rev.) FABRIC DESIGN AND STRUCTURE:

INSTRUCTIONAL OBJECTIVE:

1. UNDERSTAND FABRIC STRUCTURE:
- 1.1 State introduction and classification of woven fabric.
- 1.2 Explain elements of woven design.

2. UNDERSTAND THE TERMINOLOGY RELATED TO FABRICS:
- 2.1 Define warp.
- 2.2 Define weft.
- 2.3 Define peg plan.
- 2.4 Define lifting plan.
- 2.5 Define draft and its construction.
- 2.6 State Wire and heaLd frame.

3. UNDERSTAND WEAVE:
- 3.1 Explain plain weave.
- 3.2 Explain Mat weave.
- 3.3 Explain Basket weave.
- 3.4 Explain hop sack weave.

4. UNERSTAND CONSTRUCTION OF TWILL:
- 4.1 Define uses and construction of twill.
- 4.2 Make right and left hand twill.
- 4.3 Explain Herring bone twill.
- 4.4 Explain pointed twill.
- 4.5 Explain broken twill.
- 4.6 Explain angle of inclination of twill weaves

5. UNDERSTAND SATIN WEAVE AND SATEEN WEAVE:
- 8.1 Explain construction and uses of satin weave and sateen weave.

6. UNDERSTAND DIAMOND DESIGN:
- 11.1 Explain construction and uses of diamond design.
- 11.2 Explain warp corks screw weave.
- 11.3 Explain weft corks screw weave.

7. UNDERSTAND HONEY COMB:
- 14.1 State construction of ordinary honey comb.
- 14.2 State construction of Brighten honey comb.

8. UNDERSTAND BED FORD CORD WEAVE:
- 16.1 Explain construction of Bed ford cord weave.
- 16.2 State its uses.

9. UNDERSTAND WEAVE AND COLOUR EFFECTS:
- 9.1 Explain colour introduction.
- 9.2 State effects of weave and colour.
- 9.3 Explain light theory of colour.
- 9.4 State medium of light.

9.5 Define causes of colour.
9.6 State mixture of coloured light.
9.7 State transmitting medium.
9.8 State primary colour.
9.9 Explain warm and cold colour.
9.10 Explain comparison of colour.
9.11 Define modification of colour.
9.12 State combination of colour.
9.13 Explain spread effect of colour.
9.14 Elaborate colour matching.
9.15 Explain colour and weave effect.

10. UNDERSTAND SPECIAL WEAVE:

10.1 Explain construction types and uses of special weaves.

11. PLANNING STRIP PATTERN OF WOVEN FABRIC:

11.1 Explain importance of stripes.
11.2 Explain how stripes are planned.
11.3 Describe stripes on woven fabric.

12. UNDERSTAND WEAVE ANALYSIS:

12.1 State methods of weave analysis.
12.2 Explain analysis techniques.

13. UNDERSTAND BASIC KNIT DESIGN **4 Hours**

13.1 Explain Warp Knit
13.2 Explain Weft knit

14. ANALYSE KNIT DESIGN **4 Hours**

14.1 Explain analysis Methods of knit design

TT-223(Rev.) FABRIC DESIGN AND STRUCTURE:

LIST OF PRACTICALS:

1.	Use of graph paper.	3 Hours
2.	General demonstration of different kind of fabrics.	3 Hours
3.	Designing of plain weave on graph paper.	3 Hours
4.	Designing of plain weave rib weft rib and Hop Sack --- SACK) weaves.	3 Hours
5.	Designing of different twill weaves.	3 Hours
6.	Designing of twill on certain angles.	3 Hours
7.	Preparing of paper template on twills.	3 Hours
8.	Preparing design of Satin weaves.	3 Hours
9.	Designing of zigzag twill.	3 Hours
10.	Designing of colour and weave.	3 Hours
11.	Designing of broken twill.	3 Hours
12.	Designing of combination of weave.	3 Hours
13.	Analysis of given peace of designed fabric.	3 Hours
14.	Preparation of colour spectrum.	3 Hours
15.	Colouring techniques.	3 Hours
16.	Designing of diamond weaves.	3 Hours
17.	Analysis of dobby & Jacquard design.	9 Hours
18.	Designing of honey comb weave..	3 Hours
19.	Designing of HUCKA-BACK weave.	3 Hours
20.	Dobby designing of different draft.	6 Hours
21.	Designing of crepe weave.	3 Hours
22.	Designing of special weaves – cellular weave basket corkscrew weave	3 Hours
23.	Designing of twill combination.	3 Hours
24.	Analysis of sample of honey comb.	12 Hours
25.	Analysis of different types of knitted fabrics.	6 Hours

TT-234(Rev.) SPINNING & WEAVING MECHANISM

T	P	C
4	0	4

TOTAL CONTACT HOURS:
Theory : 128

Pre-requisite: Knowledge of General Textile Technology.

AIMS OF SUBJECT:
1. To acquaint the students with the elementary principles of spinning and weaving Mechanism.
2. To teach the student proper handling and operation of Machine.

ECONOMICS:

1. SPINNING **4 Hours**
- 1.1 History.
- 1.2 Machine operation (Blow Room to Ring machine).

2. BLOW ROOM **12 Hours**
- 2.1 Objectives.
- 2.2 Principles.
- 2.3 Coarse opening zone
  - 2.3.1 Blendomat
  - 2.3.2 Bale breaker
  - 2.3.3 Axiflow
- 2.4 Fine opening zone
  - 2.4.1 Krischner Beater
- 2.5 Multimixer
- 2.6 Study of blow room lines
- 2.7 Material transportation in blow room
- 2.8 Study of scutcher and chute feed system

3. CARDING **8 Hours**
- 3.1 Material passage.
- 3.2 Card constructions.
- 3.3 Objectives.
- 3.4 Introduction of different Card types
- 3.5 Study of auto leveler on card

4. DRAWING **8 Hours**
- 4.1 Cotton passage.
- 4.2 Drafting.
- 4.3 Doubling.
- 4.4 Blending.
- 4.5 Study of auto leveler in drawing frame

5. LAP FORMER & COMBER **8 Hours**
- 5.1 Material passage in lap former
- 5.2 Material passage in Comber
- 5.3 Study of combing cycle.
- 5.4 Extraction of comber noil

6. ROVING FRAME **8 Hours**

6.1 Passage of material
6.2 Objectives of roving frame.
6.3 Working of Roving frame.

7. RING FRAME **8 Hours**

7.1 Passage of material
7.2 Objectives of Ring frame.
7.3 Working of Ring frame.

8. WINDING **8 Hours**

8.1 Types of winding
8.2 Types of packages.
8.3 Objectives of winding
8.4 Passage of yarn in winding machine
8.5 Working of Winding machine

9. WOOL **4 Hours**

8.1 Sorting.
8.2 Blending.
8.3 Classification.

10. WOOLEN YARN **8 Hours**

10.1 Use and characteristics.
10.2 Manufacturing processes.
10.3 French system of woolen yarn production.

11. WORSTED YARN **8 Hours**

11.1 Uses and characteristics of worsted yarn.
11.2 Manufacturing processes of worsted yarn.

12. WARPING **8 Hours**

12.1 Types of warping.
12.2 Study of creel and its types
12.3 Study of Head stock

13. SIZING **8 Hours**

13.1 Purpose of sizing the yarn.
13.2 Componants of sizing machine.
13.3 Tension zone on sizing machine.
13.4 Size recipe/ingredient.

14. DRAWING-IN **8 Hours**

14.1 Objectives
14.2 Methods of drawing-in

15. WEAVING **12 Hours**

15.1 Introduction of weaving
15.2 Types of loom.

15.3 Shuttle loom.
15.4 Terry loom.
15.5 Shuttle less loom.
- 15.5.1 Air jet loom.
- 15.5.2 Water jet loom.
- 15.5.3 Rapier loom
- 15.5.4 Projectile loom.
- 15.5.5 Multiphase Loom

16. LOOM MOTION **8 Hours**

16.1 Primary Motion of loom.
16.2 Secondary Motion loom.
16.3 Supplementary Motion of loom.

17. DOBBY MOTION & JACQUARD MOTION **8 Hours**

17.1 Types of dobbies.
17.2 Types of Jacquard

18. DENIM WEAVING **6 Hours**

18.1 Process of Denim weaves
18.2 Features of Denim fabric

TEXT / REFERENCE BOOKS:

1. Textile (Fibre to Fabric) by Bernard (Mc-Graw Hill).
2. Manual of Cotton Spinning by A.E. Debarr (The Textile Institute U.K.)
3. Practical Weaving Course by P.R. Jarvis (India).
4. Cotton Spinning by William Scott Taggart. (India).

TT-234(Rev.) SPINNING & WEAVING MECHANISM

INSTRUCTIONAL OBJECTIVE:

1. UNDERSTAND SPINNING

1.1 State objectives of spinning machinery.
1.2 Describe the major process of spinning from blow room to ring.

2. UNDERSTAND BLOW ROOM

2.1 State objectives of blow room.
2.2 Explain the method of opening of cotton by the action of opposing spikes.
2.3 Apply the principle of opening of cotton by the action of opposing spikes on bale breaker and hopper feeder.
2.4 Explain the operation of auto pluckers.
2.5 Explain blending feeder and vertical opener.
2.6 Describe the method of blending by blending feeder with automatic weighing pans.
2.7 Enlist the operation of auto mixer.
2.8 Explain the ultra cleaner, step cleaner and axiflow clean.
2.9 State the importance of opening and cleaning by the action of beaters.

3. UNDERSTAND THE CARDING

3.1 Explain carding machines and its principles.
3.2 State the objectives of carding machine.
3.3 Sketch the path of cotton on carding.
3.4 Explain the working of auto leveler on Card

4. UNDERSTAND THE DRAWING FRAME

4.1 Explain the drawing frame.
4.2 State the object of drawing frame.
4.3 Sketch the path of material in drawing frame.
4.4 Explain the working of auto leveler in Drawing Frame

5. LAP FORMER & COMBER **8 Hours**

5.1 Material passage in lap former
5.2 Material passage in Comber
5.3 Study of combing cycle.
5.4 Extraction of comber noil

6. ROVING FRAME **8 Hours**

6.1 Passage of material
6.2 Objectives of roving frame.
6.3 Working of Roving frame.

7. RING FRAME **8 Hours**

7.1 Passage of material
7.2 Objectives of Ring frame.
7.3 Working of Ring frame.

8. WINDING **8 Hours**

8.1 Types of winding
8.2 Types of packages.
8.3 Objectives of winding

8.4 Passage of yarn in winding machine
8.5 Working of Winding machine

9. UNDERSTAND THE WOOL
9.1 Identify the wool sorting process.
9.2 Explain the classification of wool.
9.3 Explain types of wool.

10. WOOLEN YARN
10.1 Explain the Uses and characteristics of woolen yarn
10.2 Describe Manufacturing processes of woolen yarn.

11. WORSTED YARN
11.1 Explain the uses and characteristics of worsted yarn.
11.2 Explain the manufacturing processes of worsted yarn.

12. WARPING
12.1 Define Types of warping.
12.2 Explain creel and its types
12.3 Define Head stock

13. SIZING
13.1 Narrate purpose of sizing of yarn.
13.2 Explain construction of sizing machine.
13.3 Explain working of sizing machine.

14. DRAWING-IN
14.1 Define Objectives of drawing-in process
14.2 Explain Design technique used in Drawing-in process
14.3 State methods of drawing-in process.

15. WEAVING
15.1 Define weaving process.
15.2 Explain types of loom.
15.3 Explain working of Shuttle loom.
15.4 Explain working of Terry loom.
15.5 Explain working of Shuttle less loom.
15.5.1 Explain working of Air jet loom.
15.5.2 Explain working of Water jet loom.
15.5.3 Explain working of Rapier loom
15.5.4 Explain working of Projectile loom.
15.5.5 Explain working of Multiphase Loom

16. LOOM MOTION **8 Hours**
16.1 Define Primary Motion of loom.
16.2 Describe Secondary Motion of loom.
16.3 Explain Supplementary Motion of loom.

17. DOBBY MOTION & JACQUARD MOTION **8 Hours**
17.1 State Types of dobbies.

17.2 Explain different types of Jacquard

18. DENIM WEAVING **6 Hours**

18.1 Explain process of Denim Fabric

18.2 Explain different stages of denim process

TT-243(Rev.) TEXTILE CALCULATION

T	P	C
3	0	3

TOTAL CONTACT HOURS:
Theory : 96

Pre-requisite: Textile calculations

AIMS OF SUBJECT:
1. To provide knowledge of Textile counting system.
2. To enable students to solve common technical and textile trade problem.
3. To acquaint the students with the efficiency.

ECONOMICS:

1. YARN NUMBERING SYSTEM **12 Hours**
- 1.1 Count definition.
- 1.2 Direct system of yarn numbering.
- 1.3 Indirect systems of yarn numbering.
- 1.4 Metric system.
- 1.5 Woolen worsted system.
- 1.6 Inter conversion of count.
- 1.7 Problems to all yarn numbering systems.

2. FOLDED YARN. **06 Hours**
- 2.1 Numbering of folded yarn.
- 2.2 Problems of universal system.
- 2.3 Resultant counts.
- 2.4 Average counts.
- 2.5 Folded yarn of different materials.
- 2.6 Calculation of costing of folded yarn.

3. UNIVERSAL NUMBER SYSTEM. **06 Hours**
- 3.1 Definition
- 3.2 Problems of universal system.

4. SPEED CALCULATION **06 Hours**
- 4.1 Different gear Method.
- 4.2 Problem of speed calculation.
- 4.3 Speed Calculation by belt, pulleys and rope
- 4.4 Slippage calculation
- 4.5 Worm, Worm Wheel. Ratchet Wheel and mangle wheel calculation.

5. SPINNING FORMULA **18 Hours**

5.1 Blow Room production formula and problems.
5.2 Card Production formula & problems.
5.3 Drawing production formula and problems.
5.4 Comber production formula and problems.
5.5 Simplex production formula and problems.
5.6 Ring production formula and problems.
5.7 Winding production formula and problems.

6. YARN DIAMETER CALCULATION **09 Hours**

6.1 Problems.

7. WARP AND WARPING CALCULATION. **06 Hours**

7.1 Formula of warping.
7.2 Problems.

8. SIZING CALCULATION. **09 Hours**

8.1 Formula.
8.2 Problems relating to sizing.

9. REED CALCULATION. **06 Hours**

9.1 Reed Counting System.
9.2 problems of reed

10. COVER FACTOR **08 Hours**

10.1 Cover Factor of warp
10.2 Cover Factor of weft
10.3 Problem.

11. CLOTH CALCULATION. **12 Hours**

11.1 Warp Calculation per yard of running fabric.
11.2 Material Cost calculation.
11.3 Labour cost calculation
11.4 Total Cost Calculation.

12. LOOM PRODUCTION CALCULATION. **09 HOURS**

12.1 Problem.

REFERENCE BOOKS.

13.1 Weaving Calculation by sen Gupta D.B. Tara Porewala Son & Co Boruby (India)
13.2 Cotton Spinning Calculation Saddique Pakistan.

TT-243(Rev.) TEXTILE CALCULATION

INSTRUCTIONAL SUBJECT:

1. UNDERSTAND YARN NUMBER SYSTEM.
- 1.1 State yarn numbering.
- 1.2 Explain direct system.
- 1.3 Explain indirect system.
- 1.4 Explain Metric system.
- 1.5 Explain worsted system.
- 1.6 Evaluate all yarn numbering systems.
- 1.7 Calculate different count and inter-conversion different counts.

2. UNDERSTAND FOLDED YARN.
- 2.1 Calculate count of folded yarn.
- 2.2 Manipulate count of folded yarn.
- 2.3 Determine average count.
- 2.4 Manipulate count of folded yarn of different material.
- 2.5 Calculate the cost of folded yarn.

3. UNDERSTAND UNIVERSAL NUMBER SYSTEM.
- 3.1 Define universal number system.
- 3.2 Manipulate universal number system.
- 3.3 Define Tex, Grex and denier.
- 3.4 Calculation in tex. Grex and denier.

4. UNDERSTAND SPEED CALCULATION
- 4.1 Calculate the speed by gear methods.
- 4.2 Calculate the speed by gear and belt methods.
- 4.3 Compare the slippage percentage.
- 4.4 Calculate the speed of worm, worm wheel, Ratcher wheel and mangle wheel.

5. UNDERSTAND SPINNING FORMULAS.
- 5.1 Manipulate production of blow room.
- 5.2 Manipulate production of carding frame.
- 5.3 Manipulate production of drawing machine.
- 5.4 Manipulate production of comber machine.
- 5.5 Manipulate production of simplex machine.
- 5.6 Manipulate production of ring machine.
- 5.7 Manipulate production of winding machine.

6. UNDERSTAND YARN DIAMETER CALCULATION.
- 6.1 Explain yarn diameter.
- 6.2 Calculate yarn diameter in millimeter.
- 6.3 Calculate yarn diameter in inches.

7. UNDERSTAND WARP CALCULATION.
- 7.1 Define formula for warping calculation.
- 7.2 Manipulate warping production.

8. UNDERSTAND SIZE CALCULATION.

7.1 Define formula for size calculation.
7.2 Manipulate sizing production.
7.3 Calculate size content for different count

9. UNDERSTAND REED CALCULATION.

9.1 Manipulate reed calculation.
9.2 Calculate reed width

10. UNDERSTAND FACTOR INVOLVED IN CLOTH CALCULATION.

10.1 Calculate warp of running fabric using different count & different material.
10.2 Manipulate warp of running fabric.
10.3 Manipulate weft of fabric.

11. CLOTH CALCULATION

11.1 Determine material cost of cloth.
11.2 Determine labour cost for a piece of cloth.
11.3 Determine total cost of fabric.

12. UNDERSTAND LOOM PRODUCTION CALCULATION.

12.1 Determine loom production calculation.
12.2 State factor effecting loom production.
12.3 Determine loom efficiency.

TT-254 TEXTILE LAB (Spinning, Weaving)

T	P	C
0	12	4

TOTAL CONTACT HOURS: = 384 Hours

Pre-requisite: Textile calculations

SPINNING PRACTICALS: Practical : 192 Hrs.

1.	Introduction to Blow Room lines and waste extracted in blow room	6 Hours
2.	Passage of Cotton through Card.	6 Hours
3.	Machine parts in detail of card and study of waste	6 Hours
4.	Passage and line diagram of drawing frame.	6 Hours
5.	Roller setting for different varieties of cotton.	6 Hours
6.	Detailed study and working of changable gears of Drawing frame	6 Hours
7.	Study of lap former and its parts	6 Hours
8.	Study of Comber and its parts	6 Hours
9.	Passage and line diagram of roving frame.	6 Hours
10.	Study of various motion in roving frame.	6 Hours
11.	Study of parts and its working in roving frame spindle flyer traverse motion.	6 Hours
12.	Passage and line diagram of ring frame.	6 Hours
13.	Introduction of ring frame construction and major parts.	6 Hours
14.	Common types of rollers and its weighting system.	6 Hours
15.	Detail study and working of different parts in detail on ring frame.	6 Hours
16.	Detail study of winding machine and its parts	6 Hours
17.	Study of sorting method of wool in a woolen mill.	6 Hours
18.	Report on woolen and worsted system.	6 Hours

WEAVING PRACTICALS: Practical = 192 Hrs.

1.	General survey of weaving system and machinery layout plan.	6 Hours
2.	Study of primary motions and their diagrams.	6 Hours]
3.	Study of power transmission of loom and its diagram.	6 Hours
4.	Study of shedding motion and picking motion relation of each.	6 Hours
5.	Denting and drafting.	6 Hours
6.	Gaiting up of warp.	6 Hours
7.	Preparation of heald frames, and reed and its calculation.	6 Hours
8.	Study of tappets and their setting.	6 Hours
9.	Study of knotting process on loom.	6 Hours
10.	Take up motion-calculation and diagram.	6 Hours
11.	Study of let off motion.	6 Hours
12.	Study of Beating up motion.	6 Hours
13.	Operation and diagram of dobby parts.	6 Hours
14.	Preparation and mounting of dobby chain or lattice.	6 Hours
15.	Study of warp and weft stop motion.	6 Hours
16.	Study of different types of selveges.	6 Hours
17.	Study of Shuttle box with diagram.	6 Hours
18.	Detail study of crank sley, loose reed and back up.	6 Hours

TT-261 **TECHNICAL TEXTILE**

T	P	C
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TOTAL CONTACT HOURS:

THEORY = 32
PRACTICAL = 0

AIMS:

The consumption of technical textile is around 24 million tons of that value is around US Dollars 127 billion by the year 2011. This uses of technical textiles growth is estimated 4.6% per annum in Asia, by 2.8% in US and Europe, but Pakistan's contribution in technical textile is hardly 1%. So the objective of this course is to get familiarize students with technical textile, its history, its big market, its extensive growth and its vast end-use in modern world.

1. **TECHNICAL TEXTILE** 3 Hours

   1.1. Introduction to technical textile

   1.2. Introduction to Non woven textile

   1.3. Introduction to textile composites

2. **INTRODUCTION TO NON WOVEN TEXTILE AND ITS APPLICATIONS** 3 Hours

3. **INTRODUCTION TO TEXTILE COMPOSITES AND ITS APPLICATIONS** 3 Hours

4. **12 CATAGORIES OF TECHNICAL TEXTILE AND IT'S APPLICATIONS**. 23 Hours

   4.1. Agro tech
   4.2. Build tech
   4.3. Cloth tech
   4.4. Mobi tech
   4.5. Med tech
   4.6. Pro tech
   4.7. Pack tech
   4.8. Sports tech
   4.9. Indu tech
   4.10. Home tech
   4.11. Geo tech
   4.12. Oeko tech.

Reference:

1. **Hand Book of Technical Textile**

   Published by Textile Institute Manchester

3rd Year

اسلامیات / مطالعہ پاکستان

نصاب (سال سوئم)	OEN 311	ت	پ	ک
حصہ اول اسلامیات		1	0	1
حصہ دوم مطالعہ پاکستان		کل وقت: 20 گھنٹے		

موضوعات:

-1 قرآن مجید

سورۃ الفاتحہ۔ آیۃ الکرسی۔ سورۃ البقرۃ کی آخری آیات آمن الرسول سے تا آخر اور سورۃ اخلاص مع ترجمہ و تشریح

-2 دس منتخب احادیث مع ترجمہ و تشریح

☆ بنی الاسلام علی خمس شهادة ان لا اله الا الله و اقام الصلوٰة و ایتاء الزکوٰة و حج البیت و صوم رمضان

☆ الدین النصیحة

☆ المستشار موتمن

☆ للمومن علی المومن ست خصال یعوده اذا مرض و تشهده اذا مات و یجیبه اذا دعا

☆ لیسلم علیه اذا لقیه و یشمته اذا عطس و ینصح له اذا غاب او شهد

☆ لا تخن من خانک

☆ لا یدخل الجنة قاطع

☆ ان الله حرم علیکم عقوق الامهات و اضاعة المال

☆ یسروا ولا تعسروا ولا تنفروا

☆ ذاق طعم الایمان من رضی بالله ربا و بالاسلام دینا و بمحمد نبیا

☆ افضل الذکر لا اله الا الله

-3 حقوق و فرائض

حصول تعلیم بطور فرض۔ والدین اور اولاد کے حقوق و فرائض۔ ہمسایہ کے حقوق

-4 اسلام کی اخلاقی اقدار

صبر و استقامت۔ عفو و درگذر۔ ایفائے عہد۔ اخوت، ایثار و قربانی

سال سوئم
حصہ اول اسلامیات

تدریس مقاصد

قرآن حکیم
عمومی مقصد: 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: آیۃ الکرسی۔ سورۃ بقرۃ کی آخری آیات از امن الرسول سے اور سورۃ اخلاق کا ترجمہ و تشریح 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 ہو گی
☆ عبادت 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
☆ تعلیم 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 انسانی بہبود میں ہے
☆ کفر کو اللہ کی مدد کے بغیر شکست نہیں دی جا سکتی
☆ اللہ ایک ہے
☆ اللہ کسی کا محتاج نہیں نہ اس کا کوئی شریک ہے

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

☆ احادیث کا ترجمہ بیان کر سکے

☆ احادیث کی تشریح کر سکے
☆ معاشرتی اور انفرادی زندگی میں احادیث سے راہنمائی حاصل کر سکے

حقوق و فرائض

عمومی مقصد: اسلامی معاشرے کا ایک اچھا فرد بن سکے

خصوصی مقاصد:

☆ والدین کے حقوق و فرائض بیان کر سکے
☆ ہمسایوں کے حقوق بیان کر سکے
☆ اسلام میں حقوق و فرائض کی صورت میں اپنے اندر خدمت خلق کا جذبہ پیدا کر سکے

اسلامی اقدار

عمومی مقصد: طالب علم جان سکے گا کہ تعلیم کا مقصد حسن اخلاق سے متصف ہوتا ہے

خصوصی مقاصد

☆ اخلاق کے معنی و مفہوم کو بیان کر سکے
☆ اسلام میں حسن اخلاق کی اہمیت بیان کر سکے
☆ قرآن و سنت کی روشنی میں صبر و استقلال کی اہمیت بیان کر سکے
☆ اسلام میں عفو و درگزر کی اہمیت بیان کر سکے
☆ ایفائے عہد کی اہمیت بیان کر سکے
☆ اخوت کے معنی و مفہوم کو 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 311 | ٹی پی سی
مطالعہ پاکستان | | 1 0 1
حصہ دوئم | | کل وقت: 20 گھنٹے

موضوعات

☆ قیام پاکستان
☆ باؤنڈری کمیشن
☆ ریڈ کلف ایوارڈ
☆ تقسیم بنگال و کلکتہ
☆ تقسیم پنجاب
☆ مسئلہ مہاجرین
☆ ریاست کا الحاق
☆ ریاست جموں و کشمیر
☆ نہری پانی کا تنازعہ
☆ قرار داد مقاصد
☆ علماء کے بائیس نکات
☆ 1962-1956 اور 1973 کے دساتیر کی اسلامی دفعات
☆ پاکستان کا محل وقوع اور اس کی جغرافیائی اہمیت
☆ قدرتی وسائل (تیل۔ گیس۔ کوئلہ)

تدریس مقاصد

عمومی مقاصد: قیام پاکستان کے بعد درپیش مسائل سے آگاہی حاصل کرے اور بیان کرے

☆ خصوصی مقصد:
☆ باؤنڈری کمیشن تشکیل اور اس کے فرائض بیان کر سکے
☆ ریڈ کلف اور اس کے ایوارڈ کے بارے میں 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 بارہ میں تفصیل بیان کر سکے
☆ ریاست جموں کشمیر کے بارے میں بیان کر سکے
☆ نہری پانی کے تنازعہ کو بیان کر سکے
☆ قرار داد مقاصد کی تفصیلات بیان کر سکے
☆ 22 علماء کے متفقہ اسلامی نکات بیان کر 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
☆ پاکستان میں قدرتی وسائل (تیل۔ گیس۔ کوئلہ) کے بارہ میں بیان کر سکے

(غیر مسلم طلباء کے لئے)

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کل وقت: 20

نصاب اخلاقیات — Qen 311

سال سوئم

موضوعات

- ☆ احساس ذمہ داری
- ☆ مثبت ذہن
- ☆ عدل و انصاف
- ☆ قومی خدمت کا جذبہ
- ☆ ذکر و نظر کی پاکیزگی
- ☆ احترام آدمیت
- ☆ شائستگی
- ☆ عفو و درگزر
- ☆ بردباری
- ☆ خود انحصاری
- ☆ اثر و نفوذ
- ☆ جامعیت
- ☆ اپنی ذات کی معرفت (بذریعہ ہم عمر طلباء۔ اساتذہ۔ اہم شخصیات اوارہ)

Mgm-311 INDUSTRIAL MANAGEMENT AND HUMAN RELATIONS

T	P	C
1	0	1

TOTAL CONTACT HOURS:

Theory : 64.
Practical : 00

AIMS:

Enable students to develop management skills acquaint with principles of management and human relations and develop psychological approach to solve the labour.

COURSE CONTENTS:

1. INDUSTRIAL PSYCHOLOGY: Hours-02

1.1 History and definition.
1.2 Nature and scope.

2. LEADERSHIP Hours-01

2.1 Definition and types
2.2 Qualities or good leader.

3. MOTIVATION Hours-02

3.1 Definition.
3.2 Types (financial and non financial motives)
3.3 Contact of motives.

4. MORALE Hours-01

4.1 Importance
4.2 Development.
4.3 Measurement.

5. HUMAN ENGINEERING Hours-01

5.1 Importance of Human factor in Industry.
5.2 Man machine system.
5.3 Strategy for making allocation decisions.

6. INDUSTRIAL FATIGUE AND BOREDOM Hours-02

6.1 Definition and distinction.
6.2 Psychological and distinction.
6.3 Objective causes.
6.4 Prevention.

7. INDUSTRIAL ACCIDENTS Hours-02

7.1 Psychological causes.
7.2 Objective causes.
7.3 Prevention.

8. INDUSTRIAL PREJUDICE Hours-02

8.1 Causes.
8.2 Remedies

9. PUBLIC RELATIONS **Hours-02**

9.1 Importance
9.2 Functions

10. GUIDANCE AND COUNSELING **Hours-02**

10.1 Importance
10.2 Choice of job.
10.3 During service.

11. JOB EVALUATION **Hours-02**

11.1 Importance
11.2 Methods.
11.3 Job satisfaction.
11.4 Work simplification.

12. INDUSTRIAL MANAGEMENT **Hours-02**

12.1 Introduction
12.2 Functions of management
12.3 Sub divisions of industrial management.

13. PERSONAL SELECTION **Hours-02**

13.1 Recruitment of employees.
13.2 Training.
13.3 Effect of training on production and product cost.

14. WORKING CONDITIONS **Hours-02**

14.1 Importance and consideration.
14.2 Effect on efficiency and per unit Cost.

15. TIME AND MOTION STUDY **Hours-03**

15.1 Concepts and importance.
15.2 Sequence of motion study.
15.3 Principles of motion study.
15.4 Steps to time study.
15.5 Determination of operations time.

16. QUALITY CONTROL **Hours-02**

16.1 Concepts and advantages.
16.2 Methods.

17. ROLE OF FOREMAN IN MANAGEMENT **Hours-02**

17.1 Foreman abilities.
17.2 Duties and functions.

BOOKS RECOMMENDED

1. C.S. Meyers. Industrial Psychology Oxford University Press.
2. Smith Wakley. Psychlogy of Industrial behaviours. Mc-Graw Hill. New York.
3. Ghulam Hussain, Nizamat-e-Sanaat Aur Insani Rawabat, Ilmi Kitab Khana.
4. Andrew R, Mgill, The Process of management William M. Nevmah.
5. Richard N Omen. Management of Industrial Enterprises.

INSTRUCTIONAL OBJECTIVES:

1. KNOW INDUSTRIAL PSYCHOLOGY

1.1 Describe brief history of industrial psychology.
1.2 Describe in detail definition of industrial psychology.
1.3 State nature and scope of industrial psychology.

2. KNOW LEADERSHIP

2.1 Define leadership.
2.2 Describe types of leadership.
2.3 State qualities of a good leader.

3. UNDERSTAND MOTIVATION

3.1 Define motivation.
3.2 Describe financial and non-financial motives.
3.3 Explain conflict of motives.

4. KNOW MORALE

4.1 State importance of morale.
4.2 Describe development of morals.
4.3 State the method of measurement of morals.

5. UNDERSTAND HUMAN ENGINEERING

5.1 Explain importance of human engineering in the industry.
5.2 Explain man-machine system.
5.3 Explain strategy for making allocation decisions.

6. UNDERSTAND INDUSTRIAL FATIGUE AND BOREDOM

6.1 Define fatigue and boredom.
6.2 Describe psychological causes of fatigue and boredom.
6.3 Describe objective causes of fatigue and boredom
6.4 Explain measures to prevent fatigue and boredom.

7. UNDERSTAND INDUSTRIAL ACCIDENTS

7.1 explain psychological causes of industrial accidents.
7.2 Explain objective causes of industrial accidents.
7.3 Explain measure to prevent industrial accidents.

8. UNDERSTAND INDUSTRIAL PREJUDICE

8.1 Define Prejudice.
8.2 Explain causes of industrial prejudice.

8.3 Explain remedies of industrial prejudice.

9. UNDERSTAND THE SIGNIFICANCE OF UBLIC RELATIONS

9.1 Explain importance of public relations.
9.2 Explain functions of public relations.

10. UNDERSTAND THE NEED FOR GUIDANCE AND COUNSELLING

10.1 State importance of guidance and counseling/
10.2 Explain the role of guidance and counseling in handling the job.
10.3 Describe help of guidance and counseling during service.

11. UNDERSTAND JOB EVALUATION

11.1 Explain importance of job evaluation.
11.2 Explain methods of job evaluation.
11.3 Explain job satisfaction.
11.4 Explain work simplification.

12. UNDERSTAND INDUSTRIAL MANAGEMENT

12.1 Define management.
12.2 State functions of management.
12.3 Enlist subdivision of management.
12.4 Explain objectives of industrial management.

13. UNDERSTAND TRAINING AND ITS EFFECTS

13.1 Describe the recruitment procedure of employees to an industrial concern.
13.2 Explain training.
13.3 Identity the kinds of training.
13.4 Explain the effects of training on production and product cost.

14. EFFECTS OF WORKING CONDTION ON EFFICIENCY

14.1 Explain importance of working condition.
14.2 Describe air-conditioning, ventilation, lighting and noise.
14.3 State effects of good working conditions on efficiency and per unit cost.

15. UNDERSTAND TIME AND MOTION STUDY

15.1 Explain the concept.
15.2 Describe the importance of work study.
15.3 Explain the sequence of motion study.
15.4 State the principles of motion study.
15.5 Describe the steps for carrying out time study.
15.6 Explain the method of determination of operations time.

16. UNDERSTAND THE METHODS OF QUALITY CONTROL

16.1 Define quality control.
16.2 State the advantages of quality control.
16.3 Explain methods of quality control.

17. THE ROLE OF FOREMAN IN AN INDUSTRIAL UNDERTAKING

17.1 Explain ability of the foreman.
17.2 Enlist duties of foreman.
17.3 Describe functions of foreman as middle management.

TT-314(Rev.) DYEING AND FINISHING

T	P	C
2	6	4

TOTAL CONTACT HOURS: 256 Hrs.
Theory : 64 Hrs.
Practical : 192 Hrs.

AIMS:

1. To acquaint the students with the dyeing materials Techniques used in the cotton, silk and synthetic industry.

2. To enable the students understand bleaching, finishing and printing materials, techniques used in textile industry.

C/SUB TOPIC:

1. INSPECTION OF FABRIC **2 Hours**
- 1.1 Method of Inspection.
- 1.2 Grading of Cloth

2. DESIZING **2 Hours**
- 2.1 Method of desizing.
- 2.2 Desizing machines.
- 2.3 De-oiling of knitted fabric

3. SINGEING **2 Hours**
- 3.1 Singeing machines.
- 3.2 Method of singeing.
- 3.3 Singeing of woven and knitted fabric

4. SCOURING (COTTON, WOOL, MAN MADE FIBER) **4Hours**
- 4.1 Scouring machine.
- 4.2 Scouring of cotton. (Knitted and woven)
- 4.3 Scouring of wool.
- 4.4 Scouring of M.M.F.

5. BLEACHING **6 Hours**
- 5.1 Methods of bleaching.
- 5.2 Hypochlorite bleaching.
- 5.3 Hydrogen peroxide bleaching.
- 5.4 Continuous bleaching system.
- 5.5 One bath system.
- 5.6 Bleaching of knitted fabric

6. MERCERIZATION **4 Hours**

7. WOOL BLEACHING **4 Hours**
- 7.1 Method of wool bleaching.
- 7.2 Machine used in wool bleaching.

8.	**CLASSIFICATION OF DYES**	**20 Hours**
9.	**DYEING MACHINES**	**6 Hours**
10.	**PRINTING**	**4 Hours**
11.	**APPLICATION OF FINISHING MATERIAL TO COTTON.**	**2 Hours**
12.	**FINISHING OF MAN MADE FIBRE**	**2 Hours**
13.	**FINISHING OF WOOLEN FABRIC**	**2 Hours**
14.	**DYEING OF KNITTED FABRIC** 14.1 Dyeing of knitting fabric with direct dyes (Reactive, sulphur)	**2 Hours**
15.	**FINISHING OF KNITTED FABRIC** 15.1 Shrinkage Control. 15.2 Softening of knitted fabrics.	**2 Hours**
16.	**DETAIL STUDY OF AZO FREE DYEING (ECHO DYEING)**	**2 Hours**

TT-314(Rev.) DYEING AND FINISHING

INSTRUCTIONAL OBJECTIVE:

1. UNDERSTAND INSPECTION OF FABRIC

1.1 State method of inspection of fabric.
1.2 Perform grading of cloth.
1.3 Explain grading of cloth.

2. UNDERSTAND DESIZING

2.1 State methods of desizing & deoiling of knitted fabrics.
2.2 Explain working of desizing machines.

3. UNDERSTAND SINGEING MACHINES

3.1 Explain singeing machines.
3.2 Explain working of singeing machines.
3.3 State methods of singeing.

4. UNDERSTAND SCOURING

4.1 Discuss scouring machines.
4.2 State scouring of cotton.
4.3 Explain scouring of wool.
4.4 Explain scouring of Man Made Fibre.
4.5 Continous scouring of woven cotton fabric

5. UNDERSTAND BLEACHING

5.1 Discuss methods of bleaching. (woven and knitted)
5.2 Explain hypochlorite bleaching.
5.3 Explain hydrogen peroxide bleaching.
5.4 Describe continuous bleaching system.
5.5 Describe one bath system of bleaching.

6. UNDERSTAND MERCERIZATION:

6.1 Explain mercerization process & procedures.
6.2 Explain caustization.
6.3 Explain mercerization machinery in use.
6.4 Explain latest development in mercerization.

7. UNDERSTAND BLEACHING OF WOOL

7.1 State methods of wool bleaching.
7.2 Enlist machines used in wool bleaching.
7.3 Explain working of wool bleaching machines.

8. UNDERSTAND CLASSIFICATION OF DYES

8.1 Explain dyes classification.
8.2 Describe the uses of dyes on different material.
8.3 Define colour fastness.
8.4 State direct dyes their properties and methods of application.
8.5 Explain Azoic dyes, properties and methods of application to textile material.
8.6 Explain sulphur dyes, properties and methods of application to textile material.
8.7 Explain Vat dyes, properties and method of application to textile material.

8.8 Explain solubilized Vat dyes properties and methods of application to textile materials.
8.9 Explain basic dyes, properties and method of application to textile material.
8.10 Explain Acid dyes, properties and method of application to textile material.
8.11 Explain Acid chrome dyes properties and method of application wool.
8.12 Explain reactive dyes, properties and method of application.
8.13 State general properties of reactive dyes.
8.14 Explain methods of application reactive dyes on rayon.
8.15 Explain disperse dyes and its properties.
8.16 Define methods of application of disperse dyes on man made fibre.

9. UNDERSTAND DYEING MACHINE:

9.1 State different dyeing machinery.
9.2 Explain soft flow machine.
9.3 Explain jet dyeing machines.
9.4 Explain close and open winch dyeing machines.
9.5 Explain jigger dyeing machines.
9.6 Explain circular dyeing machine.
9.7 Discuss continuous dyeing machines for cotton and polyester.
9.8 Distinguish between different dyeing machines.
9.9 Explain cone dyeing machine.

10. UNDERSTAND PRINTING:

10.1 Enlist types of textile printing.
10.2 Explain roller printing machine.
10.3 Explain working of roller printing machine.
10.4 Explain screen printing machines and its working.
10.5 Explain hand block printing and its working.
10.6 Explain rotary printing machines and its working.
10.7 State machine use in treatment of cloth after printing
10.8 Explain printing of cloth with different types of dyes.
10.9 Discuss latest development in printing machines. (Digital Printing)

11. UNDERSTAND APPLICATION OF FINISHING MATERIAL TO COTTON:

11.1 Name the material used in the finishing of cotton.
11.2 Explain the finishing of cotton.
11.3 Explain in detail calendering of cotton.
11.4 Explain working of calendering machinery and development
11.5 Explain sanforizing process

12. UNDERSTAND FINISHING MAN MADE FIBRE:

12.1 Explain the finishing process of man made fibre.
12.2 Explain the methods used for finishing of man made fibre. (Heat setting and singeing)

13. UNDERSTAND FINISHING OF WOOLEN FABRIC:

13.1 Explain the process of finishing of woolen fabric.

13.2 Discuss methods of finishing of woolen fabric.

14. UNDERSTAND DYEING OF KNITTING FABRIC.

14.1 Explain dyeing of knitting fabric with direct dyes (Reactive sulphur).

15. UNDERSTAND FINISIIING OF KNITTING FABRIC

15.1 Explain shrinking control and softening of knitting fabric.

16. UNDERSTAND AZO FREE DYEING.

16.1 Explain in detail of effects of azo dyeing.

TT-314(Rev.) DYEING AND FINISHING

LIST OF PRACTICALS:

1.	Cotton singeing and shearing	3 Hours
2.	Cotton desizing and de-oiling	6 Hours
3.	Cotton scouring	3 Hours
4.	Cotton bleaching with Hypochlorite and Hydrogen per oxide	6 Hours
5.	Wool scouring	3 Hours
6.	Wool bleaching	3 Hours
7.	Scouring of man made fibers.	3 Hours
8.	Cotton finishing (OBA/ Stiffening/Softening)	9 Hours
9.	Finishing of wool	6 Hours
10.	Finishing of man made fibers (Heat setting and Singeing)	6 Hours
11.	Printing of cotton with reactive dye stuff and pigment colours	6 Hours
12.	Application of direct dyes on cotton.	6 Hours
13.	Coupling cotton with fast salt and base of different naphthals.	12 Hours
14.	Dyeing of cotton with sulfur dyes.	6 Hours
15.	Dyeing of cotton with reactive dyes by hot method.	6 Hours
16.	Dyeing of cotton with reactive dyes by cold method.	6 Hours
17.	Dyeing of cotton with vat dyes.	6 Hours
18.	Dyeing of mordant and unmordant cotton with basic dyes.	12 Hours
19.	Dyeing of wool with acid dyes.	6 Hours
20.	Dyeing of wool with chrome dyes.	6 Hours
21.	Dyeing of rayon with direct, reactive vat. Soluble vat dyes.	6 Hours
22.	Dyeing of acetate and viscose (cross dyeing)	6 Hours
23.	Mercerizing of cotton	3Hours
24.	% age of size material	3Hours
25.	Desizing efficiency	3Hours
26.	Absorbancy of fabric by capillary rise method	3Hours
27.	Tear strength of bleach fabric	3Hours
28.	Tensile strength of bleach fabric	3Hours
29.	Pilling by martindale tester	6Hours
30.	Identification of chemical damage for cotton in mercerization	3Hours
31.	Washing fastness of dyed and printed fabric	6Hours
32.	Dry cleaning fastness of dyed and printed fabric	6Hours
33.	Light Fastness of dyed and printed fabric	6Hours
34.	Crocking of dyed and printed fabric	3Hours
35.	Shrinkage test of fabric	3Hours
36.	Washing fastness of Man Made Fibers & Blended fibers	3Hours
37.	Dry cleaning fastness of Man Made Fibers & Blended fibers	3Hours
38.	Perspiration fastness of dyed fabric	3Hours

TT-323(Rev.) TEXTILE TESTING AND QUALITY CONTROL

T	P	C
2	3	3

TOTAL CONTACT HOURS:

Theory : 64 Hrs.
Practical : 96 Hrs.

This course is designed.

1. To develop the knowledge and skill in students to make him fit for working in any textile testing Laboratory.
2. To train the student in the assessment of quality of textile materials.

C/SUB TOPIC:

1. TEXTILE TESTING: 6 Hours

1.1 Introduction.
1.2 Uses in textile industry.
1.3 Standard Conditions For Textile Testing:
1.4 Standard humidity and temperature in textile.
1.5 Control of operating and testing conditions.

2. MOISTURE CONTENT: 4 Hours

2.1 Moisture regain in fibers.
2.2 Moisture content in fibers.
2.3 Types of Hygrometers,

3. MICROSCOPE: 4 Hours

3.1 Study of different types of microscopes
3.2 Uses, Adjustment and sample preparation
16.3 Manipulation.

4. MEASUREMENT OF FIBRE LENGTH. 4 Hours

4.1 Introduction of Fibrograph.
4.2 Procedure for preparation sample.
4.3 Operation of the fibrograph
4.4 Calculations.

5. MATURITY OF COTTON FIBERS. 2 Hours

2.1 Introduction.
2.2 B.S.I. Cotton fiber maturity test.
2.3 Test by microscope.
2.4 Calculation.

6. FINENESS OF COTTON: 2 Hours

6.1 Introduction.
6.2 Importance of fiber fineness.
6.3 Measurement of fineness by air flow method.

7. MEASUREMENT OF FIBER STRENGTH 2 Hours

7.1 Introduction

7.2 Importance
7.3 Measurement of fiber strengths by different methods

8. YARN TWIST: 4 Hours

8.1 Definition of Twist.
8.2 Amount of Twist.
8.3 Direction of twist.
8.4 Twist in yarn strength.
8.5 Measurement of twist.
8.6 The twist Contaction method.

9. MEASUREMENT OF YARN COUNT 4 Hours

9.1 Introduction
9.2 Importance of yarn number
9.3 Measurement of yarn number

10. MEASUREMENT OF YARN STRENGTH: 4 Hours

10.1 Factors effecting yarn strength
10.2 Lea strength testing machine
10.3 Uster fully Automatic tester.
10.4 Importance of single yarn strength.
10.5 Tensorapid single yarn strength.
10.6 Principal of operation.

11. TENSILE STRENGTH OF FABRIC: 4 Hours

11.1 Fabric strength testing.
11.2 Strip test.
11.3 Grab test.
11.4 The Bursting tester.

12. ANALYSIS OF CLOTH: 4 Hours

12.1 Fabric Density
12.2 G.S.M & G.L.M
12.3 Threads per inch (cm) woolen fabric.
12.4 Measurement of crimp percentage.

13. ANALYSIS OF FABRIC DEFECTS: 4 Hours

13.1 Introduction.
13.2 Classification of fabric defects.
13.3 Point system of grading.

14. APPEARANCE OF YARN AND FABRICS: 4 Hours

14.1 Appearance test of yarn.
14.2 Grading of yarn according to appearance.
14.3 Appearance of fabric.
14.4 Inspection and grading of fabric.

15. STATISTICAL DATA: 4 Hours

15.1 Sampling.
15.2 Sampling plan.
15.3 Acceptable quality level and its application in sampling.

16. STANDARD DEVIATION: **4 Hours**

16.1 Mean calculation
16.2 Co-efficient of variation.

17. MEASUREMENT OF REGULARITY: **2 Hours**

17.1 Uster test for sliver.
17.2 Uster test for roving.
17.3 Uster test for yarn.
17.4 Result Analysis.

18. INTRODUCTION ISO-9000: **2 Hours**

18.1 Requirement.
18.2 Detail study.
18.3 Version.

REFERENCE BOOK:

1. Manual on Textile Testing by Naeem Ahmed.
2. Textile Testing and Quality Control by Elliot B. Grover.

TT-323(Rev.) TEXTILE TESTING AND QUALITY CONTROL

INSTRUCTIONAL OBJECTIVES:

1. UNDERSTAND TXTILE TESTING:
- 1.1 Explain the importance of textile testing.
- 1.2 Explain the role of testing in process development.
- 1.3 Enlist the methods of selection of raw material in textile testing.
- 1.4 Explain general aspect of testing.
- 1.5 State the atmospheric conditions of textile testing.
- 1.6 Explain textile testing laboratory specifications.

2. UNDERSTAND MOISTURE CONTENT:
- 2.1 State the moisture content.
- 2.2 Determination of moisture content in textile.
- 2.3 Explain the different types of Hygrometer.
- 2.4 Explain the effect of humidity in textile manufacturing.

3. UNDERSTAND MICROSCOPE:
- 3.1 Explain manipulation of microscope.
- 3.2 Sketch the microscope used in textile.

4. UNDERSTAND MEASUREMENT OF FIBRE LENGTH.
- 4.1 Explain the fibre length, span length, measurement by electronic method.
- 4.2 Analyse fibrograph results.
- 4.3 Explain the fibre length by comb sorter method.

5. UNDERSTAND MATURITY OF COTTON FIBERS.
- 5.1 Define the maturity of cotton fibre.
- 5.2 Explain method of cotton fiber maturity test by B.S.I.
- 5.3 Describe the maturity testing of cotton by microscope method.

6. UNDERSTAND FINENESS OF COTTON:
- 6.1 Define fineness..
- 6.2 Measure the fineness by air flow method.

7. UNDERSTAND MEASUREMENT OF FIBER STRENGTH
- 7.2 Define Importance of fiber strength
- 7.3 Explain Measurement of fiber strengths by different methods

8. UNDERSTAND YARN TWIST:
- 7.1 Define twist in yarn.
- 7.2 Calculate the amount of twist in yarn.
- 7.3 Explain the relationship between twist and count.
- 7.4 Determine twist in yarn by straightened fibre.
- 7.5 Determine twist in yarn by twist Contaction method.
- 7.6 Determine Twist and yarn strength.
- 7.7 Measurement of twist.
- 7.8 The twist Contaction method.

9. UNDERSTAND THE MEASUREMENT OF YARN COUNT
- 9.2 State Importance of yarn number
- 9.3 Measure the yarn number

10. UNDERSTAND MEASUREMENT OF YARN STRENGTH:

10.1 Define yarn strength.
10.2 Explain the factors affecting yarn strength.
10.3 Explain the yarn strength on the uster single yarn tester.
10.4 Explain different methods yarn strength testing.
10.5 Explain the working of tensorapid strength tester.
10.6 Interpret the graph of tensorapid single yarn strength tester.
10.7 Explain the principle and operation of tensorapid tester.

11. UNDERSTAND TENSILE STRENGTH OF FABRIC:

11.1 Explain of strip test of fabric.
11.2 Describe the tongue tear test of fabric.
11.3 State the method of determination of bursting strength

12. UNDERSTAND ANALYSIS OF CLOTH:

12.1 Define Fabric Density
12.2 Explain G.S.M & G.L.M
12.3 Define crimp.
12.4 Explain the method of determining ends and picks/inch.
12.5. Explain the cover factors.
12.6 Determine the count of yarn removed from fabric.

13. UNDERSTAND FABRIC DEFECTS:

13.1 Explain the inspection of fabric.
13.2 Classify the major, minor and sub-minor defects of fabric.
13.3 Explain points system of grading.
13.4 Enlist the fabric defects.

14. UNDERSTAND APPEARANCE OF YARN AND FABRICS:

14.1 Explain the yarn grading.
14.2 Classify the grade of yarn.
14.3 Explain the inspection machine.
14.4 Inspection and grading of fabric.

15. UNDERSTAND STATISTICAL DATA, PRESENTATION AND INTERPRETATION:

15.1 Explain sampling.
15.2 State different sampling plans.
15.3 Explain acceptable quality level and its applications.

16. UNDERSTAND STANDARD DEVIATION:

16.1 Explain standard deviation for average.
16.2 Explain application and interpretation of standard deviation.
16.3 Explain co-efficient of variation.

17. UNDERSTAND MEASUREMENT OF REGULARITY:
UNDERSTAND THE UNIFORMITY MEASUREMENT:

17.1 Define the uniformity from lap to yarn.
17.2 Explain the analysis data for sliver, roving and yarn.

18. UNDERSTAND ISO-9000:

18.1 Explain ISO-9000 and its versions.
18.2 Describe its application to textile.

TT-323(Rev.) TEXTILE TESTING AND QUALITY CONTROL

TEXTILE TESTING PRACTICALS:

All Practical work should performed under international quality standards (AATCC, ASTM, ISO etc)

1.	Sample conditioning and relative humidity calculations	9 Hours
2.	Identification of textile fibers.	9 Hours
3.	Estimation of cotton fibers maturity by microscope method.	3 Hours
4.	Determination of yarn count or yarn number.	12 Hours
5.	Determination of twist in yarn and package form.	3 Hours
6.	Determination of strength and count of spun yarn.	3 Hours
7.	Identification of warp and weft direction.	3 Hours
8.	Determination of strength of cloth by bursting method.	3 Hours
9.	Method of twist in yarn removed from fabrics.	3 Hours
10.	Analysis of yarn and fabric..	3 Hours
11.	Measurement of cloth thickness and fabric density	3 Hours
12.	Measurement of single yarn strength by single yarn tensorapid strength tester.	9 Hours
13.	Test of sliver for irregularity by Uster tester.	3 Hours
14.	Test of yarn irregularity by Uster tester.	3 Hours
15.	Test of roving for irregularity by Uster tester.	3 Hours
16.	Different method of testing single yarn regularity.	9 Hours
17.	Classification and location of faults by Uster spectrograph.	6 Hours
18.	Test of fibers by Presley strength tester.	3 Hours
19.	Measurement of staple length of cotton by fibrograph.	3 Hours
20.	Measurement of fabric strength by different methods.	3 Hours
21.	Method of estimating fibre staple length by hand sampling.	3 Hours

Reference:

1. Manuals of AATCC, ISO, DIN, ASTM, BS system

TT-332(Rev.) MILL ENGINEERING & SERVICES

T	P	C
1	3	2

TOTAL CONTACT HOURS: 128 Hours

Theory : 32 Hrs.

Practical : 96 Hrs.

AIM OF SUBJECT:

To develop within each students knowledge and understanding of mill engineering, including information relating to construction operation and maintenance of a mill and plants.

TOPIC/SUB TOPIC:

1. ELECTRICAL SUPPLY: 2 Hours

1.1 Electrical distribution

1.2 Electrical distribution different department in textile mill

2 INDUCTION MOTOR 2 Hours

2.1 Operation of Induction motor.

2.2 Maintenance of Induction motors.

3. A.C. 1 Hours

3.1 Conversion of A.C. to D.C

4. ILLUMINATIN IN TEXTILE MILL AND SAFETY. 1 Hours

4.1 Lux. lumen

4.2 Fire control instrument.

5. STEAM 1 Hours

5.1 Properties of steam.

5.2 Steam requirements for power.

5.3 Steam requirement for processing industry .

6. DIESEL ENGINES. 1 Hours

6.1 Types of diesel Engines.

6.2 Function and working of diesel electric generator.

7. INTERNAL COMBUSTION ENGINE. 1 Hours

8. FUNCTION OF COMBUSTION ENGINE. 1 Hours

9. LUBRICANTS. 2 Hours

9.1 Oiling and greasing.

9.2 Oil and Greasing schedule for different textile machinery

10. MILL BUILDING. 4 Hours

10.1 Layout plan of mill

10.2 Characteristics of mill building.

10.3 Mill Planning.

11. HUMIDIFICATION. 2 Hours

11.1 Types of humidifier.
11.2 Working of humidifier.

12. BOILERS. 2 Hours

12.1 Introduction to boiler.
12.2 Types of Boilers.
12.3 Uses in textile mills.

13. PUMPS. 2 Hours

13.1 Characteristics of pumps.
13.2 Types of pumps.
13.3 Complete working of different types of pumps.

14. HEALTH AND SAFETY MEASURES 1 Hours

14.1 Introduction to hazards
14.2 Types of fire hazards.

15. BEARINGS. 1 Hours

15.1 Different types of bearing uses in textile mills.

16. AIR CONDITIONING 6 Hours

17.1 Number of air cycles in one hour in different textile department
17.2 Air washer system
17.3 Chiller
17.4 Textile mill air-conditioner maintenance

17. FIBER SEPARATOR AND MICRODUST SYSTEM. 2 Hours

18.1 Working of fiber separator

TT-332(Rev.) MILL ENGINEERING & SERVICES

INSTRUCTIONAL OBJECTIVES:

1. UNDERSTAND ELECTRICAL SUPPLY
- 1.1 State the electrical distribution.
- 1.2 Describe the electrical distribution in textile mill.
- 1.3 State short-circuiting.

2. UNDERSTAND INDUCTION MOTOR:
- 2.1 Explain the working of induction motors.
- 2.2 Explain maintenance of induction motor.

3. UNDERSTAND A.C. AND D.C.:
- 3.1 Describe A.C. and D.C.
- 3.2 Explain how and why A.C. is converted into D.C.

4. UNDERSTAND ILLUMINATION AND SAFETY IN TEXTILE MILLS:
- 4.1 Explain the mill illumination.
- 4.2 State the specialized applications and give standard illumination level in textile mill.
- 4.3 Describe the combination of original artificial light.
- 4.4 Calculate a lighting level.
- 4.5 Explain the lighting scheme in a mill.
- 4.6 Explain different types of fire extinguisher.

5. UNDERSTAND STEAM:
- 5.1 Explain steam.
- 5.2 Discuss the properties of steam.
- 5.3 Explain the steam requirement for processing mill.
- 5.4 Explain steam requirement for processing.
- 5.5 Enlist types of boilers.
- 5.6 Sketch diagram of boilers.

6. UNDERSTAND DIESEL ENGINE:
- 6.1 Explain diesel engine.
- 6.2 Enlist types of diesel engine.
- 6.3 Describe the function of diesel electric generator in textile mills.

7. UNDERSTAND INTERNAL COMBUSTION ENGINE:
- 7.1 Describe the functions of combustion engine.
- 7.2 Sketch a diagram of internal combustion engine.

8. UNDERSTAND THE LUBRICANTS:
- 8.1 Explain oiling and greasing.
- 8.2 Enlist types of different lubricants.
- 8.3 Explain lubricant used for rotor spinning.

9. UNDERSTAND MILL BUILDING:
- 9.1 Sketch lay out plan of mill building of spinning mill.
- 9.2 Sketch a floor plan from Blow Room to Ring.

10. UNDERSTAND HUMIDIFICATION:

10.1 Explain working of humidification.
10.2 Study the effects of humidification.
10.3 Describe the humidification plan.

11. UNDERSTAND THE BOILERS:

11.1 Study the industrial boilers.
11.2 Explain the types of boilers
11.3 Sketch a diagram of vertical boiler.
11.4. Describe the maintenance requirement of a boiler.

12. UNDERSTAND THE PUMPS:

12.1 Explain the characteristic of pumps.
12.2 Enlist the types of pumps.
12.3 Explain the function of pumps.
12.4 Sketch a diagram of pumps.
12.5 Explain maintenance of pumps.

13. UNDERSTAND THE HAZARDS:

13.1 Enlist the types of fire hazards.
13.2 Explain the fire hydrant system.
13.3 Explain the sprinkler heads.
13.4 Explain labour instruction about fire hazards & its measurement through fire extinguisher
13.5 Explain environmental protection and machine safety.

14. UNDERSTAND THE BEARINGS:

14.1 State different types of bearings.
14.2 Explain the uses of bearings in he textile mills.
14.3 Sketch different types of bearings.

15. UNDERSTAND AIR-CONDITIONING OF TEXTILE MILL:

15.1 State number of air cycles in one hour in different department textile mill.
15.2 Explain air washer system.
15.3 Describe Chiller.
15.4 Narrate working of textile mill air conditioning.
15.5 Sketch an air conditioning plant of a textile mill.

16 UNDERSTAND FIBER SEPARATOR AND MICRODUST SYSTEM:

16.1 Describe waste collecting system of Blow Room.
16.2 Explain micro dust cleaner system.
16.3 Explain working of fiber separator.

TT-332(Rev.) MILL ENGINEERING & SERVICES

LIST OF PRACTICALS:

1.	First Aid and paramedical training	12 Hours
2.	Study of fire and there extinguishing methods	6 Hours
3.	Study of power transmission by gear belt chain rope and pulley (in Blow Room, carding, Comber etc).	6 Hours
4.	Types of Motors (Electric)	6 Hours
5.	Study of motors employed in textile machinery.	6 Hours
6.	Maintenance of electric motor use in Textile Mills.	6 Hours
7.	Horse power of motor in spinning and weaving department.	6 Hours
8.	Illumination required in textile industry.	6 Hours
9.	Humidification and their methods of control.	6 Hours
10.	Lightening in a textile mill.	6 Hours
11.	Study of sling psychrometer.	6 Hours
12.	Dew point temperature finding.	6 Hours
13.	Study of hygrometer/humidity state.	6 Hours
14.	Relative humidity finding.	6 Hours
15.	Moisture content finding.	6 Hours
16.	Boiler safety and its measurement	3 Hours
17.	Pressure gauge and temperature gauge measurement	3 Hours

TS-313(Rev.)

SPECIAL PROJECT ON SPINNING.

T-P-C
3-0-3

TOTAL CONTACT HRS.
Theory: 96 Hrs.

PRE-REQUISITE: G.T.T, S.& W.M.

AIM This course is designed;
1. To acquaint student with the maintenance of spinning Machinery.
2. To acquaint students with the working and maintenance of Auto coner.

TOPIC:

1. PREPARATION OF LAP. 18 HRS.
- 1.1 Study in detail of Blow Room different Machinery:
  - 1.1.1 Auto plucker.
  - 1.1.2 Bale Breaker.
  - 1.1.4 Step cleaner.
  - 1.1.5 Axi flow cleaner.
  - 1.1.6 Multi Mixer.
- 1.2 Scutcher & 2 way distributor.
- 1.3 Chute Feed Systems.

2. BLOW ROOM BEATER. 6 HRS.
- 2.1 Types.
- 2.2 Uses of beater.
- 2.3 Setting and speed of Blow Room Beaters.
- 2.4 Beating point.
- 2.5 Beats/minute calculation.
- 2.6 Beats/inch calculation.

3. CARDING MACHINE. 15 HRS.
- 3.1 Types of Cards.
- 3.2 Tandem card.
- 3.3 Double laps card.
- 3.4 Card Settings and its effects.
- 3.5 Change of hand sliver at card.
- 3.6 Automation at carding.

4. ERECTION OF CARD. 6 HRS.
- 4.1 Floor spacing.
- 4.2 Balancing of cylinder & doffer.
- 4.3 Bare grinding.
- 4.4 Wire mounting.
- 4.5 Grinding.

5. DRAW FRAME. 9 HRS.
- 5.1 Working.
- 5.2 Change in draft.
- 5.3 Roller setting.

5.4 Gear calculation.

6. SIMPLEX. 12 HRS.

6.1 Working.
6.2 Study of Builder motion.
6.3 study of differential motion.
6.4 Cone drum study.
6.5 Change on draft.
6.6 Gear calculation

7. RING FRAME SETTING. 12 HRS.

7.1 Major parts of Ring Frame.
7.2 Working of major parts.
7.3 Change in draft.
7.4 How builder Motion works.
7.5 Gearing diagram of ring frame.
7.6 Different drafting system at ring frame.
7.7 Twist calculation
7.8 Twist multiplier

8. OPEN END SPINNING. 12 HRS.

8.1 Machine Structure.
8.2 Rotor sizes for different counts, function of combing roll.
8.3 Uses and Advantages.

9. AUTO CONER. 9 HRS.

9.1 Machine Major parts.
9.2 Working of knotter and splicer.
9.3 Maintenance.
9.4 Quality reports analysis.

BOOKS RECOMMENDED.

1. Cotton Set by Gilbert Merril .
2. Mannual of Cotton Spinning by A.E. De. Barr (The Textile Institute U.K).
3. Cotton Spinning By William Scott Taggart. India.

TS-313(Rev.) SPECIAL PROJECT ON SPINNING.

INSTRUCTIONAL OBJECTIVES

1. UNDERSTAND PREPARATION OF LAP.

1.1 Describe working of Auto plucker in detail.
1.2 Sketch a neat diagram of Autoplucker.
1.3 Describe working of Bale Breaker in detail.
1.4 Sketch a neat diagram of Bale Breaker.
1.5 Describe the working of Bale digester in detail.
1.6 Sketch a neat diagram of Bale digester.
1.7 Describe the working of step cleaner in detail.
1.8 Sketch a neat diagram of step cleaner.
1.9 Describe the working of Axi-flow cleaner in detail.
1.10 Sketch a neat diagram of Axi-flow cleaner.
1.11 Describe the working of Multi Mixer in detail.
1.12 Sketch a neat diagram of Multi-Mixer.
1.13 Explain the working of porcupine opener.
1.14 Make diagram of porcupine opener.
1.15 State the uses of Kirshner beaters.
1.16 Draw a neat sketch of Kirshner Beater.
1.17 Draw the diagram of chute feeder.

2. UNDERSTAND BLOW ROOM BEATERS.

2.1 State types of beaters used in modern blow room.
2.2 State critical features of each beaters.
2.3 Explain the setting of blow room beaters.
2.4 Narrate beating points.
2.5 State beats/minutes.
2.6 Calculate beaters/inch.

3. UNDERSTAND CARDING MACHINE.

3.1 Enlist the types of carding machine.
3.2 Explain tandem card.
3.3 Explain double lap card.
3.4 Explain card setting and its effects.
3.5 Explain change of count at carding.
3.6 Explain Automation at carding.

4. UNDERSTAND ERECTION OF CARD.

4.1 Explain card erection.
4.2 State floor spacing.
4.3 State in detail the balancing of cylinder.
4.4 State in detail the balancing of doffer.
4.5 State bare grinding.
4.6 Explain card grinding.
4.7 Explain card wire.
4.8 Describe card wire mounting.

5. UNDERSTAND DRAW FRAME ADJUSTMENT.

5.1 Define working of breaker and finisher draw frame.
5.2 Explain change in draft in draw frame.
5.3 Explain rollers settings at draw frame.
5.4 Explain in detail draw frame parts.

6. UNDERSTAND SIMPLEX MACHINE.

6.1 Define working of simplex machine.
6.2 State in detail the builder motion.
6.3 Sketch a builder motion.
6.4 Describe the differential motion.
6.5 Sketch a differential motion.
6.6 Define working of cone drum.
6.7 Define laying, tapper insertion.
6.8 Explain change of gears at simplex.

7. UNDERSTAND RING FRAME SETTING.

7.1 Enlist major parts of ring frame.
7.2 Describe working of major parts of ring frame.
7.3 State change in draft of ring frame.
7.4 State in detail different drafting system at ring frame.
7.5 Define roller setting at ring frame.

8. UNDERSTAND OPEN END SPINNING.

8.1 Explain the open end spinning machine.
8.2 Sketch diagram and show passage of material in open end yarn.
8.3 Describe the function of combing roller in open end spinning
8.4 Enlist merit and demerits of open end yarn.

9. UNDERSTAND AUTO CONER.

9.1 State major parts of Auto coner.
9.2 Describe working of Auto coner.
9.3 State maintenance of auto coner.
9.4 Make reports of auto coner.
9.5 Differentiate between knotted and spliced yarn.

TS-323(Rev.) **SPINNING MECHANISM** **T P C**
3 0 3

TOTAL CONTACT HOURS.
Theory: 96 Hours.

PRE-REQUISITE: 5 G.T.T and spinning and weaving mechanism.

AIM OF SUBJECT: This course is designed

1. The course aim is to acquaint the standard about the spinning operations different types of drafting on spinning
2 To enable students to work on card comber, drawing simplex ring and rotor spinning

TOPIC/SUB-TOPIC:

1. DETAIL OF WOOLEN CARDS. 6 HOURS

1.1 Introduction of woolen Card.
1.2 Feeding section.
1.3 Cylinder section.
1.4 Draft section.
1.5 Coiler calendar.
1.6 Passage of Material Through Card

2. WORSTED CARDS. 6 HOURS

2.1 Introduction of worsted Card.
2.2 Feeding section.
2.3 Cylinder section.
2.4 Draft section.
2.5 Coiler calendar.
2.6 Compression of woolen and worsted Card

3. DEVELOPMENT IN COTTON CARDING. 4 HOURS

3.1 Development Of card feeding Section
3.2 Development of Card Clothing.
3.3 Development of card Delivery section.
3.4 Auto Leveling in Carding.

4. PARTS OF CARDING ENGINE. 4 HOURS

4.1 Feeding section.
4.2 Taker in section.
4.3 Cylinder section.
4.4 Draft section.
4.5 Stripping.
4.6 Calendar.
4.7 Coiler calendar.

5. CARD CLOTHING. 4 HOURS

5.1 Introduction.
5.2 Plain clothing.
5.3 Metallic Card Clothing.
5.4 Grinding of card wire

6. SERVICE AND MAINTENANCE OF CARD. 6 HOURS

7. CARD SETTING IN DETAIL. 6 HOURS

8. STOP MOTION AT CARDING. 6 HOURS

9. COILER SYSTEM. 6 HOURS

10. CARDING FAULTS. 6 HOURS

10.1 Name of card faults.
10.2 Reason of faults.
10.3 Effect on quality.

11. DRAWING FRAME. 4 HOURS

11.1 Breaker drawing frame
11.2 Finisher drawing frame
11.3 Maintenance of drawing frame
11.4 Auto Leveling in drawing frame

12. COMBER MACHINE AND LAP FORMER. 8 HOURS

12.1 Lap former Machine Detail.
12.2 Lap former developments.
12.3 Draft in lap former.
12.4 Introduction to comber Machine.
12.5 Objects of combing machine.
12.6 Values of combing.
12.7 Types of cotton combed.
12.8 Path of cotton through comber
12.9 Combing machine operation
12.10 Combing actions
12.11 Degree of combing
12.12 Comber Adjustment

13. SIMPLEX MACHINE. 10 HOURS

13.1 History of Simplex.
13.2 Developments in simplex.
13.3 Traverse Mechanism
13.4 Study of simple machines major parts.
- 13.4.1 Spindle
- 13.4.2 Flyer
- 13.4.3 Drafting system
- 13.4.4 Charge gears and effects
- 13.4.5 T.P.I

13.5 Working of simplex.
- 13.5.1 Builder Motion study.
- 13.5.2 English Builder.
- 13.5.3 American Builder.
- 13.5.4 Bunch Builder.
- 13.5.5 Differential Motion.
- 13.5.6 Differential Motion Construction.
- 13.5.7 Differential Motion working in details.
- 13.5.8 Laying in Roving.
- 13.5.9 Winding and winding tension.
- 15.5.10 Cone Drum regulator.

13.6 Electro Mechanical Builder Motion.
13.7 Drafting System.
- 13.7.1 Draw drafting system.
- 13.7.2 Different types of long drafting system.
- 13.7.3 Doubling
- 13.7.4 Effects of drafting on quality.
- 13.7.5 Drafting Faults

14 RING FRAME **8 HOURS**

14.1 Drafting System
- 14.1.1 Inclination of roller stand.
- 14.1.2 Weighting of drafting system
- 14.1.3 Detail study of drafting roller setting etc.

14.2 Function and Operation of ring frame.
14.3 Ring and traveller.
14.4 Compact Yarn attachments
14.5 Siro yarn attachments

15. ROTOR SPINNING MACHINE. **9 HOURS**

15.1 Construction of Machine.
15.2 Working of Rotor Spinning.
15.3 Maintenance of Rotor Spinning Machine.

16. WINDING. **3 HOURS**

16.1 Introduction of winding.
16.2 Detail study of parts.
16.3 Study of yarn Clearer.

REFERENCE BOOK:

1. Cotton Set Gilbert R Merret.
2. Manual of Cotton Spinning (set) by A.E.Debarr.
3. Spinning Info's P.R Lord.

TS-323(Rev.) SPINNING MECHANISM

INSTRUCTIONAL OBJECTIVES.

1. UNDERSTAND WOOLEN CARD.
- 1.1 Explain woolen card.
- 1.2 Sketch diagram of woolen card and show the flow of material.

2. UNDERSTAND WORSTED CARD.
- 2.1 Explain worsted card.
- 2.2 Sketch diagram showing flow of material.

3. UNDERSTAND DEVELOPMENT IN COTTON CARDING.
- 3.1 Explain the development in cotton carding.

4. UNDERSTAND CARDING ENGINE DIFFERENT PARTS.
- 4.1 Explain feeding section.
- 4.2 Sketch diagram of feeding section.
- 4.3 Explain taker in section.
- 4.4 Sketch diagram of taker in.
- 4.5 Explain cylinder section.
- 4.6 Sketch diagram of cylinder section.
- 4.7 Explain doffer section.
- 4.8 Sketch diagram of doffer section.
- 4.9 Explain stripping section.
- 4.10 Sketch diagram of stripping section.
- 4.11 Explain calendar section.
- 4.12 Sketch diagram of calendar section.

5. UNDERSTAND CARD CLOTHING AND MAINTENANCE AND REPAIR OF CARD CLOTHING.
- 5.1 Define card clothing.
- 5.2 Enlist types of card clothing.
- 5.3 Describe flexible card clothing.
- 5.4 Explain metallic card clothing and flexible wire.
- 5.5 Distinguish between metallic card clothing.

6. UNDERSTAND CARD MAINTENANCE.
- 6.1 State the card maintenance.
- 6.2 Explain card maintenance.
- 6.3 Name parts overhauled in long term.
- 6.4 Differentiate card gauging and card overhauling.

7. UNDERSTAND CARD GAUGING.
- 7.1 Define card gauging.
- 7.2 Make card gauging.

8. UNDERSTAND STOP MOTION OF CARDING.
- 8.1 Define stop motions at carding.
- 8.2 Enlist stop motions at carding.
- 8.3 Explain stop motions at carding.

9. UNDERSTAND CARD COILER SYSTEM.
- 9.1 Define card coiler system.
- 9.2 Explain card coiler system.
- 9.3 Explain types of coils

10. UNDERSTAND CARDING FAULTS.

10.1 Define carding faults.
10.2 Enlist carding faults.
10.3 Explain carding faults.
10.4 Explain causes of carding faults.
10.5 Describe the effects of carding faults on quality.
10.6 Explain remedies to carding faults.

11. UNDERSTAND COMBER MACHINE AND LAP FORMER MACHINE.

11.1 Define combing machine.
11.2 Explain combing actions.
11.3 Sketch diagram showing material in the comber machine.
11.4 Discuss types of cotton combed.
11.5 Define degree of cotton combed.
11.6 Explain comber machine adjustment.
11.7 discuss comber machine.
11.8 Define lap former machine.
11.9 Explain development in lap former machine.
11.10 Define drafting at lap former.

12. UNDERSTAND DRAWING FRAME.

12.1 Explain breaker drawing frame.
12.2 Explain finisher drawing frame.
12.3 Describe drawing frame maintenance.

13. UNDERSTAND SIMPLEX MACHINE.

13.1 Explain history of simplex.
- 13.1.1 Explain development in simplex.
- 13.1.2 Describe traverse motion at simplex.
- 13.1.3 Explain simplex machine major parts.
- 13.1.4 Explain spindle.
- 13.1.5 Explain flyer.
- 13.1.6 Explain drafting system on simplex.
- 13.1.7 Explain change gears at simples machines.
- 13.1.8 Describe the effects of change gear at simplex machine.
- 13.1.9 Explain T.P.I (Twist per inch) and its effect on roving.

13.2 Understand Working of simplex machine.
- 13.2.1 Explain builder motion.
- 13.2.2 Explain English builder motion.
- 13.2.3 Explain American builder motion.
- 13.2.4 Explain bunch builder.
- 13.2.5 Define differential motion.
- 13.2.6 Explain construction of differential motion.
- 13.2.7 Define laying in roving frame.
- 13.2.8 Define winding and winding tension.
- 13.2.9 Define cone drum regulator.
- 13.2.10 Define electro mechanical builder motion.
- 13.2.11 State drafting system.
- 13.2.12 Define long drafting system.
- 13.2.13 Describe different type of long drafting system.
- 13.2.14 Describe the defects of doubling in drafting.
- 13.2.15 Define effects of drafting on quality.

14. UNDERSTAND RING FRAME.

14.1 Explain drafty systems of ring frame.
14.2 Define drafting roller inclination.
14.3 Define weighting of drafting system.

14.4 State in detail ring frame drafting system.
14.5 Define operation and function of ring frame.
14.6 Explain types of ring used in ring frame.
14.7 Explain ring travellers.
14.8 Explain use of ring travellers as per yarn counts.

15. UNDERSTAND OF ROTOR SPINNING MACHINE.

15.1 Explain the construction of rotor spinning machine.
15.2 Explain the working of rotor spinning machine.
15.3 Enlist advantages and disadvantages of rotor spinning yarn.
15.4 Describe maintenance of rotor spinning machine.
15.5 Explain the method to change count in open end spinning.

16. UNDERSTAND AUTO LEVELLER

16.1 Explain autoleveller
16.2 Describe working of autoleveller.

TS-332(Rev.) **COTTON AND TEXTILE YARN**

T-P-C
2-0-2

TOTAL CONTACT HOURS:

Theory: 64 Hrs.

TOPICS/SUB TOPIC:

1. COTTON **2 HRS.**

1.1 Varieties of cotton.
1.2 Growing of cotton.
1.3 Harvesting of cotton.

2. THE MARKETING OF COTTON. **4 HRS.**

2.1 Importance of cotton as a textile fiber in our national economy.
2.2 Different varieties of cotton grown in the world.
2.3 Brazilian and Indian Cotton.
2.4 American Cotton.

3. COTTON QUALITY. **2 HRS.**

3.1 Cotton quality parameters.
3.2 Grading of American Cotton.
3.3 Grading of Pakistan cotton.

4. MIXING OF COTTON. **4 HRS.**

4.1 Mixing and effects of mixing on the quality of cotton yarn.

5. SURGICAL WOOL (COTTON). **4 HRS.**

5.1 Flow Chart of manufacturing.
5.2 Raw material.
5.3 Processing detail.

6. TEXTILE YARN. **4 HRS.**

6.1 Introduction.
6.2 Types of yarns.
6.3 Characteristic of yarn.
6.4 Quality of yarn.
6.5 Yarn defects.
6.6 Woolen yarn.
6.7 Worsted yarn.
6.8 Fancy yarn.
6.9 Plied yarn.
6.10 Cables yarns.
6.11 Industrial uses of yarns.

7. ROPES AND TWINE (JUTE HEMP, RAMIE). **4 HRS.**

7.1 Introduction.
7.2 Uses.

8. PAKISTAN STANDARDS. **2 HRS.**

8.1 Standards.
8.2 Standard method & equipment for testing of yarn.

9. CHARACTERISTIC OF OPEN END YARN. **4 HRS.**

9.1 Uses in industry.

10. TECHANICAL YARN. 4 HRS.

10.1 Mono filament yarn.
10.2 Multi filament yarn.
10.3 Highly twisted polyester yarn.
10.4 Bulked yarn.
10.5 Stabilized yarn.
10.6 Kevlar Yarn
10.7 Nomex Yarn
10.8 Spandex Yarn.
10.9 Polyproplene Yarn

11. BLENDED YARN. 4 HRS.

11.1 Cotton/polyester blend yarn.
11.2 Viscose/polyester blend yarn.
11.3 Acrylic/wool blend yarn.
11.4 Purpose of blending.
11.5 Properties of blended yarn.

12. DOUBLE YARN. 4 HRS.

12.1 Properties and uses of double yarn.
12.2 Method of doubling.
12.3 Two for one twister and its working.

13. COTTON YARN. 4 HRS.

13.1 Warp yarn.
13.2 Weft yarn.
13.3 Knitting yarn.

14. SILK YARN. 4 HRS.

14.1 Production of silk yarn.
14.2 Properties of silk yarn.
14.3 Uses of silk yarn.

15. SEWING THREAD. 4 HRS.

15.1 Characteristic of sewing thread.
15.2 Flow chart of manufacturing of sewing thread.
15.3 Detail study of manufacturing.

16. EMBROIDERY YARN. 4 HRS.

16.1 Types and manufacturing method.

17. CARPET YARN. 4 HRS.

17.1 Properties of carpet yarn.

18. INDUSTRIAL YARN. 4 HRS.

18.1 Tyre cord.
18.2 Parachute yarn.
18.3 Upholstery yarn.

TS-332(Rev.) COTTON AND TEXTILE YARN

INSTRUCTIONAL OBJECTIVES:

1. UNDERSTAND COTTON GROWING AND HARVESTING.

1.1 State properties of cotton.
1.2 Explain varieties of cotton.
1.3 State botanical name of cotton family.
1.4 Explain cotton harvesting.
1.5 State new techniques in cotton growing and harvesting.
1.6 Name plucking methods.
1.7 Explain mechanical plucking of cotton.
1.8 Name cotton growing countries of the world.

2. UNDERSTAND THE MARKETING OF COTTON.

2.1 State marketing techniques of cotton.
2.2 Explain how cotton is marketed in Pakistan.
2.3 Define Pakistan cotton markets.
2.4 Explain market share of major cotton growing countries of the world.
2.5 Give importance of cotton as a textile fibre in our national economy.
2.6 Differentiate varieties of cotton yarn in the world.
2.7 Define Brazilian and Indian cotton.
2.8 Explain American cotton.
2.9 Define Egyptian and Sudanese cotton.

3. UNDERSTAND COTTON QUALITY.

3.1 Name cotton quality parameters.
3.2 Explain grading of American cotton.
3.3 Explain grading of Pakistan cotton.

4. UNDERSTAND MIXING OF COTTON.

4.1 Describe importance of mixing of cotton.
4.2 Explain mixing and effects of mixing on the quality of cotton yarn.
4.3 Explain outcome of poor mixing of cotton.

5. UNDERSTAND SURGICAL WOOL (COTTON).

5.1 Explain surgical wool.
5.2 Describe flow chart of manufacturing.
5.3 Explain raw material and processing in detail.

6. UNDERSTAND TEXTILE YARN.

6.1 List different methods for manufacturing textile yarn.
6.2 Name types of textile yarn.
6.3 State characteristic of textile yarn.
6.4 Explain the quality of yarn.
6.5 Enlist yarn defects.
6.6 State various yarn defects.
6.7 Explain woolen yarn.
6.8 Explain worsted yarn.
6.9 Differentiate woolen and worsted yarn.
6.10 Describe fancy yarn.
6.11 Explain plied yarn.
6.12 Explain cable yarn.

6.13 Define industrial uses of yarn.

7. UNDERSTAND ROPE AND TWINE.

7.1 Explain rope and twine of jute.
7.2 Explain rope and twine of hemp.
7.3 Explain rope and twine of ramie.

8. UNDERSTAND PAKISTAN STANDARD INSTITUTION STANDARDS.

8.1 Explain P.S.I standards laid down for textile yarn.
8.2 State standard methods & equipment for textile yarn.

9. UNDERSTAND OPEN END YARN.

9.1 Explain open end yarn.
9.2 Discuss characteristic of open end yarn.

10. UNDERSTAND POLYESTER YARN.

10.1 Explain Mono filament yarn.
10.2 Explain Multi filament yarn.
10.3 Explain Highly twisted polyester yarn.
10.4 Describe Bulked yarn.
10.5 Explain Stabilized yarn.

11. UNDERSTAND BLENDED YARN.

11.1 Define Purpose of blending.
11.2 Explain Viscose/polyester blend yarn.
11.3 Explain Acrylic/wool blend yarn.
11.4 Explain Cotton/polyester blend yarn.
11.5 Enlist Properties of blended yarn.

12. UNDERSTAND DOUBLE YARN.

12.1 Enlist Properties and uses of double yarn.
12.2 Explain method of doubling.
12.3 Explain in details two for one twister and its working.

13. UNDERSTAND COTTON YARN.

13.1 Define Warp yarn.
13.2 Define Weft yarn.
13.3 Define Knitting yarn.

14. UNDERSTAND SILK YARN.

14.1 Explain production of silk yarn.
14.2 Enlist properties of silk yarn.
14.3 Define uses of silk yarn.

15. UNDERSTAND SEWING THREAD.

15.1 Define characteristic of sewing thread.
15.2 Make flow chart of manufacturing of sewing thread.
15.3 Explain detail study of manufacturing of sewing threads.

16. UNDERSTAND EMBROIDERY YARN.

16.1 Describe manufacturing method.

17. UNDERSTAND CARPET YARN.

17.1 Explain carpet yarn.
17.2 Explain properties and requirement of carpet yarn.

18. UNDERSTAND INDUSTRIAL YARN.

18.1 Explain industrial yarn

18.2 Define Tyre cord.
18.3 Define Parachute yarn.
18.4 Define Upholstery yarn.

TS-344: TEXTILE SPINNING LAB.

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TOTAL CONTACT HOURS.

Theory:0
Practical:384 Hours.

1.	Operation of Carding engine.	12 Hrs.
2.	Setting of card at the back and control of dropping and impurities.	12 Hrs.
3.	Setting of cylinder and flats and control flat stripping.	12 Hrs.
4.	Setting of card at the front.	12 Hrs.
5.	Gearing Diagram of card and speed calculation.	12 Hrs.
6.	Grinding of card.	12 Hrs.
7.	Operation of drawing frame.	12 Hrs.
8.	Setting of drafting roll according to the varieties of cotton.	12 Hrs.
9.	Gearing diagram of drawing frame and speed calculation.	12 Hrs.
10.	Gearing diagram of roving frame.	12 Hrs.
11.	Setting the builder motion on roving frame.	12 Hrs.
12.	Changing different twist wheels on roving frame.	12 Hrs.
13.	Roving traverse, its adjustments, detailed study and adjustments.	12 Hrs.
15.	Construction, functions of spindles and flyers.	12 Hrs.
16.	Study in details of cone drum differential and building motion.	12 Hrs.
17.	Introduction of combing department sliver Lapper, ribbon Lapper and comber.	12 Hrs.
18.	Operation of roving frame.	12 Hrs.
19.	Setting and adjustment, of builder motion.	12 Hrs.
20.	Setting of drafting roller of ring frame.	12 Hrs.
21.	Change the count at ring frame.	12 Hrs.
22.	Speed calculation of the roller.	12 Hrs.
23.	Different types of travellers.	12 Hrs.
24.	Traverse motion in ring frame.	12 Hrs.
25.	Introduction of combing cycle and study of combing machine.	12 Hrs.
26.	Study of silver Lappers.	12 Hrs.
27.	Study of ribbon Lapper and comber.	12 Hrs.
28.	Major parts of combing.	12 Hrs.
29.	Passage of cotton through combing machine.	12 Hrs.
30.	Study of open end spinning.	12 Hrs.
31.	Study of different parts of winding machine	12 Hrs.