PROJECT FOR DEVELOPMENT OF CENTER OF EXCELLENCE (CoE)

FOR TECHNICAL EDUCATION

Government College of Technology

Railway Road, Lahore

THREE (03) YEARS CURRICULA DAE ARCHITECTURE TECHNOLOGY

TABLE OF CONTENTS

DESCRIPTION	PAGE NO
SCHEME OF STUDIES (ARCHITECTURE TECHNOLOGY)	**3**
CURRICULUM DAE 1st YEAR	**4-70**
CURRICULUM DAE 2nd YEAR	**71-124**
CURRICULUM DAE 3rd YEAR	**125-153**

ARCHITECTURE TECHNOLOGY

Scheme of Studies

(1st Year)

Course Code	Course Title	Hrs	T	P	C	Page
Gen 111	Islamiat and Pakistan Studies	32	1	0	1	06
Eng 112	English	64	2	0	2	15
Math 113	Applied Mathematics-I	96	3	0	3	19
Phy 122	Applied Physics	128	1	3	2	29
Coms 111	Communication Skills	96	0	3	1	39
ARCH-112	Introduction to Architecture	128	1	3	2	41
ARCH-123	Architectural Graphics-I	288	0	9	3	46
ARCH-133	Building Material & Construction-I	160	2	3	3	50
ARCH-143	Computer Aided Drafting & Presentation-I	224	1	6	3	59
	Total	**1216**	**11**	**27**	**20**	

(2nd Year)

Course Code	Course Title	Hrs	T	P	C	Page
GEN-211	Islamiat and Pakistan Studies (T1)	32	1	0	1	73
MATH-212	Applied Mathematics-II (T2)	64	2	0	2	79
ARCH-212	Environmental Studies-I (T2)	64	2	0	2	88
ARCH-223	Structural Mechanics & R.C.C Design (T2P3)	160	2	3	3	93
ARCH-233	Architectural Drawing & Design-I(P9)	288	0	9	3	99
ARCH-242	Computer Aided Drafting and Presentation II	192	0	6	2	101
ARCH-253	Building Materials and Construction-II	160	2	3	3	106
ARCH-262	History of Architecture (T2)	64	2	0	2	113
ARCH-274	Surveying and Leveling (T2P6)	256	2	6	4	118
	Total	**1280**	**13**	**27**	**22**	

(3rd Year)

Course Code	Course Title	Hrs	T	P	C	Page
Gen 311	Islamiat / Pakistan Studies	32	1	0	1	127
ARCH 312	Environmental Studies II	64	2	0	2	131
ARCH 324	Architectural Drawing & Design II	384	0	12	4	135
ARCH 332	Model Making	192	0	6	2	136
ARCH 343	Specification & Estimation	160	2	3	3	137
ARCH 353	Building Materials & Construction -III	160	2	3	3	143

ARCH 362	Construction Management & Safety Practices	64	2	0	2	148
ARCH 372	Computer Aided Drafting & Presentation III	192	0	6	2	152
Total		1248	9	30	19	

PROJECT FOR DEVELOPMENT OF CENTER OF EXCELLENCE (CoE)

FOR TECHNICAL EDUCATION

Government College of Technology
Railway Road Lahore

CURRICULUM

DAE 1st YEAR

ARCHITECTURE TECHNOLOGY

ARCHITECTURE TECHNOLOGY

Scheme of Studies

(1st Year)

Course Code	Course Title	Hrs	T	P	C	Page
Gen 111	Islamiat and Pakistan Studies	32	1	0	1	06
Eng 122	English	64	2	0	2	15
Math 113	Applied Mathematics-I	96	3	0	3	19
Phy 122	Applied Physics	128	1	3	2	29
Coms 111	Communication Skills	96	0	3	1	39
ARCH-112	Introduction to Architecture	128	1	3	2	41
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	Total	**1216**	**11**	**27**	**20**	

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 تنالو 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 عنھوانتھوا

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 ما یحب لنفسہ

4- المسلم من سلم المسلمون من سنہ المسمون من لسانہ ویدہ

5- فی امنت باللہ سلم استقم

6- خیر کم خیر کم لاہلہ

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 فنا خلف

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، حکمتیں 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 مکی و 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 روشنی میں اپنی زندگی کا جائزہ لے سکے

دین اسلام

4- 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، زکواۃ) کے فوری احکامات 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	ڈی	بی	سی
حصہ دوم مطالعہ پاکستان		1	0	1

کل وقت - 20 گھنٹے

موضوعات

اخلاقیات کی تعریف اور اہمیت

اخلاقیات کا معیار (قانون، عقل، الہامی کتب)

مندرجہ ذیل اخلاق کی وضاحت

- ☆ دیانت داری
- ☆ وفاداری
- ☆ 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 کتنا 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 اتحاد سے حسن کارکردگی کو بیان کر سکے
- ☆ مصلحت کے فوائد بیان کر سکے

نصاب (سال اول) Gen-III

حصہ دوئم　　مطالعہ پاکستان　　کل وقت 12 گھنٹے

موضوعات

☆ حریت فکر : مسلمان قوم میں آزادی فکر کی تاریخ ۔ معاملات میں سیاسی آزادی کی اہمیت اور ضرورت ۔ ذاتی ، جماعتی غلامی کے نقصانات

☆ نظریہ پاکستان
قیام پاکستان کی اساس (دین اسلام) قیام پاکستان کی غرض ، اہمیت 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 ۔ (سندھ) 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 ثانی کی علمی خدمات بیان کر سکے
- شاہ ولی اللہ کی علمی خدمات بیان کر سکے
- مجدد الف ثانی اور شاہ ولی اللہ نے جو تبلیغ دین اور مسلمانوں میں سیاسی شعور پیدا کیا اسے بیان کر سکے

علمی تحریکیں

عمومی مقصد

- برصغیر کی علمی تحریکوں سے آگاہی حاصل ہو سکے

خصوصی مقاصد:

- علی گڑھ - دیوبند - ندوۃ العلماء مدرسۃ 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	0	2

AIMS & OBJECTIVES

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 **04 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 **08 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.

04 hours

5. TRANSLATION **06 hours**

5.1 Translation from Urdu into English.

5.2 For Foreign Students: A paragraph or a dialogue.

RECOMMENDED BOOKS

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

Eng-112 **ENGLISH**

INSTRUCTIONAL OBJECTIVES

PAPER-A

1. DEMONSTRATE BETTER READING, COMPREHENSION AND VOCABULARY

1.1 Manipulate, skimming and scanning of the text.

1.2 Identify new ideas.

1.3 Reproduce facts, characters in own words

1.4 Write summary of stories

2. UNDERSTAND FACTS OF THE TEXT

2.1 Rewrite words to fill in the blanks recalling the text.

2.2 Use own words to fill in the blanks.

PAPER-B

3. APPLY THE RULES OF GRAMMAR IN WRITING AND SPEAKING

3.1 Use rules of grammar to construct meaningful sentences containing a 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-I**

Total Contact Hours		T	P	C
Theory:	96 Hours	3	0	3

Pre-requisite

Must have completed a course of Elective Mathematics at Matric level

AIMS & OBJECTIVES

After completing the course the students will be able to

1. Solve problems of Algebra, Trigonometry, vectors, Mensuration, 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 **06 Hours**

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. **03 Hours**

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. 03 Hours

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 06 Hours

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 06 Hours

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 **06 Hours**

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 central Angle

6.6 Problems

7. TRIGONOMETRIC FUNCTIONS AND RATIOS **06 Hours**

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 IDENTITIES **06 Hours**

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 06 Hours

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 Hours

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
09 Hours

11.1 Scalars & Vectors

11.2 Addition & Subtraction

11.3 The unit Vectors I, j, k

11.4 Direction Cosines

11.5 Scalar or Dot Product

11.6 Deductions

11.7 Dot product in terms of orthogonal components

11.8 Vector or cross product

11.9 Deductions

11.10 Analytic Expression for a x b

11.11 Problems

12. MATRICES AND DETERMINANTS **09 Hours**

12.1 Definition of Matrix

12.2 Rows & Columns

12.3 Order of a Matrix

12.4 Algebra of Matrices

12.5 Determinants

12.6 Properties of Determinants

12.7 Solution of Linear Equations

12.8 Problems

REFERENCE BOOKS

1. Technical Mathematics Vol-I, Ilmi Kitab Khana, Lahore by **Ghulam Yasin Minhas**

2. Polytechnic Mathematic Series Vol I & II, Majeed Sons, Faisalabad by **Prof. Riaz Ali Khan**

3. A Text Book of Algebra and Trigonometry, Punjab Text Book Board, Lahore by **Prof. Sana Ullah Bhatti**

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 discriminate.

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 FRACTION INTO PARTIAL FRACTIONS USING DIFFERENT 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 an angle.

6.3 Explain sexagesimal and circular systems for the measurement of angles.

6.4 Derive the relationship between radian and degree.

6.5 Convert radians to degrees and vice versa.

6.6 Derive a formula for the circular measure of a central angle.

6.7 Use this formula for solving problems.

7. APPLY BASIC CONCEPTS AND PRINCIPLES OF TRIGONOMETRIC FUNCTIONS.

7.1 Define the basic trigonometric functions/ratios of an angle as ratios of the sides of a right triangle.

7.2 Derive fundamental identities.

7.3 Find trigonometric ratios of particular angles.

7.4 Draw the graph of trigonometric functions.

7.5 Solve problems involving trigonometric functions.

8. USE TRIGONOMETRIC IDENTITIES IN SOLVING TECHNOLOGICAL PROBLEMS.

8.1 List fundamental identities.

8.2 Prove the fundamental law.

8.3 Deduce important results.

8.4 Derive sum and difference formulas.

8.5 Establish half angle, double angle & triple angle formulas.

8.6 Convert sum or difference into product & vice versa.

8.7 Solve problems.

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

9.1 Define angle of elevation and angle of depression.

9.2 Prove the law of sine's 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 MENSURATION IN FINDING SURFACES, VOLUMES AND WEIGHTS OF SOLIDS.

10.1 Define mensuration of plane and solid figures.

10.2 List formulas for perimeters & areas of plane figure.

10.3 Define pyramid and cone.

10.4 Define frusta of pyramid and cone.

10.5 Define a sphere and a shell.

10.6 Calculate the total surface and volume of each type of solid.

10.7 Compute weight of solids.

10.8 Solve problems of these solids.

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

11.1 Define vector quantity.

11.2 Explain addition and subtraction of vector.

11.3 Illustrate unit vectors i, j, k.

11.4 Express a vector in the component form.

11.5 Explain magnitude, unit vector, direction cosines of a vector.

11.6 Derive analytic expression for dot product and cross product of two vector.

11.7 Deduce conditions of perpendicularity and parallelism of two vectors.

11.8 Solve problems

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

12.1 Define a matrix and a determinant.

12.2 List types of matrices.

12.3 Define transpose, adjoint and inverse of a matrix.

12.4 State properties of determinants.

12.5 Explain basic concepts.

12.6 Explain algebra of matrices.

12.7 Solve linear equation by matrices.

12.8 Explain the solution of a determinant.

12.9 Use Crammers Rule for solving linear equations.

Phy-122 **APPLIED PHYSICS**

Total Contact Hours

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

AIMS &OBJECTIVES

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. 02 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. 04 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 04 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. 02 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 W**AVE MOTION. 05 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. 05 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

6.5 Doppler effect

7 LIGHT. 05 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. 02 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. 03 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 Fundamentals of Physics Vol-I and II by **Tahir Hussain**

2 Fundamentals of Physics Vol-I and II by **Farid Khawaja**

3 Schaum's Series Physics by **Wells and Slusher**

4 Advanced Level Practical Physics by **Nelkon and Oyborn**

5 Practical Physics by **Mehboob Ilahi Malik and Inam-ul-Haq**

6 Lasers - Principles and Applications by **Wilson**

7 Experimental Physics Note Book by **M. Aslam Khan and M. Akram Sandhu**

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 calipers.

3 Find the area of cross-section of the given wire using micrometer screw gauge.

4 Prove that force is directly proportional to (a) mass, (b) acceleration, using fletchers' trolley.

5 Verify law of parallelogram of forces using Grave-sands apparatus.

6 Verify law of triangle of forces and Lami's theorem

7 Determine the weight of a given body using

a) Law of parallelogram of forces

b) Law of triangle of forces

c) Lami's theorem

8 Verify law of polygon of forces using Grave-sands apparatus.

9 Locate the position and magnitude of resultant of like parallel forces.

10 Determine the resultant of two unlike parallel forces.

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 lens using converging lens.

31 Find focal length of diverging lens using concave mirror.

32 Find angular magnification of an astronomical telescope.

33 Find angular magnification of a simple microscope (magnifying glass)

34 Find angular magnification of a compound microscope.

35 Study working and structure of camera.

36 Study working and structure of sextant.

37 Compare the different scales of temperature and verify the conversion formula.

38 Determine the specific heat of lead shots.

39 Find the coefficient of linear expansion of a metallic rod.

40 Find the heat of fusion of ice.

41 Find the heat of vaporization.

42 Determine relative humidity using hygrometer.

COMS-111 **COMMUNICATION SKILLS**

Total Contact Hours: 96	T	P	C
	0	3	1

AIMS & OBJECTIVES:

1- To enable students to express their ideas in a systematic and coherent manner: orally and written.
2- To inculcate skills of reading, writing, speaking, comprehension, presentation.
3- To enable students to meet the communication demands of the professional organizations and the field.

List of Practical

1. Assignments on components, characteristics & types of **communication**. (06 Hours)

2. Practice and discussion on **intrapersonal communication,** its significance, characteristics and techniques. (09 Hours)

3. Practice and discussion on **interpersonal communication** its significance, characteristics and techniques. (09 Hours)

4. Practice and discussion on **non-verbal communication**, its significance, types and techniques. (06 Hours)

5. Practice and discussion **on language**, its development and characteristics of English language. (09 Hours)

6. Practice and discussion on **oral communication**, its significance and techniques. (12 Hours)

7. Practice and assignment on **written communication**, its significance and quality of a good piece of writing. (09 Hours)

8. Practice and assignment on **writing process**, its different stages, data collection techniques and ethical consideration of writing. (06 Hours)

9. Practice and assignment on **essay writing**. (09 Hours)

10. Practice and assignments on **letter / application writing**. (09Hours)

11. Practice and assignments on **report writing**. (12 Hours)

Facility:

A room for discussion is required size 30'*40'=1200 sq.ft. The room will be provided before a pilot class starts.

RECOMMENDED BOOKS

1. Communication (2nd. Edition) by **Larry L. Barker Prentice-Hall Inc. ISBN: 0-13-1533460**

2. Writing Academic English by **Alice Oshima & Ann Hogue, Addison-Wesley Publishing Company ISBN: 0-201-054795**

3. Technical Writing: Process & Product by **Sharon J. Gerson & Steven M. Gerson, Pearson Education ISBN: 81-7808-381-7**

4. Human Communication by **Joseph a. Devito**

ARCH-112 **INTRODUCTION TO ARCHITECTURE**

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

AIMS & OBJECTIVES:

1 To enable the students to understand architecture as a creative profession.
2 To make students understand the development of architecture.
3 To make students familiar with the design process as a creative activity.

COURSE CONTENTS

1. INTRODUCTION TO ARCHITECTURE 0**6 Hours**

1.1 Meaning/ Definitions of Architecture

1.2 Characteristics of Architecture

1.3 Architecture as a Science

1.4 Architecture as an Art

1.5 Architecture as a Social Science

1.6 Different forces shaping up architecture

2. INTRODUCTION TO CREATIVITY 0**4 Hours**

2.1 What is Creativity?

2.2 Characteristics of Creative People

2.3 Is Creativity an Innate or Learned Behavior

3. INTRODUCTION TO FUNDAMENTALS 0**8 Hours**

3.1 Elements of Architecture

3.2 Principles of Architecture

4. INTRODUCTION TO ARCHITECTURAL DESIGN 0**5 Hours**

4.1 Different stages of Architectural Design process

5. CONTEXT AND ARCHITECTURE 0**4 Hours**

5.1 Components of Built Environment

5.2 Architecture as the most significant feature

5.3 How Context influence architecture

6. ARCHITECTURE AND SOCIETY 0**5 Hours**

6.1 Relationship between Architecture & Society

6.2 Importance of Architecture in a Society

6.3 Architecture as an Index of a Society

ARCH-112 INTRODUCTION TO ARCHITECTURE

INSTRUCTIONAL OBJECTIVES

1. UNDERSTAND INTRODUCTION TO ARCHITECTURE

1.1 Define Architecture

1.2 Describe the Characteristics of architecture

1.3 Describe Architecture as a science

1.4 Describe Architecture as an Art

1.5 Describe Architecture as a social science

1.6 Explain different forces shaping up Architecture

2. UNDERSTAND INTRODUCTION TO CREATIVITY

2.1 Define Creativity

2.2 Explain Characteristics of Creative people

2.3 Explain Creativity as an Innate or Learned Behavior

3 UNDERSTAND INTRODUCTION TO FUNDAMENTALS

3.1 Describe Elements of Architecture

3.2 Describe Principles of Architecture

4. UNDERSTAND INTRODUCTION TO ARCHITECTURAL DESIGN

4.1 Explain Different stages of Architectural Design process

5. UNDERSTAND CONTEXT AND ARCHITECTURE

5.1 Describe Components of Built Environment

5.2 Explain Architecture as the most significant feature

5.3 Explain: How Context influence architecture?

6. UNDERSTAND ARCHITECTURE AND SOCIETY

6.1 Describe Relationship between Architecture & Society

6.2 Describe Importance of Architecture in a Society

6.3 Explain Architecture as an Index of a Society

RECOMMENDED BOOKS

1. Understanding Architecture-An Introduction to Architecture and Architectural Theory, 2nd Edition by **Hazel Conway, Rowan Roenisch ISBN: 978-0-415-32058-0**

2. Introduction to Architecture Edited by **James C. Snyder, Anthony J. CAtanese**
McGraw Hill Book Company ISBN 0-07-059547-X

3. Architecture and allied design by **Anthony c.Antiniades**

4. Architecture form, space and order(2nd edition) by **Francus D.K Ching 1996**

ARCH-112 **INTRODUCTION TO ARCHITECTURE**

List of Practical

1. Assignments on “characteristics of Architecture’ through Photographs **(12 Hours)**
2. Assignments on “Topics of Creativity” **(12 Hours)**
3. Elements of Architecture (such as Food Street, the Mall, etc.) **(20 hours)**
4. Principles of Architecture **(16 hours)**
5. Visit of Walled City of Lahore (Built Environment) **(20 hours)**
6. Assignments on “Architecture and Society” **(16 hours)**

Equipment and Materials

Only consumable materials are required which may be purchased at any time such as Drawing sheet, Color pencils, Water color, etc. Drawing board will be arranged by each student himself.

ARCH-123 **ARCHITECTURAL GRAPHICS-I**

Total Contact Hours: 288

T	P	C
0	9	3

AIMS&OBJECTIVES

1. To enable the student to learn art and skill of free hand drawing
2. To introduce various techniques of free hand drawing using different materials and tools
3. To enable students to understand graphics as a language/tool of expression for the architects.
4. To enable students to understand elements and principles through two dimensional patterns and three dimensional composition and their relationship to designing of building.

LIST OF PRACTICALS

Module I (Free Hand Drawing) **06 weeks (54 Hours)**

1. Intro and practice with materials and tools (06 Hours)
2. The elements of a free hand sketch (06 Hours)
3. Line (06 Hours)
4. Shape (06 Hours)

5. Details (06Hours)
6. Tone (06 Hours)
7. Shadows (06 Hours)
8. Composition (06 Hours)
9. Colour (03 Hours)
10. Form (03 Hours)

NOTE:

A sketch book showing free hand sketches shall be developed over the Module 1.

Module II (Technical & Geometrical Drawing) 06 weeks (54 Hours)

1. Drawing instruments and their uses (12 Hours)
2. Types of scales and their uses (12 Hours)
3. Dimensioning (12 Hours)
4. Geometrical drawing (18 Hours)
    i. Lines
    ii. Angles
    iii. Tri angles
    iv. Quadrilaterals
    v. Polygons

Module III (Drawing of Solids) 06 weeks (54 Hours)

1. Projections (27 Hours)
    i. Pictorial projections
    (Isometric, Oblique)
    ii. Orthographic Projection, Elevation, Section

2. Solids (27 Hours)

   i. Polyhedra
      (Cube, Prisms, Pyramids, etc.)

   ii. Solids of revolution
      (Cone, Cylinder, Sphere, etc)

   iii. Oblique solids
      (Frustum, Truncated, etc)

Module IV (Architecture Drawing) **14 weeks (126 Hours)**

1. Draw plan of a building. (27 Hours)
2. Draw an elevation of a building. (36Hours)
3. Draw sections of a building. (27 Hours)
4. Practice in labeling & dimensioning. (36 Hours)

Equipment and Materials

(For Module-I)

Geometry box with set squares, Drawing sheet, Color pencils, Water color

(For Module-II, III,VI)

The present drafting table will be replaced by a drafting table size 36”*24” with parallel bar fixed on the table and a flexible chair. They will be provided by “Project for Development of Center of Excellence” for each student in each drawing room/ hall (Total 35 sets).

RECOMMENDED BOOKS

1. Free Hand Drawing and Architectural Rendering By **Albert O Halse**

2. Freehand Drawing for Architects and Interior Designers (Paperback) by **Magali Delgado Yanes**

3. Introduction to Architecture by **James C. Synder & Anthon J. Catanese (eds.) McGraw-Hill Book Company ISBN 0-07-059547-X**

4. Architectural Drawing-A visual Compendium of Types & Methods (2nd ed.) by **Rendow Yee John Wiley & Sons Inc. ISBN 0-471-05540-9**

5. Design Drawing by **Francis D.K. Ching with Steven P. Juroszek, Van Nostrand Reinhold ISBN: 0-442-01909-2**

6. Architectural Drafting & Design by **Donald E. Helper & Paul I. Wallach McGraw-Hill Book Company**

7. Architectural Graphics by **Frank Ching, Van Nostrand Reinhold ISBN: 2700.C46**

8. Building construction Illustrated by **Francis D.K Ching & Cassandra Adams 3rd edition 2001**

ARCH-133 BUILDING MATERIALS & CONSTRUCTION-I

Total Contact Hours: 160		T	P	C
Theory	: 64	2	3	3
Practical	: 96			

AIMS & OBJECTIVES

After studying this subject, students will be able to familiarize with the different building materials to attain suitable knowledge and skills in use of materials in various buildings.

COURSE CONTENTS

1. INTRODUCTION 06 Hours

1.1 Classification of materials

1.2 Natural materials

1.3 Man made materials

2. STRUCTURAL MATERIALS **16 Hours**

2.1 Brick

2.2 Stone

2.3 Concrete

2.4 Steel

2.5 Timber

3. NON- STRUCTURAL MATERIALS **16 Hours**

3.1 Glass

3.2 Metal (Aluminum, steel, etc.)

3.3 Timber

3.4 Plastics

4. FINISHING MATERIALS **14 Hours**

4.1 Plasters

4.2 Paints

4.3 Tiles

4.4 Marble

5. INSULATING/WATER PROOFING MATERIALS **12 Hours**

5.1 Rigid and flexible materials

5.2 Sound/Thermal insulating materials such as wood, Glass wool, Cork, Vermiculite, Polystyrene, Polyurethane

ARCH-133 **BUILDING MATERIALS & CONSTRUCTION-I**

INSTRUCTIONAL OBJECTIVES

1. INTRODUCTION

1.1 Describe the Classification of materials

1.2 State Natural materials

1.4 State Man made materials

2. UNDERSTAND THE STRUCTURAL MATERIALS

2.1 Brick

2.1.1 Define the bricks

2.1.2 Classify the type of bricks

2.1.3 Explain the properties of bricks

2.1.4 Explain types of brick bonds

2.1.5 State advantages and disadvantages

2.1.6 Describe the merits and demerits of English and Flemish bond

2.1.7 Illustrate brick masonry

2.2 Stone

2.2.1 Define stone

2.2.2 Classify stone

2.2.3 Classify building stone

2.2.4 Describe kinds of building stone

2.2.5 Define stone masonry

2.2.6 Classify type of stone masonry

2.2.7 Explain each classification of stone masonry

2.3 Concrete

2.3.1 State composition of concrete (Cement, sand, water, Aggregates)

2.3.2 Define the type of aggregates

2.3.3 Explain concrete process in following sequence

I Mixing of concrete

II Placing of concrete

III Curing of concrete

2.3.4 Define precast concrete

2.3.5 Define hollow block

2.3.6 Describe the comparison of insitu and precast concrete

2.4 Steel

2.4.1 Define steel

2.4.2 Describe the properties of steel

2.4.3 Describe the behavior of steel against the temperature

2.4.4 Describe the uses of steel

2.5 Timber

2.5.1 Define timber

2.5.2 Explain seasoning of timber

2.5.3 Describe the defects of timber

3. UNDERSTAND NON- STRUCTURAL MATERIALS

3.1 Glass

3.1.1 Define glass

3.1.2 State the types of glass

3.1.3 Describe the uses of glass

3.2 Metal

3.2.1 Define Metal

3.2.2 Describe different types of metals

3.2.3 Explain the properties of metals (such as Aluminum, steel, etc.)

3.2.4 Describe the uses of different Metals

3.3 Timber

3.3.1 State the types of joints in Timber

3.3.2 Explain the uses of Timber

3.4 Plastics

3.4.1 Define plastic

3.4.2 State the types of plastics

3.4.3 Describe the uses of plastics

4. UNDERSTAND FINISHING MATERIALS

4.1 Plasters

4.1.1 Describe the constituents of plaster

4.1.2 Explain the process of plastering

4.2 Paints

4.2.1 Describe the constituents of paint

4.2.2 Describe different types of paints

4.2.3 Describe the uses of paints

4.2.4 Define varnish

4.2.5 Describe the properties of varnish

4.2.6 Describe the uses of varnish

4.3 Tiles

4.3.1 Define tiles

4.3.2 Classify tiles.

4.3.3 Describe uses of tiles

4.4 Marble

4.4.1 Define Marble

4.4.2 Classify Marbles

4.4.3 Describe uses of marbles

5. UNDERSTAND INSULATING/WATER PROOFING MATERIALS

5.1 Rigid and flexible materials

5.1.1 Define Rigid and flexible materials

5.1.2 Classify the Rigid and flexible materials

5.1.3 Explain the properties of Rigid and non-Rigid materials

5.1.4 Describe the uses of Rigid and flexible materials

5.2 **Sound/Thermal insulating materials such as wood**

5.2.1 Define Sound/Thermal insulating materials

5.2.2 Classify Sound/Thermal insulating materials

5.2.3 Explain the properties of Sound/Thermal insulating materials

5.2.4 Describe the uses of Sound/Thermal insulating materials

RECOMMENDED BOOKS

1. Building materials by **Z. H.SAYED**
2. Building materials by **M. A. ZAMAN**
3. Building materials & fabrications by **NISTE**
4. Building construction by **ARORA & GUPTA**
5. Building construction by **S.K.SHARMA**

ARCH-133 BUILDING MATERIALS & CONSTRUCTION-I

LIST OF PRACTICALS

1. To visit display room for materials and prepare a sheet of natural and man-made material. **(06 Hours)**
2. To visit display room for materials and verify different types of clays and their properties. **(06 Hours)**

3. To visit display room for materials and prepare a sheet of various types of brick bonds and visit a local brick manufacturing kiln like PAK FACE bricks Factory. **(06 Hours)**
4. To visit display room for materials and prepare a sheet of different types of kiln, ceramic and marble tiles and visit a local ceramic tile industry like Emco tiles. **(06 Hours)**
5. To visit display room for materials and observe different types of building stones and prepare a sheet of (i) ashlars masonry (ii) rubble masonry. **(06 Hours)**
6. To visit display room for materials and compare fat lime & hydraulic lime and verify their properties **(03 Hours)**
7. To visit display room for materials and study different types of cement and verify their properties **(03 Hours)**
8. To visit display room for materials and compare different types of aggregates and make a local tour to visit manufacturing of concrete **(06 Hours)**
9. To visit display room for materials and comparison different types of steel and compare their tensile strength in material testing lab **(06 Hours)**
10. To visit display room for materials and compare different types of glass with property and sizes **(06 Hours)**

11. To visit display room for materials and study different timbers and prepare a sheet of different types of timber joints, reconverted wood (chipboard, lasani board, vin board) **(06 Hours)**

12. To visit display room for materials, compare different plastics and prepare a sheet of different types of plastic variety like PVC sheets, PVC pipes & pipe fittings **(06 Hours)**

13. To visit display room for materials and verify aluminum variety & prepare a sheet of aluminium door & windows **(06 Hours)**

14. To visit display room for materials and study different variety of thermo pore sheets in roof insulation and pipe insulation for water supply and for air conditioning system **(06 Hours)**

15. To visit display room for materials and study different types of paints and varnishes **(06 Hours)**

16. To visit display room for materials and compare different interior finishes their properties **(03 Hours)**

17. To visit display room for materials and study external finishes with properties and uses **(03 Hours)**

18. To visit display room for materials and study water proofing materials and compare

(i) Flexible materials

(ii) Rigid materials

(iii) Other materials **(06 Hours)**

Facility

A display room for materials is required size 30'x 40'=1200sq.ft. The room will be provided before a pilot class starts.

Equipment and Materials

Conventional and latest building materials such as GRC (Glass-fiber Reinforced Concrete), etc. will be provided by "Project for Development of Center of Excellence" before a pilot class starts.

ARCH-143 COMPUTER AIDED DRAFTING AND PRESENTATION-I

Total Contact Hours: 224

Theory : 32 T P C

Practical : 192 1 6 3

AIMS & OBJECTIVES

1. To introduce the students about basics of computers (Ms-Windows, Ms-Office, Internet & e-mail)
2. To introduce the basics of computer designing (CAD)
3. To gain and insight into the theoretical as well as practical aspects of CAD.
4. To equip students with the tools and techniques required for modern designing / drawing.

COURSE CONTENTS: THE COURSE COMPRISES THREE MODULES

Module I

1. INTRODUCTION OF COMPUTER: 02 Hours

1.1 Definition of computer

1.2 Types of computers

1.3 Input, output

1.4 Hardware

1.5 Software

1.6 Programs

1.7 Magnetic disk, Floppy disk, Flash drive.

2. MS-WINDOWS 02 Hours

2.1 Introduction to Windows

2.2 Loading & Shut down process

2.3 Introduction to Desktop items (Creation of Icons, Shortcut, Folder & modify

Taskbar)

2.4 Desktop properties

2.5 Use of Control Panel

2.6 Searching a documents

2.7 File and folder creation and management

2.8 Software installation and un-installation

2.9 Formatting of Hard disks & Drives

2.10 Protection against viruses.

Module II

3. MS-OFFICE (MS-WORD) 03 Hours

3.1 Introduction to Ms-Office

3.2 Introduction to Ms-Word & its Screen

3.3 Create a new document

3.4 Editing & formatting the text

3.5 Saving & Opening a document

3.6 Page setup (Set the Margins & Paper)

3.7 Spell Check & Grammar

3.8 Paragraph Alignment

3.9 Inserting Page numbers, Symbols, Text box & Picture in the document

3.10 Use of different Format menu drop down commands

3.11 Insert the Table and its Editing

3.12 Printing the document

3.13 Saving a document file as PDF format

4. MS-OFFICE (MS-EXCEL) 02 Hours

4.1 Introduction to MS-Excel & its screen

4.2 Entering data & apply formulas in worksheet

4.3 Editing & formatting the cells, row & column

4.4 Insert graphs in sheet

4.5 Page setup, print preview & printing

4.6 Types & categories of charts

5. MS-OFFICE (MS-POWER POINT) 02 Hours

5.1 Introduction to MS-Power point

5.2 Creating a presentation

5.3 Editing & formatting a text box

5.4 Adding pictures & colors to a slide

5.5 Making slide shows

5.6 Slide Transition

6. INTERNET & E-Mail 01 Hour

6.1 Introduction to Internet & browser window

6.2 Searching, Saving and Printing a page from internet

6.3 Creating, Reading & Sending E-Mail

6.4 Explanation of some advance features over the internet and search engines

Module III

7. AUTO CAD MENUS: 01 Hour

8. CO-ORDINATE SYSTEM 01 Hour

9. DISPLAY COMMANDS 02 Hours

9.1 Plan

9.2 Redraw

9.3 Regent

9.4 Viewers

9.5 Zoom

10. DRAW COMMANDS 04 Hours

10.1 Line

10.2 Arc

10.3 Circle

10.4 Ellipse

10.5 Poly line

10.6 Point

10.7 Polygon

10.8 Text

10.9 Hatch

10.10 Insert

10.11 Dimensioning

11. CONSTRUCT & EDIT COMMANDS 04 Hours

11.1 ARRAY

11.2 Break

11.3 Change

11.4 Copy

11.5 Divide

11.6 Erase

11.7 Explode

11.8 Extend

11.9 Entity

11.10 Move

11.11 Rotate

11.12 Poly edit

11.13 Offset

11.14 Fillet

11.15 Chamfer

11.16 Trim

12. FILE COMMANDS 01 Hour

12.1 Open file

12.2 Save file

13. SETTINGS 02 Hours

13.1 Grid

13.2 Snap

13.3 Limits

13.4 O-snap

13.5 Unit control

13.6 Layers

13.7 Dimension style

14. INTERNATIONAL CAD STANDARDS 02 Hours

14.1 Architectural symbols

14.2 Line colors'

14.3 layers management

15. PREPARE HOUSE PLAN USING ABOVE COMMANDS 03 Hours

ARCH-143 COMPUTER AIDED DRAFTING AND PRESENTATION-I

INSTRUCTIONAL OBJECTIVES:

THE COURSE COMPRISES THREE MODULES

Module I

1. UNDERSATAND INTRODUCTION OF COMPUTER

1.1 Definition of computer

1.2 Describe brief history of a computer

1.3 Describe input

. 1.4 Describe output

1.5 Explain hardware

1.6 Explain software

1.7 Explain programs

1.8 Explain magnetic disk

1.9 Explain Floppy disk, Flash drive

2. UNDERSATAND MS-WINDOWS

2.1 Explain Introduction to Windows

2.2 Describe Loading & Shut down process

2.3 Explain Introduction to Desktop items (Creation of Icons, Shortcut, Folder & modify Taskbar)

2.4 Explain Desktop properties

2.5 Describe Uses of Control Panel (Add/Remove/programs, Date and Time, Mouse and Create user Account)

2.6 Explain the method of Searching a documents

Module II

3. UNDERSATAND MS-OFFICE (MS-WORD)

3.1 Explain Ms-Office.

3.3 Describe Ms-Word & its Screen

3.3 Describe How to create a new document

3.4 Explain Editing & formatting the text

3.5 Describe Saving & Opening a document

3.6 Explain Page setup (Set the Margins & Paper)

3.7 Explain Spell Check & Grammar

3.8 Explain Paragraph Alignment

3.9 Explain Inserting Page numbers, Symbols, Text box & Picture in the document

3.10 Describe Uses of different Format menu drop down command

3.11 Explain Insert the Table and its Editing

3.12 Describe printing the document

3.13 Describe saving a document file as PDF format

4. UNDERSATAND MS-OFFICE (MS-EXCEL)

4.1 Explain MS-Excel & its screen.

4.2 Describe Entering data & apply formulas in worksheet

4.3 Describe Editing & formatting the cells, row & column

4.4 Describe Insert graphs in sheet

4.5 Describe Page setup, print preview & printing

4.6 Explain Types & categories of charts

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

5.1 Describe MS-Power point

5.2 Explain creating a presentation

5.3 Describe Editing & formatting a text box

5.4 Explain Adding pictures & colors to a slide

5.5 Describe Making slide shows

5.6 Explain Slide Transition

6. UNDERSATAND INTERNET & E-Mail

6.1 Explain Internet & browser window

6.2 Explain Searching, Saving and Printing a page from internet

6.3 Describe Creating, Reading & Sending E-Mail

6.4 Explain some advance features over the internet and search engines

Module III

7. UNDERSTAND AUTO CAD MENU:

7.1 Define Auto Cad

7.2 Explain the screen menus

7.3 Explain the pull down menus

8. UNDERSTAND CO-ORDINATE SYSTEM USED IN ARCHITECTURAL COMPUTER DRAWINGS

8.1 Explain the UCS

8.2 Explain the co-ordinate system

9. UNDERSTAND THE DISPLAY COMMANDS

9.1 Explain the application of following display commands.

I Pan
II Redraw
III Regent
IV Viewers
V Zoom

10. UNDERSTAND DRAW COMMANDS

10.1 Explain different types of Lines

10.2 Explain different methods to draw:

I Arc
II Circle
III Ellipse
IV Poly line
V Point
VI Polygon

10.3 Explain different Text styles

10.4 Apply different Hatch styles

10.5 Explain Insertion of:

I Blocks
II Files

10.6 Explain different types of Dimensioning.

11. UNDERSTAND THE CONSTRUCT & EDIT COMMANDS

11.1 Define the following commands.

I Rectangular & Polar Array
II Break
III Change
IV Copy
V Divide

VI Erase
VII Explode
VIII Extend
IX Entity
X Move
XI Rotate
XII Poly edit
XIII Offset
XIV Fillet
XV Chamfer
XVI Trim

12. UNDERSTAND DIFFERENT FILE COMMANDS

12.1 Explain the File utility.

12.2 Explain different File commands.

13. APPLY DIFFERENT SETTINGS TO PRODUCE ARCHITECTURAL DRAWINGS

13.1 Explain the utility of following commands

I Grid
II Snap
III Limits
IV O-snap
V Unit control
VI Layers
VII Dimension style

14. UNDERSTAND INTERNATIONAL CAD STANDARDS

14.1 Explain different Architectural symbols

14.2 Explain different Line colors'

14.3 Explain different layers management

15. UNDERSTAND HOW TO DRAW HOUSE PLAN IN CAD

15.1 Explain How to prepare House plan.

NOTE: LATEST VERSION OF AUTO CAD WILL BE USED.

ARCH-143 COMPUTER AIDED DRAFTING AND PRESENTATION-I

LIST OF PRACTICALS

Practical Hours: 192

1. Identify different hard wares (keyboard, mouse, CPU, disk drives, disks, monitor & printer) **(12 Hours)**

2. Practice of Ms-Windows XP (Operating system) **(12 Hours)**

3. Practice of application of different commands of MS-OFFICE (MS-WORD) **(18 Hours)**

4. Practice of application of different commands of MS-OFFICE (MS-EXCEL) **(12Hours)**

5. Practice of application of different commands of MS-OFFICE (MS-POWER POINT) **(12 Hours)**

6. Practice of Internet & E-MAIL **(06 Hours)**

7. Practice of Auto Cad menus **(6 Hours)**

8. Practice of Co-ordinate system **(06 Hours)**

9. Practice of Display commands **(12 Hours)**

10. Practice of Draw commands **(24 Hours)**

11. Practice of Construct commands **(24 Hours)**

12. Practice of File commands **(06 Hours)**

13. Practice of all settings **(12 Hours)**

14. Practice of international CAD standards such as Architectural Symbols, Line colors', and Layers management **(12 Hours)**

15. Preparing a house plan in CAD & plotting. **(18 Hours)**

Facility

There are presently two CAD rooms for Architecture.

Equipment and Materials

There are presently total 52 computers available. The following items will be provided by project for Development of center of Excellence before pilot class starts.

Item	Specification	Quantity
Computer	Core2Duo (RAM:1GB), 19 inch Display	15
Laser Printer	A4 Size, Black & White	1
Ink Jet Color Printer	24 inch in width	1
Scanner	With ADF	1

Projector with screen	3000 Rumens	1

PROJECT FOR DEVELOPMENT OF CENTER OF EXCELLENCE (CoE)

FOR TECHNICAL EDUCATION

Government College of Technology
Railway Road Lahore

CURRICULUM

DAE 2ND YEAR

ARCHITECTURE

TECHNOLOGY

Govt. College of Technology Railway Road, Lahore.

ARCHITECTURE TECHNOLOGY

Scheme of Studies

(2nd Year)

Course Code	Course Title	Hrs	T	P	C	Page
GEN-211	Islamiat and Pakistan Studies (T1)	32	1	0	1	73
MATH-212	Applied Mathematics-II (T2)	64	2	0	2	79
ARCH-212	Environmental Studies-I (T2)	64	2	0	2	88
ARCH-223	Structural Mechanics & R.C.C Design (T2P3)	160	2	3	3	93
ARCH-233	Architectural Drawing & Design-I(P9)	288	0	9	3	99

ARCH-242	Computer Aided Drafting and Presentation II	192	0	6	2	101
ARCH-253	Building Materials and Construction-II	160	2	3	3	106
ARCH-262	History of Architecture (T2)	64	2	0	2	113
ARCH-274	Surveying and Levelling (T2P6)	256	2	6	4	118
	Total	**1280**	**13**	**27**	**22**	

اسلامیات/مطالعہ پاکستان

نصاب (سال دوم)

حصہ اول	اسلامیات	Gen 211	ٹی	پی	سی
			1	0	1

حصہ دوم مطالعہ پاکستان

کل وقت:20 گھنٹے

موضوعات

1۔ سورہ المومنون ایک تا گیارہ آیات معہ ترجمہ

2۔ دس منتخب احادیث معہ ترجمہ وتشریح

- خیر کم من تعلم القران و علمه
- لاایمان لمن لا امانة له و لادین لمن عهدله
- ایاکم والظن ان الظن اکذب الحدیث
- من احدث فی امرنا هذا ما لیس منه فهورد
- من حمل علینا السلاح فلیس منا
- اناو کافل الیتیم فی الجنة هکذا
- لا یومن احد کم حتی اکون احب الیه من والده و ولده و الناس اجمعین
- من بنی لله مسجد ابنی الله له بیتا فی الجنة
- لاضرر ولا ضرار فی الاسلام
- کلکم راع و کلکم مسئول عن رعیته

3 سیرت طیبہ

- مکی زندگی، ولادت، بعثت، ہجرت

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

خطبہ حجۃ الوداع

4۔ حضور ﷺ بحیثیت:

معلم کامل۔ سربراہ خاندان

5۔ اسلامی معاشرہ

نظام تعلیم اور اس کے مقاصد۔ عدل وانصاف۔ امر بالمعروف ونہی عن المنکر

جہاد، کسب حلال، مسجد (اہمیت وفضیلت)

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

سال دوم　　اسلامیات

تدریسی مقاصد

قرآن مجید　　منتخب آیات قرآنی

عمومی مقصد۔ طالب علم پہچان سکے کہ آیات قرآنی کی روشنی میں مومن کے اوصاف کیا ہیں۔

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 اسلام کی اخلاقی اقدار (انفرادی واجتماعی) 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 میں 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 واقعہ 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 خصوصیات 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 کے لفظی و اصطلاحی معنی بیان کر سکے۔
- جہاد کی اہمیت بیان کر سکے۔
- جہاد اور قتال 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 بارے میں اقدامات کو جان سکے۔

اسلامی ریاست

عمومی مقاصد ، اسلامی ریاست کی خصوصیات بیان کر سکے۔

خصوصی مقاصد

ریاست کی تعریف بیان کر سکے۔
اسلامی ریاست میں طرز حکومت سے آگاہی حاصل کر سکے۔
اسلامی ریاست کی خصوصیات بیان کر سکے۔
اسلامی ریاست کے اغراض و مقاصد بیان کر سکے۔
اسلامی ریاست کے قیام کے لئے جدوجہد کر سکے۔

نصاب اخلاقیات (غیر مسلم طلبا، کیلئے)

ٹی	پی	سی
1	0	1

کل وقت 20 گھنٹے

سال دوم

موضوعات

معاشرتی اقدار (بلحاظ ہمسایہ، اقوام، قومی سطح، شہری سطح، صحتی اداروں کی سطح، ضروریات، ورثہ

- حقوق و فرائض
- قوت برداشت
- قوت ارادی
- لگن و جذبہ
- وسیع النظری
- بے غرضی
- انسان دوستی
- حفاظتی شعور
- پاس آزاری
- کامل آگاہی
- تغیرات کو قبول کرنا
- خود شناسی

نصاب مطالعہ پاکستان

ٹی	پی	سی
1	0	1

کل وقت 12 گھنٹے

سال دوم

حصہ دوم

موضوعات

- دوقومی نظریہ
- تحریک پاکستان
- انڈین کانگرس
- مسلم لیگ
- تقسیم بنگال
- میثاق لکھنو
- تحریک خلافت
- سندھی تحریک
- تجاویز دہلی
- نہرو رپورٹ
- قائداعظم کے چودہ نکات
- خطبہ الہ آباد
- انتخابات 1938 اور انتقال اقتدار
- قرارداد پاکستان

حصہ دوم

مطالعہ پاکستان -

تدریسی مقاصد

تحریک پاکستان

عمومی مقصد قیام پاکستان کے اسباب ومحرکات کو بیان کر سکے۔

خصوصی مقاصد

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

MATH-212 APPLIED MATHEMATICS-II

Total Contact Hours: 64

T	P	C
2	0	2

Pre-requisite:

Must have completed Mathematics-I

AIMS AND OBJECTIVES:

After Completing the course the students will be able to

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

COURSE CONTENTS

1. Functions & Limits **04 Hours**

1.1 Constant & Variable Quantities

1.2 Function & their classification

1.3 The concept of limit

1.4 Limit of a function

1.5 Fundamental theorems on 1 unit

1.6 Some important limits

1.7 Problems

2. Differentiation **04 Hours**

2.1 Increments

2.2 Differential Coefficient or Derivative

2.3 Differential ab-initio or by first Principle

2.4 Geometrical interpretation of differential coefficient

2.5 Differential coefficient of X""+(ax-b)a

3. Differentiation of Algebraic Functions **04 Hours**

3.1 Explicit functions

3.2 Implicit functions

3.3 Parametric forms

3.4 Problems

4. Differentiation of Trigonometric Functions **04 Hours**

4.1 Differentiation Coefficient of Sin x, Tan x, from first principle

4.2 Differentiation Coefficient of cosec x, Sec x, Cot x

4.3 Differentiation of inverse trigonometric functions

4.4 Problems

5. Differentiation of Logarithmic & Exponential Functions 04 Hours

5.1 Differentiation of in x

5.2 Differentiation of Log ax

5.3 Differentiation of ay

5.4 Differentiation of c

5.5 Problems

6. Rate of Change of Variable 04 Hours

6.1 Increment 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 Integration

7. Integration 08 Hours

7.1 Concept

7.2 Fundamental Formulas

7.3 Important rules

7.4 Problems

8. Methods of Integration 06 Hours

8.1 Integration by substitution

8.2 Integration by parts

8.3 Problems

9. Definite Integrals **06 Hours**

9.1 Properties

9.2 Application to area

9.3 Problems

10. Plane Analytic Geometry & Straight Line **06 Hours**

10.1 Co-ordinate system

10.2 Distance formula

10.3 The ratio formulas

10.4 Inclination and slope of line

10.5 The slope formula

10.6 Problems

11. Equations of the Straight Line **06 Hours**

11.1 Some important forms

11.2 General forms

11.3 Angle forms

11.4 Parallelism & perpendicularity

11.5 Problems

12. The Equations of the Circle **08 Hours**

12.1 Standard form of equation

12.2 Central form of equation

12.3 General form of equation

12.4 Radius & Co-ordinates of the centre

Recommended Books

i. **Thomas Finny-** Calculus an analytic geometry

ii. **Ghulam Yasin Minhas** – Technical Mathematics VOL-II Ilmi Kitab Khana Lahore

iii. **Prof. Riaz Ali Khan**- Polytechnic Mathematics series VOL-I & II Majeed Sons Faisalabad

iv. **Prof. Sana Ullah Batthi-**Calculus and analytic geometry. Punjab Text Book Board, Lahore

MATH-212 **APPLIED MATHEMATICS–II**

INSTRUCTIONAL OBJECTIVES

1. **Use the Concept of Functions and Their Limits in Solving Simple Problems**

   1.1 Define a function

   1.2 List of all type of functions

   1.3 Explain the concept of limit and limit of a formula

   1.4 Explain fundamental theorems on limits

   1.5 Derive some important limits

   1.6 Solve simple problems on limits

2. **Understand and the Concept of Differential**

   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 sum of finite number of functions

   2.4 Solve related problems

3. **Use Rules of Differentiation To Solve Problems of Algebric Functions**

   3.1 Differentiate ab-initio Xn and (ax-b)n

   3.2 Derive product, quotient and chain rules

3.3 Find derivatives of implicit functions & explicit functions

3.4 Differentiate parametric forms, functions w.r i. 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, cot x

4.2 Derive formulas for derivation of sec x, cosec x, cot x

4.3 Find differential coefficient of inverse trigonometric functions

5. Use Rules of Differentiation To Logarithmic and Exponential Functions

5.1 Derive formulas for differential coefficient of logarithmic and exponential functions

5.2 Solve problems

6. Understand Rate of Change of One variable With Respect To Another

6.1 Write expression for velocity, acceleration and slope of a line

6.2 Define and increasing and a decreasing function, maxima and minima value, 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. Apply Concept of Integration In Solving Technological Problems

7.1 Explain the concept of integration

7.2 Write basic theorems of integration

7.3 List some of formulas of integration

7.4 Derive fundamental formulas of integration

7.5 Solve problems based on these formulas/rules

8. Understand Different Methods of Solving Definite Integrals

8.1 List standard formulas

8.2 Integrate a function by substitution method

8.3 Find integrals by the method of integration by parts

8.4 Solve problems using these methods

9. Understand The Methods of Solving Definite Integrals

9.1 Define definite integral

9.2 List properties of definite integrals using definite integrals

9.3 Find area under the curves

9.4 Solve problems of definite integrals

10. Understand And The Concept of Plane Analytic Geometry

10.1 Explain the rectangle co-ordinate system

10.2 Locate points in different quadrants

10.3 Derive distance formula

10.4 Derive section formula

10.5 Derive slope formula

10.6 Solve problems using the above formulas

11. Use Equations of Straight Line In Solving Problems

11.1 Define Straight line

11.2 State general forms of equation of a straight line

11.3 Derive slope intercept and intercept forms equations of a straight line

11.4 Derive expression for angle two straight lines

11.5 Derive conditions of perpendicularity and parallelism of two straight lines

11.6 Solve problems involving these equations / formulas

12. Use Technological Problems Using Equation of Circle

12.1 Define a circle

12.2 Describe standard, central and general forms of the equation of a circle

12.3 Convert general forms to the central forms of equation of a circle.

12.4 Deduce formulas for the radius and the co-ordinates of the centre of a circle

12.5 From the general form derive equation of the circle passing through three given points

12.6 Solve problems involving these equations

ARCH-212 Environmental Studies-I

Total Contact Hours: 64

T	P	C
2	0	2

AIMS & OBJECTIVES

This course has been designed so as enable students to understand the processes in the physical environment and their effects on humans and buildings and to be able to counteract their ill effect through design. At the same time the course also addresses the environmental issues as enshrined in our architectural heritage.

COURSE CONTENTS

1. Physical Environment **08 Hours**

- 1.1 Introduction
- 1.2 Social aspect
- 1.3 Economical aspect
- 1.4 Aesthetics & ecological aspect

2. Climate **08 Hours**

- 2.1 Introduction
- 2.2 Characteristics
- 2.3 Tropical climate
- 2.4 Effect of climate on residential buildings

3. Ventilation **08 Hours**

3.1 Definition and importance

3.2 Types and design guidlines of openings for ventilation

4. Illumination **10 Hours**

4.1 Definition and importance

4.2 Solar Geometry

4.3 Day light

4.4 Artificial illumination

5. Heat Transfer In Building **10 Hours**

5.1 Introduction

5.2 Need

5.3 Insulating material & application

5.4 Shading devices

5.5 Trees (different types of trees & bushes to control temperature)

6. Water Supply And Drainage **10 Hours**

6.1 Definition

6.2 Sources of water supply

6.3 Domestic water supply system(OHWT, UGWT)

6.4 Equipments of water supply

6.5 Drainage systems(Soakage pit, Septic tank)

6.6 Slopes and connection to public sewers

7. Plumbing And Sanitation **10 Hours**

7.1 Definition

7.2 Need

7.3 Symbols

7.4 Plumbing Fixtures

7.5 Sanitary fittings

7.6 Water pollution, sources and control techniques

ARCH-212 **Environmental Studies-I**

INSTRUCTIONAL OBJECTIVES

1. Understand Various Aspect of Physical Environment

1.1 Explain the term Physical Environment (Both Natural & Man-Made)

1.2 Describe the Social aspects of Physical Environment

1.3 Explain the Economical aspects of Physical Environment

1.4 Explain the Aesthetics & ecological aspects of Physical Environment

2. Understand Climate And Its Effects On Buildings

2.1 Explain the term Climate

2.2 Explain the Characteristics of Climate

2.3 Describe the main features of Tropical climate

2.4 Explain the effect of climate on residential buildings

3. Understand Concept of Ventilation In Designing of Openings

3.1 Explain ventilation and its importance

3.2 Describe types of ventilation

3.3 Design consideration of openings for ventilation

4. Understand Illumination In Buildings

4.1 Define illumination and its importance in different buildings

4.2 Explain solar geometry

4.3 Describe day light effects on buildings

4.4 Explain artificial illumination in buildings

5. Understand Heat Transfer In Buildings

5.1 Explain different ways of heat transfer in buildings

5.2 Describe the need of Thermal Insulation in buildings

5.3 State Insulating material and their application for Thermal Insulation

5.4 Explain Shading devices used in buildings

5.5 Explain the role of trees & bushes to control temperature

6. Understand Water Supply And Drainage System In Buildings

6.1 Define water supply

6.2 Describe Sources of water supply

6.3 Explain Domestic water supply system (Hot & Cold)

6.4 Explain Equipments used in water supply

6.5 Storage of water supply (UGWT, OHWT)

6.6 Explain Drainage systems used in buildings

6.7 Explain Slopes in Drainage systems and connection to public sewers

6.8 Introduction to soakage pit and septic tank

7. Understand Plumbing And Sanitation

7.1 Define Plumbing and Sanitation

7.2 Describe the need of Plumbing and Sanitation in domestic buildings

7.3 Describe Symbols used in Plumbing and Sanitation of buildings

7.4 Describe Plumbing Fixtures used in buildings

7.5 Describe different Sanitary fittings used in domestic buildings

7.6 Explain Water pollution its sources and different techniques to Control Water pollution

Recommended Books

i. Manual of Tropical Housing and Building part-II

Climatic Design by **Koengberga Ingersoil ISBN No: 0582445460-9(Hard copy)**

ii. Design with climate (Bioclimatic approach to Architectural recognition) by **Olgyay Victor Preston University Press New Jersey**

iii. Climate Responsive Architecture by **TATA McGraw HILL**

iv. Solar Passive Design

ARCH-223 **STRUCTURAL MECHANICS & R.C.C. DESIGN**

Total Contact Hours: 160

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

AIMS AND OBJECTIVES

After studying this course, the students will be familiar with structure, behavior of building material, design element, strength of element structure members.

COURSE CONTENTS

1. Elasticity

1.1 Definition
1.2 Limit of elasticity
1.3 Yield point
1.4 Modulus of elasticity
1.5 Calculation of modulus of elasticity

2. Stress

2.1 Definition
2.2 Types
2.3 Numerical problems

3. Strain

3.1 Definition
3.2 Calculation

4. Centre of Gravity

4.1 Definition

4.2 Calculation

5. Moment of Inertia

5.1 Definition

5.2 Calculation

6. Bending Moment And Shearing Force

6.1 Definition

6.2 Numerical problems regarding cantilever and simply supported beams

7. Deflection

7.1 Definition

7.2 Significance

7.3 Slope of beam

7.4 Numerical problems

8. Soil Mechanics

8.1 Introduction

8.2 Types

8.3 Technical terms

8.4 Bearing capacity of soil

9. Column And Footing

9.1 Introduction

9.2 Types

9.3 Description

9.4 Calculations

10. R.C.C. Beam

10.1 Introduction

10.2 Types

10.3 Description

10.4 Calculations

11. R.C.C. Slab

11.1 Introduction

11.2 Types

11.3 Description

11.4 Calculations

12. Simple Stair Case

12.1 Introduction

12.2 Types

12.3 Description

ARCH-223 STRUCTURAL MECHANIC & R.C.C DESIGN

INSTRUCTIONAL OBJECTIVES & LIST OF PRACTICALS

1. Understand The Elasticity 04 Hours

1.1 Define elasticity

1.2 State elastic limit

1.3 State yield point

1.4 State modulus of elasticity

1.5 Compute modulus of elasticity

- **Calculations/ Lab Experiment/ Site visit on the topic** 06 Hours

2. Understand The Stress 04 Hours

2.1 Define stress

2.2 State the types of stress

2.3 Distinguish between tensile, compressive and shear stress

2.4 State stress in beam

2.5 Explain relationship between stress, moment of resistance and modulus of section

- **Calculations/ Lab Experiment/ Site visit on the topic 06 Hours**

3. Understand The Strain **04 Hours**

3.1 Explain strain

3.2 Describe the relation between stress and strain

- **Calculations/ Lab Experiment/ Site visit on the topic 06 Hours**

4. Understand The Centre of Gravity **04 Hours**

4.1 Explain the centre of gravity

4.2 Calculate the C.G of of various sections (e.g L,I,H,T, Channel and Regular)

- **Calculations/ Lab Experiment/ Site visit on the topic 06 Hours**

5. Understand The Moment of Inertia **04 Hours**

5.1 Explain the moment of inertia

5.2 Describe the formula of inertia

5.3 Introduction to various formulae

- **Calculations/ Lab Experiment/ Site visit on the topic 06 Hours**

6. Understand The B.M & S.F In Beam **06 Hours**

6.1 Introduction to shear force and bending moment

6.2 Describe significance of S.F and B.M in R.C.C. and steel structure

- **Calculations/ Lab Experiment/ Site visit on the topic** 09 Hours

7. Understand The Deflection **04 Hours**

7.1 Introduction to deflection

7.2 Significance of deflection

7.3 Describe slope of beam

- **Calculations/ Lab Experiment/ Site visit on the topic** 06 Hours

8. Understand Soil Mechanics **06 Hours**

8.1 Introduction to soil

8.2 Types of soils

8.3 Description of technical terms used in soil mechanics

8.4 Explain bearing capacity of soil

- **Calculations/ Lab Experiment/ Site visit on the topic** **09 Hours**

9. Understand The Column And Footing **08 Hours**

9.1 Introduction to columns and footings

9.2 Describe different types of columns and footings

9.3 Explain structure of columns and footings

9.4 Calculations for approximate sizing

- **Drawing/ Lab Experiment/ Site visit on the topic** **12 Hours**

10. Understand The Beam & Lintel **06 Hours**

10.1 Introduction to beams

10.2 Describe different types of beams

10.3 Description of beam in terms of structure

10.4 Calculations for approximate sizing

- **Drawing/ Lab Experiment/ Site visit on the topic** **09 Hours**

11. Understand The Slab **08 Hours**

11.1 Introduction to slab

11.2 Describe different types of slabs

11.3 Description of slabs in terms of structure

11.4 Calculations for approximate sizing

- **Drawing/ Lab Experiment/ Site visit on the topic** **12 Hours**

12. Understand The Simple Stair Case **08 Hours**

12.1 Fundamentals of stair case

12.2 Design and drawing of stair case

- **Calculations/ Lab Experiment/ Site visit on the topic 12 Hours**

Recommended Books

i. Structural mechanic & R.C.C design by **NISTE. STD-141**

ii. Structural mechanic & R.C.C design by **W.MORGAN.**

Tools/ Equipment

Drawing board, Set Square, T-Square, Pencil, Eraser, Sharpener, Graph paper, Mixing machine for 25 kg, Compressive test machine, Tensile test machine, Molding for cubes tests, Vibrator for concrete, Electric and hand compactor.

ARCH-233 ARCHITECTURAL DRAWING & DESIGN-I

Total Contact Hours: 288 Hours

T	P	C
0	9	3

AIMS & OBJECTIVES

1. To enable students to understand architectural design process & Flow diagram, circulation systems
2. To enable student to design simple spaces –simple functions to multi-user to multi- function spaces
3. To enable students to apply knowledge of graphics gained in 1st year to present their designs

List of Practical

1. Designing a bathroom (Plan, Sections) **18 Hours**
2. Designing a kitchen(Plan, Sections) **18 Hours**

3. Designing a bedroom with bathroom (Plan, Internal Layout) **27 Hours**
4. Designing a lounge (Plan, Layout) **27 Hours**
5. Designing a drawing room and dining room (Plan, Elevation, Details) **27 Hours**
6. Designing of different types of stairs (Plan, Elevation, Details) **36 Hours**
7. Parking design **18 Hours**
8. Designing a small residential building (Plan, Elevations, Sections, Details) **36 Hours**
9. Making submission drawing of a residential building for LDA and DHA Lahore **45 Hours**
10. Designing and preparing basic design (Plan, Elevations, Sections) of a small building e.g Bank, Restaurant and Architect's office **36 Hours**

Recommended Books

i. How to Plan a House by **Gilbert Townsed S.B.**

ii. Time Saver Standards (Building Type) by **John Hankook Calendar, ISBN 0-07-099076-x**

iii. Architectural Graphics Standards by **Charles G.Ramsy & Hanrold R.Sleeper**

Tools/Equipment

Drawing Table, T-Square, Set Square, Pencil, Eraser, Sharpener

ARCH 242 **Computer Aided Drafting and Presentation-II**

Total Contact Hours: 192

T	P	C
0	6	2

AIMS AND OBJECTIVES

1. To introduce advance commands of AutoCAD to students
2. To enable the students to prepare drawings in addition to plan e.g. sections, elevations
3. To enable the students to prepare working drawings
4. Achieve the goals in the least possible time
5. To enable the students to prepare 3D drawings
6. To enable the students to render the 3D AutoCAD Model in 3Ds Max

COURSE CONTENTS

1. Advance commands of AutoCAD

2. Introduction to Elevations and Section
3. Working Drawings
4. Short Cuts
5. Scale Adjustment in Drawing and Getting Prints on any given scale
6. 3-D Modeling in AutoCAD
7. 3-D Max

COURSE DETAILS

1. **Advance Commands of AutoCAD (**To be determined by the teacher**)** **18 Hours**
2. **Introduction to Elevations and Section** **15 Hours**
   - 2.1 Concept of Elevation
   - 2.2 Drawing elevation through plan rotation methods
   - 2.3 Introduction to “Ray” and construction line
   - 2.4 Concept of section
   - 2.5 Drawing section through “Plan rotation Method”
   - 2.6 Specifications
     - 2.6.1 Traditional specifications
     - 2.6.2 Regional Specifications

2.6.3 Specifications writing

3. WORKING DRAWINGS **27 Hours**

3.1 Introduction of working drawing

3.2 Purpose of working drawing

3.3 International standards of drafting and meanings of different types of lines

3.4 Preparation of working drawing

3.5 Dimensioning

3.6 Editing dimensions

3.7 Changing dimensions style

3.8 Line type scale

3.9 Adjusting line type scale

4. Shortcuts **06 Hours**

4.1 Multiple commands for the same outcome and then selecting the one that suits best to any situation

5. Scale Adjustment In Drawing And Getting Print On Any Given Scale **06 Hours**

5.1 Concept of scale

5.2 Difference between drawing scale and print scale

5.3 Printing scales

6. 3-D Modeling In AutoCAD **24 Hours**

6.1 Concept of 3-D Modeling

6.2 Terminology of 3-D

6.1.1 Isometric

6.2.1 Perspective

6.3 Drawing manually on 3-D coordinates system to understand the concept of x-y axes

6.4 Extrude

6.4.1 Through extrusion angle

6.4.2 Through path

6.5 Changing thickness of line

6.6 Difference between extrude and changing thickness

6.7 Solid editing

6.8 UCS

6.9 Views

6.10 Following tool bars will be studied

6.10.1 Edit

6.10.2 Dimensioning

6.10.3 Layers

6.10.4 Modify

6.10.5 Object Snap

6.10.6 Insert

6.10.7 Express tools

6.10.8 Text

7. 3-D Max

78 Hours

7.1 Introduction to 3D Max

7.1.1 Grid & Units

7.1.2 Basic Tools

7.2 2D Drawing

7.2.1 Basic Shapes

7.2.2 Editable Spline

7.3 3D Modeling

7.4 Basic Modeling

7.4.1 Standard Primitives

7.4.2 Extended Primitives

7.5 Mesh

7.5.1 Editable Mesh

7.5.2 Editable Poly Mesh

7.6. Surface

- ❖ Plan
- ❖ Patch Grid

7.7 Materials

- ❖ Standard Materials
- ❖ Maping

7.8 Lighting

7.8.1 Standard Lighting

7.8.2 Intro. to Photometric Lighting

7.8.3 Advance Lighting

7.8.4 Lighting Effect

7.8.5 Photoshop

7.9 Camera

7.9.1 Intro & Camera Composition

7.10. Rendering

7.10.1 Scan line Renderer

7.10.2 Rendering Effects

7.10.3 Different File Formats

7.10.4 Introduction to Photoshop

8. Prepare a project at the end of curriculum **18 Hours**

Recommended Books

i. Auto Cad 2006 manual,3-D Max Manual

Tools/Equipment

Computer system Core 2 Due, Color Printer A13 Size, Scanner, AutoCAD 2006/ Latest Version of AutoCAD (Software), 3-D Max (Software) CD's

ARCH-253 **Building Materials & Construction-II**

Total Contact Hours: 160	T	P	C
Theory 64 Hours	2	3	3
Practical 96 Hours			

AIMS & OBJECTIVES

After studying this course, the students will be able to familiar with the construction of buildings

COURSE CONTENTS

1. Foundation **06 Hours**

1.1 Excavation

1.2 Types of foundation

1.3 Termite proofing

1.4 Moisture and thermal insulation

Assignment/ Practical **12 Hours**

- ❖ Prepare an excavation plan
- ❖ Prepare foundation details for different types of walls / columns

2. Walls **08 Hours**

2.1 Types of walls, load bearing / non load bearing walls reinforced concrete wall (Retaining wall, Toe wall)

2.2 Masonry works

2.3 Lintels & arches

2.4 D.P.C, in walls

Assignment/ Practical **12 Hours**

- ❖ Draw the section of brick wall, stone wall & the block wall
- ❖ Draw section of wall from foundation to parapet (x-section of wall)

3. Floors **08 Hours**

3.1 Types and components of flooring

3.2 Specifications on different types of floors

Assignment/ Practical **06 Hours**

- ❖ Draw the sectional detail of flooring

4. Roofs **08 Hours**

4.1 Types and uses of roofs

4.2 Roof specifications

4.3 Types of wooden roofs

4.4 Shell roof & dome

Assignment/ Practical **12 Hours**

- ❖ Draw the section of roof & its detail
- ❖ Draw the types of wooden floor
- ❖ Draw the plan, elevation and section of Dome

5. Stairs **08 Hours**

5.1 Types, explanation of stairs & their uses

5.2 Lift well , Escalator, Ramps

Assignment/ Practical **12 Hours**

- ❖ Draw plan, elevation and section of different stair cases
- ❖ Draw the plan and sections of lift well, escalator and ramps

6. Doors **06 Hours**

6.1 Different types of Doors

6.2 Construction of wooden & steel doors

6.3 Termite proofing of timber

Assignment/ Practical **12 Hours**

- ❖ Draw the plan, elevation & section of wooden doors
- ❖ Draw the detail of steel doors

7. Windows **06 Hours**

7.1 Different types of windows

7.2 Construction techniques of wooden & metal windows

Assignment/ Practical **12 Hours**

- ❖ Draw the plan, elevation and section of windows
- ❖ Draw the details of metal windows

8. Scaffolding, Shoring and Under Pining **08 Hours**

8.1 Scaffolding, its types & construction

8.2 Shoring & its types

8.3 Under pining & its importance

Assignment/ Practical **03 Hours**

- ❖ Visit the site for understanding about the scaffolding, shoring & underpinning

9. Working Drawing **06 Hours**

9.1 Working drawing & its importance in Architecture

9.2 List of working drawings

Assignment/ Practical **15 Hours**

- Draw the complete set of working drawings of a medium size building (as done in Architecture, Drawing and Design -1)

Tools / Equipment

Drawing board, Set Square, T-Square, Scale, Pencil, Eraser, Sharpener Electric compactor and hand compactor, Vibrator, Rip saw for making scaffolding, Helmet and Gloves, Overall, Glasses.

ARCH-253 **Building Materials and Construction-II**

INSTRUCTIONAL OBJECTIVES

1. Understand the Types of Foundations

1.1 Define excavation and techniques of excavation including basement

1.2 Define foundation

1.3 Explain the foundation details

1.4 State the types of foundation

1.5 Describe the termite proofing

1.6 Describe the moisture and thermal insulation

2. Understand the Types of Walls and Their Construction

2.1 Describe types of wall, load bearing, non load bearing walls, reinforced concrete walls (Retaining walls and Toe walls)

2.2 Explain the construction of brick wall

2.3 Explain the construction of stone wall

2.4 Explain the construction of block wall

2.5 Explain the construction of partition walls and cavity walls

2.6 Explain the construction of lintels sills and arches

2.7 Define D.P.C

2.8 Describe D.P.C. in walls

3. Understand the Floor

3.1 Explain the types of floors

3.2 Explain the details of concrete floor

3.3 State the floor specifications

4. Understand the Details of Different Types of Roofs

4.1 State the types of roofs

4.2 Explain the types of wooden roof

4.3 Explain the roof details

4.4 Describe shell roof

4.5 Describe dome

4.6 Describe the roof covering materials

4.7 Describe the uses of roofs

4.8 Explain truss and its uses

5. Understand the Details of Different Stairs

5.1 Define technical terms used in stairs

5.2 Explain the types of stairs

5.3 Explain the details of stair case

5.4 Describe the uses of stairs

6. Understand the Details of Different Doors

6.1 State the types of doors

6.2 Explain the construction of wooden and steel doors

6.3 Explain the use of different types of doors

7. Understand the Different Types of Windows And Their Construction

7.1 Explain the types of windows

7.2 Explain the construction of wooden and metal windows

7.3 Explain the use of different types of windows

8. Understand the Scaffolding, Shoring And Underpinning In Building

8.1 Define scaffolding, shoring and underpinning

8.2 Explain the types of scaffolding, shoring and underpinning

8.3 Describe the construction of scaffolding, shoring and underpinning

9. Understand the Different Types of Working Drawings

9.1 Explain the different types of working drawings

9.2 Describe the importance of working drawings

9.3 State the list of working drawings

Recommended Books

i. **Building Construction** by Arrora & Gupta

ii. **Building Construction** by Sharma

iii. **Building Construction** by Kalcurni

iv. **Building Construction** by Deshpande

v. **Building Construction** by Rangwala

ARCH-262 **HISTORY OF ARCHITECTURE**

Total Contact Hours: 64

T	P	C
2	0	2

AIMS & OBJECTIVES:

1 To create an awareness about different driving forces shaping up architecture
2 To implant better understanding with relevance to time and context
3 To create an understanding about world architecture
4 To create an understanding of architecture of Pakistan

COURSE CONTENTS

1. Ancient Civilizations **08 Hours**

1.1 Main characteristics of the civilizations
- 1.1.1 Indus valley
- 1.1.2 Mesopotamia
- 1.1.3 Egyptian

2. Greek Architecture **08 Hours**

2.1 Introduction
2.2 Characteristics of Greek Architecture
2.3 Orders of Greek Architecture
2.4 Study of famous buildings

3. Roman Architecture **08 Hours**

3.1 Introduction
3.2 Characteristics of Roman Architecture
3.3 Study of famous buildings

4. Byzantine and Gothic Architecture **12 Hours**

Main characteristics of the following

4.1 Byzantine style of architecture

4.2 Gothic style of architecture

4.3 Famous buildings of Byzantine and Gothic style

5. Renaissance Architecture **08 Hours**

5.1 Introduction

5.2 Characteristics

5.2.1 Early Renaissance

5.2.2 High Renaissance

5.3 Study of famous buildings

6. Muslim Architecture **08 Hours**

6.1 Characteristics of Early Muslim Architecture

6.2 Main Characteristics of Muslim Architecture in subcontinent

6.3 Study of famous building in Pakistan (Lahore Fort, Badshahi Mosque, Jahangir's Tomb)

7. Modernism and Post-Modernism **12 Hours**

7.1 Introduction

7.2 Characteristics of Modern Architecture

7.3 Birth of Post-Modern Architecture

7.4 Characteristics of Post-Modern Architecture

ARCH-262 **HISTORY OF ARCHITECTURE**

INSTRUCTIONAL OBJECTIVES

1. Understand Ancient Civilization

1.1 Describes the main features of pre historic Architecture

1.2 Explain the Characteristics of the following ancient civilization:

- 1.2.1 Indus valley civilization
- 1.2.2 Mesopotamia civilization
- 1.2.3 Egyptian civilization

2. Understand Greek Architecture

2.1 Introduction of Greek civilization

2.2 Describe main characteristics of Greek Architecture

2.3 Explain orders of Greek Architecture

2.4 Explain the main features of the following buildings

- 2.4.1 The Parthenon Athens
- 2.4.2 The Greek Theatre

3. Understand the Roman Architecture

3.1 Introduction to Roman civilization

3.2 Describe the main characteristics of Roman Architecture

3.3 Explain the orders of Roman Architecture

3.4 Explain main features of the following buildings

- 3.4.1 Roman Colosseum
- 3.4.2 Pantheon Rome

4. Understand Byzantine and Gothic Architecture

4.1 Introduction to middle ages Architecture

4.2 Describe the characteristics of the following civilizations

4.2.1 Byzantine Architecture

4.2.2 Gothic Architecture

4.3 Explain the main features of the following buildings

4.3.1 Hagia Sophia Constantinople

4.3.2 Cathedral-Notre Dame, Paris

5. Understand Renaissance Architecture

5.1 Introduction to Renaissance Architecture

5.2 Describe the main Architectural Characteristics of the following:

5.2.1 S. Lorenzo, Florence

5.2.2 Peter, Rome

6- Understand the Muslim Architecture

6.1 Describe the main characteristics of Early Muslim Architecture

6.2 Explain main characteristics of Muslim Architecture in Sub-Continent

6.3 Explain the Architectural features and materials of the following buildings

6.4.1 Old Fort Lahore

6.4.2 Jahangir Lahore

6.4.3 Badshahi Mosque

7- Understand Modernism and Post-Modernism

7.1 Introduction to Modern Architecture

7.2 Describe the main characteristics of Modern Architecture

7.3 Explain the works of the following Architects:

7.3.1 Le Coubusior

7.3.2 Mies van der Rohe

7.3.3 Frank Llyod Wright

7.4 Describe the birth of Post-Modern Architecture

7.5 Explain the characteristics of Post-Modern Architecture

Recommended Books

i. History of Architecture by **Sir Banister Fletcher (ISBN 81-239-0641-2)**

ii. Architecture in Pakistan by **Kamil Khan Mumtaz (ISBN 9971-84-141-x)**

iii. Lahore: its history, Architectural remains and Antiquities by **S.M. Latif**

iv. Indian Architecture by **Percy Brown**

v. The Raj, Lahore & Bhai Ram Singh by **Perviaz Vandal & Sajida Vandal**

vi. Islamic Architecture Form, Function and Meaning by **Robert Hillen Brand**

Ref. Edembra University Press **ISBN: 0748604790**

ARCH-274 **SURVEYING AND LEVELING**

Total Contact Hours: 256 T P C

Theory 64 Hours 2 6 4

Practical 192 Hours

AIMS & OBJECTIVES

1. This course will familiarize with basic principles of surveying
2. Develop in students the skill about the use of surveying instruments
3. Familiarize students with the use of surveying in civil engineering / Architecture practices

COURSE CONTENTS

1. Surveying **04 Hours**

1.1 Introduction

1.2 Division

1.3 Principles

1.4 Scales

2. Chain Survey **04 Hours**

2.1 Introduction

2.2 Types

2.3 Equipment

2.4 Method

3. Compass Survey **06 Hours**

3.1 Introduction

3.2 Types

3.3 Equipment

3.4 Method

3.5 Types of traversing

4. Plane Table Survey **06 Hours**

4.1 Introduction

4.2 Equipment

4.3 Testing

4.4 Method

5. Leveling **18 Hours**

5.1 Introduction to leveling

5.2 Introduction to level

5.3 Instruments for leveling

5.4 Types of level

5.5 Adjustment of level

5.6 Types of leveling

5.7 Method of leveling

6. Verniers **06 Hours**

6.1 Introduction

6.2 Principles

6.3 Types

6.4 Term used

7. Theodolite **20 Hours**

7.1 Introduction

7.2 Parts

7.3 Types

7.4 Definition of terms

7.5 Adjustment

7.6 Function

7.7 Measuring

7.8 Traversing

7.9 Errors

7.10 Plotting

7.11 Introduction to total station

Recommended Books

i. Surveying & leveling I & II by **T.P. Kanat-Kar**

ii. Surveying & leveling by **S.K. Hussain**

iii. Surveying & leveling by **David Clark**

iv. Surveying & leveling by **Hakim Ali**

v. Surveying & leveling by **S. Ahmed**

vi. Surveying & leveling by **P. Son Chosh**

vii. Rasul manual I & II

viii. Text book of advanced surveying by **A. Lior**

ix. Surveying (T + P) by **Raymond-E-Devis**

ARCH-274 **SURVEYING & LEVELLING**

INSTRUCTIONAL OBJECTIVES

1. Know The Surveying

1.1 Define surveying

1.2 State division of surveying

1.3 Describe types of land survey

1.4 Determine principle of surveying

1.5 Explain different types of scale

2. Understand Chaining

2.1 Define chaining

2.2 Explain test of chain

2.3 State types of chain

2.4 Explain folding & unfolding of chain

2.5 Explain use of optical square

2.6 Explain use of cross staff

2.7 Describe how to manipulate the area with the help of diagram

2.8 Explain how to plot the layout graphically

3. Understand The Compass Survey

3.1 State the compass survey

3.2 Describe the types

3.3 State open traversing

3.4 State close traversing

3.5 Explain how to operate compass

3.6 Illustrate how to choose the traversing

3.7 Explain method of applying the procedure

4. Understand The Plane Table Survey

4.1 Define the plane table surveying

4.2 Explain how to operate the plane table survey

4.3 Explain testing of plane table

4.4 Explain how to apply the plane table survey

4.5 Explain the orientation of plane table

5. Understand The Leveling

5.1 Define leveling

5.2 Define level

5.3 Explain how to operate auto set level, tripod, plum bob & staves

5.4 State the types of leveling (fly reciprocal, check)

5.5 Describe the use of auto level

5.6 Explain the use of digital level

5.7 Explain the method of reduction of level by height of instrument method

5.8 Explain method of reduction of levels by rise & fall method

5.9 Prepare a sheet

6. Understand The Verniers

6.1 Define vernier

6.2 Explain principles of vernier

6.3 State types of vernier

6.4 Describe the terms used in vernier

7. Understand Theodolite

7.1 Define theodolite, microptic theodolite,vernier theodolite and digital theodolite

7.2 Explain theodolite parts

7.3 State its types

7.4 Describe terms use in theodolite

7.5 Explain the adjustment of theodolite

7.6 Explain function of theodolite

7.7 Explain measuring angle of theodolite

7.8 Explain traversing of theodolite

7.9 Prepare the sheet

7.10 Introduction to total station, laser and digital Theodolite

List of Practicals

i. Ranging line by different methods **06 Hours**

ii. Setting out right angle with the help of different instruments. **06 Hours**

iii.	Preparation of chain survey sheet	**12 Hours**
iv.	Calculation of F.B, B.B, R.B & W.C.B included angle etc	**06 Hours**
v.	Compass survey of an area in the field	**12 Hours**
vi.	Carry out plane table survey and area	**18 Hours**
vii.	Practice in the use of taking reading on a staff	**06 Hours**
viii.	Temporary adjustment of a auto level, digital level	**06 Hours**
ix.	Finding RL. Height of instrument	**06 Hours**
x.	Taking longitudinal section and cross section of ½ K.M long route	**18 Hours**
xi.	Taking level of contour survey of an area	**18 Hours**
xii.	Numerical problems on vernier	**18 Hours**
xiii.	Practice on theodolite	**24 Hours**
xiv.	Practice on Total Station	**24 Hours**
xv.	Prepare a sheet	**12 Hours**

Tools / Equipment

Various types of chains, Ranging rods, Cross stop, Optical square, Measuring tape, Surveyor Compass, Prismatic Compass with all accessories, Field/ measuring book, Plane table, Alidade, Telescopic

Alidade, Plum bob, Magnetic needle, Hand level, wooden mallet, wooden pegs, Venires, Abne level, Autoset level with all accessories, Digital Theodolite, Total Station etc.

PROJECT FOR DEVELOPMENT OF CENTER OF EXCELLENCE FOR TECHNICAL EDUCATION

Government College of Technology Railway Road Lahore

CEC Meeting at UET, Lahore AUGUST15, 2011

REVISED CURRICULUM DAE 3rd YEAR ARCHITECTURE TECHNOLOGY

Govt. College of Technology Railway Road, Lahore

ARCHITECTURE TECHNOLOGY

SCHEME OF STUDIES (3rd Year)

Course Code	Course Title	Hrs	T	P	C	Page
Gen 311	**Islamiat/Pakistan Studies**	32	1	0	1	127
ARCH 312	**Environmental Studies II**	64	2	0	2	131
ARCH 324	**Architectural Drawing & Design II**	384	0	12	4	135
ARCH 332	**Model Making**	192	0	6	2	136
ARCH 343	**Specification & Estimation**	160	2	3	3	137
ARCH 353	**Building Materials & Construction -III**	160	2	3	3	143
ARCH 362	**Construction Management & Safety Practices**	64	2	0	2	148
ARCH 372	**Computer Aided Drafting & Presentation III**	192	0	6	2	152
	Total	1248	9	30	19	

اسلامیات/مطالعہ پاکستان

نصاب (سال سوم)

		ٹی	پی	سی
حصہ اول	اسلامیات Gen 311	1	0	1

حصہ دوم مطالعہ پاکستان

کل وقت 20 گھنٹے

موضوعات

1 قرآن مجید

سورۃ الفاتحہ۔ آیۃ الکرسی۔ سورۃ البقرہ کی آخری آیات از امن الرسول تا آخر اور سورہ اخلاص معہ ترجمہ وتشریح

2 دس منتخب احادیث معہ ترجمہ وتشریح

- بنی الاسلام علی خمس شہادۃ ان لا الہ الا اللہ و اقام الصلوۃ و ایتاء الزکوۃ و حج البیت وصوم رمضان
- الدین النصیحہ
- المستشار الموتمن
- للمومن علی المومن ست خصال یعودہ اذا مرض و یشمتہ اذامات ویجیبہ اذا دعاہ ویسلم علیہ اذالقیہ و یشمت اذا عطس و ینصح لہ اذاغاب او شہد لا تخن من خانک
- لا یدخل الجنۃ قاطع
- ان اللہ حرم علیکم عقوق الامہات و اضاعۃالمال
- یسرا ولا تعسرا بشرا ولا تنفرا
- ذاق طعم الایمان من رضی باللہ و بالاسلام دینا و بمحمدنبیا
- افضل الذکر لاالہ الا اللہ

3 حقوق وفرائض

حصول تعلیم بطور فرض ، والدین اور اولاد کے حقوق وفرائض، ہمسایہ کے حقوق

4 اسلام کی اخلاقی اقدار

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

منتخب احادیث

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

خصوصی مقاصد

- احادیث کا ترجمہ بیان کر سکے۔
- احادیث کی تشریح کر سکے۔
- معاشرتی اور انفرادی زندگی میں احادیث سے 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۔
- ہمسائیوں کے حقوق بیان کر سکے۔
- اسلام میں حقوق و فرائض کی اہمیت بیان کر سکے۔
- حقوق و فرائض کی آگاہی 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 ہونا 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 درگذر 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 سوم)

مطالعہ پاکستان	Gen-311	ٹی	پی	سی
		1	0	1

کل وقت 12 گھنٹے

حصہ دوم

قیام پاکستان

موضوعات

- باؤنڈری کمیشن
- ریڈکلف ایوارڈ
- تقسیم بنگال وکلکتہ
- تقسیم پنجاب
- مسئلہ مہاجرین
- ریاستوں کا الحاق
- ریاست جموں وکشمیر
- نہری پانی کا تنازعہ
- قرارداد مقاصد
- علماء کے بائیس نکات
- 1956 - 1962 اور 1973 کے دساتیر کی اسلامی دفعات
- پاکستان کا محل وقوع اور اس کی جغرافیائی اہمیت

مطالعہ پاکستان

حصہ دوم

قیام پاکستان

تدریسی مقاصد

عمومی مقصد قیام پاکستان کے بعد درپیش مسائل سے آگاہی حاصل کرے اور بیان کرے۔

خصوصی مقاصد

- باؤنڈری کمیشن کی تشکیل اور اس کے فرائض بیان کر سکے۔
- ریڈکلف 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 بارے میں تفصیل بیان کر سکے۔
- ریاست جموں کشمیر کے بارے میں بیان کر سکے۔
- نہری پانی کے تنازعہ کو بیان کر سکے۔
- قرارداد مقاصد کی تفصیلات بیان کر سکے۔
- 22 علماء کے متفقہ اسلامی نکات بیان کر سکے۔
- 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 بارے میں بیان کر سکے۔

ARCH 312 ENVIRONMENTAL STUDIES II

Total Contact Hours: 64 Hours **T P C**

Theory: 64 **2 0 2**

Practical: 0

AIMS & OBJECTIVES:

This course has been designed to enable students about the ill effects of environment and methods for the rectification of these hazards for the production of healthy & friendly environment. At the same time the course also includes the application of water supply & sewerage techniques for small scale buildings.

COURSE CONTENTS

8. ACCOUSTICS **10 Hours**

8.1 Introduction
8.2 Principal of sound
8.3 Define intensity, pitch, reverberation of sound
8.4 Transmission of sound in buildings
8.5 Qualities of sound absorbing materials
8.6 Types of sound absorbing material
8.7 Methods of sound insulation

9. FIRE PREVENTION & PROTECTION **10 Hours**

9.1 Introduction
9.2 Importance
9.3 Types of fires
9.4 Causes & effects of fire
9.5 Preventive measures in design of buildings
9.6 Protective measures in design of buildings
9.7 Types of fire resisting materials
9.8 Fire protective systems in buildings

10. SEWERAGE **20 Hours**

10.1 Introduction
10.2 Definition of some important terminologies
10.2.1 Sewage & its types

10.2.2 Sewer & its types
10.2.3 Infiltration & inflow
10.2.4 Ex-filtration

10.3 Systems of sewerage
10.4 Slopes
10.5 Connection to public sewers
10.6 Pipes (Kinds & Users)
10.7 Septic tanks & other treatment tanks
10.8 Cesspools
10.9 Chlorination

11. HEATING, VENTILATION AND AIR CONDITIONING **12 Hours**

11.1 Introduction
11.2 Heating
11.3 Ventilation
11.4 Air conditioning, its scope & applications
11.5 Human comfort
11.6 Piping, valves, ducts, fans & insulation
11.7 Heating & cooling loads
11.8 HVAC codes

12. ELECTRIFICATION **12 Hours**

12.1 Introduction & importance
12.2 Instruction in electrification
12.3 Cables, circuits & their types
12.4 Insulation & its types
12.5 Parts in conduit layout
12.6 Phases of power
12.7 Earthing system
12.8

Recommended Books

I. **Water Supply & Sewerage by** Earnest W Steel & Terence J MC Ghee ISBN-0071008233, 978007008235(6th edition, May, 2007

II. **Building construction by** S C Rangwala ISBN-978-81-85594-87-3(27th edition, 2008)

III. **Climatic Design** by Koengberga Ingersoil ISBN No: 0582445460-9(Hard copy), 9788125011071, 1975

IV. **Design with climate**(Bioclimatic approach to Architectural recognition) by Olgyay Victor Preston university Press new Jersey ISBN-9786691079431(June, 1963)

V. **Air Conditioning Principles & Systems** by Edward G. Pita (Fourth Edition) ISBN No: 0135053064

ARCH 312 ENVIRONMENTAL STUDIES II

INSTRUCTIONAL OBJECTIVES

1. ACCOUSTICS

1.1 Define acoustics.
1.2 Explain the principal of sound.
1.3 Define intensity, pitch, and reverberation of sound.
1.4 Explain the transmission of sound in different buildinds
1.5 Describe the qualities of sound absorbing materials.
1.6 Explain types of sound absorbing material.
1.7 Explain methods of sound insulation.
1.8 Acoustic design of an auditorium.

2. FIRE PREVENTION & PROTECTION

2.1 What is meant by fire protection in buildings?
2.2 Explain the importance of fire protection in buildings.
2.3 Explain the types of fires
2.4 Explain causes & effects of fire.
2.5 Describe Preventive measures in design of buildings
2.6 Describe Protective measures in design of buildings
2.7 Explain types of fire resisting materials.
2.8 Explain Fire protective systems in buildings

3. SEWERAGE SYSTEM

3.1 Define sewerage.
3.2 Definition of some important terminologies.
  3.2.1 Sewage & its types
  3.2.2 Sewer & its types
  3.2.3 Infiltration & inflow
  3.2.4 Ex-filtration
3.3 Explain systems of sewerage.

3.4 Explain slopes in sewerage design.
3.5 Explain connection to public sewers.
3.6 Explain Pipes (Kinds & Users).
3.7 Explain the importance of sewage treatment.
3.8 Explain septic tanks & other treatment tanks.
3.9 Explain cesspools.
3.10 Explain chlorination.

4. HEATING, VENTILATION AND AIR CONDITIONING

4.1 An introduction to HVAC
4.2 What is meant by heating?
4.3 What is meant by ventilation?
4.4 Explain air conditioning, its scope & application.
4.5 What are the components of air conditioning system?
4.6 Explain human comfort.
4.7 Explain piping, valves, ducts, fans, insulation in HVAC
4.8 What are heating & cooling loads?
4.9 Explain briefly HVAC codes

5. ELECTRIFICATION

5.1 An introduction to electrification & its importance
5.2 Explain the instruction in electrification
5.3 Explain cables, circuits & their types
5.4 Explain insulation & its types
5.5 What are the parts of conduit layout?
5.6 Explain phases of power
5.7 What is meant by earthing system?

ARCH 324 ARCHITECTURAL DRAWING & DESIGN II

Total Contact Hours: 384	**T**	**P**	**C**
Theory : 0 Practical : 384	**0**	**12**	**4**

AIMS & OBJECTIVES

To enable the students to make working drawings for various buildings.

LIST OF PRACTICALS

1.	To make working drawings of a single storey building including design of units such as bath, kitchen, bed etc.,	**120 Hours**
2.	To make working drawings of a double storey building showing all details	**120 Hours**
3.	To make working drawings of a Commercial building	**144 Hours**

Recommended Books

I. **How to Plan A House** by Gilbert Townsed Publisher: American Technical Society; Tech. publication,1952

II. **Time Saver Standards** (Building Type) by John Hankook Calendar, ISBN 0-07-099076-x (2nd edition, July17, 2010)

III. **Architectural Graphics Standards** by Charles G. Ramsy & Hanrold R. Sleeper ISBN-9780471700913 (11th edition, July7, 2008) recommended book by American Institute of Architects

Tools & Equipments:

Computers with high specifications, Licensed Software, Printers, Plotters, Scanners (digitizer tool)

ARCH 332 MODEL MAKING

Total Contact hours: 192

T	P	C
0	6	2

Theory : 0

Practical : 192

AIMS & OBJECTIVES

The students will be able to know about volumes & forms of the buildings. They will also be able to learn the skill of making models of different buildings including land scaping & physical environment.

LIST OF PRACTICALS

1. Cutting of box board, card board & sheet **36 Hours**
2. Make blocks of different 3D shapes in card board and composition of shapes. **36 Hours**
3. Make a block model of a building. **36 Hours**
4. Prepare a detailed model of a double storey building With landscaping. **84 Hours**

Recommended Books

I. The Art of Architectural Model by Akiko Busch, ISBN 0-8306-9969-4 1991, New York, NY 10010 ISBN-0071579745 (1990)

II. Drawing and Model Making by Alexander Ratensky, ISBN 0-8230-7369-6 1983 New York 10036

Tools & Equipments:

Laser cutting Machine, Paper cutter, steel ruler, glass, wood table for cutting, hand saw, foam sheet

ARCH 343 SPECIFICATIONS & ESTIMATION

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

Aims & Objectives

This subject is designed to enable the students to be familiarized with specifications & complete estimate of a single and double storey building & bye- laws.

COURSE CONTENTS

1. **UNITS** **02 Hours**
   - 1.1 Conversion from one unit to another
   - 1.2 Units of building materials/items of work
2. **BUILDING SPECIFICATIONS** **04 Hours**
   - 2.1 Introduction
   - 2.2 Types
   - 2.3 Use of reference specification
3. **BILL OF QUANTITIES** **15 Hours**
   - 3.1 Earthwork in excavation of foundation
   - 3.2 P.C.C in foundation
   - 3.3 Brickwork in foundation
   - 3.4 Brickwork in plinth level
   - 3.5 DPC in walls
   - 3.6 Brickwork in super structure

3.7 Plastering on walls

3.8 Pointing of walls

3.9 Calculation of openings i.e. doors, windows etc

3.10 Calculate the steel work in RCC members i.e. lintels, beams, columns & slabs

3.11 Calculate the concrete work in RCC members

4. SPOT ITEMS **03 Hours**

4.1 Define spot item.

4.2 Calculation of spot item.

5. MATERIAL STATEMENT **03 Hours**

5.1 Define material statement

5.2 Prepare materials statement

6. MARKET RATE SCHEDULE **05 Hours**

6.1 Define market rate schedule.

6.2 Application of MRS

7. SCHEDULE OF BARS **06 Hours**

7.1 Define schedule of bars

7.2 Prepare schedule of bars of different structural members

8. ESTIMATION **06 Hours**

8.1 Define estimation

8.2 Types of estimation

8.3 Technical terms used in estimation

9. ROUGH COST ESTIMATE OF A SMALL STRUCTURE **03 Hours**

9.1 Define rough cost estimate

9.2 Prepare rough cost estimate of a single storey building

10. DETAILED ESTIMATE **05 Hours**

10.1 Define detailed estimate

10.2 Types of detailed estimate

10.3 Prepare detailed estimate of a single storey building

11. RATE ANALYSIS **12 Hours**

11.1 Introduction

11.2 Purpose of rate analysis

11.3 Prepare rate analysis of different items of work for a small structure

Recommended Books

I. Estimation & Costing in CE Theory & Practice by **B.N Dutta** ISBN-817476213297881747621 39 (1998)
II. Indian Practical Civil engineers hand book by **P.N Khanna** ISBN-8172747299 (2008)
III. Estimation & Costing by **NISTE, Islamabad** (1987)
IV. Estimation & Costing by **M. A. Aziz, Islamabad**
V. ISBN-609728948 (1967)
VI. Estimation & Costing by **David Drat**

ARCH 343 SPECIFICATIONS & ESTIMATION

INSTRUCTIONAL OBJECTIVES

1. UNDERSTAND THE UNITS

1.1 Define units.

1.2 Explain types of units.

1.3 Enumerate basic S.I units for different works.

1.4 Enumerate measuring units in F, P.S. System.

1.5 Able to convert F.P.S to S.I and S.I to F.P.S units.

1.6 Describe Units of different building materials/items of work

2. UNDERSTAND THE BUILDING SPECIFICATIONS

2.1 Define specification.

2.2 State types of specifications.

2.3 State use of reference specification.

3. ESTIMATING THE QUANTITIES OF BUILDING MATERIALS

3.1 Earthwork in excavation of foundation

3.2 P.C.C in foundation

3.3 Brickwork in foundation

3.4 Brickwork in plinth level

3.5 DPC in walls

3.6 Brickwork in super structure

3.7 Plastering on walls

3.8 Pointing of walls

3.9 Calculation of openings i.e. doors, windows etc

3.10 Calculate the steel work in RCC members i.e. lintels, beams, columns & slabs

3.11 Calculate the concrete work in RCC members

4. UNDERSTAND THE SPOT ITEMS

2.1 Explain spot item.

4.2 Calculation of spot item

5. UNDERSTAND THE MAKING MATERIAL STATEMENT

6.1 Explain material statement

5.2 Prepare materials statement

6. MARKET RATE SCHEDULE

6.1 Define market rate schedule

6.2 Application of MRS

7. UNDERSTAND THE SCHEDULE OF BARS

7.1 Explain schedule of bars

7.2 Prepare schedule of bars of different structural members

8. UNDERSTAND THE ESTIMATION

8.1 Explain estimation

8.2 Explain the types of estimation

8.3 Explain technical terms used in estimation

9. UNDERSTAN THE ROUGH COST OF ESTIMATE OF A SMALL STRUCTURE

9.1 Define rough cost estimate

9.2 Prepare rough cost estimate of a single storey building

10. UNDERSTAND THE DETAILED ESTIMATE OF DOUBLE STOREY BUILDING

10.1 Define detailed estimate

10.2 Types of detailed estimate

10.3 Prepare detailed estimate of a single storey building

11. UNERSTAND THE RATE ANALYSIS

11.1 Define rate analysis.

11.2 Explain the purpose of rate analysis

11.2 Rate analysis of:

11.2.1 Excavation

11.2.2 Foundation concrete

11.2.3 B.B.W in F & P

11.2.4 B.B.W in S/S structure

11.2.5 D.P.C of P.C.C

11.2.6 Cement plaster

11.2.8 Cement pointing

11.2.8 White washing

11.2.9 Paint

11.2.10 Joinery work

11.3.11 Septic tank

ARCH 343 SPECIFICATION & ESTIMATION

LIST OF PRACTICALS

1.	Describe the specification of building materials/items of work	**03 Hours**
2.	Calculate the materials/items of work for different shapes	**09 Hours**
3.	Prepare material statement of different items of work	**06 Hours**
4.	Measurement of item of work in different units	**06 Hours**
5.	Prepare schedule of bars of one way slab	**09 Hours**
6.	Prepare schedule of bars of two way slab	**09 Hours**
7.	Calculate the steel and schedule of bar of column and lintel	**12 Hours**

8. Prepare rough estimate of a single storey building from the given drawing **06 Hours**

9. Prepare detailed estimate of a single storey building from the given drawing **06 Hours**

10. Prepare detailed estimate of septic tank from the given drawing **06 Hours**

11. Prepare detailed estimate of plumbing from the given drawing **06 Hours**

12. Prepare detailed estimate of water supply & sewerage scheme from the given scheme. **18 Hours**

Tools & Equipments

Drawing Instruments, Scholar Sheets & Calculator

ARCH 353 BUILDING MATERIALS & CONSTRUCTION-III

Total Contact hours: 160

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

AIMS & OBJECTIVE

The study of this subject will enable the student to be familiar with complete working drawings used for construction.

COURSE CONTENTS

1. FORMWORK **08 Hours**

1.1 Define formwork, its types & quality control
1.2 Materials of formwork
1.3 Removal of formwork & its impact on concrete

2. FALSE CEILING **06 Hours**

2.1 False ceiling

2.2 Purpose of false ceiling
2.3 Material use in false ceiling
2.4 Construction of false ceiling

3. STEEL STRUCTURES 08 Hours

3.1 Steel structures
3.2 Types of steel structures
3.3 Advantages and disadvantages of steel structure.
3.4 Types of joints in steel structure.
3.5 Connection of steel members.

4. PRE-CAST CONSTRUCTION & PRESTRESSING 24 Hours

4.1 Define Pre-cast construction
4.2 Advantages & limitations of Pre-casting.
4.3 Connections of pre-cast members
4.4 Types of pre-stressing.
4.5 Techniques of pre-stressing

5. DEFECTS IN BUILDINGS 10 Hours

5.1 Settlement in buildings
5.2 Defects due to moisture movements.
5.3 Cracks and their sealing.

6. TERMITE PROOFING

6.1 Define termite proofing.
6.2 Purpose of termite proofing.
6.3 Types of termite proofing.
6.4 General principals of termite proofing.
6.5 Methods of termite proofing.

7. EARTHQUAKE & BUILDINGS 08Hours

7.1 Define Earthquake.
7.2 Technical terms used in Earthquake.
7.3 Origin of earth quake
7.4 Seismic waves.
7.5 Scales to measure earthquake
7.6 Earthquake zones in Pakistan
7.7 Construction principles of earthquake resistant structures.
7.8 Building configuration of earthquake resistant structures

Recommended Books

vi. **Building Construction** by **Arrora & Gupta**
ISBN-86037785(1988)

vii. **Building Construction** by **Sharma**
ISBN-9788121901673 (May,1987)

viii. **Building Construction** by **Kalcurni**

ix. **Building Construction** by **Deshpande**

x. **Building Construction** by **Rangwala**
ISBN-9380358154 (2010)

xi. **Seismic Design for Architecture** by **Andrew Charleson**
ISBN # 978-0-7506-8550-4 (2009)

ARCH 353 BUILDING MATERIALS & CONSTRUCTION -III

INSTRUCTIONAL OBJECTIVES

1. FORMWORK

1.1 Define formwork and explain its types & quality control
1.2 Explain materials of formwork.
1.3 Explain removal of formwork and its impact on concrete.

2. FALSE CEILING

2.1 Explain false ceiling.
2.2 Describe the purpose of false ceiling.
2.3 Explain the materials used in false ceiling.
2.4 State the construction of false ceiling.

3. STEEL STRUCTURE

3.1 Steel structure
3.2 Describe different types of steel structure
3.3 Advantages and disadvantages of steel structure.
3.4 Describe different types of joints in steel structure.
3.5 Connection of steel members.

4. PRE-CAST CONSTRUCTION & PRESTRESSING

4.1 Define Pre-cast construction & pre-stressing.
4.2 Advantages & limitations of Pre-casting.
4.3 Connections of pre-cast members.
  4.3.1 Column to foundation connection.
  4.3.2 Column to column connection.
  4.3.3 Beam and column connection.
4.4 Define & explain pre-stressing
4.5 Explain the types of pre-stressing
4.6 Explain the techniques of pre-stressing

5. DEFECTS IN BUILDINGS.

5.1 Describe settlement in buildings
5.2 Explain defects in buildings due to moisture
5.3 Explain Cracks and their sealings.

6. TERMITE PROOFING

6.1 Define and explain termite proofing.
6.2 Purpose of termite proofing.
6.3 Classification / types of termite proofing.
6.4 Describe general principals of termite proofing.
6.5 Methods of termite proofing.

7. EARTHQUAKE & BUILDINGS 08Hours

7.1 Define and explain Earthquake.
7.2 Describe the technical terms used in Earthquake.
7.3 Origin of earth quake
7.4 Describe Seismic waves and its types.
7.5 Scales to measure earthquake
7.6 Earthquake zones in Pakistan
7.7 Construction principles of earthquake resistant structures.
7.8 Building configuration of earthquake resistant structures

ARCH 353 BUILDING MATERIALS & CONSTRUCTION -III

LIST OF PRACTICALS

1. To visit the site of any under construction building for formwork. **12 Hours**

2. To visit the site of any building during erection of false ceiling. **09 Hours**

3. To visit the Lahore Railway Station for showing the different steel members in steel roof and steel stair case. **12 Hours**

4. To visit any construction company for pre-stressing members. **09 Hours**

5. To visit any construction company for pre-stressing members. **15 Hours**

6. To visit any building where defects are produced. **15 Hours**

7. Practice of plumbing & electrical installation. **12 Hours**

8. To visit any building with different Joints **12 Hours**

ARCH 362 CONSTRUCTION MANAGEMENT & SAFETY PRACTICES

Total Contact Hours: 64	**T**	**P**	**C**
Theory: 64	**2**	**0**	**2**
Practical: 0			

AIMS AND OBJECTIVES

This course will help the students to develop an understanding about the various types of projects within the construction industry, how they are conceived and managed. The different stages involved in the managing of various projects, complications involved and how their different solutions can be achieved.

COURSE CONTENTS

1. VARIOUS ASPECTS OF CONSTRUCTION MANAGEMENT 04 Hours

1.1 Define construction management
1.2 Objectives & functions of construction management

2. **BUILDING CONTRACTS 10 Hours**

3.1 Define contract
3.2 Differentiate between contract & work order
3.3 Various systems of construction
3.4 Merits & demerits of various contracting systems

3. **TENDER DOCUMENTS & CONTRACT CONDITIONS 20 Hours**

4.1 Define Tender
4.2 Pre-requisites for tendering
4.3 Methods of inviting tender
4.4 Important points for the preparation of tender notice
4.5 Draft of tender notice
4.6 Tender Documents
4.7 General & special conditions of contract
4.8 Important terminologies involve in contract document
- 4.8.1 Earnest Money
- 4.8.2 Security Deposit
- 4.8.3 Award of work
- 4.8.4 Possession of site
- 4.8.5 Penalty
- 4.8.6 Arbitration & Arbitrator
- 4.8.7 Liquidated & Un liquidated Damages
- 4.8.8 Mobilization Advance
- 4.8.9 Retention Money

4. **OBJECTIVES OF SCHEDULING 06 Hours**

5.1 Define schedule
5.2 Breakdown of construction work into activities
5.3 Making of material, equipment & labor schedule
5.4 Define bar chart

5.5 Define critical path method (CPM)

5. **OCCUPATIONAL HEALTH & SAFETY** **04 Hours**

5.1 Define OH & S, health & ISO
6.2 Define Compensation Act
6.3 Define Safety
6.4 Importance of safety
6.5 Methods of promoting safety concepts

7. CAUSES & PREVENTION OF ACCIDENTS **10 Hours**

7.1 Define Accidents
7.2 State causes of accidents
7.3 Safety precautions while using ladder
7.4 Safety precautions while using formwork
7.5 Safety precautions to be taken while excavating in trench
7.6 Safety precautions during road repairing
7.7 Safety precautions during maintenance of sewer line
7.8 Safety practice while using concrete mixer
7.9 Safety measures to be adopted while demolishing old buildings
7.10 Define Direct & Indirect costs of accidents

8. STUDY OF PC-1 TO PC-4 **10 Hours**

8.1 Introduction of PC-1
8.2 Study of PC-2
8.3 Study of PC-3
8.4 Study of PC-4

Recommended Books

I. **A Guide to Project Management** by william Duncan

ISBN-B00151KEBS(1996)3rd Edition PMBOK Guide, ANSI/PM 99-00-2004

II. **Project Management** Work Book & Exam study guide

ISBN-9780470278727(2009)

III. **PMP & CAMP** by Kerzner & Saladies

ISBN-0470278722 (10th edition 2009)

IV. **Project Management** by NISTE, Islamabad

ARCH 362 CONSTRUCTION MANAGEMENT & SAFETY PRACTICES

INSTRUCTIONAL OBJECTIVES

1. VARIOUS ASPECTS OF CONSTRUCTION MANAGEMENT

1.1 Define Construction Management

1.2 Explain the Objectives & functions of construction management

3. BUILDING CONTRACTS

3.1 Define contract
3.2 Explain the difference between contract & work order
3.3 Explain various systems of construction
3.4 Explain merits & demerits of various contracting systems

4. TENDER DOCUMENTS & CONTRACT CONDITIONS

4.1 Define Tender
4.2 Explain pre-requisites for tendering
4.3 Explain methods of inviting tender
4.4 Explain important points for the preparation of tender notice
4.5 Draft of tender notice
4.6 Explain Tender Documents
4.7 Explain general & special conditions of contract (FIDDIC-4) Use PEC website
4.8 Define some important terminologies involve in contract document
- 4.8.1 Earnest Money
- 4.8.2 Security Deposit
- 4.8.3 Award of work
- 4.8.4 Possession of site
- 4.8.5 Penalty
- 4.8.6 Arbitration & Arbitrator
- 4.8.7 Liquidated & Un-liquidated Damages
- 4.8.8 Mobilization Advance
- 5.8.9 Retention Money

5. OBJECTIVES OF SCHEDULING

5.1 Define schedule
5.2 Explain breakdown of construction work into activities
5.3 Explain the procedure of making of material, equipment & labor schedule
5.4 Define bar chart
5.5 Define critical path method (CPM)

6. OCCUPATIONAL HEALTH & SAFETY

6.1 Define OH & S, health & ISO
6.2 Define Compensation Act
6.3 Define Safety
6.4Describe importance of safety in a constructional project
6.5Explain methods of promoting safety concepts

7. CAUSES & PREVENTION OF ACCIDENTS

7.1 Define Accidents
7.2 Explain causes of accidents
7.3 Explain safety precautions to be adopted while using ladder
7.4 Explain safety precautions to be adopted while using formwork
7.5 Explain safety precautions to be taken while excavating in trench
7.6 Explain safety precautions during road repairing
7.7 Explain safety precautions during maintenance of sewer line
7.8 Explain safety practices while using concrete mixer
7.9 Explain safety measures to be adopted while demolishing old buildings
7.10 Define Direct & Indirect costs of accidents

8. STUDY OF PC-1 TO PC-4

8.1 Introduction of PC-1
8.2 Study of PC-2
8.3 Study of PC-3
8.4 Study of PC-4

ARCH 372 <u>COMPUTER AIDED DRAFTING AND PRESENTATION-III</u>

Total Contact Hours: 192

T	P	C
0	6	2

Theory: 0

Practical: 192

AIMS AND OBJECTIVES

This subject has been designed to enable the students to know about rendering AutoCAD files in Photoshop, to make architectural presentations, brochures & postures. Animation will help students to perceive 3D of the buildings and they will be able to make presentations more professionally.

LIST OF PRACTICALS

PART –I ADOBE PHOTOSHOP

1. Practice of main screen of adobe Photoshop (title bar, menu bar, options bar , image window, tool box, layer palette, channels palette ,filters, color palette, statue bar) **18 Hours**
2. Practice of digital images and graphics, file size, file format, resolution, color mode, file compression. **12 Hours**
3. Practice of creating new canvas (present size, width, height, resolution, mode, content), tools in the tool palette using option bars. **06 Hours**
4. Practice of selection tools, painting and drawing tools, retouching tools, text type tools, zoom tool/hand tool/eye droper tool/notes tools and color handling tools **06 Hours**
5. Practice of over view, importing images and printing files and web site imagery **06 Hours**
6. Practice of rendering of Architectural drawings using Photoshop tools **06 Hours**
7. Final project **12 Hours**

PART –II 3D STUDIO MAX

1. Practice of , how to install 3d max, **06 Hours**

2. Practice of user interface (view ports, selecting objects), project setting (measurement, saving project, opening project, object organization). **12 Hours**

3. Practice of modeling tools (object types, 3d parametric objects), modifiers (modifier stack, essential modifiers) **12 Hours**

4. Practice of organizing objects (object cloning, creating shapes and splines), introduction to lighting (light types and simple light setup) **12 Hours**

5. Practice of rendering and image control, indirect illumination and exposure controls and light setting (global, light scene fan, volume, shadows) day lighting **18 Hours**

6. Practice of working with material editor, material types, map types and creating a pro material and mapping coordinates **12 Hours**

7. Practice of repairing , render frame window, render output choices & importing a CAD/3Ds file to MAX, Composition of an Architectural Scene Rendering. **12 Hours**

8. Practice of using animation editor, curve editor and linking objects, animation controls, auto key **12 Hours**

9. Final project **30 Hours**

Tools & Equipments:

Computers with high specifications, Licensed Software, Printers, Plotters, Scanners (digitizer tool)