CURRICULUM
For
THREE YEARS' DIPLOMA OF ASSOCIATE ENGINEER
IN
SOFTWARE TECHNOLOGY

Entry Level: -	Matriculation (Science)
Duration of Course: -	Three Years
Credit Hours:	**62** (Annual System)
Methodology:	Theory 40%
	Practical 60 %
Examination System:	Annual System (the same as other DAEs programs)

Technical Education and Vocational Training Institution

TEVTA

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Date: 17-5-22
Sign:

DAE in SOFTWARE TECHNOLOGY
SCHEME OF STUDIES

			T	P	C
FIRST YEAR					
Gen	111	Islamiat & Pakistan Studies	1	0	1
Eng	112	English	2	0	2
GenC	112	Chinese Language-1	2	0	2
Math	123	Applied Mathematics-I	3	0	3
Phy.	132	Applied Physics	1	3	2
Ch.	132	Applied Chemistry	1	3	2
CIT	112	Computer Application Software	0	6	2
SWT	**112**	Introduction to Computer Programming with JAVA	1	3	2
SWT	**122**	Introduction to database concepts and SQL programming	1	3	2
SWT	**132**	Basics of HTML5 Web Development	1	3	2
	Total		**13**	**21**	**20**
SECOND YEAR					
Gen	211	Islamiat & Pak Studies	1	0	1
Math	233	Applied Mathematics-II	3	0	3
Mgm	211	Business Communication	1	0	1
GenC	212	Chinese Language-2	2	0	2
MgmC	212	Understanding China	2	0	2
CIT	**223***	Computer Networks	2	3	3
MTR	272	Digital Logic Design	1	3	2
SWT	212	Basics of Android APP Development	1	3	2
SWT	**223**	Web Development with JAVA	1	6	3
CIT	**263**	Relational Data-Base Management System	2	3	3
CIVIL	271	Entrepreneurship	1	0	1
SWT	231	Project Training-1	0	3	1
	Total		**17**	**21**	**24**
THIRD YEAR					
Gen	311	Islamiat & Pak Studies	1	0	1
Eng	311	Technical Report Writing	1	0	1
CIT	**344**	Graphic Designing	2	6	4
CIT	**333**	Operating System	2	3	3
SWT	312	Advanced HTML5 Web Development	1	3	2
SWT	322	Advanced Development with JAVA	1	3	2
SWT	332	Machine Learning Applications	1	3	2
SWT	342	Advanced Android APP Development	1	3	2
SWT	351	Project Training- 2	0	3	1
	Total		**10**	**24**	**18**

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اسلامیات / مطالعہ پاکستان

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

کتاب و سنت

(ا) قرآن مجید

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

1.1 تنالوا البر حتی تنفقوا مما تحبون

1.2 واعتصموا بحبل اللّٰہ جمیعا" ولا تفرقو

1.3 ولا یجرمنکم شنان قوم علی ان لا تعدلوا

1.4 ان اللّٰہ یامرکم ان تودوا الامانات الی اھلھا

1.5 ان اللّٰہ یامر بالعدل والاحسان

1.6 ان الصلوتہ تنھی عن الفحشاء والمنکر

1.7 لقد کان لکم فی رسول اللّٰہ سوۃ حسنتہ

1.8 ان اکرمکم عند اللّٰہ اتقاکم

1.9 وما آتاکم الرسول فخرزوہ ومانھی عنھوانتھوا

1.10 ولوفو بالعھد

1.11 وماشروھن بالمعروف

1.12 یمحق اللّٰہ الربووبربی الصمنقات

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 درس منتخب احادیث مع ترجمہ و تشریح

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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 لسانہ ویدہ
5- قل امنت باللہ ثم استقم
6- خیرکم خیرکم لاھلہ
7- سباب المسلم فسوق وقتالہ کفر
8- المومن اخو المومن

حصہ اول

حصہ اسلامیات

مدرسی مقاصد

۱- قرآن مجید

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

خصوصی مقاصد: طالب علم اس قابل ہو جائے گا کہ

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

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

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

2- سنت

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

خصوصی مقصد:

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

3- منتخب احادیث نبویہ

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

خصوصی مقصد: احادیث کا ترجمہ و تشریح کر سکے

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

دین اسلام

عمومی مقاصد: دین اسلام کے بنیادی مقاصد اور عبادات کے بارے میں جان سکے اور بیان کر سکے

خصوصی مقاصد

لفظ دین اسلام کے لغوی اور اصطلاحی معنی بیان کر سکے

اسلام کے بنیادی مقاصد کی اہمیت بیان کر سکے

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

عبادت کے لغظی و اصطلاحی معنی بیان کر سکے

عقیدے اور عبادت کا فرق بیان کر سکے

عبادات (نماز، روزہ، حج، زکواۃ) کے فوری، اخلاقی 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

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(غیر مسلم طلباء کے لئے)

نصاب اخلاقیات سال اول	GEN 101	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، الہی 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

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نصاب اخلاقیات (سال اول)

تدریسی مقاصد

عمومی مقاصد: اعلیٰ اخلاق کی وجہ سے کل ترقی میں کامل قدر اضافہ کر سکے

خصوصی مقاصد: طالب اس علم سے اس قابل ہو گا کہ

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

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نصاب (سال اول) Gen III

حصہ دوئم　　مطالعہ پاکستان　　کل وقت 12 گھنٹے

موضوعات

☆ حریت فکر: مسلمان قوم میں آزادی فکر کی تاریخ۔ مسلمانوں میں سیاسی آزادی کی اہمیت اور ضرورت۔ زوال و جمود غلامی کے اثرات

☆ نظریہ پاکستان

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

☆ نظریہ پاکستان کا تاریخی پس منظر

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

☆ تعلیمی تحریکیں

علی گڑھ۔ ندوۃ العلماء (لکھنؤ)۔ مدرسۃ الاصلاح (سرائے میر)۔ (مشرقی) اسلامیہ کالج (پشاور) انجمن حمایت اسلام (لاہور)

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☆ محمد بن قاسم کے ہندوستان پر حملہ کی وجہ بیان کر سکے
☆ محمد بن قاسم کے ہندوستان پر حملہ کے اثرات بیان کر سکے
☆ بیان کر سکے کہ ہندوستان میں ہندو مسلم دو قومی نظریہ کا نکتہ آغاز کیا ہے
☆ مجدد الف ثانیؒ کی علمی خدمات بیان کر سکے
☆ شاہ ولی اللہ کی علمی خدمات بیان کر سکے
☆ مجدد الف ثانیؒ اور شاہ ولی اللہ 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 کر سکے

خصوصی مقاصد:

☆ علی گڑھ - دیوبند - ندوۃ العلماء مدرسۃ الاسلام ، 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	2	0	2
Practical	0			

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

COURSE CONTENTS

ENGLISH PAPER "A"

1 PROSE/TEXT **16 hours**

1.1 First eight essays of Intermediate English Book-II

2 CLOZE TEST **4 hours**

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

ENGLISH PAPER "B"

3 GRAMMAR **26 hours**

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

4. COMPOSITION **8 hours**

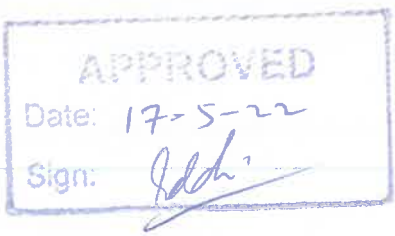
4.1 Letters/Messages
4.2 Job application letter
4.3 For character certificate/for grant of scholarship
4.4 Telegrams, Cablegrams and Radiograms, Telexes, Facsimiles
4.5 Essay writing
4.6 Technical Education, Science and Our life, Computers, Environmental Pollution, Duties of a Student.

5. TRANSLATION **10 hours**

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

RECOMMENDED BOOKS

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



Eng-112 ENGLISH

INSTRUCTIONAL OBJECTIVES

PAPER-A

1. DEMONSTRATE BETTER READING, COMPREHENSION AND VOCABULARY

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

2. UNDERSTAND FACTS OF THE TEXT

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

PAPER-B

3. APPLY THE RULES OF GRAMMAR IN WRITING AND SPEAKING

3.1 Use rules of grammar to construct meaningful sentences containing a 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. APPLY 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.

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GenC-112 CHINESE LANGUAGE

Total contact hours

		T	P	C
Theory	64			
Practical	0	2	0	2

PART ONE

AIMS This course consists of 32 classes (including mid-term test and final test). After completing this part, students can master the primary Chinese language knowledge taught in the content of the course, and be able to achieve and exceed the **HSK level One**.

INSTRUCTION OBJECTIVE The course is mainly for zero-based learners. Through the study of this course, learners can lay a solid language foundation and have a preliminary understanding of Chinese language structure, including Pinyin, Chinese characters, words, grammar and other knowledge. After completing this course, learners can understand and use some basic words and sentences, and complete the most basic communication, such as greeting, asking, introducing, shopping and so on.

COURSE CONTENTS

1. **Lesson 1 Hello Vs Nǐhǎo** **1 hour**
   This lesson briefly introduces pinyin and spelling methods.
2. **Hello!** **1 hour**
   This lesson briefly introduces the sentence patterns used in greeting, such as dialogue, greeting farewell, and introducing one's own name.
3. **Lesson 3 I am Thai** **1 hour**
   Teach students to understand basic classroom language, learn to use "national + person" for simple communication dialogue, and introduce which country they come from.
4. **Lesson 4 What's the date today** **1 hour**
   This lesson introduces the expression of numbers, years, months, etc., and teaches students to ask about a date and answer it.
5. **Lesson 5 This is my brother** **1 hour**
   By introducing family members, students can understand the simple words when asking about family status and introduce them briefly.
6. **Lesson 6 I'm nineteen years old** **2 hours**
   This lesson expands quantifiers and animal names, and introduces the expression of age, so that students can ask and answer each other's age correctly.
7. **Lesson 7 What time is it** **2 hours**
   This lesson introduces the usage of hours, minutes and seconds, so that students can describe their lives with time points.
8. **Lesson 8 What do you like to do on weekends** **2 hours**
   This lesson introduces the expressions of hobbies, interests, activities and other related nouns, so as to help students communicate with each other by using simple linking sentences.

Semi-MID-TERM REVIEW **2 hours**

Mid-term review is a summary of the knowledge learned in the past. The test paper uses the knowledge points learned in the past to design listening questions, answering questions by looking at pictures, connecting questions, filling in blanks, etc., which are illustrated with pictures and interesting, and can test students' learning effect.

9. **Lesson 9 Introduce yourself** **2 hours**
   Explain the related expressions related to self-introduction, and students can correctly introduce their names, families, ages, hobbies, school majors, etc. 2
10. **Lesson 10 My father is in Beijing** **2 hours**
    This lesson introduces the names of major cities in China, Britain and Europe, and introduces the use

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of "person + place" in sentences.

11. Lesson 11 I came to Beijing by plane **2 hours**

This lesson introduces the means of transportation and how to express long sentences in combination with the time and place learned before.

12. Lesson 12 I eat at the company 2 hours **2 hours**

This lesson introduces the polite expressions used in eating.

13. Lesson 13 The weather is fine on Monday **2 hours**

It shows the conversations and topics that may appear when you want to date.

14. Lesson 14 How much is it altogether **2 hours**

This lesson introduces the vocabulary and sentences commonly used in shopping, and how to use Chinese for daily shopping.

15. Lesson 15 What would you like to have **2 hours**

This lesson introduces the classic Chinese and Thai cuisine, the terms of treating guests, and the communicative terms of how to order food in restaurants.

16. Lesson 16 The bathroom is next to the pantry **2 hours**

This lesson introduces location and location words, and how to use location words to introduce the location of a place.

Semi- FINAL REVIEW **2 hours**

Similar to the mid-term test questions, it is a test of important knowledge points of the course to test students' learning effect. This lesson briefly introduces pinyin and spelling methods.

PART TWO

AIMS After completing this part, students can master the basic Chinese language knowledge taught in the content of the course, and be able to reach and exceed **HSK level TWO.**

INSTRUCTION OBJECTIVE Learners can master the language knowledge and use some basic grammar and sentence patterns in communication, learn to express personal feelings and attitudes in Chinese, and can complete communicative functions such as gratitude, apology, introduction and farewell, and begin to understand Chinese cultural knowledge and cultivate interest in learning.

COURSE CONTENTS

1. Lesson 1 I was still sleeping at 7 o'clock **1 hour**

This lesson introduces the grammatical points of "still", so that students can correctly understand the meaning of sentences related to "still" and use this sentence pattern correctly for communication.

2. Lesson 2 It will be cloudy tomorrow **1 hour**

By introducing the weather in several Chinese cities, explain how to use temperature to answer weather questions.

3. Lesson 3 That one is five hundred dollars cheaper than this one **1 hour**

This lesson explains comparative sentences, and compares them in terms of price, height and temperature, so that students can understand comparative sentences thoroughly.

4. Lesson 4 This is a family photo **1 hour**

This lesson introduces family members in detail through appearance, clothing and occupation, so that students can master more detailed description methods.

5. Lesson 5 It is forbidden to take pictures here **2 hours**

This lesson leads students to understand the relevant knowledge points of expressing commands, such as forbidden and forbidden, so that students can correctly understand the meaning of words in daily life.

6. Lesson 6 I can't find something **2 hours**

This lesson introduces the use of language points in "V + should + result complement", so that students can correctly use relevant sentence patterns in communication.

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7. Lesson 7 I have been to Sichuan and seen pandas **2 hours**

This lesson introduces Chinese culture through "V + have been to", such as the Great Wall, the Forbidden City, national treasures, etc., so that students can use this sentence pattern correctly in communication.

8. Lesson 8 I hope you can come to my wedding **2 hours**

By introducing Chinese weddings, this lesson enables students to master the verbal usage of banquet invitation, holiday blessing, emotional expression and euphemistic refusal.

Semi-MID-TERM REVIEW **2 hours**

This section leads students to review the knowledge points they have learned in the past and conduct mid-term tests through reading pictures, listening questions and connecting questions to test students' learning effect.

9. Lesson 9 Be ill, take more rest **2 hours**

This lesson introduces the vocabulary related to illness and the doctor's medication advice, so that students can correctly describe and understand the doctor's meaning in the process of seeing a doctor.

10. Lesson 10 The station is just across the road **2 hours**

This lesson introduces the way of asking places and answers by asking directions, which helps students to use relevant sentence patterns for practical communication questions and answers.

11. Lesson 11 She sings very well **2 hours**

This lesson focuses on hobbies and introduces the correct use of related words in sentences.

12. Lesson 12 Did you do well in the exam **2 hours**

By describing the examination process and the situation of answering questions, students can correctly understand the instructions of the examination room, the distribution of questions and the analysis of test paper problems

13. Lesson 13 Buy two and get one free **2 hours**

This lesson introduces the commodity names of supermarkets, as well as common terms such as promotional activities, discounts and price reductions.

14. Lesson 14 We're a new restaurant **2 hours**

This lesson helps students understand how to understand the waiter's recommendation and put forward the food requirements for ordering.

15. Lesson 15 The girl is dressed in white clothes **2 hours**

This lesson introduces others' clothes and how to use grammar points to describe the state of something through "V + be dressed in".

16. Lesson 16 You can be discharged from hospital next week **2 hours**

This lesson introduces a variety of expressions, such as hospitalization, visiting patients and discharge, so that students can understand the language of hospital scenes and strengthen their multi-scene communication ability.

Semi- FINAL REVIEW **2 hours**

This section is similar to the mid-term review, which leads students to review the knowledge points they have learned in the past and conduct final tests by looking at pictures, listening questions, connecting questions, etc., to test students' learning effect.

Recommended Books:-

Tang Chinese Course 1 for PART- TWO

Tang Chinese Course 2 for PART TWO

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Math-123 APPLIED MATHEMATICS-I

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3	0	3

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

AIMS: After completing the course the students will be able to

1. Solve problems of Algebra, Trigonometry, vectors, 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 **6 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. BINOMIAL THEOREM **6 Hours**

2.1 Factorials
2.2 Binomial Expression
2.3 Binomial Co-efficient
2.4 Statement
2.5 The General Term
2.6 The Binomial Series
2.7 Problems.

3. PARTIAL FRACTIONS **6 Hours**

3.1 Introduction
3.2 Linear Distinct Factors Case I
3.3 Linear Repeated Factors Case II
3.4 Quadratic Distinct Factors Case III
3.5 Quadratic Repeated Factors Case IV
3.6 Problems

4. FUNDAMENTALS OF TRIGONOMETRY **6 Hours**

4.1 Angles
4.2 Quadrants
4.3 Measurements of Angles
4.4 Relation between Sexagesimal & circular system
4.5 Relation between Length of a Circular Arc & the Radian Measure of its central Angle
4.6 Problems

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5. TRIGONOMETRIC FUNCTIONS AND RATIOS — **6 Hours**

5.1 Trigonometric functions of any angle
5.2 Signs of trigonometric Functions
5.3 Trigonometric Ratios of particular Angles
5.4 Fundamental Identities
5.5 Problems

6. GENERAL IDENTITIES — **6 Hours**

6.1 The Fundamental Law
6.2 Deductions
6.3 Sum & Difference Formulae
6.4 Double Angle Identities
6.5 Half Angle Identities
6.6 Conversion of sum or difference to products
6.7 Problems

7. SOLUTION OF TRIANGLES — **6 Hours**

7.1 The law of Sines
7.2 The law of Cosines
7.3 Measurement of Heights & Distances
7.4 Problems

8. VECTORS AND PHASORS — **12 Hours**

8.1 Scalars and Vectors
8.2 The unit Vectors i, j, k
8.3 Direction Cosines
8.4 Dot Product
8.5 Cross Product
8.6 Analytic Expressions for dot and cross products
8.7 Phasors
8.8 Significance of j Operator
8.9 Different Forms
8.10 Algebraic Operations
8.11 Problems

9. COMPLEX NUMBERS — **9 Hours**

9.1 Introduction and Properties
9.2 Basic Operations
9.3 Conjugate
9.4 Modulus
9.5 Different Forms
9.6 Problems

10. BOOLEAN ALGEBRA AND GATE NETWORKS — **15 Hours**

10.1 Concept and basic laws
10.2 Sums of product and products of sums
10.3 Binary, decimals and octals, presentation of decimal numbers in BCD
10.4 Intercoversion of numbers
10.5 OR Gates and AND Gates

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10.6 Logical Expressions and their simplifications
10.7 Demorgan`s Theorams
10.8 NAND Gates and NOR Gates
10.9 Problems

11. PLANE ANALYTIC GEOMETRY AND STRAIGHT LINE **6 Hours**

11.1 Coordinate system
11.2 Distance formula
11.3 Ration Formulas
11.4 Inclination and slope of line
11.5 Slope Formula
11.6 Problems

12. EQUATIONS OF THE STRAIGHT LINE **6 Hours**

12.1 Some Important Forms
12.2 General form
12.3 Angle Formula
12.4 Parallelism and Perpendicularity
12.5 Problems

13. EQUATIONS OF THE CIRCLE **6 Hours**

13.1 Standard and Central forms of equations
13.2 General Form of Equation
13.3 Radius and Coordinates of Center
13.4 Problems

RECOMMENDED BOOKS

1. Ghulam Yasin Minhas, Technical Mathematics Vol I, Ilmi Kitab Khana, Lahore
2. Riaz Ali Khan, Polytechnic Mathematics Series Vol- I and Vol -II, Majeed Sons, Faisalabad.
3. Sana Ullah Bhatti, A Text Book of Algebra and Trigonometry, Punjab Text Book Board, Lahore
4. Sana Ullah Bhatti, A Text Book of Analytic Geometry and Calculus, Punjab Text Book Board, Lahore

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Math-123 APPLIED MATHEMATICS-I

INSTRUCTIONAL OBJECTIVES

1. USE DIFFERENT METHODS FOR THE SOLUTION OF QUADRATIC EQUATION

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

2. APPLY BINOMIAL THEOREM FOR THE EXPANSION OF BINOMIAL AND EXTRACTION OF ROOTS.

2.1 State binomial theorem for positive integral index.
2.2 Explain binomial coefficients:
(n,0), (n,1).....(n,r)..... (n,n)
2.3 Derive expression for the general term.
2.4 Calculate the specified terms.
2.5 Expand a binomial of a given index.
2.6 Extract the specified roots.
2.7 Compute the approximate value to a given decimal place.
2.8 Solve problems involving binomials.

3. APPLY DIFFERENT METHODS FOR RESOLVING A SINGLE FRACTION INTO PARTIAL FRACTIONS USING DIFFERENT METHODS

3.1 Define a partial fraction, a proper and an improper fraction.
3.2 Explain all the four types of partial fractions.
3.3 Set up equivalent partial fractions for each type.
3.4 Explain the methods for finding constants involved.
3.5 Resolve a single fraction into partial fractions.
3.6 Solve problems involving all the four types.

4. UNDERSTAND THE SYSTEMS OF MEASUREMENT OF ANGLES.

4.1 Define angles and the related terms.
4.2 Illustrate the generation of an angle.
4.3 Explain sexagesimal and circular systems for the measurement of angles.
4.4 Derive the relationship between radian and degree.
4.5 Convert radians to degrees and vice versa.
4.6 Derive a formula for the circular measure of a central angle.
4.7 Use this formula for solving problems.

5. UNDERSTAND BASIC CONCEPTS AND PRINCIPLES OF TRIGONOMETRIC FUNCTIONS.

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

5.2 Derive fundamental identities.
5.3 Find trigonometric ratios of particular angles.
5.4 Draw the graph of trigonometric functions.
5.5 Solve problems involving trigonometric functions.

6. USE TRIGONOMETRIC IDENTITIES IN SOLVING TECHNOLOGICAL PROBLEMS.

6.1 List fundamental identities.
6.2 Prove the fundamental law.
6.3 Deduce important results.
6.4 Derive sum and difference formulas.
6.5 Establish half angle, double and triple angle formulas.
6.6 Convert sum or difference into product and vice versa.
6.7 Solve problems.

7. USE CONCEPT, PROPERTIES AND LAWS OF TRIGONOMETRIC FUNCTIONS FOR SOLVING TRIANGLES.

7.1 Define angle of elevation and angle of depression.
7.2 Prove the law of sines and the law of cosines.
7.3 Explain elements of a triangle.
7.4 Solve triangles and the problems involving heights and distances.

8. UNDERSTAND PRINCIPLES OF VECTORS AND PHASORS

8.1 Define unit vectors i, j, k.
8.2 Express a vector in the component form.
8.3 Explain magnitude, unit vector, direction cosines of a vector.
8.4 Explain dot product and cross product of two vector.
8.5 Deduce important results from dot and cross product.
8.6 Define phasor and operator j.
8.7 Explain different forms of phasors.
8.8 Perform basic Algebraic operation on phasors.
8.9 Solve problems on phasors.

9. USE PRINCIPLES OF COMPLEX NUMBERS IN SOLVING TECHNOLOGICAL PROBLEMS.

9.1 Define a complex number and its conjugate.
9.2 State properties of complex numbers.
9.3 Give different forms of complex numbers.
9.4 Perform basic algebraic operations on complex numbers.
9.5 Solve problem involving complex numbers.

10. SOLVE TECHNICAL PROBLEMS USING PRINCIPLES OF BOOLEAN ALGEBRA

10.1 Explain fundamental concepts of Boolean algebra
10.2 Explain binary numbers, octal numbers, decimal numbers and their interconversion.
10.3 Explain digital addition and multiplication and its applications to OR gates and AND Gates
10.4 Illustrate complimentation and inversion
10.5 Evaluate logical expression
10.6 List basic Laws of Boolean Algebra
10.7 Explain De-Morgan's theorem
10.8 Explain basic duality of Boolean algebra

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10.9 Derive Boolean expression
10.10 Explain combination of GATES
10.11 Illustrate sum of products and product of sum
10.12 Derive product of sum expression
10.13 Explain NAND Gates and NOR Gates
10.14 Use the map methods for simplifying expressions
10.15 Explain sub-cubes and covering

11. UNDERSTAND THE CONCEPT OF PLANE ANALYTIC GEOMETRY

11.1 Explain the rectangular coordinate system.
11.2 Locate points in different quadrants.
11.3 Derive distance formula.
11.4 Describe the ratio formula
11.5 Derive slope formula
11.6 Solve problems using the above formulae.

12. USE EQUATIONS OF STRAIGHT LINE IN SOLVING PROBLEMS.

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

13. SOLVE TECHNOLOGICAL PROBLEMS USING EQUATIONS OF CIRCLE

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

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Phy-132: Applied Physics

Total Contact Hours:
Theory: 32
Practical: 96

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1	3	2

Aims:
The students will be able to understand the fundamental principles and concept of Physics use these to solve problems in practical situations/technological courses and understand concepts to learn advance Physics/technical course.

Course contents	Hours
1. Measurements	**02**
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**
2.1. Revision of head to tail rule	
2.2. Laws of parallelogram, triangle and polygon of forces	
2.3. Resolution of a vectors by rectangular components	
2.4. Multiplication of two vectors, dot product and cross product	
3. Motion	**04**
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	**04**
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. Sound	**06**
5.1. Longitudinal waves	
5.2. Intensity, loudness, pitch and quality of sound	
5.3. Units of intensity of level and frequency response of ear	
5.4. Interference of sound waves silence zones, beats	
5.5. Acoustics	
5.6. Doppler effect	
6. Light	**06**
6.1. Review laws of reflection and refraction	
6.2. Image formation by mirrors and lenses	
6.3. Optical instruments	
6.4. Waves theory of light	

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6.5. Interference, diffraction, polarization of light waves
6.6. Applications of polarization in sunglasses, optical activity and stress analysis

7. **Optical Fiber** 02
   7.1. Optical communication and problems
   7.2. Review total internal reflection and critical angle
   7.3. Structure of optical fiber
   7.4. Fiber material and manufacture
   7.5. Optical fiber – uses

8. **Lasers** 03
   8.1. Corpuscular theory of light
   8.2. Emission and absorption of light
   8.3. Stimulated absorption and emission of light
   8.4. Laser principles
   8.5. Structure and working of lasers
   8.6. Types of lasers with brief description
   8.7. Applications (Basic concepts)
   8.8. Material processing
   8.9. Laser welding
   8.10. Laser assisted machining
   8.11. Micro machining
   8.12. Drilling, scribing and marking
   8.13. Printing
   8.14. Lasers in medicine

9. **Electromagnetic waves** 03
   9.1. Magnetic field around a current carrying conductor
   9.2. Electric field induced around an changing magnetic flux
   9.3. Moving fields
   9.4. Types of electromagnetic waves
   9.5. Generation of Radio waves
   9.6. Spectrum of electromagnetic waves

10. **Artificial Satellites** 02
   10.1. Review law of gravitation
   10.2. Escape velocity
   10.3. Orbital velocity
   10.4. Geosynchronous and geostationary satellites
   10.5. Use of satellites in data communication

Recommended Books:

1. Tahir Hussain, Fundamentals of Physics Vol. – I and II
2. FaridKhawaja, Fundamental of Physics Vol. – I and II
3. Wells and Slusher, Schaum'sSerices Physics
4. Nelkon and Oyborn, Advanced Level Practical Physics
5. MehboobIllahi Malik and Inam-ulHaq, Practical physics
6. Wilson, Lasers – Principles and Applications
7. M. Aslam Khan and M. AkramSandhu, Experimental Physics Note Book

Phy-132 Instructional Objectives: Applied Physics

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 problem.
   - 3.2 Explain relation between liner 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. **Understand concepts of sound**
   - 5.1 Describe longitudinal wave and its propagation.
   - 5.2 Explain the concepts: Intensity, loudness, pitch and quality of sound.
   - 5.3 Explain units of intensity of level and frequency response of ear.
   - 5.4 Explain phenomena of silence zones, beats.
   - 5.5 Explain acoustics of buildings.
   - 5.6 Explain Doppler's Effect giving mathematical expressions.
6. **Use the concepts of geometrical optics to mirrors and lenses**
   - 6.1 Explain laws of reflection and refraction.
   - 6.2 Use mirror formula to solve problems.
   - 6.3 Use the concepts of image formation by mirrors and lenses to describe working of optical instruments, e.g. microscope, telescopes, camera and sextant.
7. **Understand wave theory of light**
   - 7.1 Explain wave theory of light.
   - 7.2 Explain phenomena of interference, diffraction, polarization of light waves.
   - 7.3 Describe uses of polarization given in the course contents.
8. **Understand the structure, working and uses of optical fiber**
   - 8.1 Explain the structure of the optical fiber.
   - 8.2 Explain its principles of working.
   - 8.3 Describe use of optical fiber in industry and medicine.
9. **Understand the structure, working and uses of lasers**
   - 9.1 Explain the stimulated emission of radiation.
   - 9.2 Explain the laser principle.
   - 9.3 Describe the structure and working of lasers.

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9.4 Distinguish between types of laser.
9.5 Describe the applications of lasers in the fields mentioned in the courses contents.

10. Understand nature, types, generation and spectrum of electromagnetic waves

10.1 Explain magnetic field due to current and electric field due to changing magnetic flux.
10.2 Explain moving fields.
10.3 Describe types of electromagnetic waves.
10.4 Explain generation of radio waves
10.5 Explain spectrum of electromagnetic waves.

11. Understand types and uses of artificial satellites

11.1 Explain escape velocity.
11.2 Explain orbital velocity.
11.3 Distinguish between geosynchronous and geostationary satellites.
11.4 Describe uses of artificial satellites in data communication.

Phy-132 List of Practicals: Applied Physics 96 Hrs.

1. Draw graphs representing the functions:
   1.1. Y=mx for m=0, 0.5, 1.2
   1.2. $Y=x^2$
   1.3. 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. Proven that force is directly proportional to (a) mass, (b) acceleration, using Fletcher's 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:
   7.1. Law of parallelogram of forces.
   7.2. Law of triangle of forces.
   7.3. Lami's theorem.
8. Verify law op 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 plan mirror.
29. Find focal length of converging lens by displacement method.
30. Find focal length of diverging lenses 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 leas 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.

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Ch-132 APPLIED CHEMISTRY

Total Contact Hours
Theory 32
Practical96

T	P	C
1	3	2

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

AIMS After studying this course a student will be able to:

1. Understand the significance and role of chemistry in the development of modern technology.
2. Becomes acquainted with the basic principles of chemistry as applied in the study of relevant Technology.
3. Knows the scientific methods for production, properties and use of materials of industrial & technological significance.
4. Gain skill for the efficient conduct of practicals in a chemistry lab.

1. INTRODUCTION — 2 Hours

1.1 The scope and significance of the subject.
1.2 Orientation with reference to Technology.
1.3 Terms used & units of measurements in the study of chemistry.

2. FUNDAMENTAL CONCEPTS OF CHEMISTRY — 2 Hours

2.1 Symbols, Valency, Radicals, formulas.
2.2 Chemical Reactions & their types.
2.3 Balancing of equations by ionic method.

3. ATOMIC STRUCTURE — 2 Hours

3.1 Sub-atomic particles.
3.2 Bohr's Atomic Model.
3.3 The periodic classification of elements and periodic law
3.4 General characteristics of a period and group.

4. CHEMICAL BOND — 2 Hours

4.1 Nature of chemical Bond.
4.2 Electrovalent bond with examples.
4.3 Covalent Bond(Polar and Non-polar, sigma & Pi Bonds with examples.
4.4 Co-ordinate Bond with examples.

5. SOLIDS AND LIQUIDS — 3 Hours

5.1 The liquid and Solids state.
5.2 The liquids and their general properties (Density, viscosity, surface tension capillary action etc).
5.3 Solids and their general properties.
5.4 Crystal structure of solids
5.5 Crystals of Si and Ge.

6. WATER — 3 Hours

6.1 Chemical nature and properties.

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6.2 Impurities.
6.3 Hardness of water (types, causes & removal)
6.4 Scales of measuring hardness (Degress Clark, French, PPM, Mgm per litre).
6.5 Boiler feed water, scales and treatment.
6.6 Sea-water desalination, sewage treatment.

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

7.1 Definitions with examples.
7.2 Properties, their strength, basicity & Acidity.
7.3 Salts and their classification with examples.
7.4 pH-value and scale.

8. OXIDATION & REDUCTION **2 Hours**

8.1 The process with examples.
8.2 Oxidizing and Reducing agents.
8.3 Oxides and their classifications.

9. NUCLEAR CHEMISTRY **2 Hours**

9.1 Introduction.
9.2 Radioactivity (Alpha, beta and gamma rays).
9.3 Half life process.
9.4 Nuclear reaction & transformation of elements.
9.5 Isotopes and their uses.

10. ALLOYS **2 Hours**

10.1 Introduction with need.
10.2 Preparation and properties.
10.3 Some important alloys and their composition.

11. CORROSION **2 Hours**

11.1 Introduction with causes.
11.2 Types of corrosion.
11.3 Rusting of Iron
11.4 Protective measures against corrosion.

12. ELECTRO CHEMISTRY **2 Hours**

12.1 Ionization and Arrhenius theory of Ionization.
12.2 Electrolytes and Electrolysis.
12.3 Faraday's Laws and numericals related to them.
12.4 Application of Electrolysis (Electron, lathing etc).
12.5 Electro Chemical cells.

13. ELECTRICAL INSULATING MATERIALS. **2 Hours**

13.1 Introduction.
13.2 Solid insulators with chemical nature.
13.3 Liquid insulators with chemical nature.
13.4 Gaseous insulators with chemical nature.
13.5 Uses and their classification.

14. SEMI CONDUCTORS. **2 Hours**

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14.1 Introduction
14.2 Atomic structure of silicon and germanium.
14.3 Bonding & Conductivity.
14.4 Energy bands in a semiconductor.

15. ETCHING PROCESS. **2 Hours**

15.1 The process and its aims.
15.2 Etching reagents.
15.3 Applications of processors.

RECOMMENDED BOOKS

1. Intermediate Text-Books of chemistry I & II
2. ILMI Applied Science by SH. Ata Mohammed
3. Materials science by J.C.Anderson & Leaver.
4. Polytechnic Chemistry by G.N.Ready (ELBS & Nelson, Hong Kong).
5. Chemistry for engineers by Eric Gyngell.

Ch-132 APPLIED CHEMISTRY

INSTRUCTIONAL OBJECTIVES

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

1.1 Define chemistry and its terms.
1.2 Define the units of measurements in the study of chemistry.
1.3 Explain the importance of chemistry in various fields of specialization.
1.4 Explain the role of chemistry in this technology.

2. UNDERSTAND LANGUAGE OF CHEMISTRY AND CHEMICAL REACTIONS.

2.1 Define symbol, valency, radical, formula with examples of each.
2.2 Write chemical formula of common compounds.
2.3 Define chemical reaction and equations.
2.4 Describe types of chemical reactions with examples.
2.5 Explain the method of balancing the equation by ionic method.

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

3.1 Define atom.
3.2 Describe the fundamental sub atomic particles
3.3 Distinguish between atomic no. mass no. and between isotope and isobars.
3.4 Explain the arrangements of electrons in different shells and sub energy levels and understand bohr's atomic model.
3.5 Explain the grouping and placing of elements in the periodic table especially Si & germanium.
3.6 State the periodic law of elements.
3.7 Explain the trend of properties of elements based on their position in the periodic table.
3.8 Explain general characteristics of a period and a group.

4. UNDERSTAND THE NATURE OF CHEMICAL BONDS.

4.1 Define chemical Bond.
4.2 State the nature of chemical bond.
4.3 Differentiate between electrovalent and covalent bonding.
4.4 Explain the formation of polar and non polar, sigma and pi-bond with examples.
4.5 Describe the nature of coordinate bond with examples.

5. UNDERSTAND THE STATES OF MATTER AND DISTINGUISHES SOLIDS FROM GASES.

5.1 Describe the liquid and solid states of matter.
5.2 State the general properties of liquid.
5.3 State the general properties of solid.
5.4 Explain the formation of crystals and their types.
5.5 Describe the crystal structure of Si and Ge.

6. UNDERSTAND THE CHEMICAL NATURE OF WATER.

6.1 Describe the chemical nature of water with its formula.
6.2 Describe the general impurities present in water.
6.3 Explain the causes and methods to remove hardness of water.
6.4 Express hardness in different units like mg/litre. p.p.m, degrees Clark and degrees

French.

6.5 Describe the formation and nature of scales in boiler feed water.
6.6 Explain the method for the treatment of scales.
6.7 Explain the sewage treatment and desalination of sea water.

7. UNDERSTAND THE NATURE OF ACIDS, BASES AND SALTS.

7.1 Define acids, bases and salts with examples.
7.2 State general properties of acids and bases.
7.3 Differentiate between acidity and basicity.
7.4 Define salts, give their classification with examples.
7.5 Explain pH value of solution and pH scale.

8. UNDERSTAND THE PROCESS OF OXIDATION AND REDUCTION.

8.1 Define oxidation.
8.2 Illustrate the oxidation process with examples.
8.3 Define reduction.
8.4 Explain reduction process with examples.
8.5 Define oxidizing and reducing agents and give at least six examples of each.
8.6 Define oxides.
8.7 Classify the oxides and give examples.

9. UNDERSTAND THE FUNDAMENTALS OF NUCLEAR CHEMISTRY.

9.1 Define nuclear chemistry and radio activity.
9.2 Differentiate between alpha, beta and gamma particles.
9.3 Explain half life process.
9.4 Explain at least six nuclear reactions resulting in the transformation of some elements.
9.5 State the uses of isotopes.

10. UNDERSTAND THE NATURE OF ALLOYS USED IN THE RESPECTIVE TECHNOLOGY.

10.1 Define alloy.
10.2 Explain different methods for the preparation of alloys.
10.3 Explain important properties of alloys.
10.4 Explain the composition, properties and uses of alloys.

11. UNDERSTAND THE PROCESS OF CORROSION.

11.1 Define corrosion.
11.2 Describe different types of corrosion.
11.3 State the causes of corrosion.
11.4 Explain the process of rusting of iron.
11.5 Describe methods to prevent/control corrosion.

12. UNDERSTAND THE APPLICATION OF ELECTROCHEMISTRY IN DIFFERENT FIELDS OF INDUSTRIES.

12.1 Define ionization, electrolyte and electrolysis.
12.2 Describe Arrhenius theory of ionization.
12.3 State Faraday's laws of electrolysis.
12.4 Apply Faraday's laws of different fields of industry.
12.5 Solves numerical problem on Faraday's Laws.
12.6 Explain the construction and working of Daniel cell and lead accumulator.

13. KNOW THE USE OF INSULATING MATERIALS.

13.1 Define insulator, conductor.

13.2 Classify solid, liquid and gaseous insulators with their chemical nature.

13.3 Describe their uses.

14. UNDERSTAND THE NATURE AND CHEMISTRY OF SEMI CONDUCTORS.

14.1 Define semi -conductors.

14.2 Draw the atomic structure of silicon and germanium.

14.3 Describe the process of bonding and conductivity in conductors and semi-conductors.

14.4 Explain energy bands in semi- conductors.

15. USE ETCHING PROCESS IN DIFFERENT FIELDS OF TECHNOLOGY.

15.1 Define etching process and its aims.

15.2 Enlist the chemicals/reagents used in the process.

15.3 Explain the use of the process in the technology.

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CH-132 APPLIED CHEMISTRY

LIST OF PRACTICALS

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

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4.2. Data Types
4.3. Entering and Editing Data
4.4. Worksheets and Workbooks
4.5. Data Manipulation
4.6. Printing Worksheet
4.7. Formatting Cells
4.8. Calculation Using Formula
4.9. Function and Function Wizard

5. Presentation **32**
5.1. Opening and Closing Presentation Application Program
5.2. Presentation Views
5.3. Entering and Editing Presentation Objects
5.4. Slides and Transition
5.5. Animation

6. Non-Procedural Interactive Database **32**
6.1. Opening and Closing Interactive Database Program
6.2. Creating Database Tables
6.3. Setting Up Database Tables
6.4. Creating Queries for Tables
6.5. Creating Data Entry Forms for Tables
6.6. Generating Reports from Tables

7. Internet **24**
7.1. Opening and Closing Internet Browser
7.2. E-Mail
7.3. Search Engine
7.4. Surfing the WWW

8. Graphics and Image **14**
8.1. Opening and Closing Scanning Software
8.2. Scanning pictures
8.3. Editing Graphics
8.4. Saving Graphics

9. Video **8**
9.1. Opening and Closing Video Software
9.2. Playing video

Total Hours: 192

References

- **Microsoft Office 6 in 1,** Peter Aiken, and others, Que Corporation
- **Teach Yourself Windows in 24 Hours**, Perry G., Sams Publishing
- **MS Office Unleashed**, Sams Publishing
- **Teach Yourself NETSCAPE Communicator**, Sams Publishing

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Course Title:	**CIT-112**	**Computer Application Software**	**T**	**P**	**C**
			0	**6**	**2**

An application-oriented course on basic use of computers. It aims to provide the students in their first year the experience of using the machine hands-on. The course covers the immediate application of computers in business and daily use. It covers the topics on how to use the computers and useful application programs in graphical user interface.

Course Objectives

At the end of the course the students are expected to be able to

- Identify and describe the use and function of external parts of a microcomputer from an end-user point of view.
- Understand the basic operations and use of current operating system
- Run and use application programs
- Use the computer for daily business activities
- Use keyboard and mouse correctly and with ease
- Appreciate the usefulness of computer in work and daily activities

COURSE OUTLINE

Practical Contents	**Hours**
1. **Introduction to Computer: End-User Point of View** 1.1. Basic Design of Computer 1.2. Hierarchy of Memory 1.3. External View of Computer 1.4. Input and Output Devices	**6**
2. Windows Operating System 2.1. Computer Bootstrap 2.2. Window Objects and Application Programs 2.3. File System 2.4. Windows Explorer and Windows Help	**12**
3. Word Processing 3.1. Opening and Closing Word Processor Application Program 3.2. Opening, Saving and Closing Document 3.3. Editing and Navigating Documents 3.4. Document Views and Printing Documents 3.5. Formatting Document and Inserting Objects 3.6. Enhancement and Tools and Tables	**32**
4. Spread Sheet 4.1. Opening and Closing Spread Sheet Application Program	**32**

CIT 112 – Computer Application Software

INSTRUCTIONAL OBJECTIVES

1. Introduction to Computer: End-User Point of View

1.1. Enumerate the main block components of computer
1.2. Describe the function of each component
1.3. Enumerate the components of hierarchy of memory
1.4. Identify the main external elements of computer
1.5. Describe the function of each external part of computer
1.6. Describe main input/output devices of computer
1.7. Name the keys of keyboard
1.8. Use keyboard and mouse correctly

2. Windows Operating System

2.1. Start a computer
2.2. List the steps computer takes to start
2.3. Identify the elements of Windows startup screen
2.4. Identify main parts of Windows window
2.5. Navigate Windows window
2.6. Launch application program from Windows
2.7. Describe the file system of Windows
2.8. Identify icons for files, folders and drives
2.9. Launch Windows Explorer
2.10. Navigate Windows Explorer
2.11. Identify icons, bars and elements of Explorer windows
2.12. Use Explorer to work on files and folders
2.13. Use Windows Help

3. Word Processing

3.1. Open (launch) and close Windows Word
3.2. Navigate Word window
3.3. Use menu bars and tool bars
3.4. Open document and operate it.
3.5. Edit and navigate document
3.6. Change views of document and print it
3.7. Format documents
3.8. Insert objects on Word document
3.9. Use Tools and enhancements of Word processor
3.10. Write formatted document in Word

4. Spread Sheet

4.1. Open (launch) and close Windows Excel
4.2. Navigate Excel window
4.3. Use menu bars and tool bars of Excel
4.4. Open Excel spreadsheet and work on it
4.5. Enter data in Excel spreadsheet
4.6. Edit, manipulate and navigate Excel spreadsheet
4.7. Format Excel cell

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4.8. Print Excel workbook
4.9. Calculate cell values using formula
4.10. Use function and function wizard of Excel

5. Presentation

5.1. Launch (Open) and close Windows PowerPoint
5.2. Display PowerPoint slides in different views
5.3. Enter, edit and manipulate objects in slide show
5.4. Enhance the slide presentation with transition and animation
5.5. Create presentation in PowerPoint
5.6. Present slide show in PowerPoint

6. Non-Procedural Interactive Database

6.1. Open Windows Access
6.2. Create database and its tables
6.3. Define and setup properties of tables
6.4. Create and edit queries for tables
6.5. Create and edit forms for tables
6.6. Create and generate report for tables

7. Internet

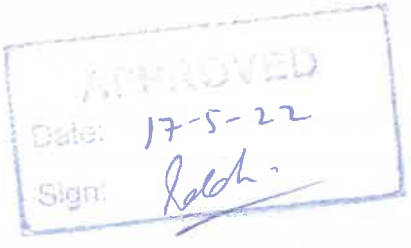
7.1. Launch Windows Explorer and close it
7.2. Launch Netscape Internet browser
7.3. Navigate Windows Explorer and Netscape and use their tools and icons
7.4. Compose, send and receive electronic mail (email)
7.5. Manage mails of email
7.6. Search information from Internet through Windows Explorer or Netscape Navigator
7.7. Manipulate the information searched from Internet (save, print or forward)
7.8. Surf the World Wide Web

8. Graphics and Image

8.1. Open and close graphics software and scanners
8.2. Set up the graphics software and scanners
8.3. Scan, edit and save pictures
8.4. Use graphics software

9. Video

9.1. Launch video software and close it
9.2. Setup video software
9.3. Use video software
9.4. Play video clips



SWT-112 Introduction to Computer Programming with JAVA

Course Title: Introduction to Computer Programming with JAVA	T	P	C
	1	3	2

This course is suitable for programming beginners, with a focus on cultivating students' object-oriented programming (OOP) ability. OOP-related analysis will run through the whole course, laying a solid foundation for subsequent courses such as Android programming. With OOP being the core, the course adopts the idea of proceeding from the real world problems to computer programs to give students gradual and in-depth explanation over the knowledge covered in this course, preparing students for subsequent courses.

Course Objectives

- Obtain the ability to design and document business logic according to the actual needs of users
- Obtain the ability to use JDK for basic Java programming
- Obtain the ability to program with Java branching statements
- Obtain the ability to program with Java looping statements
- On the basis of mastering arrays, expand the understanding of two-dimensional to three-dimensional arrays
- Obtain the ability to program basic operations on arrays
- Obtain the ability to program basic operations to write strings
- Obtain the ability to program to catch exceptions
- Obtain the ability to define your own exception classes
- Obtain the ability to understand the basic structure of a graphical interface
- Obtain the ability to program basic graphical user interfaces with AWT and Swing

COURSE OUTLINE

Contents	Hours
1. **Project requirements analysis and design** 1.1 Write "Project Requirements Analysis"	2
2. **Eclipse integrated development environment** 2.1 Create an App project 2.2 Create a Java App program in Eclipse 2.3 Power-off tracking for the Java App program	2
3. **Basic structure of Java programs** 3.1 Basic structure of Java programs 3.2 Loops and branches 3.3 Arrays and strings 3.4 Design of OOP	16
4. **Exception handling** 4.1 The meaning of exceptions and how to catch them 4.2 Custom exception and its handling	8
5. **Graphic interface**	4

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5.1 AWT Graphical user interface
5.2 Develop Applets programs
5.3 Swing Graphical user interface
5.4 Develop Applets programs
5.5 Inner classes
5.6 Develop SWT/JFace Programs

Total Hours: ***32***

References:

- Head First Java, 2nd Edition 2nd Edition by Kathy Sierra, Bert Bates
- Java: Learn Java in One Day and Learn It Well. Java for Beginners with Hands-on Project by LCF Publishing, Jamie Chan

LIST OF PRACTICALS

1. Project requirements analysis and design
2. Modular design of the project
3. Project interface design and implementation
4. Code design and implementation of project functions
5. Project test
6. Project joint debugging
7. Project design description

INSTRUCTIONAL OBJECTIVES

1. Proficiency in functional modeling
2. Proficient in drawing data flow diagrams
3. Proficient in the basic writing format of the software "Requirements Analysis"
4. Proficient in developing Java projects with Eclipse
5. Proficient in the program structure of Java App
6. Understand the concepts of class encapsulation, inheritance, and polymorphism in OOP
7. Proficient in programming abstract classes and interfaces
8. Familiar with the basic concepts of exceptions
9. Proficient in the basic program framework and capture of exceptions
10. Proficient in writing custom exception programs
11. Proficient in AWT, Swing, SWT/JFace and other graphical interface technologies
12. Understand inner classes and become proficient in using inner classes in graphical user interfaces

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Introduce Database Concepts and SQL Programming

Course Code: **SWT-122**	T	P	C
Course Title: Introduce database concepts and SQL programming	**1**	**3**	**2**

The course mainly covers the use, design, management and maintenance of database, with an aim to train programmers, system administrators and system operators to develop, manage and maintain database. After learning MySQL database, students will master the basic knowledge and skills of MySQL database management and maintenance, with the proficient ability to complete the basic operation of the database. They'll have a preliminary understanding of database programming methods such as stored procedures, stored functions, triggers, etc., and have strong hands-on abilities, competencies to adapt to career change, as well as the ability of continued learning.

Course Objectives

- Master the installation, configuration and daily management of MySQL
- Understand the language structure of MySQL
- Obtain the basic understanding of the design and use of MySQL database
- Master the installation and configuration of MySQL and third-party graphics management software
- Familiar with the use of MySQL graphical management tools for daily management of database users, logs, backups, etc.
- Proficient in using tools and commands to achieve basic operations on databases, tables, queries, views, and indexes

COURSE OUTLINE

Contents	Hours
1. **Basic knowledge of database** 1.1 Understand the basics of databases 1.2 Install and configure MySQL database	4
2. **Database design** 2.1 Relational database design 2.2 Standardization of database design 2.3 Practice: PetStore DB design	4
3. **Definition of data** 3.1 Create and manage databases 3.2 Create and manage database tables 3.3 Integrity constraints of data 3.4 Create databases and tables with graphical interface tools 3.5 Practice: PetStore DB creation	4
4. **Data operation**	4

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4.1 Insert table data
4.2 Modify table data
4.3 Delete table data
4.4 Practice: Data entry in PetStore DB

5. **Data query** 4
5.1 Single table query
5.2 Multi-table query
5.3 Sorting and Subtotals
5.4 Practice: Data query in PetStore DB

6. **View** 4
6.1 Creating views
6.2 View operation
5.4 Practice: View of PetStore DB

7. **Indexing and partitioning** 4
7.1 Indexes and their applications
7.2 Database partitioning
7.3 Practice: Index and partition of PetStore DB

8. **Data security** 4
8.1 User and data security
8.2 Backup and restore
8.3 Database transactions and multiple users
8.4 Practice: Management of PetStore DB

Total Hours: ***32***

References:

- **Fundamentals of Database Systems**
  Ramez Elmasri, Shamkant Navathe
  5th Edition 2009 ISBN: 9788131716250
- **Database Management Systems**
  C. J. Dates
  8th Edition, 2001 ISBN 0-901-543432-8
- **Database System Concept**
  Peter Rob, Carlos Coronel
  ISBN: 9788131509708
- **Introduction to PL\SQL by Oracle Press**

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LIST OF PRACTICALS

1. **Install MySQL database**
   (1) Install MySQL server
   (2) Install Navicat
   (3) Connect and disconnect the server

2. **Database design**
   (1) Database design of a teaching management system
   (2) Database design of an employee management system

3. **Create database and tables**
   (1) Reader classification table
   (2) Reader table
   (3) Inventory table
   (4) Borrowing form
   (5) Book List

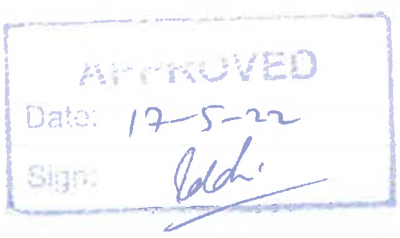
4. **Data operation**
   (1) Reader classification table
   (2) Reader table
   (3) Inventory table
   (4) Borrowing form
   (5) Book List

5. **Data query**
   (1) Basic use of the SELECT statement
   (2) Use of subquery
   (3) Use of join query
   (4) Use of GROUP BY, ORDER BY and LIMIT

6. **View**
   (1) Create a view
   (2) Query a view
   (3) Update a view
   (4) Delete a view

7. **Index**
   (1) Create an index
   (2) Create an index with the CREATE INDEX statement
   (3) Create an index with the ALTER TABLE statement
   (5) Delete an index
   (6) Creation and management of partitions

8. **Data security**
   (1) Database user
   (2) Grant and revoke access
   (3) Create users and grant access using the graphical interface
   (4) Data backup and recovery
   (5) Database transactions and multiple users



INSTRUCTIONAL OBJECTIVES

1. Understand the basic concepts of database, database management system, data model and database applications;
2. Master the installation and configuration of MySQL database;
3. Familiar with MySQL environment
4. Master the basic skills of designing relational databases;
5. Master the basic methods of standardized database design.
6. Familiar with two MySQL database operation methods: command line and graphical interface;
7. Master the creation, modification and deletion of databases and tables;
8. Understand integrity constraints of data and master the methods of creating various data integrity constraints;
9. Familiar with the operation of data in database tables by command line and graphical interface;
10. Master the insertion, modification and deletion of table data;
11. Master the use of SHOW and DESCRIBE statements.
12. Familiar with the basic structure of the SELECT statement;
13. Master the application of each clause of the SELECT statement;
14. Proficient in using the SELECT statement to achieve data query, subtotal and sorting.
15. Understand the basic concepts of views;
16. Familiar with the basic operations of views;
17. Master the use of views to insert, modify, and delete data.
18. Understand the classification of indexes, and master the methods of creating and deleting indexes;
19. Understand the pros and cons of indexing;
20. Understand the types of partitions, and master the methods of creating and deleting partitions;
21. Master the basic operations of managing partitions;
22. Master the various methods of adding, modifying and deleting users;
23. Master the basic operations of granting and revoking access.
24. Master the various methods of data backup and recovery;
25. Understand how transactions and multi-users are handled.

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Basics of HTML5 Web Development

Course Code: **SWT-132**
Course Title: **Basics of HTML5 Web Development**

T	P	C
1	3	2

This course introduces the basic knowledge of HTML5 development. It aims is to equip students with basic skills of HTML5 development so that they can create simple HTML5 dynamic pages. It covers the concept and syntax of HTML5, CSS basics, selector, etc. and simple JavaScript programming.

Course Objectives

At the end of the course, the students are expected to be able to:

- Understand the concepts related to website development
- Master the integrated development environment of web page development and debugging
- Master the syntax and attributes of text tags, image tags and list tags in web pages
- Master the syntax and attributes of HTML text hyperlinks, image hyperlinks and email hyperlinks
- Master the syntax and attributes of HTML tables, form syntax and attributes, and syntax and attributes of common controls such as text box, password box, list menu, radio box and check box
- Master CSS id selector, class selector and element selector
- Master the common pseudo-class and pseudo-element selectors of CSS
- Master CSS font and text attributes, color and background attributes, border and margin attributes, list and hyperlink attributes
- Master the differences and connections between block elements and inline elements
- Master CSS settings for floating positioning, absolute positioning, and fixed positioning
- Master CSS to handle floating overflow
- Master the simple syntax and applications of JS
- Master the declaration and use of JS functions
- Master the use of common methods of JS built-in objects
- Master reading and writing of DOM object attributes with JS
- Master setting of CSS attributes of DOM objects with JS
- Master JS common keyboard and mouse events

COURSE OUTLINE

COURSE CONTENTS	Hours
1. Basics of web page design and implementation 1.1 The first web page "Hello World" 1.2 Development and debugging tool HBuilder	**2**
2. Create invitation letter with HTML 2.1 Background setting 2.2 Layout 2.3 Font, color, and size setting of text	**4**

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3. CSS style design 4

3.1 CSS introduction
3.2 Using CSS basic styles
3.3 CSS writing rules
3.4 Implementation of registration page

4. Design and implementation of navigation bar 4

4.1 Layout design
4.2 Implementation of special effects
4.3 Adapt to screen size

5. Basics of JavaScript DOM programming 4

5.1 Understand the tree structure of HTML document
5.2 Understand the programming mode of DOM
5.3 Master the basic syntax of JavaScript
5.4 Master the basic use of window objects
5.5 Master the basic use of document objects
5.6 Master the production of the effects of complete selection and incomplete selection
5.7 Understand the node usage of JavaScript
5.8 Able to dynamically create tag elements using JavaScript

6. Create the registration page 2

6.1 Imitate Baidu registered account interface
6.2 Form validation
6.3 Special effects production

7. Drag and drop event 4

7.1 JavaScript event
7.2 Implementation of drag-and-drop effect

8. JavaScript DOM programming 8

8.1 Master the basic use of window objects
8.2 Master the basic use of document objects
8.3 Master the production of the effects of complete selection and incomplete selection
8.4 Understand the node usage of JavaScript
8.5 Able to dynamically create tag elements using JavaScript

References

- **"Web Front-End Development (Elementary)"**, edited by Education and Examination Center of Ministry of Industry and Information Technology, Publishing House of Electronics Industry
- "**Murach's HTML5 and CSS3**", 4th Edition by Anne Boehm and Zak Ruvalcaba
- "**HTML, CSS, and JavaScript All in One: Covering HTML5, CSS3, and ES6"** by Julie Meloni and Jennifer Kyrnin

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LIST OF PRACTICALS

1. Creating invitation letter
2. Design and implementation of navigation bar
3. Registration page implementation
4. Questionnaire survey making
5. Drag-and-drop event - implementation of recycle bin function
6. Drawing static Olympic rings
7. Hand-painting real time clock
8. Implementation of music player

INSTRUCTIONAL OBJECTIVES

1. Understand the concepts related to website establishment
2. Master the establishment of integrated development environment for web page development
3. Master the debugging of web page elements
4. Master the design and implementation of tagged web page structure
5. Master the syntax and attributes of text tags in web page
6. Master the syntax and attributes of image tags in web page
7. Master the syntax and attributes of list tags in web page
8. Master the tag syntax and attributes of HTML text hyperlinks
9. Master the tag syntax and attributes of HTML image hyperlinks
10. Master the tag syntax and attributes of HTML email hyperlinks
11. Master the tag syntax and attributes of image hotspots
12. Master the tag syntax and attributes of HTML tables
13. Master the tag syntax and attributes of HTML forms
14. Master the tag syntax and attributes of common controls such as HTML form text box, password box, list menu, radio box and check box
15. Master CSS id selector
16. Master CSS class selector
17. Master CSS element selector
18. Master the common pseudo-class and pseudo-element selectors of CSS
19. Master CSS fonts and text attributes
20. Master CSS color and background attributes
21. Master CSS border and margin attributes
22. Master CSS list and hyperlink attributes
23. Master the differences and connections between block elements and in-line elements
24. Master CSS settings for floating positioning, absolute positioning and fixed positioning
25. Master CSS to handle floating overflow
26. Master the layout design and implementation of upper and lower frame web pages
27. Master the layout design and implementation of Chinese-style web pages
28. Master the syntax and applications of JS array
29. Master the syntax and applications of JS branch structure
30. Master the syntax and applications of JS loop structure
31. Master the declaration and use of JS functions
32. Master the use of common methods of JS built-in objects
33. Master reading and writing of DOM object attributes with JS
34. Master setting of CSS attributes of DOM objects with JS
35. Master JS common keyboard and mouse events

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اسلامیات / مطالعہ پاکستان

مضمون (سال دوم)	GEN 211	
حصہ اول اسلامیات		ق ع ک
حصہ دوم مطالعہ پاکستان		1 0 1
		کل وقت: 20 گھنٹے

موضوعات

1. سورۃ المومنون آیت ۱ تا ۱۱ مع ترجمہ
2. درس منتخب احادیث مع ترجمہ و تشریح
   - ☆ خیارکم من تعلم القرآن وعلمہ
   - ☆ لا ایمان لمن لا امانۃ لہ ولا دین لمن لا عہد لہ
   - ☆ وایاکم والظن فان الظن اکذب الحدیث
   - ☆ من احدث فی امرنا ہذا ما لیس منہ فہو رد
   - ☆ من حمل علینا السلاح فلیس منا
   - ☆ انا وکافل الیتیم فی الجنۃ
   - ☆ لا ضرر ولا ضرار فی الاسلام
   - ☆ کلکم راع وکلکم مسئول عن رعیتہ
3. سیرۃ طیبہ
   - ☆ مکی زندگی۔ ولادت۔ بعثت۔ ہجرت
   - ☆ مدنی زندگی۔ مواخات۔ میثاق مدینہ۔ غزوہ بدر (اسباب و نتائج)
4. حضور ﷺ بحیثیت
   - ☆ خطیب (خطبہ حجۃ الوداع)

   معلم، مدبر اور خاندان
5. اسلامی معاشرہ

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

   جہاد۔ کسب حلال۔ مسجد (اہمیت و فضیلت)
6. اسلامی ریاست کی تعریف۔ اسلامی ریاست کی خصوصیات۔ اسلامی حکومت کے فرائض۔ اسلامی طرز حکومت

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Date: 17-5-22
Sign:

اسلامیات

تدریس مقاصد

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

قرآن مجید — منتخب آیات قرآنی

خصوصی مقاصد:

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

احادیث نبویہ

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

خصوصی مقاصد:

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

سیرت طیبہ

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

خصوصی مقاصد:

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

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☆ حضور ﷺ کی بطور سربراہ خاندان بیان کر سکے

اسلامی معاشرہ

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

خصوصی مقاصد:

☆ اسلامی معاشرہ کا معنی و مفہوم بیان کر سکے

☆ اسلامی معاشرہ کی امتیازی خصوصیات بیان کر سکے

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

☆ تبلیغ کے لغوی معنی بیان کر سکے

☆ تبلیغ کی اہمیت و ضرورت بیان کر سکے

☆ جہاد کے لفظی و اصطلاحی معنی بیان کر سکے

☆ جہاد کی اہمیت بیان کر سکے

☆ جہاد اور قتل میں فرق بیان کر سکے

☆ جہاد کی مختلف اقسام بیان کر سکے

☆ لفظ مسجد کی تعریف کر سکے

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

اسلامی ریاست

عمومی مقاصد: اسلامی ریاست کی خصوصیت بیان کر سکے

خصوصی مقاصد:

☆ ریاست کی تعریف بیان کر سکے

☆ اسلامی ریاست میں طرز حکومت سے آگاہی حاصل کر سکے

☆ اسلامی ریاست کی خصوصیات بیان کر سکے

☆ اسلامی ریاست کے اغراض و مقاصد بیان کر سکے

☆ اسلامی ریاست کے قیام کیلئے جدوجہد کر سکے

حصہ دوم

مطالعہ پاکستان

تدریس مقاصد

تحریک پاکستان

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

خصوصی مقاصد:

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

(غیر مسلم طلباء کے لئے)

نصاب اخلاقیات
سال دوم

ٹی	پی	سی
1	0	1

کل وقت: 20 گھنٹے

موضوعات

معاشرتی اقدار، لحاظ، ہمدلی، قومی سطح، شہری سطح، صنفی اداروں کی سطح، ضروریات، ورثہ

- ☆ حقوق و فرائض
- ☆ قوت برداشت
- ☆ قوت ارادی
- ☆ تحمل و بردباری
- ☆ وسیع النظری
- ☆ بے غرضی
- ☆ انسانی دوستی
- ☆ ثقافتی شعور
- ☆ پاس آزادی
- ☆ کامل انصاف
- ☆ تغیرات کو قبول کرنا
- ☆ خود شناسی

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نصاب اخلاقیات

سال دوم

تدریس مقاصد

عمومی مقاصد :

طالب علم: اخلاقیات کی اہمیت و ضرورت سے آگاہ ہو سکے اور بیان کر سکے

خصوصی مقاصد: طالب علم اس قابل ہو کہ

- ☆ موضوعات کا مطلب بیان کر سکے
- ☆ عملی زندگی سے مثالوں کی نشاندہی کر سکے
- ☆ اپنی شخصیت اور معاشرے پر موضوعات کے مطابق مثبت اثرات پیدا کرنے کے طریقے بیان کر سکے
- ☆ اعلیٰ اخلاقی اقدار میں سے

ثابت برداشت۔ قوت ارادی۔ لگن جذبہ۔ وسیع النظری۔ بے غرضی۔ انسانی اور سماجی خدمت۔ شعور۔ آزادی۔ کامل الکلمی اور خود شناسی کی اہمیت بیان کر سکے

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

MATHS-233 Applied Mathematics-II

	T	P	C
Total Contact Hrs:	3	0	3
Theory: 96 Hrs.			
Practical: 0			

Aims & Objectives:

After completing the course the students will be able to:

Solve the problems of calculus and analytical Geometry.

Course Contents:

1. **FUNCTIONS & LIMITS.** 6 Hours
   - 1.1 Constants and variables
   - 1.2 Functions & their types
   - 1.3 The concept of limit
   - 1.4 Limit of a function
   - 1.5 Fundamental theorems on limit
   - 1.6 Some important limits
   - 1.7 Continuous function
   - 1.8 Problems

2. **DIFFERENTIATION.** 06 Hours
   - 2.1 Increments
   - 2.2 Geometrical interpret
   - 2.3 Differentiation ab –initio by first principle.
   - 2.4 Geometrical interpretation of differential coeff.
   - 2.5 Differentiation coefficient of X^n and $(a+b)^n$
   - 2.6 Problems.

3. **DIFFERENTIATION OF ALGEBRAIC FUNCTIONS** 9 Hours
   - 3.1 Explicit Functions
   - 3.2 Implicit Functions
   - 3.3 Parametric Forms
   - 3.4 Problems

4. **DIFFERENTIATION OF TRIGONOMETRIC FUNCTIONS** 6 Hours
   - 4.1 Differential Coefficient of Sinx, Cosx, Tanx from first principle.
   - 4.2 Differential Coefficient of Cosecx, Secx, Cotx.
   - 4.3 Differential Coefficient of Inverse Trigonometric Functions
   - **4.4** Problems

5. **DIFFERENTIATION OF LOGARITHMIC & EXPONENTIAL FUNCTION 15 Hours**
   - 5.1 Differentiation of lnx
   - 5.2 Differentiation of Log a^x
   - 5.3 Differentiation of a^x
   - 5.4 Differentiation of e^x

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5.5 Problems

6. RATE OF CHANGE OF VARIABLES. 6 Hours

6.1 Increasing and decreasing functions
6.2 Maxima and Minima
6.3 Criteria for maximum & minimum values
6.4 Methods of finding maximum & minimum
6.5 Rate measure
6.6 Slope of a line
6.7 Velocity and acceleration
6.8 Problems

7. INTEGRATION (SIMPLE BASIC RULES) 9 Hours

7.1 Concept
7.2 Fundamental Formulae
7.3 Important Rules
7.4 Problems

8. METHODS OF INTEGRATION 9 Hours

8.1 Integration by substitution
8.2 Integration by parts
8.3 Problems

9. DEFINITE INTEGRALS. 6 Hours

9.1 Properties
9.2 Application to area
9.3 Problems.

10. DIFFERENTIAL EQUATION. 6 Hours

10.1 Introduction
10.2 Order and Degree
10.3 First Order Differential Equation of 1st Degree
10.4 Solution of Problems
10.5 Problems

11. LAPLACE TRANSFORMATION. 9 Hours

11.1 Laplace Transformations
11.2 Inverse Laplace Transformations
11.3 Problems

12. FOURIER SERIES 9 Hours

12.1 Introduction
12.2 Periodic Functions
12.3 Even and Odd Functions
12.4 Problems

13. STATISTICS 6 Hours

13.1 Concept of mean, median and mode
13.2 Standard Deviation
13.3 Laws of probability
13.4 Problems

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RECOMMENDED BOOKS

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

		T	P	C
Course Code:	**Mgm -211**			
Course Title:	**Business Communication**	**1**	**0**	**1**

Second course on English language focusing on business communication. It aims to develop communication skills as applied in business and commerce such as the writing and business correspondence. It covers oral communication and art of listening, interviewing, and report writing among others. It is a pure class discussion.

Course Objectives

At the end of the course the students are expected to be able to

- Understand the basic principles of good and effective business writing in commercial and industrial fields.
- Use the English language effectively for communication in business
- Apply knowledge and skill to write business communication with confidence and ease.
- Write legibly in handwriting and compose communication documents with correct formats.
- Appreciate the usefulness of written language

COURSE OUTLINE

Contents	Hours
1. Communication Process. 1.1. Purposes of communication 1.2. Communication process 1.3. Distortions in communication 1.4. Consolidation of communication 1.5. Communication flow 1.6. Communication for self development	**6**
2. Oral Communication Skills 2.1. Significance of Speaking 2.2. Verbal and Non-verbal Messages 2.3. Strategic Steps of Speaking 2.4. Characteristics of Effective Oral Messages 2.5. Communication Trafficking 2.6. Oral Presentation	**6**
3. Questioning Skills 3.1. Nature and Types of Questions 3.2. Characteristics of a Good Questions 3.3. Questioning Strategy	**3**
4. Listening Skills 4.1. Principles of Active Listening 4.2. Skills of Active Listening 4.3. Barriers to Listening	**5**

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4.4. Reasons of Poor Listening.
4.5. Giving Feedback.

5. Interviewing Skills **3**
5.1. Significance of Interviews
5.2. Characteristics of Interviews
5.3. Activities in an Interviewing Situation
5.4. Types of Interviews.
5.5. Interviewing Strategy.

6. Report Writing **3**
6.1. Goals of Report Writing
6.2. Report Format
6.3. Types of Reports
6.4. Report Writing Strategy.

7. Reading Comprehension **2**
7.1. Reading Problems
7.2. Four Reading Skills

8. Group Communication **4**
8.1. Purposes of Conducting Meetings
8.2. Planning a Meeting
8.3. Types of Meetings
8.4. Selection of a Group for Meeting
8.5. Group Leadership Skills
8.6. Running a Successful Meeting
8.7. Active Participation Techniques

Total Hours: **32**

References

- **Effective Business Communication and Report Writing**, Sh. Ata-ur-Rehman.
- **Technical Reporting**, Ulman J.N. Could JR..

Mgm 211 – Business Communication

INSTRUCTIONAL OBJECTIVES

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

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

3. **Questioning Skills**
   - 3.1. Determine the uses of questioning skills and clarify information in the oral communication process
   - 3.2. Identify different types of questions.
   - 3.3. Determine the purpose of each type of question and its application.
   - 3.4. Identify the hazards to be avoided when asking questions.
   - 3.5. Demonstrate questioning skills.

4. **Listening Skills**
   - 4.1. Demonstrate the use of active listening skill in the oral communication process
   - 4.2. State the principles of active listening.
   - 4.3. Identify skills of active listening.
   - 4.4. Identify barriers to active listening.
   - 4.5. State the benefits of active listening.
   - 4.6. Demonstrate listening skills.
   - 4.7. Explain the importance of giving and receiving feed back.

5. **Interview Skills**
   - 5.1. Determine the appropriate interview type for the specific work-related situation and conduct a work-related interview.
   - 5.2. State the significance of interviews.
   - 5.3. State the characteristics of interviews.
   - 5.4. Explain the activities in an interviewing situation.
   - 5.5. Describe the types of interviews
   - 5.6. Explain the interviewing strategy
   - 5.7. Prepare instrument for a structured interview

6. Report Writing

6.1. Prepare a report out-line, based on subject matter and audience
6.2. Identify the different types of reports
6.3. Determine when to use an informal or formal report presentation
6.4. Identify the stages of planning a report
6.5. Identify the parts of a report and choose the parts appropriate for each type of report
6.6. Draft a report outline

7. Reading Comprehension

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

8. Group Communication

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

GenC-212 Chinese Language-2

Total contact hours

		T	P	C
Theory	64	2	0	2
Practical	0			

AIMS There are 20 lessons (including 4-unit reviews) in this course. It is recommended to complete 8 lessons and the unit reviews in 32 class hours. After completing this course, students can master the advanced-basic Chinese language knowledge in the content of the course, and be able to reach and exceed **HSK level THREE**.

COURSE CONTENTS

1. Lesson 1 Pick up international students at the airport **3 hours**

This lesson introduces grammatical knowledge such as "flexible use of interrogative pronouns" and "basic forms of clutch words", which requires students to use sequential words correctly and understand the contextual meaning of some special words.

2. Lesson 2 What would you like to drink **3 hours**

This lesson introduces the rhetorical question form "can…?" and the related words "not only… but also...", and learn to express your needs correctly in communication.

3. Lesson 3 I'm kidding you **4 hours**

This lesson explains the fixed structures "more and more", "more A, more B", etc., and understands how to praise in Chinese and how to deal with others' praise.

4. Lesson 4 I like winter best **4 hours**

Through the description of weather, students can learn the usage of adverbs such as "often" and "always", which express frequency, and compare and describe similar phenomena.

UNIT REVIEW 1 (INCLUDING TESTS) **2 hours**

Summarize the contents of Lesson 1-4, review key words and grammar knowledge, and help learners really consolidate their mastery. There are tests designed, which can detect what has been learned before, so as to check for leaks and fill gaps.

5. Lesson 5 I caught a cold **3 hours**

This lesson learns the basic usage of "active" sentence, understands the expressions related to illness and medical treatment, and learns the language communication in hospital scenes.

6. Lesson 6 You are really careless **3 hours**

Learn and summarize the usage of simple directional complements "V come" and "V leave", and master the basic expression of request and evaluation functions in daily communication.

7. Lesson 7 English black tea is healthy and delicious **4 hours**

Understand how to express approximate numbers in Chinese, how to persuade others and how to express their basic attitude.

8. Lesson 8 I'm not a shopaholic **4 hours**

This lesson is related to online shopping. Learn the expression "A is A, that is" and learn how to express your views from different angles.

UNIT REVIEW 2 (INCLUDING TESTS) **2 hours**

This section leads students to review the knowledge points they have learned in the past, and conduct mid-term tests to test students' learning effect.

9. Lesson 9 Why did grandparents move **3 hours**

This lesson introduces a life event related to "moving house", the expression of learning conditions

and the extended meaning of directional complement through events.

10. Lesson 10 Eat hot pot for the first time **3 hours**

This lesson introduces the way of having dinner in China through "hot pot" and some basic situations of Chinese restaurants, so as to help learners get a preliminary understanding of Chinese dining customs.

11. Lesson 11 Teacher Wang is going to change the house **4 hours**

This lesson is related to "housing" in "food, clothing, housing and transportation". While understanding the story, students can learn language knowledge such as hypothetical relationship and overlapping of disyllabic verbs.

12. Lesson 12 Single Li Wenchao **4 hours**

This lesson introduces emotional problems, learn about young people's concepts of marriage and love, and learn how to compare them in Chinese.

UNIT REVIEW 3 (INCLUDING TESTS) **2 hours**

Review the previous knowledge, students answer questions through the platform, check the learning situation, and help teachers and students analyze their learning situation.

13. Lesson 13 This is her new home **3 hours**

This lesson introduces the living conditions of young people at present, and understands how to describe the living environment, learn the Chinese expression of concepts such as location and existence.

14. Lesson 14 Allen's weekend **3 hours**

This lesson introduces school life, understand the sentence structure expressing complete negation, and summarize the usage of three auxiliary words "adjective", "adverb" and "should".

15. Lesson 15 Fall in love with public square dancing **4 hours**

By introducing the living conditions of the elderly in China, students can learn Chinese comparative structure, enumerating relations and various usages of complements.

16. Lesson 16 Taste English afternoon tea **4 hours**

This lesson introduces grammatical knowledge such as "passive" sentence and "adjective reduplication". Through the study of this lesson, students can understand the dining habits of restaurant ordering and national dishes.

UNIT REVIEW 4 (INCLUDING TESTS) **2 hours**

This section is a review test class, leading students to review the knowledge points learned in the past for final tests to test students' learning effect.

INSTRUCTION OBJECTIVE:-

Through this course, learners can systematically learn the language knowledge at this stage and cope with general communication, and can communicate on familiar topics and meet the basic communication needs of daily life and study, and gradually understand and be familiar with Chinese communication etiquette, cultural customs, etc.

Recommended Book

Tang Chinese Course 3

MgmC-212 **Understanding China**

Course Code: **MgmC- 212**	**T**	**P**	**C**
Course Name: Understanding China	**2**	**0**	**2**

A course about understanding Chinese culture and introducing China's national conditions. It aims to enable international students in China to better understand China, learn Chinese language and culture, enhance understanding of different cultures, and learn about China's geographical history, philosophy, religion, political economy, etc. It covers Chinese geography and history, philosophy and religion, politics and economy, literature and art, science and technology education, medicine, and sports, etc.

Course Objectives

At the end of the course, the students are expected to be able to:

- Master the basic overview of China
- Enhance knowledge of Chinese language
- Broaden horizon
- Learn the integration and communication between different cultures

COURSE OUTLINE

COURSE CONTENTS	Hours
1. Geography	**2**
1.1 China from the perspective of the world	
1.2 China's natural environment	
1.3 China's mountains and rivers (1)	
1.4 China's mountains and rivers (2)	
1.5 City Highlight - Beijing	
1.6 City Highlight - Shanghai	
1.7 City Highlight - Hongkong	
1.8 Natural Landscape (1) Five Mountains, Jiuzhaigou Valley and Zhangjiajie	
1.9 Natural Landscape (2) Xinjiang	
1.10 Natural Landscape (3) Tibet	
1.11 Cultural Tour	
2. History	**8**
2.1 Chinese Ancestors	
2.2 Emperor Qin Shihuang	
2.3 Emperor Wu in Han Dynasty	
2.4 Silk Road in Western Han Dynasty	
2.5 Prosperous Period of Tang Dynasty	
2.6 Riverside Scene at Qingming Festival	
2.7 Genghis Khan and Kublai Khan	
2.8 Ming Taizu (the First Emperor of the Ming Dynasty)	
2.9 The Great Voyages of Zheng He	

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2.10 Prosperous Period of Qing dynasty (from Kangxi to Qianlong)
2.11 Opium War
2.12 Sun Yat-sen and Kuomintang
2.13 The Communist Party of China (CPC)
2.14 Mukden Incident (9.18 Incident)
2.15 Mao Zedong and the Founding of the PRC
2.16 Diplomatic Relations of the PRC
2.17 Deng Xiaoping and Reform and Opening-up
2.18 New Era of Socialism with Chinese Characteristics

3. Philosophy 4

3.1 The representative figure of Confucianism - Confucius
3.2 The representative figure of Confucianism - Mencius
3.3 The core concept of Confucianism - ritual
3.4 The core concept of Confucianism - benevolence and benevolent governance
3.5 The core concept of Confucianism - Taoism, reason, and knowledge acquirement by investigation
3.6 Taoism - Lao Tzu's Tao and inaction
3.7 Taoism - Chuang Tzu's equality of things and unfettered
3.8 Other schools of thought - Legalism
3.9 Other schools of thought - Military Strategist

4. Religion 4

4.1 Folk Beliefs and Ancestor Worship
4.2 Taoism
4.3 Buddhism in China
4.4 Buddhist Doctrine, Zen, and Buddhist scenic spots
4.5 Other Religions and China's Religious Policies

5. National Governance 4

5.1 National Flag, National Anthem, and National Emblem
5.2 Administrative divisions
5.3 National Institutions (1)
5.4 National Institutions (2)
5.5 Political Parties (1)
5.6 Political Parties (2)
5.7 Foreign policy

6. Literature and Art 4

6.1 Stages and Genres of Chinese literature
6.2 Pre-Qin Literature
6.3 Tang Poetry
6.4 Song Ci
6.5 Four Great Classical Novels
6.6 Modern Chinese Contemporary Literature (1)
6.7 Modern Chinese Contemporary Literature (2)
6.8 Chinese Opera (1)
6.9 Chinese Opera (2)
6.10 Chinese Opera (3)
6.11 Concept of Chinese Traditional Music
6.12 Characteristics of Chinese Traditional Music and Music Appreciation
6.13 Diversified Modern Chinese Music

7. Language and Literature 4

7.1 Mandarin and Dialect
7.2 Ancient Chinese and Modern Chinese

7.3 Idioms
7.4 Origin and Development of Chinese Characters
7.5 Six Categories of Chinese Characters
7.6 Simplified and Traditional Chinese Characters

8. Calligraphy and Painting 4

8.1 Definition of Calligraphy
8.2 The Evolution of Chinese Calligraphy - Bone inscriptions and bronze inscriptions
8.3 The Evolution of Chinese Calligraphy - Regular script
8.4 The Evolution of Chinese Calligraphy - Cursive script
8.5 The Evolution of Chinese Calligraphy - Running script
8.6 Calligraphy Creation and the Charm of Calligraphy
8.7 Four Treasures of the Study
8.8 Calligraphy and Other Arts
8.9 Basic Knowledge of Chinese Painting
8.10 Artistic Features of Chinese Painting
8.11 Appreciation of Three Major Themes and Representative Works of Chinese Painting

9. Economy 4

9.1 Agriculture
9.2 Industry
9.3 Three Major Industries in China
9.4 "Internet plus" - New engine of the Chinese economy
9.5 Digital Economy 2.0
9.6 Belt and Road Initiative

10. Science and Technology 4

10.1 Four Great Ancient Inventions
10.2 Bronze Ware
10.3 Seismograph
10.4 Ceramics
10.5 Hybrid Rice
10.6 Five-hundred-meter Aperture Spherical Radio Telescope (FAST)
10.7 China High Speed Rail
10.8 Jiaolong Manned Submersible
10.9 Supercomputer Sunway TaihuLight
10.10 Aerospace Science and Technology
10.11 Internet Payment

11. Education 4

11.1 Imperial Examination System
11.2 Chinese Literature
11.3 China's Examination
11.4 Teaching Chinese to Speakers of Other Languages

12. Medical and Health 4

12.1 Medical and Health Service System in China
12.2 Traditional Chinese Medicine (TCM)
12.3 History of TCM
12.4 Core Concept of TCM
12.5 Acupuncture and Massage
12.6 TCM and Life (1)
12.7 TCM and Life (2)
12.8 Understanding Chinese Medicine
12.9 Mystery of TCM Treatment
12.10 International Communication of TCM

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13. Sports and Wushu (Chinese Martial Art) 4

13.1 Traditional Sports - Kite
13.2 Traditional Sports - Archery
13.3 Chinese Women and the Olympic Games
13.4 Taiji Boxing
13.5 Overview of Wushu Films and Dramas
13.6 Wushu Elements in Wushu Films and Dramas
13.7 Cultural Connotation of Chinese Wushu

14. Traditional Festivals and Chinese Cuisine 4

14.1 Chinese Traditional Festivals
14.2 Chinese Traditional Festivals-The Spring Festival&The Lantern Festival
14.3 Chinese Traditional Festivals-The Dragon Boat Festivall&The Mid-Autumn 14.4 Festival
14.5 Chinese Cuisine

15. Historical and Cultural Heritage 4

15.1 Human Civilization: "Peking Man" Site at Zhoukoudian
15.2 Dunhuang Mogao Grottoes
15.3 Great Engineering: Great Wall and Dujiangyan Irrigation System
15.4 Royal Tombs: Xiaoling Mausoleum and Imperial Tombs of the Ming and Qing Dynasties
15.5 The Largest Bronze Ware: Simuwu Great Tripod
15.6 Warring States Court Musical Instrument: Chime-Bells of Marquis Yi of the Zeng State
15.7 Types of Chinese Ancient Buildings
15.8 Royal Architecture: The Forbidden City
15.9 Ancient Residential Buildings: Quadrangles
15.10 Chinese Gardens

16. Intangible Cultural Heritage 4

16.1. Current Status of Intangible Cultural Heritage
16.2 Gesar
16.3 Guqin
16.4 Rural Music and Dance
16.5 Shadow Play
16.6 Cantonese Opera
16.7 Chinese Seal Cutting
16.8 Nanjing Yunjin Brocade
16.9 Twenty-four Solar Terms
16.10 Crosstalk
16.11 Acrobatics
16.12. Protection of Intangible Cultural Heritage

Total Hours: 64

References:

- Understanding China(Digital and Paper format), edited by Cheng Aimin, jointly developed by Peking University、Beijing Normal University、Zhejiang University、Tianjin University、Harbin Institute of Technology、Xi'an Jiaotong University、Wuhan University 、Chongqing University、Shanghai International Studies University、Dalian Medical University、South China Normal University、Jiangsu Normal University and Tang International Education Group, published by Shanghai Foreign Language Education Press, recommended by China Association for International Education (CAFSA)

MgmC- 212 – Understanding China

INSTRUCTIONAL OBJECTIVES

1. Understand the basic geography of China and some famous Chinese cities
2. Understand the unique natural and cultural landscape
3. Master basic knowledge of Chinese history and important historical figures
4. Understand the basic context and major issues in the development of Chinese history
5. Understand the main schools of Chinese traditional philosophy and their representatives
6. Understand the relevant core concepts
7. Master the influence of Chinese philosophy on the mindset and lifestyle of Chinese people
8. Understand the development and spread of Taoism, Buddhism, Islamism and Christianity
9. Understand the current status and policies of religious in China
10. Master the basic knowledge in seven videos
11. Describe the main contents of China's political system in Chinese
12. Compare the similarities and differences between China's political system and home country
13. Correct and comprehensive understanding of China's political system
14. Understand knowledge related to Chinese literature
15. Understand the inheritance and absorption of Chinese contemporary music to traditional music culture
16. Experience the characteristics of Chinese language
18. Understand the language and text of China as a whole
19 Understand the evolution of Chinese calligraphy
20. Understand the basic knowledge of Chinese painting and appreciation of representative works
21. Learn knowledge and information in related fields
22. Understand the logic and reasons behind the development of China's economy
23. Understand the ancient and modern Chinese scientific and technological civilization
24. Understand the unique and long-standing Chinese education
25. Master the core concepts of harmony between man and nature, five elements of qi, yin and yang and the basic principles of health preserving in four seasons
26. 5. Familiarize with the efficacy of acupuncture and massage and the nature and function of traditional Chinese medicine
27. Understand the Chinese medical service system; Characteristics of Tibetan medicine, Mongolian medicine, Hui medicine and Zhuang medicine
28. Understand the development history of TCM
29 International communication of traditional Chinese medicine science
30. Learn the development history of Chinese traditional sports
31. Master Chinese traditional sports such as kite and archery and their related cultural connotations
32. Understand the characteristics and advantages of modern competitive sports in China
33. Understand the spiritual connotation of Chinese Wushu
34. Understand the diet of traditional Chinese festivals
35. Understand the basic situation of Chinese historical and cultural heritage
36. Know important ancient sites and cultural relics: Peking Man Site Zhoukoudian, Dunhuang Mogao Grottoes, Great Wall, Dujiangyan Irrigation System, 37. Imperial Tombs of the Ming and Qing Dynasties, Simuwu Great Tripod, Chime-Bells of Marquis Yi of the Zeng State, etc.
38. Understand the historical and cultural value of cultural heritage
39. Master the basic situation, basic characteristics, and main types of Chinese ancient buildings
40. Familiarize with representative ancient buildings, and know important ancient sites and cultural relics: Peking Man Site Zhoukoudian, 41. Dunhuang Mogao Grottoes, Great Wall, Dujiangyan Irrigation System, Imperial Tombs of the Ming and Qing Dynasties, Simuwu Great Tripod,

Chime-Bells of Marquis Yi of the Zeng State, etc.
42. Understand the historical and cultural value of ancient buildings
43. Able to distinguish different architectural and garden styles and features
44. Able to read and explain relevant key words
45. Understand the development, current situation, and protection of China's intangible cultural heritage

		T	P	C
Course Code:	**CIT -223**			
Course Title:	**Computer Networks**	2	3	3

Introductory course on data communication and computer networks. It aims to provide the students conceptual tools to understand the design and implementation of data communication as applied to computer networks. It discusses the layered model. It covers communication, media, WAN, LAN, Internetworking, protocols, network management and troubleshooting. This comes with practical component to complement classroom discussion.

Course Objectives

At the end of the course, the students are expected to be able to

- Understand basic concepts and principles of data communication as applied to computer networking
- Synthesize the different approaches of data communication in networking and assess their effectiveness in implementation
- Troubleshoot and diagnose network faults and correct them
- Assemble cabling system of a network
- Recognize the inherent problems in networking and appreciate the solutions of the problems

COURSE OUTLINE

Contents	Hours
1. Principles of Data Communication and Networking	***8***
1.1. Development of Communication and Data Communication	
1.2. Overview of OSI and TCP/IP model	
1.3. Data Transmission	
1.3.1. Analog Transmission	
1.3.2. Digital Transmission	
1.3.3. Signal Impairment	
1.4. Transmission Media	
1.4.1. Types of Cables and Connectors	
1.4.2. Telephony and Wireless Communication	
2. Data Link Control	**4**
2.1. Addressing scheme (Mac addresses)	
2.2. Error detection and correction	
3. Multiplexing	**4**
3.1. Frequency-Division Multiplexing	
3.2. Time-Division Multiplexing	
4. Local Area Network (LAN)	**12**
4.1. LAN Architecture	
4.2. Topologies	
4.3. LAN Systems	
4.3.1. Ethernet and Fast Ethernet (CSMA/CD)	
4.3.2. Token Ring and FDDI	

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5. Connectivity Devices — **4**
- 5.1. Modems
- 5.2. Hubs and Repeaters
- 5.3. Bridges, Routers and Gateways

6. Internetworking — **20**
- 6.1. Principles of Internetworking
- 6.2. Protocols
  - 6.2.1.OSI Model
  - 6.2.2.TCP/IP Suite
- 6.3. Internet Protocol (IP) and
- 6.4. Addressing scheme at NW layer (IP address classes)
- 6.5. Routing Protocol
- 6.6. Transport Protocols and Transport Services
- 6.7. Addressing scheme at Transport layer (Port addresses)
- 6.8. Application Layer protocols
- 6.9. Addressing scheme at Application layer (DNS)

7. Network Administration and Management — **8**
- 7.1. Types of Servers
- 7.2. Managing Accounts
- 7.3. Performance Monitoring

8. Network Troubleshooting — **4**
- 8.1. Structured Cabling
- 8.2. Network Testing Tools
- 8.3. Fault Diagnosis: Troubleshooting Connectivity and Communication

Total Hours: 64

References

- **Networking Essentials**, Joe Casad and Dan Newland, Techmedia
- **Computer Networks, 2Ed**, Andrew S. Tanenbaum, Prentice Hall
- **Data and Computer Communications, 4Ed.**, William Stallings, MacMillan
- **Local Area Networks**, 2Ed, Peter Hodos
- **An introduction to Local Area Networks**, Greg Nunemacher
- **Networking Explained**, Gallo
- **Networking Essentials, 2Ed**, Microsoft Press

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CIT 223 – Computer Networks

LIST OF PRACTICALS

1. Identifying various hardware components of a network
2. Studying network card
3. Splicing a coaxial cable
4. Terminating twisted pair cable
5. Terminating coaxial cable
6. Using Cable Testers
7. Configuring Mac address on Windows / Linux OS
8. Configuring IP addresses on Windows / Linux OS
9. Design of a Local Area NW of computers
10. Troubleshooting NW connectivity.
11. Installing and configuring a NW printer
12. Using Network Tools and Analyzers
13. Using Network Monitors

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CIT 223 – Computer Networks

INSTRUCTIONAL OBJECTIVES

1. Principles of Data Communication and Networking

1.1. Discuss the development of communication
1.2. State the principles of data communication
1.3. Describe methods of data transmission
1.4. Differentiate analog signal from digital signal
1.5. Explain causes of transmission error
1.6. List transmission media
1.7. Describe each transmission media
1.8. State the advantage and disadvantage of each transmission media

2. Data Link Control

2.1. Protocols at data link layer
2.2. Understand importance of Mac address
2.3. Describe methods of error detection and correction

3. Multiplexing

3.1. Explain the need for multiplexing
3.2. Describe Frequency-division multiplexing
3.3. Describe Synchronous Time-division Multiplexing

4. Local Area Network (LAN)

4.1. Describe LAN architecture
4.2. Identify different topologies of LAN
4.3. Describe different topologies of LAN
4.4. Illustrate different topologies
4.5. State the advantage and disadvantages of each topology
4.6. Describe different LAN systems like Ethernet
4.7. Explain the advantage and disadvantage of different LAN systems
4.8. Describe bridges

5. Connectivity Devices

5.1. Explain the need for connectivity devices
5.2. State the operational principle of Modems
5.3. Describe Modem
5.4. Describe hubs and repeaters
5.5. Describe bridges, routers and gateways
5.6. Illustrate the relationships of this devices in networking

6. Internetworking

6.1. Explain the principles in Internetworking
6.2. Explain the need for protocols in Internetworking
6.3. Describe each layer of OSI model of network
6.4. Differentiate connectionless and connection-oriented internetworking
6.5. Describe the Internet Protocol
6.6. Discuss the development of Internet Protocol
6.7. Describe routing protocols
6.8. Explain transport protocol
6.9. Describe Transmission Control Protocol (TCP)

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6.10. Explain the advantage of TCP/IP from OSI

7. Network Administration and Management

7.1. Describe different types of servers
7.2. Create and manage user accounts
7.3. Use software to conduct performance monitoring of network
7.4. Explain the data protection and security
7.5. Describe means to protect data and secure its integrity in network system.

8. Network Troubleshooting

8.1. Describe structured cabling
8.2. Identify network testing tools
8.3. Use network testing tools to diagnose network fault
8.4. Perform network fault diagnoses
8.5. Troubleshoot network connectivity and communication faults

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MTR -272

DIGITAL LOGIC DESIGN

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

Aims

- To understand the fundamentals of digital electronics
- To understand the applications of digital electronic devices in the industry

COURSE CONTENTS

1. INTRODUCTION — 2 Hours

1.1 Digital & analogy quantities
1.2 Number systems, BIT, BYTE, NIBBLE
1.3 Elements of digital electronics

2. LOGIC GATES — 3 Hours

2.1 AND Gate
2.2 OR Gate
2.3 NOT Gate
2.4 NAND Gate
2.5 NOR Gate
2.6 XOR Gates

3. BOOLEAN ALGEBRA — 2 Hours

3.1 Laws of Boolean algebra
3.2 De Morgans Laws
3.3 Boolean Function Generation from truth tables

4. ARITHMETIC LOGIC CIRCUITS — 3 Hours

4.1 Half adders
4.2 Full adders
4.3 Adder-subtractor
4.4 Comparators

5. COMBINATIONAL LOGIC AND DATA PROCESSING CIRCUITS — 3 Hours

5.1 Multiplexers & logic (IC's such as 74150)
5.2 Demultiplexers (IC's such as 74154)
5.3 Decoders
5.4 BCD-to-Decimal Decoders (such as 7445)
5.5 Seven-Segment Decoders & Displays
5.6 Encoders (IC's such as 74147)
5.7 Read-only memories

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5.8 Diode ROM
5.9 Commercially available ROM

6. FLIP-FLOPS — 4 Hours

6.1 RS Flip-Flop
6.2 Clocked RS Flip-Flop
6.3 D Flip-Flop
6.4 Edge-triggered D Flip-Flop
6.5 JK Flip-Flop

7. CLOCKS & TIMERS — 4 Hours

7.1 TTL clock
7.2 555–astable, monostable
7.3 Applications

8. SHIFT REGISTERS — 3 Hours

8.1 Introduction, shift-Right & shift-Left
8.2 Serial in-serial out
8.3 Serial-in parallel-out
8.4 Parallel-on serial-out

9. COUNTERS — 2 Hours

9.1 Introduction, types
9.2 Ripple counter
9.3 Synchronous counter
9.4 Presentable counter
9.5 Digital clock

10. MEMORIES — 3 Hours

10.1 Introduction, volatile, non-volatile
10.2 Memory Addressing
10.3 ROM, PROM, EPROM, capacity
10.4 RAM, Static & dynamic, capacity

11. APPLICATION OF DIGITAL ELECTRONICS — 2 Hours

11.1 Digital clock
11.2 Frequency & time period counter
11.3 Moving Message Display

RECOMMENDED BOOKS

1. Industrial Electronics: James A. Rehg and Glenn J. Sartori (2005)
2. Digital Electronics: A Practical Approach William Kleitz (8th Edition) (2007)
3. Power Electronics :B.W. Williams

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DIGITAL LOGIC DESIGN

INSTRUCTIONAL OBJECTIVES

1. **KNOW THE BASIC TERMS RELATED TO DIGITAL ELECTRONICS.**
   - 1.1 State in a tabulated form the merits & demerits of analog & digital quantities
   - 1.2 Define basic terms related to digital electronics

2. **UNDERSTAND THE WORKING OF VARIOUS LOGIC GATES**
   - 2.1 Describe the working of AND Gate
   - 2.2 Describe the working of OR Gate
   - 2.3 Describe the working of NOT Gate
   - 2.4 Describe the working of NAND Gate
   - 2.5 Describe the working of NOR Gate
   - 2.6 Describe the working of XOR Gates
   - 2.7 Understand the configurations formed by combining gates

3. **INTRODUCTION TO BOOLEAN ALGEBRA & ITS LAWS**
   - 3.1 Study the laws of boolean algebra
   - 3.2 Study the De Morgans Laws
   - 3.3 Understand the boolean function generation from truth tables

4. **DETAILED DESCRIPTION OF ARITHMETIC LOGIC CIRCUITS**
   - 4.1 Describe the working of Half adders
   - 4.2 Describe the working of Full adders
   - 4.3 Describe the working of Adder-subtractor
   - 4.4 Describe the working of comparators

5. **UNDERSTAND THE WORKING AND USES OF COMBINATIONAL LOGIC CIRCUITS, INCLUDING DATA PROCESSING CIRCUITS**
   - 5.1 Define the terms multiplexer, demultiplexers, decoder, encoders, BDC converters
   - 5.2 Explain multiplexers, using logic circuits & block-diagrams (multiplexers using IC's such as 74150)
   - 5.3 Explain demultiplexers, using block-diagrams (using IC's such as 74154)
   - 5.4 Explain using block-diagram<BDC& its conversion to Decimals, using IC's, such as7445
   - 5.5 Explain seven segments decoders, showing block diagrams, giving examples for letters & digits.
   - 5.6 Describe the operation of combinational logic circuits as applied to data processing circuits
   - 5.7 Explain the working of 7-segment display circuit

6. **DETAILED DESCRIPTION OF FLIP-FLOPS**
   - 6.1 Describe the working of RS Flip-Flop
   - 6.2 Describe the working of Clocked RS Flip-Flop
   - 6.3 Describe the working of D Flip-Flop
   - 6.4 Describe the working of Edge-triggered D Flip-Flop
   - 6.5 Describe the working of JK Flip-Flop

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7. UNDERSTAND THE WORKING OF CLOCKS & TIMERS

- 7.1 Study the function of a TTL clock
- 7.2 Study the Timer 555 – astable, monostable
- 7.3 Identify the applications of clock and timers

8. KNOW ABOUT SHIFT REGISTERS

- 8.1 Study the basic concepts of shift-right & shift-left registers
- 8.2 Understanding the serial in-serial out configuration
- 8.3 Understand the serial-in parallel-out configuration
- 8.4 Understand the parallel-on serial-out configuration

9. UNDERSTAND THE WORKING OF COUNTERS

- 9.1 Study the basics and the types of counters
- 9.2 Describe the working of the ripple counter
- 9.3 Describe the working of synchronous counter
- 9.4 Describe the working of presentable counter
- 9.5 Understand the working of digital clock

10 KNOWS VARIOUS TYPES OF MEMORIES

- 10.1 Define various types of memories: ROM, PRM, EPROM, RAM
- 10.2 State memory of common memory devices in KB, MB
- 10.3 Know the system of memory addressing

11 APPLY THE CONCEPTS OF DIGITAL ELECTRONICS FOR PROJECT(S)

- 11.1 Explain the use of digital electronic circuits as elements of a chosen system
- 11.2 Describe the use of digital electronic circuits for the following:-
  - 11.2.1 Moving display
  - 11.2.2 Frequency counters
  - 11.2.3 Digital clock

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DIGITAL LOGIC DESIGN

MTR -272

LIST OF PRACTICALS

1. Identify and verify truth tables for AND, OR, NOT Gates ICs
2. Identify and verify truth tables for NOR, NAND, XOR Gates ICs
3. Construct and verify truth tables of half adder, full adder
4. Connect and study an adder & subtractor circuits
5. To perform and study the function of Decoder & demultiplexer through related IC
6. To perform and study the function of Encoder & Multiplexer through related IC
7. Identify and verify the functions of RS Flip-Flop
8. Identify and verify the functions of Clocked RS Flip-Flop
9. Identify and verify the functions of D Flip-Flop
10. Identify and verify the functions of JK Flip-Flop
11. Connect a 555 IC as
    - A-stable multivibrator
    - Monostable multivibrator
    - Bistable multivibrator
12. Connect and observe the working of shift registers (SISO, SIP, PISO, PIPO)
13. Identify, connect and observe working of ripple and synchronous counters
14. Select components, assemble and observe working of a digital clock
15. Study the working of memory devices
16. Assemble and observe working of frequency counter (Project – 2)
17. Assemble and observe working of moving message display (Project – 3)

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Course Code: **SWT-212** T P C
Course Title: **Basics of Android APP Development** 1 3 2

This course covers the knowledge and skills related to Android programming. It aims to develop Android-based mobile applications with the JAVA object-oriented programming ideas, and lay a solid language foundation for students to develop Android applications. It aims to train students to develop small and medium-sized Android application software. It covers Android programming ideas, performance optimization principle, development environment establishment, core component application, resource application, interaction design, data storage and device management.

Course Objectives

At the end of the course, the students are expected to be able to:

- Master the design concept of good user experience
- Master Android programming ideas
- Master the principle of Android performance optimization.
- Master the Android development environment establishment
- Master the core component application of Android
- Master the resource application of Android
- Master the graphical interface application skills of Android
- Master the interaction design of Android
- Master the data storage of Android
- Master the device management of Android

COURSE OUTLINE

COURSE CONTENTS	Hours
1. Establishment of Android development environment	2
1.1. Establishment of Android development environment	
1.2. Use of Android development environment	
1.3. Use of Android development environment common windows and tools	
1.4. Help documents for Android	
1.5. Android app store;	
2. **Application of Android Core component**	6
2.1. Activity la yout	
2.2. Activity's life cycle	
2.3. launchMode of Activity	
3. Common UI components of Android	6
3.1. Basic view component	
3.2. Event model	
3.3. Relative layout and linear layout	
3.4. ProgressBar ScrollView DatePicker TimePicker	
3.5. Style, Shape and Selector	
4. Communication between applications	6
4.1. Intent and Intent Filter	

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4.2. Action of system program
4.3. Data transfer between activities
4.4. Customize Action

5. Fragment **4**
5.1. Life cycle of Fragment
5.2. Dynamic loading Fragment
5.3. Static loading Fragment
5.4. Communication between Fragment and components

6. List and adapter **4**
6.1. AdapterView
6.2. ArrayAdapter
6.3. SimpleAdapter
6.4. BaseAdapter
6.5. ViewPage

7. Data storage of Android **4**
7.1. SharedPreferences
7.2. Text reading and writing
7.3. XML files
7.4. Sqlite database
7.5. SD card

Total Hours: 32

References:

- **"Android Application Development"**, Publishing House of Electronics Industry, 1st Edition, 2009
- **"Android For Dummies"**, 2nd Edition by Dan Gookin

SWT- 212 - Basics of Android APP Development

LIST OF PRACTICALS

1. Android "Hello World" application
2. DDMS log output program
3. WeChat login interface
4. Go to the main interface after WeChat password verification
5. WeChat login progress bar display
6. WeChat multi-tab page
7. WeChat multi-tab page
8. Background image switching of WeChat component in different touch states
9. WeChat chat message
10. WeChat address book grouping information display
11. WeChat grouping list display

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INSTRUCTIONAL OBJECTIVES

1. Establishment of Android development environment

1.1 Android Studio installation and configuration
1.2 JDK, SDK download and installation
1.3 Output the first Android application

2. Core component of Android

2.1 Relative layout and linear layout
2.2 Login interface
2.3 launchMode of Activity

3. Common UI components of Android

3.1 TextView
3.2 Button
3.3 EditText
3.4 ImageView
3.5 CheckBox
3.6 RadioButton
3.7 Get the current system time
3.8 Mode and Implementation of Incident Response
3.9 Electric light status switch
3.10 Comprehensive application of layout
3.11 Calculator

4. Communication between applications

4.1 Action for calling system program
4.2 Speed dial
4.3 Calling system Action

5. Fragment

5.1 LogCat tracks the Fragment life cycle
5.2 Tracking of Fragment life cycle
5.3 Static loading of Fragment
5.4 Dynamic loading of Fragment
5.5 Main interface

6. List and Adapter

6.1 Common use of Adapter
6.2 Taobao Intelligent Search Navigation Bar
6.3 Common use of ViewPage
6.4 Taobao product view

7. Data Storage of Android

7.1 Extended operation
7.2 Login status maintenance
7.3 SD operation
7.4 Address book list export
7.5 SQlite database operation
7.6 Blocking blacklist apps

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		T	P	C
Course Code:	**SWT -223**			
Course Title:	**Web Development through JAVA**	**1**	**6**	**3**

A course introducing the design and development of a Web page with JAVA. It intends to provide the trainees with working knowledge on creating a Web page using JAVA programming language. It covers the discussion on the WWW and the Internet, HTML and CSS basics, JAVA Script, JQuery, JAVA Servlets, JSP, Session Management, JDBC Programming, tools, linking, FrontPage basics, formatting, multimedia, and site creation and maintenance. Java has strong support for web development. While Java on the desktop, with the notable exception of Eclipse RCP based application was never a huge success, Java is frequently used at the server side. This has a laboratory component to enhance learning.

Course Objectives

At the end of the course the students are expected to be able to

- Describe Web development technologies
- Describe the concepts and methods of designing a Web page for the World Wide Web.
- Use any text editor to create an HTML code.
- Use the elements of the HTML to format a Web page
- Install necessary software for Setting up development Environment
- Explain and apply HTML and CSS tags
- Apply Java Script in webpages
- Apply JQuery within webpages
- Describe and use Java servlets
- Explain and apply Java Server Pages elements
- Explain and use Session Management applications and techniques
- Explain JDBC, configure MySQL and use its methods
- Customize Tags
- Explain and apply use Java Server Faces

COURSE OUTLINE

Contents	Hours
1. Introduction to Web Development	2
1.1 What is a Web Application?	
1.2 HTTP Basics	
1.3 Types of HTTP Requests	
1.4 Server Side Programming	
1.5 Client Side Programming	
1.6 Web Application Layers	
2. Setting up Development Environment	2
2.1 Installation of Apache Tomcat Server	
2.2 Installation of IDE (Eclipse / NetBeans)	
2.3 Standard Directory Structure of Java Web Application	

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2.4 Development of Web Application

3. HTML and CSS — **2**
3.1 Describe Html Document Structure and Tags
3.2 Describe CSS Styles
3.3 Designing Tables
3.4 Designing Forms
3.5 Advance Page Layout

4. Javascript — **4**
4.1 Introduction to Javascript
4.2 Hiding and Showing Elements
4.3 Styling Elements
4.4 Using Jquery
4.5 Jquery Selectors
4.6 Validating Forms

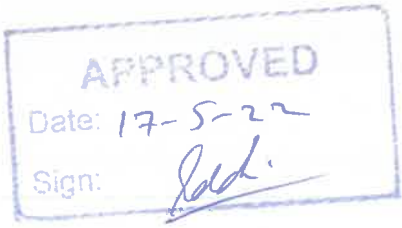
5. Java Servlets — **4**
5.1 What is a Servlet?
5.2 Advantages of Servlet
5.3 Servlet Types
5.4 Writing Basic Hello World Servlet
5.5 Servlet Life Cycle
5.6 Servlet and Forms
5.7 Servlet and Input Validation

6. Java Server Pages — **3**
6.1 Introduction
6.2 Life Cycle of JSP
6.3 JSP Elements
6.4 JSP Standard Actions

7. Session Management — **4**
7.1 What is a Session?
7.2 What is a Cookie?
7.3 URL Rewriting
7.4 Hidden Field
7.5 Working with HTTP Session

8. JDBC Programming — **8**
8.1 Introduction
8.2 Configure MySQL
8.3 Connecting to the Database
8.4 Accessing Data
8.5 The execute Query Method
8.6 The execute Update Method

9. Custom Tags — **3**
9.1 Custom Tags Overview
9.2 Custom Tag Handlers
9.3 Customizing Tag behavior with attributes



Total Hours: 32

References:

- **Learning Web Design: A Beginner's Guide to (X)HTML, Stylesheet and Web** by Jennifer Niederst Robbins
- **Beginning JSP, and Tomcat** by Giulio Zambon

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Date: 17-5-22
Sign:

Web Development with JAVA
LIST OF PRACTICAL

1. Installation of Apache Tomcat Server
2. Installation of IDE (NetBean)
3. Deploy simple website in Apache Tomact Server
4. Design a Page Layout using Html and CSS
5. Install ODBC Driver
6. Install and Configure MySQL
7. Design User Registration Form and Store User in Database
8. Design Login User Form and Validate User
9. Show All Registered Users in a grid
10. Search users by name and show in grid.
11. Update User Profile
12. Form Validation using JQuery
13. Create a form using Java Servlet
14. Store and Retrieve data from Session
15. Create address book application

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SWT -223 Web Development with Java

INSTRUCTIONAL OBJECTIVES

1. Introduction to Web Development
- 1.1. Define Web Application
- 1.2. Explain HTTP Basic
- 1.3. Describe Types of HTTP Request
- 1.4. Discuss Server Side Programming Languages
- 1.5. Describe Client Side Programming Languages
- 1.6. Explain Web Application Layers

2. Setting up Development Environment
- 2.1. Install of Apache Tomcat Server
- 2.2. Install of IDE (Eclipse / NetBeans)
- 2.3. Explain the Standard Directory Structure of Web Application
- 2.4. Develop a Web Application

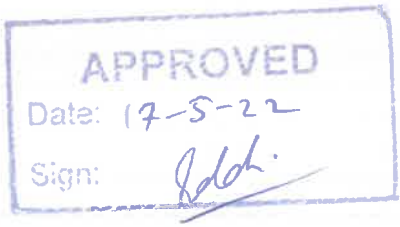
3. Html and CSS
- 3.1. Describe Html document structure
- 3.2. Describe Html Elements
- 3.3. Implement CSS styles
- 3.4. Design Tables
- 3.5. Design Forms
- 3.6. Use Page Layout

4. Javascript
- 4.1. Explain what is Javascript
- 4.2. Hide and Show Elements
- 4.3. Apply styles on elements
- 4.4. Define JQUERY
- 4.5. Explain the JQUERY Selectors
- 4.6. Apply validation on HTML form

5. Java Servlets
- 5.1. Define Servlets
- 5.2. Describe the advantages of Servlets
- 5.3. Describe different types of a Servlets
- 5.4. Describe Servlet Life Cycle
- 5.5. Create Forms using Servlet
- 5.6. Add Validation on Form

6. Java Server Pages
- 6.1. Define JSP
- 6.2. Describe Life Cycle of JSP
- 6.3. Explain JSP Elements
- 6.4. Explain JSP Standard Actions

7. Session Management
- 7.1. Define a 'Session'
- 7.2. Define a 'Cookie'
- 7.3. Explain URL Rewriting



7.4. Explain Hidden Field
7.5. Use HTTP Session

8. JDBC Programming

8.1. Define JDBC
8.2. Configure MySQL
8.3. Connect the Database
8.4. Access Data
8.5. Implement execute Query Method
8.6. Implement execute Update Method

9. Custom Tags

9.1. Explain Custom Tags
9.2. Describe Custom Tag Handlers
9.3. Customize Tag behavior with attributes

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		T	P	C
Course Code:	**CIT- 263**			
Course Title:	**Relational Data Base Management System**	2	3	3

Databases are part of our everyday life. Whether we are accessing our bank accounts, paying bills, searching the Web or calling a call centre, our requests are most likely posted to a database management system. The aim of the course is a paradigm shift from "computation" to "information" and covers some of the core concepts on data structuring and querying. It covers fundamentals of database architecture, database management systems, and database systems, Principles and methodologies of database design, and techniques for database application development.

Course Objectives

At the end of the course, the students are expected to be able to

- Design and Implement a Relational database for real life problems
- Write Complex Queries and Use SQL
- Suggest a Centralized / Distributed system according to organizational needs
- Design and implement solutions for the small business organizations

COURSE OUTLINE

Contents	*Hours*
1. Introduction Introducing the Database Management System Field Definitions and Naming Conventions Components of DB Applications DB Tools; Microsoft Access, MySQL	**6**
2. Database System Legacy DB Systems File Processing Systems Hierarchical Model Network Model	**4**
3. Database Models Semantic Data Model Relational Model Database Models and the Internet	**4**
4. Relational Database Management Systems A logical view of Data; Entities and Attributes Tables and their Characteristics, Keys Integrity rules Entity and referential integrity Relational Database operators	**6**
5. Normalization of Database Tables	**6**

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Need for Normalization
Conversion to First Normal Form
Conversion to Second Normal Form
Conversion to Third Normal Form
Boyce-Codd Normal Form (BCNF)

6. **Relational Algebra and SQL** — **16**
   Unary and Binary operations
   Cartesian Product
   Set Operations
   SQL Operators
   Relational Algebra and SQL
   Introduction to DDL and DML
   Data Control Language
   Aggregate Function in SQL, Grouping Data
7. **Database Life Cycle (DBLC)** — **4**
   Database Initial Study
   Database Design
   Database Design Strategies
   Centralized versus Decentralized Design
8. **Entity Relationship (E-R) Modeling** — **12**
   Basic Modeling Concepts
   Degrees of Data Abstraction
   Association and Cardinality
   Relationship Participation
   Composite Entities, Entity Super types and subtypes
   Enhanced Entity Relationship Diagram
   Transform ER/EER to Relational Model
9. **Transaction Management** — **6**
   What is a Transaction?
   Evaluating Transaction Results
   Transaction Management with SQL
   Transaction Log, Transaction Types

Total Hours: 64

References

- **Fundamentals of Database Systems**
  Ramez Elmasri, Shamkant Navathe
  5th Edition 2009 ISBN: 9788131716250
- **Database Management Systems**
  C. J. Dates
  8th Edition, 2001 ISBN 0-901-543432-8
- **Database System Concept**
  Peter Rob, Carlos Coronel
  ISBN: 9788131509708
- **Introduction to PL\SQL by Oracle Press**

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LIST OF Practicals

Sr.	Lab- Topics/ Practical
01.	Introduction to Microsoft Access Installation and basic usage
02.	Introduction to MySQL database management system Installation and basic usage
03.	Create Database Create Table, Data types, DML (insert, delete, update) operations Concept of primary key
04.	More than One table Concept of join and foreign key, Referential Integrity Cascade update and Cascade delete operations Master-Details tables and DML
05.	Concept of QBE (Query by Example) grid in MS Access Writing Queries using QBE Aggregate functions Datasheet, SQL and design view
06.	Simple Select Statement Select and Project operations Where clause
07.	Operators (Arithmetic, Logical, Concatenation) Null value in Expressions Between, In , Like operators Column Alias Sorting (order by clause) Single Row Functions
08.	Group functions Group By, Having Clause Joins & Types
09.	Database Concepts DDL and DML Transactions
10.	Database Connectivity with mySQL
11.	Database Connectivity(Login Problem) Save, Retrieve, Update using PHP & MySQL Data movement between page navigation
12.	User Level Security and Access Rights Relational Modeling using Erwin

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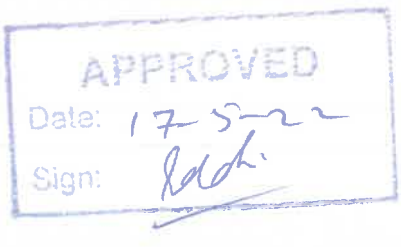
CIT-263 – Relational Data Base Management System

INSTRUCTIONAL OBJECTIVES

After completing this course the student must demonstrate the knowledge and ability to:

1. Understand the needs of a DBMS software
2. Describe the components of a database and its naming conventions.
3. Clear overview of different existing DMS tools like MS Access and MySQL
4. Understand, appreciate and effectively explain the underlying concepts of legacy and latest database technologies.
5. Understand different models of DBMS, like hierarchical and network.
6. Understand the pros and cons of semantic and relational data models.
7. Understand and apply integrity rules on a data base
8. Understand the difference between entity integrity and reverential integrity.
9. Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS
10. Have clear understanding of relational database operators.
11. Understand the need for normalization.
12. Understand the steps required to normalize a database.
13. Should be able to practically bring a database from 1st normal form to BCNF
14. Normalize a database
15. Understand the set operations and SQL operators
16. Understand of Data Manipulation Language (DML), Data Definition Language (DDL), and Data Control Language (DCL)
17. Populate and query a database using SQL DML/DDL commands.
18. Understand all the steps required to design a basic database to meet the need of an organization.
19. Design and implement a database schema for a given problem-domain
20. Understand the importance of database modeling using ER-model and enhanced ER-model
21. Understand the difference between entities, super-types, and subtypes.
22. Should be able to transform ER / EER to relational model
23. Differentiate between transaction processing system and functional area information system
24. Understand the difference between transaction log and transaction types



Civil-271

ENTREPRENEURSHIP

TOTAL CONTACT HOURS:	32	T P C
Theory:	32	1 0 1
Practical:	0	

AIM: The student will be able to understand the procedures governing estimation of earth work and complete estimate of single storey building in order to:

1- Understanding the concept and elements of small business enterprise.
2- Apply the techniques for generating business ideas as well as for identifying and assessing business opportunities.
3- Understand the procedures required for establishing an enterprise.
4- Understand the procedures for assessing market and for selecting location for a small business.
5- Understand the importance of financial record keeping in a small business.
6- Develop business plan and evaluate it in real market situation.
7- Apply the concepts of Chemical / Pharmaceutical Engineering on planning, designing and layout of related technical projects.

Course Contents

1- Entrepreneurship and Management

1.1 The concept of entrepreneurship
1.2 Entrepreneurial style Vs Managerial style
1.3 Terminology used in entrepreneurship
1.4 Classification of business; difference between social and commercial business
1.5 Reasons for Entrepreneurship; importance in society, self employment, benefits & limitation, Importance of relations/links
1.6 Entrepreneurial motivation; setting goals and risk assessment.
1.7 Small enterprises; elements, ideas, motivation, resources, business plan etc.

2- Entrepreneurship and innovation

2.1 Creativity and innovation; creativity potential, techniques for developing creative abilities
2.2 Business ideas; resources of business ideas, collective thinking and creative thinking,
2.3 Risk involved in innovation
2.4 Identifying and assessing business opportunities

3- Entrepreneurs

3.1 Entrepreneurial characteristics
3.2 Assessment of entrepreneurial potential; assessment of individuals
3.3 Entrepreneurial Leadership: abilities for a successful businessman
3.4 Self discipline; check list for attaining self discipline
3.5 Decision making skills; steps for decision making, rating of decision making skills
3.6 Principles of negotiation; resolving business issues through negotiation

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4- Establishment of An Enterprise

4.1 Market; Five 'W' of market, competitors, assessment of market size & demand

4.2 Business location; importance, selection of site

4.3 Legal forms of business; Proprietorship, Partnership, limited company, Cooperative, advantages &disadvantages

4.4 Costing of product; direct and indirect cost

4.5 Break even analysis: fixed and variable costs, calculating break even indicates & applications

4.6 Finance & sources of financing; equity financing & loan financing, initial capital & working capital estimation

5- Management of an Enterprise

5.1 Hiring and managing people; hiring procedures, term & condition of services and Job description etc.

5.2 Managing sales & supplies; characteristics of successful sales personals, importance of advertisement, life cycle of product, selection of supplies, work order, delivery & payment etc.

5.3 Management of capital; operating cycle concept, management of cash & stock etc.

5.4 Accounting and book keeping: cash book, balance sheet etc.

5.5 Income tax; income tax returns, computation of business income

5.6 Sales tax; basic scheme of sale tax, assessment of return etc.

6- Business Plan

6.1 Purpose of business plan

6.2 Components of business plan; outline, process of writing business plan

6.3 Analysis of business plan: feasibility; breakeven point, evaluating problem in starting business

6.4 Standard business plan

Recommended / Reference Books:

1 Small Business and Entrepreneurship by Paul Burns and Jim Dew Hurst.

2 Innovation and Entrepreneurship By Peter F. Drucker

3 Entrepreneurial Success By John B. Miner

4 Entrepreneurship for economic Growth by P.N Singh

5 Knowing About Business (KAB), ILO

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INSTRUCTIONAL OBJECTIVES

1- Understand the concept and elements of Entrepreneurship

1.1 Define entrepreneurship
1.2 Explain the concept of entrepreneurship
1.3 Explain the various types of enterprise that exist in the community
1.4 Identify and interpret the terms and elements involved in the concept of enterprise
1.5 Appreciate that the advancement of individual and society in general when entrepreneurship is adopted
1.6 Explain various motivational factors that entrepreneurs possess and utilize.
1.7 Exhibit the skills needed to assess and evaluate a risk
1.8 Describe the outline of small enterprise

2- Understand the techniques for generating business ideas as well as for identifying and assessing business opportunities

2.1 Describe the creativity and innovation
2.2 Apply the techniques for developing creative abilities
2.3 Explain the resources of business idea
2.4 Explain the collective and creative thinking
2.5 Explain how to generate a business idea
2.6 Appreciate the importance of, and posses techniques for identifying and assessing business opportunities.

3- Understand personal characteristics needed to be a successful entrepreneur

3.1 Identify the various entrepreneurial characteristics
3.2 Access personal potential for becoming future entrepreneurs.
3.3 Identify leadership qualities which are essential to the success of entrepreneurs
3.4 Identify self- management skills and how they are important to be enterprising
3.5 Apply a rational approach to make personal and business decisions
3.6 Explain the steps for decision making and rating of decision making skills
3.7 Apply the rules of negotiation for resolving business issues

4- Understand the procedures required for establishing an enterprise

4.1 Describe the market & marketing
4.2 Differentiate between sellers and buyers` market
4.3 Describe the five `w` of market
4.4 Explain the procedure for assessing the market size and demand
4.5 Explain the major factors to be considered when selecting a location for a business
4.6 Describe the basic types of business ownership and the limitation of each
4.7 Explain the computation of initial and working capital needed to start an enterprise
4.8 Identify the advantages and disadvantages of using various sources of capital to start an enterprise
4.9 Explain the component of cost of product
4.10 Explain the break even analysis for a new business
4.11 Calculate the breakeven point for various new business

5- **Understand the various techniques that affect the management of an enterprise.**

5.1 Describe the hiring method/Procedures
5.2 Describe the term & conditions of services and job description for various employments
5.3 Describe the characteristics of successful sales personals
5.4 Describe the life cycle of product
5.5 Identify the various ways of selecting suppliers,
5.6 Explain the inventory management of stock, raw material and finished goods etc.
5.7 Appreciate the importance of financial record keeping in a small business
5.8 Explain techniques to keep cost as low as possible
5.9 Develop balance sheet for a small enterprise
5.10 Explain the operating cycle concept
5.11 Explain the income tax computation procedure for a small business
5.12 Explain the basic scheme of sales tax
5.13 Explain the assessment procedure for returns and filling of returns.

6- **Apply the entrepreneurship knowledge for development of business plan for a small business and evaluate in a real market situation.**

6.1 Appreciate the importance of business plan
6.2 Explain the process of writing a business plan
6.3 Develop feasibility for a business idea
6.4 Realize the problem that may be encountered when starting a small business/Enterprise
6.5 Develop a business plan for a small business on the standard format
6.6 Evaluate the business plan in a real market situation

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Date: 17-5-22
Sign:

Course Code: **SWT-231** | **T P C**
Course Name: **Project Training- 1** | **0 3 1**

This course mainly enables students to familiarize with the development process of web applications, from front-end to back-end development and from PC web site to Mobile App development, so that students are able to perform requirement analysis and design of simple web applications, and develop practical web applications using MVC design pattern.

Course Objectives

At the end of the course, the students are expected to be able to:

- Build SSM development environment correctly
- Prepare database
- Use the classic five-layer structure (model layer, data access layer, business logic layer, control layer and view layer) to implement the most classic login module and create, delete, read and update (CRUD)management module of a web system.
- Implement login detection using interceptor
- Implement pagination of list pages
- Familiarize with the applications of JavaScript in the front end
- Develop front-end applications using HTML, CSS, and JavaScript
- Master the use of vue framework
- Master the use of Adobe XD software
- Master the use of Adobe Photoshop software
- Master the basic development of Android
- Possess certain drafting ability
-

COURSE OUTLINE

Practical CONTENTS	**Hours**
1. **Backend planning** 1.1 System architecture design 1.2 Database design 1.3 Prepare database resource	6
2. **Backend development** 2.1 Install the required jar package 2.2 Prepare the project environment 2.3 Build the development environment	26

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2.4 Development of each module	
3. **Frond end analysis and prototype design**	6
3.1 Project requirement analysis	
3.2 Webpage layout design	
4. Frond end development	26
4.1 Install vue, create project	
4.2 Install vue scaffold	
4.3 Development page	
4.4 Create components for each page	
4.5 Write the layout of each page	
5. **Android App analysis and prototype design**	6
5.1 Requirement analysis	
5.2 Introduction of prototype design tools	
6. **APP development**	26
6.1 Prototype design	
6.2 Develop each module of App	
6.3 Operate on simulator or real machine	

Total Hours: 96

References:

- **None**

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LIST OF PRACTICALS

1. System architecture design
2. Design the database required by the project as a whole
3. Import the required data through the database file
4. Import the required jar package through the resource file from the teacher
5. Create projects through IDE and create a wide range of dependencies to pom.xml
6. Develop the functions of account login, verification login and logout
7. Develop account management module
8. Install vue scaffold and analysis its structure
9. Create components for each page
10. Implement data transfer of each page through the route of vue.js
11. Run the project successfully
12. Master the use of Adobe XD software
13. Master the use of Adobe Photoshop software
14. Familiarize with the development environment of Android studio
15. Make a simple APP
16. Write code for layout files
17. Write code for java files
18. Run on simulator or real machine through debugging

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DAE CIVIL TECHNOLOGY
YEAR 3

سال سوئم

حصہ اول اسلامیات

تدریس مقاصد

قرآن حکیم

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

خصوصی مقاصد: طالب علم اس قابل ہو جائے گا کہ

سورۃ الفاتحہ: آیۃ الکرسی۔ سورۃ البقرۃ کی آخری آیات از امن الرسول سے اور سورۃ الفلق کا ترجمہ، تشریح کر سکے

طالب علم درج ذیل کا مفہوم بیان کر سکے

- ☆ رب العالمین صرف اللہ تعالیٰ ہے
- ☆ اللہ رحم کرنے والا ہے
- ☆ قیامت کے دن بادشاہی اللہ کی ہو گی
- ☆ عبادت اور استعانت کا حقدار صرف اللہ ہے

طالب علم درج ذیل کا مفہوم بیان کر سکے

- ☆ اللہ پاک ہر عیب سے پاک ہے
- ☆ اللہ کے اسمائے حسنہ حق اور قیوم ہیں
- ☆ تعلیم انبیاء پر ایمان لانا ضروری ہے
- ☆ رسول، ملائکہ، کتب سماویہ پر ایمان لانا فرض ہے
- ☆ اطاعت حقیقی صرف اللہ کے لیے ہے
- ☆ اسلامی اخلاقیات پر عمل کرنا انسانی بساط میں ہے
- ☆ کفر کو اللہ کی مدد کے بغیر شکست نہیں دی جا سکتی
- ☆ اللہ ایک ہے
- ☆ اللہ کسی کا محتاج نہیں نہ اس کا کوئی شریک ہے

منتخب احادیث

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

خصوصی مقصد:

- ☆ احادیث کا ترجمہ بیان کر سکے

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Date: 17-5-22
Sign:

☆ احادیث کی تشریح کر سکے

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

حقوق و فرائض

عمومی مقصد: اسلامی معاشرے کا ایک اچھا فرد بن سکے

خصوصی مقاصد:

☆ والدین کے حقوق و فرائض بیان کر سکے

☆ ہمسایوں کے حقوق بیان کر سکے

☆ اسلام میں حقوق و فرائض ادائی 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 درگزر کی اہمیت بیان کر سکے

☆ ایفائے عہد کی اہمیت بیان کر سکے

☆ اخوت کے معنی و مفہوم کو بیان کر سکے

☆ اخوت اسلامی کی اہمیت بیان کر سکے

☆ اسلام کی اعلیٰ اقدار کو اپنا کر مثالی معاشرہ پیدا کر سکے

نصاب (سال سوئم)	QEN 311	ٹی پی سی
مطالعہ پاکستان		1 0 1
حصہ دوئم		کل وقت: 20 گھنٹے

موضوعات

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

APPROVED
Date: 17-5-22
Sign:

(غیر مسلم طلباء کے لئے)

نصاب اخلاقیات		ٹی پی سی
سال سوئم	Qen 311	1 0 1
موضوعات		کل وقت: 20

کرے

☆ احساس ذمہ داری
☆ ثبت ذہن
☆ عدل و انصاف
☆ قومی خدمت کا جذبہ
☆ ذکر و نظر کی پاکیزگی
☆ احترام آدمیت
☆ شائستگی
☆ عفو و درگزر
☆ بردباری
☆ خود انحصاری
☆ اثر و نفوذ
☆ جامعیت
☆ اپنی ذات کی معرفت (بذریعہ ہم عمر طلباء۔ اساتذہ۔ اہم شخصیات کوارہ)
☆ قرار داد مقاصد کی تفصیلات بیان کر سکے
☆ 22 علماء کے متفقہ اسلامی نکات بیان کر سکے
☆ قیام پاکستان کے بعد نفاذ اسلام کی کوششوں کو بیان کر سکے
☆ پاکستان کے محل وقوع اور اس کی جغرافیائی اہمیت بیان کر سکے
☆ پاکستان میں قدرتی وسائل (تیل۔ گیس۔ کوئلہ) کے بارہ میں بیان کر سکے

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(غیر مسلم طلباء کے لئے)

نصاب اخلاقیات

سال سوئم

تدریس مقاصد

عمومی مقصد: ملکی ترقی کے لیئے اعلیٰ اوصاف کے ساتھ بہتر طور پر ملک و ملت کی خدمت کر سکے

خصوصی مقاصد: طالب علم اس قابل ہو گا کہ

- ☆ موضوعات کا مطلب بیان کر سکے
- ☆ عملی زندگی سے مثالوں کی نشاندہی کر سکے
- ☆ موضوعات کی اہمیت بیان کر سکے
- ☆ اپنی شخصیت اور معاشرے پر موضوعات کے مطابق اثرات پیدا کرنے کے طریقے بیان کر سکے
- ☆ مثبت ذہن کے ساتھ کام کر سکے
- ☆ عدل و انصاف سے ادارہ میں، دفتر میں بہتر ماحول پیدا کر سکے
- ☆ ماحول کو اخلاقی طور پر پاکیزہ بنائے
- ☆ کارکنوں کی بہتر طور پر دل جوئی کر سکے
- ☆ کارکردگی میں اضافہ کر سکے
- ☆ باہمی احترام کی برکات سے استفادہ کر سکے

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		T	P	C
Course Code:	**Eng 311**			
Course Title:	**Technical Report Writing**	**1**	**0**	**1**

Third English course in this technology program. It aims to provide students with opportunity to sharpen their skills in using the English language through writing technical reports. It covers the basics of technical writing, techniques, document design, applications of technical writing and oral reports. It is theory class.

Course Objectives

At the end of the course the students are expected to be able to

- Understand the basic techniques of technical writing.
- Use these techniques to write readable technical report
- Compose and write technical reports
- Present effective oral reports
- Write legibly in English language
- Integrate English language as second language

COURSE OUTLINE

Contents	Hours
1. Introduction to Technical Writing 1.1. Substance of Technical Writing 1.2. Nature of Technical Writing 1.3. Qualities of Good Technical Writers 1.4. Qualities of Good Technical Writing	**2**
2. Fundamentals of Technical Writing 2.1. Composing 2.2. Cooperative Writing 2.3. Readers of Technical Writing 2.4. Collecting and Verifying Information 2.5. Readable Style	**6**
3. Techniques of Technical Writing 3.1. Informing 3.2. Defining 3.3. Describing 3.4. Arguing	**6**
4. Document Design in Technical Writing 4.1. Document Design	**6**

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4.2. Design Elements of Reports
4.3. Graphical Elements of Reports

5. Application of Technical Writing **8**
5.1. Correspondence
5.2. Instructions
5.3. Proposals
5.4. Progress Report
5.5. Feasibility Report

6. Oral Reports **4**
6.1. Preparations
6.2. Delivery Techniques
6.3. Presentation
6.4. Visual Aids

Total Hours: 32

References

- **Reporting Technical Information, 7Ed.**, K. Houp, T. Pearsall, et. al., MacMillan
- **Writing by Design, A Handbook for Technical Papers**, M. Greene, J. Ripley, Prentice Hall
- **Strategies for Technical Writing, A Handbook with Readings**, M. Lay, Holt Rinehart Winston

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Eng 311 – Technical Report Writing

INSTRUCTIONAL OBJECTIVES

1. Introduction to Technical Writing
- 1.1. Differentiate technical writing from other forms of writing
- 1.2. Describe the nature of technical writing
- 1.3. List the characteristics of good technical writer
- 1.4. Describe the qualities of good technical writing

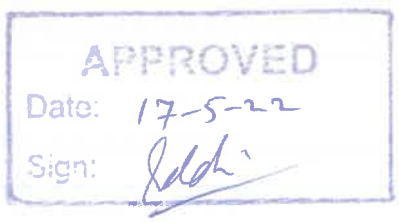
2. Fundamentals of Technical Writing
- 2.1. Compose good technical report
- 2.2. Identify the topic and purpose of a technical writing
- 2.3. Draft and revise technical report
- 2.4. Use fundamentals of technical writing to write good report
- 2.5. Plan a technical writing with several writers
- 2.6. Identify different readers of technical writers
- 2.7. Search literature for topics in technical writing
- 2.8. Write letter of inquiry
- 2.9. Write report with list and tables
- 2.10. Compose technical report that is grammatically correct and readable

3. Techniques of Technical Writing
- 3.1. Write readable report that informs
- 3.2. Use visual language, analogy, and process description to write technical report
- 3.3. Write readable report that define and describe
- 3.4. Write readable report that describe a process
- 3.5. Write readable and persuasive report that argue
- 3.6. Compose technical writing that persuade

4. Document Design in Technical Writing
- 4.1. Use correct formatting for technical writing
- 4.2. List the elements of a report
- 4.3. Describe each element of a report
- 4.4. Write report that has all the elements of report
- 4.5. Use correctly documentation formats in technical writing

5. Application of Technical Writing
- 5.1. Identify different forms of technical writing
- 5.2. Write readable correspondence
- 5.3. Write readable Instructions
- 5.4. Write readable proposals
- 5.5. Write readable progress report
- 5.6. Write feasibility report

6. Oral Reports
- 6.1. Describe elements in preparing an oral report
- 6.2. Identify different techniques of oral delivery of report
- 6.3. Present report with visual aids



Course Code:	**CIT 333**	**T**	**P**	**C**
Course Title:	**Operating System**	**2**	**3**	**3**

Operating System is a course on the main system software that manages the resources of the computer system. It aims to provide students with the understanding and operational principles of operating system. The course covers the issues of managing the resources of a computer by an operating and the implementation and techniques used by Unix/Linux system to address the issues. This comes with laboratory to enhance the classroom discussion.

Course Objectives

At the end of the course the students are expected to be able to

- Understand the concepts and issues of managing the resources of a computer by an operating system.
- Understand the operational principles and implementation of Unix/Linux/Linux operating system
- Use shell commands to administer the system.
- Run application programs in Unix/Linux/Linux environment
- Perform system administer
- Demonstrate motivation to use and administer systems in Unix/Linux/Linux platform

COURSE OUTLINE

Contents	*Hours*
1. Computer System Structures 1.1. Computer System Operation 1.2. I/O Structure 1.3. Storage Structure and Hierarchy 1.4. Hardware Protection	**4**
2. Operating System Structures 2.1. System Components 2.1.1. Process Management 2.1.2. Memory Management 2.1.3. Disk and Storage Management 2.1.4. File System 2.2. OS Services and System Calls 2.3. System Programs and Structure 2.4. System Design and Implementation	**10**
3. Unix/Linux Implementation 3.1. Logging In and Logging Out to the System	

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3.2. Configuring the Environment and Managing the Password
3.3. Unix/Linux Manual System
3.4. Unix/Linux File System and File System Organization
3.5. File Types, Names and Directories
3.6. Managing Directories: File and Directory Permissions

4. Unix/Linux Commands **16**
4.1. User-Related, Locating and Search
4.2. Usage Determination and Process-related Commands
4.3. File and Directory Manipulation
4.4. File Content and File Content Search
4.5. Printing and Scheduling
4.6. Storage and Status
4.7. Miscellaneous Commands

5. Text Processing **6**

6. Bourne Shells **6**
6.1. Introduction
6.2. Bourne Shell Basics

7. System Administration **16**
7.1. System Administration Tasks
7.2. Unix/Linux Installation Basics
7.3. Resource and User Administration
7.4. File System and Disk Administration
7.5. System Accounting and Performance Monitoring
7.6. Device and Mail Administration
7.7. UUCP and FTP Services Administration
7.8. Backing Up and Restoring the System

Total Hours: ***64***

References

- **Operating System Concepts, 5Ed.**, A. Silverschatz and P. Galvin, Addison-Wesley Publishing Co.
- **Unix/Linux Unleashed, 3Ed**, Robin Burk, et al., Sams Publishing
- **The Linux User's Guide**, Larry Greenfield
- **Unix System Management**, Robert King Ables
- **Red Hat Linux 6.0**, Red Hat Software, Inc.
- **Hand-on Unix: A Practical Guide with the Essentials**, Sobell
- **The Linux Users' Guide**, Larry Greefield
- **UNIX-The Text Book by Mansoor Sarwar**

LIST OF PRACTICAL

1. Logging On and Logging Out in Unix/Linux System
2. Setting the password
3. Configuration of Own Environment
4. Using Manual Pages
5. Using User-related Commands login, rlogin, telnet, passwd, exit, which, whence, where, man
6. Using Process-related Commands: kill, nice, ps, jobs, wait, nonup, sleep,
7. Using File and Directory Commands: touch, chmod, chgrp, chown, rm, mv, cp, cat, rcp, ln, mkdir, rmdir, ls, find, file
8. Using File Content and Search Commands: more, less, tail, head, wc, read, od, pg, tee, vi, egrep, fgrep, strings
9. Using Printing and Scheduling Commands: cancel, lp, pr, lpstat, at, atq, crontab
10. Using Storage and Status Commands: compress, cpio, dd, pack, pcat, tar, uncompress, unpack, zcat, date, env, iostat, sar, uname, uptime, vmstat
11. Using Text Processing Commands: cut, ex, fmt, fold, join, paste, sort, tr, uniq, sed
12. Using Miscellaneous Commands: banner, bc, cal, clear, time
13. Text Editing Using vi
14. Installing Unix/Linux
15. Adding New User
16. Mounting and Unmounting File System
17. Creating and Repairing File System
19. Manual System Accounting Setup
20. System Accounting Report Generation
22. Connecting and Setting Up Printers
23. Backing up and Restoring System

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CIT 333 – Operating System

INSTRUCTIONAL OBJECTIVES

1. Computer System Structures

1.1. Describe the general operations of computer
1.2. Describe interrupts
1.3. Identify different I/O devices
1.4. Describe the structure of input/output system
1.5. Describe different storage devices
1.6. Explain the hierarchy of storage devices
1.7. Identify the protection issues encountered in a computer system
1.8. Describe protection methods of computer operation

2. Operating System Structures

2.1. List functions of an operating system
2.2. Describe the functions of an operating system
2.3. Explain memory management techniques.
2.4. Describe virtual memory
2.5. Describe hierachical directory system.
2.6. Describe UNIX file system
2.7. Explain disk management system
2.8. Explain how the operating system manages the resources of a computer
2.9. Enumerate OS services and explain the service
2.10. Define system calls
2.11. Identify system programs that come with the operating system
2.12. Describe the functions of these system programs
2.13. Describe the general structure and architecture of an operating system
2.14. Illustrate the structure by diagrams
2.15. Discuss design goals of the operating system

3. Unix/Linux Implementation

3.1. Discuss the development of Unix/Linux development
3.2. Explain the design principles of Unix/Linux
3.3. Log in and log out in the system
3.4. Configure the user own environment
3.5. Change and manage own password
3.6. Use Unix/Linux help system (Manual System)
3.7. Characterize Unix/Linux file system and its organization
3.8. Name correctly file and directory
3.9. Create and delete files and directories
3.10. Set the permissions of files and directories

4. Unix/Linux Basic Commands

4.1. Invoke correctly Unix/Linux commands used in user and user-determination and file search
4.2. Invoke correctly Unix/Linux commands used in administration of own environment and process-related job
4.3. Use correctly Unix/Linux commands to manipulate files and directories
4.4. Use correctly Unix/Linux commands to search and view at contents of files
4.5. Print files using Unix/Linux commands

4.6. Use correctly Unix/Linux scheduling commands
4.7. Use correctly Unix/Linux storage and status commands
4.8. Invoke correctly text processing command
4.9. Use other miscellaneous commands available to Unix/Linux

5. Text Processing

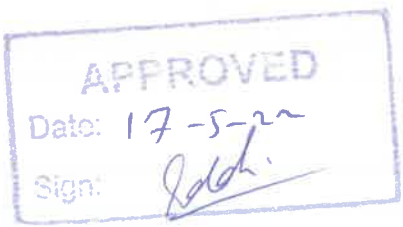
5.1. Invoke vi editor
5.2. Compose text using vi editor
5.3. Describe different mode of vi editor

6. Unix/Linux Shells

6.1. Define Unix/Linux shells
6.2. Explain the functions of shell
6.3. Describe Bourne Shell of Unix/Linux
6.4. Use Bourne shell in Unix/Linux

7. System Administration

7.1. Describe Unix/Linux system administration
7.2. Describe tasks of Unix/Linux system administration
7.3. Identify hardware requirements of Unix/Linux system
7.4. Plan and Install Unix/Linux
7.5. Start up and shutdown Unix/Linux
7.6. Add and maintain new users in the system
7.7. Set permission to users
7.8. Manage and repair file systems
7.9. Create file systems
7.10. Describe Unix/Linux system basic accounting
7.11. Set up accounting system in Unix/Linux
7.12. Describe performance monitoring in Unix/Linux
7.13. Use tools for monitoring performance of the system
7.14. Describe services facility provided by Unix/Linux
7.15. Describe device administrative tasks
7.16. Install printer to Unix/Linux system
7.17. Describe email facility of Unix/Linux
7.18. Describe mail transfer agents
7.19. Explain UUCP and FTP services
7.20. Describe FTP protocol
7.21. Setup and administer FTP services
7.22. Explain purpose of backup
7.23. Back -up and restore Unix/Linux system



Course Code:	CIT - 344	T	P	C
Course Title:	**Graphic Designing**	2	6	4

Course on Graphic Designing using Adobe Photoshop, Corel Draw, AutoCAD and Wilcom. It aims to provide students with practical exercise and knowledge on designing graphics, designing websites and drawing computer embroidery. It covers all major topics of Graphic layers. This comes with practical component to complement classroom discussion.

Course Objectives

At the end of the course, the students are expected to be able to

- Understand basic concepts to design websites and embroidery industry design.
- What tools or knowledge will help you get to the next phase in your career?
- Moving beyond branding and starting our own businesses.
- Building our own brand.
- How to design in a broader sense than fonts and paper (i.e., traditional graphic design)
- Seeking employment as a Graphic Designer to use skills with computers and the visual arts.
- More experience and more learning

COURSE OUTLINE

Contents	*Hours*
1. Introduction 1.1. Thinking Design 1.2. The Concept of Graphic Designing 1.3. What does a designer do? 1.4. What is the difference between a graphic designer and an illustrator? 1.5. What is it like being a graphic designer? 1.6. What are the applications of graphic design?	2
2. Introduction to Adobe PhotoShop 2.1. Adobe Photoshop Tools Overview 2.2. What are pixels? 2.3. Why Use Adobe Photoshop Layers? 2.4. What is a Layer? 2.5. Layers Panel 2.6. Types of Layers 2.7. Layers Short Keys	2
3. Adobe PhotoShop 3.1. Use Magic Wand tool. 3.2. Use Polygonal Lasso Tool. 3.3. Use Pen Tool	3

3.4. Change Colors with Edit in Quick Mask Mode
3.5. Shining Face
3.6. Brightness Face
3.7. Photo Retouching

4. Advanced Adobe PhotoShop **10**

4.1. Adding Eye Lashes
4.2. Use Brush tool
4.3. Makeup to a girl
4.4. Smudge tool
4.5. Filter
4.6. Sponge tool
4.7. Light Effects on an Image & Cloth
4.8. Oil Paint conversion
4.9. Convert image into sketch
4.10. Glamour Effect
4.11. Fabric Folds
4.12. Reflections
4.13. 3D Box Design
4.14. Use pen tool
4.15. Layer Style
4.16. Gradient Effect
4.17. Type Text
4.18. Shapes Tool Draw some Shapes on the box and some effects

5. Adobe PhotoShop– Designing Website **6**

5.1. Web site Design
5.2. Project Web site Design

6. Introduction to Corel draw **6**

6.1. What is CorelDRAW?
6.2. Kind of Designing
6.3. Kind of Media
6.4. Pick Tool Overview
6.5. Reshaping objects using Nodes
6.6. Aligning Objects
6.7. The duplicate command
6.8. Welding objects, Trimming objects
6.9. Intersecting objects
6.10. Simplify and Back Minus Front — Front Minus Back
6.11. Smudge Brush
6.12. Roughen Brush
6.13. Crop Tool
6.14. Knife and Erase
6.15. Virtual segment Delete
6.16. Convert outline object

7. Advanced Corel draw **10**

7.1. Freehand Tool, Bezier Tool, Artistic Media Tool, Pen
7.2. Poly Line Tool, 3 Point Curve
7.3. Connector and Dimension Tools
7.4. Spiral Tool, Polygon Tool

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7.5. Graph Paper Tool ,Complex Shape tools
7.6. Basic Shapes
7.7. Symbol Character
7.8. Text Tool
7.9. Interactive Tools for Fast Changes
7.10. Interactive Bend
7.11. Interactive Contour
7.12. Interactive Distort
7.13. Interactive Drop Shadow
7.14. Interactive Envelope
7.15. Interactive Extrude
7.16. Interactive Transparency
7.17. Eyedropper Tool Flyout
7.18. Outline Tool Flyout
7.19. Fill Tool Flyout

8. **Introduction To AutoCAD** 4
8.1. Introduction to Systems
8.2. Startup Command
8.3. Unit Set Command
8.4. Drawing Commands
8.5. Basic Commands

9. **AutoCAD 2D** 6
9.1. Creating Commands(Circle)
9.2. Creating Commands(Arc)
9.3. Apply Commands
9.4. Draw Commands -I
9.5. **Layers**
9.6. Draw Commands -II
9.7. Hatch and Blocks Commands
9.8. **Elevation Drawing**

10. **AutoCAD 3D** 6
10.1. **3D Drawing**
10.2. **3D Commands**
10.3. **Creating** a Building in 3D
10.4. AutoCAD Keyboard Shortcuts

11. **Introduction to Computerized Embroidery** 4
11.1. Introduction to Toolbars
11.2. View, Outline and Control Points
11.3. Vectors & Images Sketching Designing
11.4. Input Tools
11.5. Pointer Tools
11.6. Shaping Tools

12. **Advanced Computer Embroidery** 4
12.1. Duplicating Designs
12.2. Stitches Types
12.3. Travel
12.4. Generate
12.5. Automatic Digitizing
12.6. Creating Embroidery Lettering

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Total Hours: 64

References:-

- **Adobe Photoshop CC Classroom in a Book (2015 release), Andrew Faulkner and Conrad Chavez**
- **Photoshop Elements 14 For Dummies,** Barbara Obermeier and Ted Padova
- **CorelDRAW X7: The Official Guide**, Gary David Bouton
- **Coreldraw! for Dummies (For Dummies Computer Book Series),** Deke McClelland
- **AutoCAD 2016 For Beginners**, CADFolks
- **Mastering AutoCAD 2016 and AutoCAD LT 2016,** George Omura and Brian C. Benton, Autodesk Official Press
- **AutoCAD 2016 Instructor**, James Leach
- **Digitizing Made Easy: Create Custom Embroidery Designs Like a Pro,** John Deer
- **Fashion Design for Living,** Alison Gwilt

CIT-344 Graphic Designing

LIST OF PRACTICALS:-

1. Adobe Photo-Shop
   - 1.1. Editing Face beauty using Photo tools
   - 1.2. Convert an image into sketch and apply light effects
   - 1.3. Project Website Design
2. Corel draw:
   - 2.1. Write different kinds of Designing & Media
   - 2.2. Draw rectangular objects of equal size
   - 2.3. Reshaping objects like Fruits and Face parts
   - 2.4. Designing a house or a building
   - 2.5. Aligning an object
   - 2.6. Transformation of and object
   - 2.7. Designing a flower
   - 2.8. Draw Pakistan flag
   - 2.9. Design a tree
   - 2.10. Draw rectangle and round it using crop tools
   - 2.11. Designing a tea pot
   - 2.12. Draw a thing and clone it
   - 2.13. Design a leap
   - 2.14. Design cloths of a baby
   - 2.15. Designing a coat
   - 2.16. Design a rose flower
   - 2.17. Design paper borders
   - 2.18. Draw a polygon object
   - 2.19. Draw stars using complex star tools
   - 2.20. Desning a spiral shape
   - 2.21. Design a flower using basic shapes
   - 2.22. Write the name of the institute in a circle
   - 2.23. Design a logo of your institute
   - 2.24. Draw an object having showing shadow & transparency
   - 2.25. Designing a neckles
   - 2.26. Design an Interactive Envelope
   - 2.27. Draw pipe of a house using interactive tools
   - 2.28. Create a mango & apply Mesh tools
   - 2.29. Export of Files
   - 2.30. Assignment to import files and Inpage
   - 2.31. Assignment to Logo and Visiting Card
   - 2.32. Assignment to Flex sign Design
   - 2.33. Assignment of Embroidery Design
   - 2.34. Assignment of Graphic Design
   - 2.35. Girl Face Design
3. AutoCAD
   - 3.1. Define a measuring system with five examples
   - 3.2. Draw a Line of size 20'x5'
   - 3.3. Convert a line to Polyline
   - 3.4. Create a smooth curve that passes through or near specific points
   - 3.5. Draw a rectangle, circle based on a center point, radius and three point circle
   - 3.6. Draw an arc using three points
   - 3.7. Draw angular 45 angle, 5 inch
   - 3.8. Draw all 45^0 angles
   - 3.9. Draw a door
   - 3.10. Create and angled corner between two lines
   - 3.11. Create repeating pattern of an object
   - 3.12. Building a wall showing bricks
   - 3.13. Create and ellipse or an elliptical arc
   - 3.14. Draw a table with 4 chairs
   - 3.15. Draw a box, wedge, cone sphere and circle
   - 3.16. Draw a single story house in 3D effect

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Course Code: **SWT-312**

Course Title: **Advanced HTML5 Web Page Development**

T	P	C
1	3	2

This course covers front-end application development. It aims to enable students to develop front-end/mobile application projects through practice. It covers the basic development and operation techniques and usage skills of UI interaction, frontend-backend communication and API calling.

Course Objectives

At the end of the course, the students are expected to be able to:

COURSE OUTLINE

COURSE CONTENTS	Hours
1. Review of HTML5 basics and introduction to new characteristics 1.1 Review of basics 1.2 Introduction to new characteristics 1.3 Basic effect display of HTML5 tag	2
2. Visual studio code 2.1 Creation of web front-end projects 2.2 Personalization of Visual studio code 2.3 Project debugging in Visual studio code	2
3. CSS3 style sheet 3.1 Basics of CSS3 3.2 Using CSS to manage page format 3.3 Using CSS technology to quickly build lightweight search box	4
4. Responsive page development based on bootstrap framework 4.1 Basic layout concept of bootstrap 4.2 Develop basic news pages and implement responsiveness	4
5. CSS3 Flex Layout Practice 5.1 Basic characteristics of Flex layout	4

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5.2 Using flex layout to develop news pages
5.3 Using flex layout to ensure responsive effect

6. Webpage Piano and DOM operation 4
6.1 Using CSS3 to implement basic layout of webpage piano.
6.2 Implement interaction between piano and users through events
6.3 New characteristics of ES6 and basic asynchronous operation
6.4 Implement audio play with button pressed by users

7. Canvas fundamentals **4**
7.1 Basic usage and style design of Canvas;
7.2 How to draw graphics in Canvas;
7.3 Call, render, crop, and scale images;
7.4 Various image display effects;
7.5 Deformation method of images;
7.6 Image combination method; Master basic animation production

8. Implement cross-platform scratch-off lottery-draw effect 4
8.1 Drawing basic layout using canvas
8.2 Binding events to implement rendering of basic effect
8.3 Implement the probability lottery-draw function
8.4 Deploy with nginx and test the access effect on mobile platform

9. Perform frontend-backend interaction with Node.js 2
9.1 Server configuration management
9.2 Implement Get request;
9.3 Implement Post request

10. Design and development of HTML5 Link-Link game 2
10.1 Drawing basic scenarios of game using canvas
10.2 Binding events to implement rendering of basic effect
10.3 Design and implement automatic path finding function
10.4 Implement elimination function
10.5 Persistent storage of implementation progress
10.6 Function of uploading game score to server

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Total Hours: 32

References

- **"Basics and Practice of HTML5 Cross-platform Development"**, edited by Wang Yinfeng, etc. Higher Education Press, March, 2021.
- **"Responsive Web Design with HTML5 and CSS: Develop future-proof responsive websites using the latest HTML5 and CSS techniques",** 3rd Edition by Ben Frain
- https://javascript.info/

LIST OF PRACTICALS

1. Integrated development environment of Visual studio code
2. Webpage piano
3. Link-Link Canvas applications
4. Node.js server development
5. Cross-platform scratch-off
6. Responsive page development based on bootstrap framework
7. CSS3 Flex Layout Practice

INSTRUCTIONAL OBJECTIVES

1. Master how to use Visual studio code to develop HTML5 projects
2. Master design and development of HTML5 page
3. Master DOM-related knowledge
4. Master JavaScript DOM;
5. Develop the ability to draw graphics with Canvas;
6. Develop the ability to directly complete basic image processing with Canvas;
7. Develop the ability to design animation
8. Develop the ability to design system interface with HTML5;
9. Develop the ability to use CSS specification to write web pages in unique style;
10. Develop the ability to use simple Bootstrap components

Course Code: **SWT-322** **T P C**
Course Title: **Advanced Development with JAVA** **1 3 2**

As a professional basic course which is both theoretical and practical, the course covers the advanced technology of Java language programming. It aims to enable students to master the core theories and technologies in Java programming, including multithreading, Java API classes, collections class, IO streams, and the principle and implementation of network programming, and to use the theoretical knowledge learned to develop and redevelop some small-scale Java applications.

Course Objectives

At the end of the course, the students are expected to be able to:

- Master the implementation of multithreading
- Master thread synchronization
- Master thread communication
- Master the use of classes in Java API, and be able to perform relevant programming.
- Master the use of collections class in Java API, and be able to perform relevant programming.
- Master the use of byte/character streams, other IO streams, File class and character encoding, and be able to perform relevant programming.
- Understand the basic knowledge of network programming and the basic principles of network communication, and basically master how to develop network programs with Java language.

COURSE OUTLINE

COURSE CONTENTS	Hours
1. Java Multithreading	**8**
1.1. Implement multithreading	
1.2. Thread synchronization	
1.3. Thread communication	
1.4. Basic implementation principle of multithreading	
2. Java API Classes	**8**
2.1. String and StringBuffer class	
2.2. System class and Runtime class	
2.3. Java Math and Random class	
2.4. Java package class	

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2.5. Date class, Calendar class and DateFormate class
2.6. Master the use of common classes in Java API

3. Java Collections Classes **8**
3.1. Collections interface
3.2. List: List interface and its implementation class
3.3. Collections: Set interface and its implementation class
3.4. Mapping: Map interface and its implementation class
3.5. Master the use of collections class in API

4. Java IO Streams **4**
4.1. Byte streams
4.2. Character streams
4.3. Other IO streams
4.4. File class
4.5. Byte/character stream, other IO streams, File class and character encoding

5. Network Programming **4**
5.1. Fundamentals of network programming
5.2. Common network applications
5.3. TCP and UDP network programs based on sockets
5.4. Understand the basic knowledge of network programming and the basic principles of network communication

Total Hours: 32

References:

- **"Introduction to Java Fundamentals"**, edited by Higher Education R&D Department of ITCast, 2014 (reprinted in January 2018).
- **"Thinking in Java"**, 4th Edition by Bruce Eckel
- **"Head First Java"**, 2nd Edition by Kathy Sierra and Bert Bates

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LIST OF PRACTICALS

1. Implement multithreading with Thread
2. Scheduling of thread
3. Life cycle and state transition of thread
4. Implement multithreading with Runable
5. Synchronization of threads
6. Producer consumer model
7. Use the String class
8. Use the StringBuffer class
9. Use the System class and Runtime class
10. Use the Math class and Random class
11. Use the packaging class
12. Use the Date class and DateFormate class
13. Use the Calendar class
14. Use the Collections interface
15. Use the List interface and its implementation class
16. Use the Set interface and its implementation class
17. Use the Map interface and its implementation class
18. Use the Collections and Arrays tool class
19. Use generics
20. Use the File class
21. Use the Byte stream
22. Five methods of writing data by character stream
23. Two methods of reading data by character stream
24. Copy files using character streams
25. UDP sending data (application)
26. UDP receiving data (application)
27. TCP communication
28. TCP communication

SWT-322 - Advanced Development with JAVA

INSTRUCTIONAL OBJECTIVES

1. Java multithreading

1.1. Master the concepts of process and thread
1.2. Master the inheritance of Thread class to implement multithreading
1.3. Familiarize with getting and setting the thread name
1.4. Master thread priority and thread scheduling
1.5. Master the control of thread
1.6. Implement Runnable interface to implement multithreading
1.7. Use synchronization code block to implement thread synchronization.
1.8. Familiarize with introduction and implementation of producer consumer model
1.9. Understand the basic implementation principle of multithreading

2. Java API classes

2.1. Master the use of common class in Java API
2.2. Learn the String and StringBuffer class
2.3. Learn the System class and Runtime class
2.4. Learn the Math class and Random class
2.5. Learn the Packaging class
2.6. Learn the Date class, Calendar class and DateFormate class

3. Java collections classes

3.1. Master the Collection interface
3.2. Master the List: List interface and its implementation class
3.3. Master the Collection: Set interface and its implementation class
3.4. Master the Mapping: Map interface and its implementation class
3.5. Master the use of collection class in Java API

4. Java IO stream technologies

4.1. Master byte/character streams
4.2. Master the use of other IO streams, File class and character encoding

5. Network programming technologies

5.1. Familiarize with basic knowledge of network and Java URL class and its application
5.2. Familiarize with how to read WWW network resources from URL
5.3. Familiarize with how to connect to WWW through URL Connection
5.4. Familiarize with Java's underlying communication Socket and UDP Socket
5.5. Master UDP Socket development process
5.6. Familiarize with the basis of network programming
5.7. Familiarize with basic principles of network communication
5.8. Master how to develop network programs with Java language

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Course Code: SWT-332
Course Name: **Machine Learning Applications**

T	P	C
1	3	2

This course introduces the knowledge, development process, model selection and tuning of machine learning development and applications, and how to use relevant technology in the actual environment. It aims to enable students to understand the basic knowledge of machine learning, master the applications of machine learning and familiarize with python mathematical tools. It covers introduction to the knowledge, development process, model selection and tuning, and how to use relevant technology in the actual environment.

Course Objectives

At the end of the course, the students are expected to be able to:

- Understand the fundamentals and development of machine learning
- Master the working principle, process, and applications of machine learning
- Logical analysis, development and solution to issues related to machine learning
- Familiarize with the use of Python and other mathematical tools, and data analysis and preprocessing
- Master the methods of serialization and deserialization models with pickle and jolib
- Master the machine learning model tuning methods and generating model skills
- Master the evaluation methods of machine learning algorithm
- Models applications in different scenes

COURSE OUTLINE

COURSE CONTENTS	Hours
1. Introduction 1.1. Concept of machine learning 1.2. History of machine learning 1.3. Application and significance of machine learning 1.4. Process and applications of machine learning 1.5. Analysis and solution to issues related to machine learning	2
2. Python Mathematical Tools 2.1. Build Python development environment 2.2. Use NumPy, SciPy array operation 2.3. Use Pandas operating data 2.4. Plot graphics using Matplotlib	4

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3. Data Understanding	**4**
3.1. Data import	
3.2. Data understanding	
3.3. Data visualization	
4. Data Preparation	**4**
4.1. Data preprocessing	
4.2. Data characteristics selection	
5. Model Selection	**4**
5.1. Evaluation method of model	
5.2. Introduce algorithm evaluation matrix	
5.3. Machine learning models	
5.4. Comparison of machine learning algorithms	
6. Model Optimization	**4**
6.1. Ensemble Learning	
6.2. Model parameter tuning	
7. Deployment	**2**
7.1. Serialization and deserialization of models	
8. Project Practice	**8**
8.1. Python template for machine learning	
8.2. Regression project	
8.3. Binary classification project	
8.4. Text classification project	

Total Hours: 32

References

- **"Machine Learning: Python Practice",** edited by Wei Zhenyuan, Publishing House of Electronics Industry, January 2018, 1st edition.
- **"Introduction to Machine Learning with Python: A Guide for Data Scientists"**
- by Andreas C. Müller and Sarah Guido
- **"Machine Learning in Action"** by Peter Harrington

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SWT-332 - Machine learning and applications

LIST OF PRACTICALS

1. General process of machine learning
2. Establishment of IDE for machine learning
3. Python class library, NumPy, Pandas and Matplotlib
4. Data visualization with Matplotlib
5. Evaluation and measurement of machine learning algorithms
6. Tuning of machine learning models
7. Serialization and deserialization models with pickle and jolib
8. Iris classification
9. House price analysis
10. News classification prediction

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SWT-332 - Machine Learning Applications

INSTRUCTIONAL OBJECTIVES

1. Understand the concept of machine learning
2. Master the concepts of basic terminologies
3. Master the general process of machine learning
4. Master the establishment of IDE for machine learning
5. Proficient in machine learning programming using Python
6. Learn to use Python libraries
7. Understand csv file format
8. Master the methods of importing data using Python class library, NumPy, Pandas
9. Able to view and describe data
10. Able to briefly analyze data
11. Master the methods of data visualization using Matplotlib
12. Understand the necessity of data preprocessing
13. Master the methods of formatting data, adjusting data scale, normalizing data, and standardizing data
14. Understand the methods of feature selection
15. Understand the significance of features
16. Master the evaluation and measurement of machine learning algorithms
17. Understand the basic algorithm ideas of different models
18. Able to choose the appropriate model for different scenarios
19. Master the methods of comparison of machine learning algorithms
20. Understand the idea of ensemble method and its applications for model performance enhancement
21. Master the methods of tuning machine learning models
22. Understand the necessity of model persistence
23. Master the methods of serialization and deserialization models with pickle and jolib
24. Master the skills of generating model
25. Master the Python template for machine learning and its applications
26. Complete the whole process of machine learning based on specific scenarios

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Course Code: **SWT-342** T P C
Course Title: **Advanced Android APP Development** 1 3 2

This course discusses the advanced development content of Android development, mainly equips students with knowledge and skills of Android programming in order to develop mobile applications based on Android with JAVA object-oriented programming. It covers Android development environment establishment, application structure analysis, Android layout management, four components of application, basic controls, advanced controls, menus and dialog boxes, Android event handling, application interaction, CS communication, BS communication, etc.

Course Objectives

At the end of the course, the students are expected to be able to:

- Master the installation and configuration of Android Studio and JAVA
- Familiarize with Android Studio to manage, configure, develop, and debug Android projects
- Be able to use JAVA to develop basic backend servers and establish network communication protocols
- Be able to develop basic databases with MYSQL
- Complete BS communication and CS communication
- Master the full-stack development skills of mobile apps

COURSE OUTLINE

CONTENTS	Hours
1. Requirement Analysis 1.1 Requirement analysis based on use case diagram 1.2 Requirement analysis based on interface prototype	**2**
2 Development Design 2.1 Conceptual design 2.2 Detail design	**2**
3 Android Interface Design 3.1 Linear layout 3.2 Relative layout 3.3 Grid layout	**2**
4 Android Basic Control 4.1 Radio Button Demo 4.2 Check Box Demo 4.3 Scroll View Demo	**2**

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4.4 Spinner Demo
4.5 List View Demo

5 Android Advanced Control	**4**
5.1 Image View Demo	
5.2 Expandable List View Demo	
5.3 Menu Demo	
5.4 Gallery Demo	
5.5 Progress Bar Demo	
6 Android Event Handling	**4**
6.1 Event	
6.2 Broadcast	
6.3 Bus	
7 Android Activity and Intent	**4**
7.1 Activity management	
7.2 Activity life cycle	
7.3 Intent	
8 Android Network Communication	**2**
8.1 Backend server development	
8.2 Backend data management	
8.3 Network communication	
9 Volley Communication Mode	**2**
9.1 Backend server development	
9.2 Backend data management	
9.3 Network communication	
10 OKHTTP Communication Mode	**4**
10.1 Backend server development	
10.2 Backend data management	
10.3 Network communication	
11 Summary and Review	**4**
11.1 Consolidate the software learned this semester	
11.2 Review the knowledge learned this semester	

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References:

- **"Android Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides)",** 4th Edition by Bill Phillips, Chris Stewart, Kristin Marsicano and Brian Gardner

INSTRUCTIONAL OBJECTIVES

1. Requirement Analysis

1.1. Master requirement analysis based on use case diagram
- 1.1.1. Familiarize with system boundaries, participants, use cases and relationships
- 1.1.2. Master drawing the use case diagram

1.2. Master requirement analysis based on interface prototype
- 1.2.1. Design UI and develop the prototype system
- 1.2.2. Adjust UI and use case diagram according to user feedback

2. Development Design

2.1. Master conceptual design
- 2.1.1. Determine the number of class and class relationships
- 2.1.2. Draw the overall class diagram

2.2. Master detail design
- 2.2.1. Interface design
- 2.2.2. Data flow design
- 2.2.3. Activity design
- 2.2.4. Draw detailed class diagram

3. Android Interface Design

3.1. Design linear layout
3.2. Write linear layout code
3.3. Design relative layout
3.4. Write relative layout code
3.5. Design grid layout
3.6. Write grid layout code

4. Android Basic Control

4.1. Create RadioButton
4.2. Write RadioButton code
4.3. Create CheckBox
4.4. Write CheckBox code
4.5. Create ScrollView
4.6. Write ScrollView code
4.7. Create Spinner
4.8. Write Spinner code
4.9. Create ListView
4.10. Write ListView code

5. Android Advanced Control

5.1. Create ImageView
5.2. Writing ImageView code
5.3. Create ExpandableListView
5.4. Write ExpandableListView code

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5.5. Create Menu
5.6. Write Menu code
5.7. Create Gallery
5.8. Write Gallery code
5.9. Create ProgressBar
5.10. Write ProgressBar code

6. Android Event Handling

6.1. Implement listening through anonymous inner class
6.2: Implement direct listening interface to implement listening
6.3. User-defined internal class for implementation of interface implements listening
6.4. BroadcastReceiver
6.5. LocalBroadcastReceiver
6.6. sendBroadcast
6.7. sendOrderBroadcast
6.8. Observer Pattern
6.9. Event
6.10. Subscriber
6.11. Publisher
6.12. EventBus

7. Android Activity and intention

7.1. Create Activity
7.2. Configure Activity
7.3. Start Activity
7.4. Close Activity
7.5. Activity Running
7.6. Activity Paused
7.7. Activity Stopped
7.8. Activity Killed
7.9. Intent Action
7.10. IntentCategory
7.11. IntentData
7.12. Classification and analysis of Intent

8. Android network communication

8.1. Create JAVA project
8.2. Write JAVA code
8.3. Design network communication protocol
8.4. MySQL database design
8.5. Create, delete, read, update data
8.6. Interaction between JAVA and MySQL
8.7. CS communication
8.8. BS communication

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9. Volley Communication Mode

9.1. Create JAVA project
9.2. Write JAVA code
9.3. Design network communication protocol
9.4. MySQL database design
9.5. Create, delete, read, update data
9.6. Interaction between JAVA and MySQL
9.7. Open Session
9.8. Open the internet access queue
9.9. Generate access request
9.10. Put the request in the queue
9.11. Go back to mode to get the return value
9.12. JSON data parsing

10. OKHTTP Communication Mode

10.1. Create JAVA project
10.2. Write JAVA code
10.3. Design network communication protocol
10.4. MySQL database design
10.5. Create, delete, read, update data
10.6. Interaction between JAVA and MySQL
10.7. Open Session
10.8. Import OKHTTP external package
10.9. Generate OKHTTP object
10.10. Generate access client
10.11. Fill in access parameters
10.12. Get the return value
10.13. JSON data parsing

11. Backend Development Framework

11.1. Master the concept of backend development framework
11.2. Master the concept of object-oriented
11.3. Master MVC development mode
11.4. Design server file structure
11.5. Import framework development package
11.6. Test development package
11.7. Design communication protocol
11.8. Design Model code
11.9. Design View code
11.10. Design Control code

12. Summary and Review

12.1. Consolidate the software learned this semester
12.2. Review the knowledge learned this semester

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LIST OF PRACTICAL

1. Building Android Development Environment

1.1 Download and installation of JAVA integrated development environment and environment variable configuration
1.2 Download and installation of JAVA and environment variable configuration
1.3 Download and installation of MYSQL integrated development environment and environment variable configuration
1.4 Master download and installation of JAVA integrated development environment and environment variable configuration
1.5 Master download and installation of JDK and environment variable configuration
1.6 Master download and installation of MYSQL integrated development environment and environment variable configuration

2. Develop Online Music Player Server

2.1 Server file management
2.2 Server structure design
2.3 Server-side static webpage code writing
2.4 Design network communication protocol
2.5 Master server structure design and file management
2.6 Master server-side static webpage code writing
2.7 Master the design of network communication protocol

3. Develop Online Music Player Client

3.1 Project requirement analysis and design
3.2 Android interface design
3.3 Android control usage and event response
3.4 ORG.Apache network communication and JSON data parsing
3.5 Master project requirement analysis and design
3.6 Master Android interface design
3.7 Master Android control usage and event response
3.8 Master ORG.Apache network communication and JSON data parsing

4. Develop QQ Communication APP Server

4.1 Server database design
4.2 MYSQL database development
4.3 JAVA dynamic webpage code writing
4.4 Design network communication protocol
4.5 Master server database design and MYSQL database development
4.6 Master JAVA dynamic webpage code writing
4.7 Master the design of network communication protocol

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5. Develop QQ Communication APP Client

5.1 Project requirement analysis and design
5.2 Android UI design
5.3 Android event
5.4 Volley network communication and JSON data parsing
5.5 Master project requirement analysis and design

6. Develop Online Food Delivery APP Server

6.1 Server database design
6.2 MYSQL database development
6.3 JAVA dynamic webpage code writing
6.4 Design network communication protocol
6.5 Master server database design and MYSQL database development
6.6 Master JAVA dynamic webpage code writing
6.7 Master the design of network communication protocol

7. Develop Online Food Delivery APP Client

7.1 Project requirement analysis and design
7.2 Android interface design
7.3 Android control usage and event response
7.4 OKHTTP network communication and JSON data parsing
7.5 Master project requirement analysis and design
7.6 Master Android interface design
7.7 Master Android control usage and event response
7.8 Master OKHTTP network communication and JSON data parsing

8. Develop Online Food Delivery APP Management Page

8.1 Project requirement analysis and design
8.2 CSS interface design
8.3 JS control usage and event response
8.4 BS Network communication and form data parsing
8.5 Master project requirement analysis and design
8.6 Master CSS interface design
8.7 Master JS control usage and event response
8.8 Master BS network communication and JSON data parsing

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Course Code: **SWT-351** **T P C**
Course Name: **Project Training 2** **0 3 1**

This course develops an intelligent APP using JAVA backend, MySQL, Android, Cross-platform technologies and machine learning technologies. Enable students to get data from the server and call the interface to implement the development of intelligent Android projects. It covers Android development technology, database calling method, machine learning and back-end interface calling method.

Course Objectives

At the end of the course, the students are expected to be able to:

- Download and install Visual Studio Code
- Familiarize with the basics of Visual Studio Code development environment
- Use html, CSS, JavaScript and other technologies to implement the project effect
- Master the basic technology of JAVA backend
- Master the basic technology of MySQL
- Master the advanced development technology of Android
- Understand how to get data on the server
- Understand how to call the server's interface on Android projects
- Familiarize with process of machine learning
- Master common tools and methods for data processing
- Master exploratory technology for data analysis
- Master the training and comparison of models
- Master the methods for model optimization

COURSE OUTLINE

Practical CONTENTS	**Hours**
7. Cross-platform Web App **requirements and design** 1.1. Project requirement analysis 1.2. Webpage layout design	**6**
8. Cross-platform Web App **development** 8.1 Familiarize with project background 1.3. Layout and style of project home page 1.4. Dynamic effect of project home page 1.5. Layout, style and effect of login and registration page 1.6. Layout and style of favorite page 1.7. Dynamic effect of favorite page	**26**

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1.8. Layout and style of shopping cart page	
1.9. Dynamic effect of shopping cart page and data retrieval and calculation	
2. **Development preparation**	2
2.1. Download and install JDK	
2.2. Download the development tool Android studio	
2.3. Download XAMPP software (server software)	
3. **Backend development**	18
3.1. Install xampp software and starting tomcat server	
3.2. Import data into database file	
3.3. Deploy the backend code and database to the server	
4. **Android development**	12
4.1. Develop an App that connects to the server	
4.2. Develop the ability to run on simulator or real machine	
4.3.	
1. **Process of machine learning**	6
1.1 General process of machine learning	
1.2 Exploratory analysis of data	
1.3 Data preprocessing	
2. **Optimization of model**	12
1.4 Construction and comparison of models	
1.5 Data visualization	
1.6 Data preprocessing	
1.7 Exploratory analysis of data	
1.8 Optimization of model	
3. **Development of Machine Learning Applications**	14
3.1 Overall design of applications	
3.2 Front-end design and implementation	
3.3 Back-end design and implementation	

Total Hours: 96

References:

- **None**

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LIST OF PRACTICALS

1. Layout and style of project home page
2. Dynamic effect of project home page
3. Layout, style and effect of login and registration page
4. Layout and style of favorite page
5. Dynamic effect of favorite page
6. Layout and style of shopping cart page
7. Dynamic effect of shopping cart page and data retrieval and calculation
8. Development preparation
9. Backend development
10. Android development
11. Construction and comparison of models
12. Data visualization
13. Data preprocessing
14. Exploratory analysis of data
15. Optimization of model
16. Deployment

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