



MANONMANIAM SUNDARANAR UNIVERISTY,  
TIRUNELVELI-12

## SYLLABUS

### UG - COURSES – AFFILIATED COLLEGES

Course Structure for B. Sc. Chemistry

(Choice Based Credit System)

(with effect from the academic year 2021-2022 onwards )



Semester-IV				
Part	Subject Status	Subject Title	Subject Code	Credit
I	Language	TAMIL/MALAYALAM/HINDI	C1TL41/ C1MY41/ C1HD41	4
II	Language	ENGLISH	C2EN41	4
III	Core	INORGANIC CHEMISTRY – II	CMCH41	4
III	Major Practical IV	INORGANIC QUALITATIVE ANALYSIS – II	CMCHP4	2
III	Allied – II Paper II	ALLIED PHYSICS - II	CAPH21	3
III	Allied Practical II	ALLIED PRACTICAL – II	CAPHP2	2
III	Skill Based	PHARMACEUTICAL CHEMISTRY/ INDUSTRIAL CHEMISTRY	CSCH41/ CSCH42	4
IV	Non-Major Elective	BASIC PHYSICS – II/ ARIMUGA TAMIL	CNPH41/ CNTL41	2
IV	Common	COMPUTERS FOR DIGITAL ERA	CCDE41	2
V	Extension Activities	NCC/NSS/YRC/YWF	C5EA41	1



**Total Marks: 100 Internal Exam: 25 marks + External Exam: 75 marks**

**A. Scheme for internal Assessment:**

Maximum marks for written test: **20 marks**

**3 internal tests**, each of **1 hour** duration shall be conducted every semester.

To the average of the **best two** written examinations must be added the marks scored in. The **assignment** for 5 marks.

The break up for internal assessment shall be:

Written test- 20 marks; Assignment -5 marks Total - 25 marks

**B. Scheme of External Examination**

**3 hrs.** examination at the end of the semester

A – Part : 1 mark question two - from each unit

B – Part : 5 marks question one - from each unit

C – Part : 8 marks question one - from each unit

➤ **Conversion of Marks into Grade Points and Letter Grades**

S.No	Marks	Letter Grade	Grade point (GP)	Performance
1	90-100	O	10	Outstanding
2	80-89	A+	9	Excellent
3	70-79	A	8	Very Good
4	60-69	B+	7	Good
5	50-59	B	6	Above Average
6	40-49	C	5	Pass
7	0-39	RA	-	Reappear
8	0	AA	-	Absent

➤ **Cumulative Grade Point Average (CGPA)**

$$CGPA = \frac{\Sigma (GP \times C)}{\Sigma C}$$

- **GP** = Grade point, **C** = Credit
- CGPA is calculated only for Part-III courses
- CGPA for a semester is awarded on cumulative basis

➤ **Classification**

- First Class with Distinction : CGPA  $\geq$  7.5\*
- First Class : CGPA  $\geq$  6.0
- Second Class : CGPA  $\geq$  5.0 and  $<$  6.0
- Third Class : CGPA  $<$  5.0



## பொதுத்தமிழ்

பாடத்திட்டத்தின் நோக்கங்கள் ( Course Objectives) சங்க இலக்கியத்தின் சிறப்புகளை உணர வைத்தல்		
எதிர்பார்க்கும் படிப்பின் முடிவுகள் (Expected Course Outcomes)		
CO1	மாணவர் பண்டைத் தமிழரின் பண்பாட்டினை அறிந்து கொள்வர்	K <sub>1</sub> ,K <sub>4</sub> ,K <sub>6</sub>
CO2	வாழ்வியலுக்கான பொருள் இலக்கணத்தைக் கற்றுக் கொள்வர்	K <sub>2</sub> ,K <sub>5</sub>
CO3	இலக்கியங்கள் வாயிலாக வாழ்வியல் அறங்களைப் புரிந்து கொள்வர்.	K <sub>1</sub> ,K <sub>3</sub> ,K <sub>5</sub>
CO4.	வரலாற்றுப் பின்புலங்களை மையமாகக் கொண்டு நாடகங்கள் படைக்கும் உந்துதலைப் பெறுவர்.	K <sub>2</sub> ,K <sub>6</sub>
CO5	சங்க இலக்கியங்களின் வரலாற்றையும், தனிச்சிறப்புகளையும் அறிந்து கொள்வர்.	K <sub>2</sub> ,K <sub>5</sub>
K1 – நினைவில் கொள்ளுதல் (Remember) K2 – புரிந்து கொள்ளுதல் (understand) K3 – விண்ணப்பித்தல்(Apply) K4 – பகுத்தாய்தல் ( Analyze) K5 – மதிப்பீடு		

### அலகு:1 - செய்யுள்

நற்றிணை முதல் பட்டினப்பாலை வரை  
நியூ செஞ்சுரி புக ஹவுஸ் (பி) லிட்., திருநெல்வேலி-1  
தொலைபேசி எண்: 0462 2323990

### அலகு:2 - இலக்கணம்

1. பொருள் இலக்கணம்
2. ஒரெழுத்து ஒருமொழிகள்
3. மரபுச் சொற்கள்
4. பிறமொழிச் சொற்களை நீக்கி எழுதுதல்

### அலகு:3 - உரைநடை

வாழ்வியல் அறம் - தொகுப்பாசிரியர் - முனைவர் ச.பொ.சீனிவாசன்  
நெஸ்லிங் புகஸ் பப்ளிஷிங் அன்ட் டிஸ்ட்ரிபிட்டர்ஸ் (பி) லிட்., சென்னை -50  
தொலைபேசி எண் : 044-26251968, 26258410, 48601884

### அலகு:4 - நாடகம்

ஆதி அத்தி - ஆசிரியர் - பெ.தூரன் - பதிப்பாசிரியர் - முனைவர் சொ.சேதுபதி  
நியூ செஞ்சுரி புக ஹவுஸ் (பி) லிட்., சென்னை -50  
தொலைபேசி எண் : 044-26251968, 26258410, 48601884



**அலகு:5 - இலக்கிய வரலாறு**

1. எட்டுத்தொகை நூல்கள்
2. பத்துப்பாட்டு நூல்கள்
3. சங்க இலக்கியங்களின் சிறப்பியல்புகள்

**மேற் பார்வை நூல்கள்**

இலக்கணம் : புறப்பொருள் வெண்பாமாலை

இலக்கிய வரலாறு : ஆசிரியர் முனைவர் சி. பாலசுப்பிரமணியன்.

பாவை பப்ளிகேஷன்ஸ் 142இ ஜானி ஜான் கான் சாலை இராயப்பேட்டை

சென்னை - 14 தொலைபேசி எண் : 28482441

முனைவர் பெ. சுயம்பு

பாரதி பதிப்பகம் 113இ இராஜீவ் தெரு திசையன்விளை -57

தொலைபேசி எண் :04637 - 272096

மாணவர்களைக் களஆய்விற்கு அழைத்துச் செல்லலாம்

**Mapping with Programme Outcomes**

CO <sub>5</sub>	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	S
CO2	M	S	M	M	M
CO3	S	M	S	S	M
CO4	S	M	M	S	S
CO5	M	S	S	M	M

S- மிகையான (Strong) M- நடுநிலையான (Medium) L- குறைவான (Low)



# MALAYALAM

## UNIT – 1

### മാധ്യമമോഷ

മാധ്യമം - നിർവ്വചനം - ചരിത്രം - സാങ്കേതികവിദ്യ - വിവിധതരം മാധ്യമങ്ങളെ - സമൂഹം - സംസ്കാരം - സ്വാധീനം

### FOR DETAILED STUDY

1. ഡോ. ടി. അനിതകുമാരി - മാധ്യമമോഷ ഇന്റ

## UNIT – 2

### അച്ഛിദ്രമാധ്യമം

അച്ഛിദ്രിയുടെ ചരിത്രം - കരളേതീലയെ ആദ്യകാല പ്ലവർത്തനങ്ങളെ - പർമാസികകളുടെ ആദ്യകാലം - പുതിയ കാലത്തെ അച്ഛിദ്ര രീതികളെ - ലിപി പരിഷ്കരണം - ഡിടിപി - തനതു ലിപികളെ

### FOR DETAILED STUDY

2. ഡോ. എസ്.എസ്. ശ്രീകുമാർ - മലയാള ലിപി പരിഷ്കരണം വരുത്തിയ വിനകളെ

## UNIT – 3

### ഭൃശ്ശരവ്യാധിമാധ്യമം

റഡിയോ - ടെലിവിഷൻ - മട്ടുടിമീഡിയ - സിനിമ - പൊതു സ്വഭാവം - ഗുണഭോഷവശങ്ങളെ

### FOR DETAILED STUDY

3. ടെലിവിഷൻ പഠനങ്ങളെ - സി. എസ്. വെങ്കടേശ്വരൻ ലഖേനം - ജനകീയതയും റിയാലിറ്റിഷോകളും

## UNIT – 4

### സംബന്ധമാധ്യമം

ഇന്റർനെറ്റ് - ചരിത്രം - മലയാളത്തിലയെ ബ്ലോഗുകളെ - സംബന്ധ സാന്നിദ്ധ്യം - സോഷ്യൽ മീഡിയ - സ്മാർട്ട് ഫോൺ ഉപയോഗം - ഗുണഭോഷവശങ്ങളെ

### FOR DETAILED STUDY

4. ഡോ. അച്ഛിദ്ര ശങ്കർ എസ്. നായർ - സംബന്ധ മലയാളം



**UNIT – 5**

**പരസ്യകല**

പരസ്യം - നിർവ്വചനം - സംസ്കാരം - സ്വാധീനം- വിവിധതരം പരസ്യങ്ങളുടെ - ആശയബോധനം

**FOR DETAILED STUDY**

5. പ്ലായോഗികപരിചയം നേടുന്നതിനാവശ്യമായ പരവർത്തനങ്ങളെ നടത്തുക. പരസ്യം നിർമ്മിക്കുന്നതിനുള്ള വിഷയം നൽകുക.

**REFERENCE BOOKS**

പത്മലോകം - ഒരു സംഘം ലേഖകർ - കരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്  
 ആ ലോകം മുതൽ ഇ-ലോകം വരെ - ഡോ. ജെ. വി. വിളനിലം  
 മാധ്യമങ്ങളും മലയാളസാഹിത്യവും - കരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്  
 പത്മലോകം - കരള പരസ്യ അക്കാദമി  
 മലയാളഭാഷയും ആഗോളവൽക്കരണവും - ഡോ. കെ. എസ്. പ്ലക്കാശ്, ഡോ. എസ്. എ. ഷാനവാസ് (പ്രകാശനവിഭാഗം, കരള സർവ്വകലാശാല)  
 ഭാഷയും മാധ്യമവും - വി. കെ. നാരായണൻ  
 മാധ്യമഭാഷാ മാറ്റങ്ങളുടെ - കെ. കെ. ശ്രീരാജ്  
 ടലിവിഷൻ പഠനങ്ങളുടെ - സി. എസ്. വെങ്കിടേശ്വരൻ  
 മാധ്യമങ്ങളും മലയാളസാഹിത്യവും - എം. വി. തോമസ്  
 ഇൻറർനെറ്റ്യും ഇൻഫർമേഷൻ വിപ്ലവവും - കെ. രവീന്ദ്രൻ, ഡോ. കെ. ഇബ്രാഹിം  
 ഇൻഫർമേഷൻ സയൻസ് - ഒരാമുഖം - ഡോ. ജി. ദേവരാജൻ  
 മലയാള സബ്ബർ സാഹിത്യം - ഡോ. മനോജ് ജെ. പാലക്കുടി  
 സബ്ബർ മലയാളം - സുനീത ടി. വി. (എഡി.)  
 മാറുന്ന ലോകം മാറുന്ന മാധ്യമലോകം - എൻ. പി. രാജനേദ്രൻ  
 Progress in Information Technology - Dr. G. Devarajan  
 The Mass Media and You - Desmond D' Abreo  
 Advertising - Dr. C. N. Santakki



## HINDI

### Objectives:

1. To acquire knowledge regarding fundamental concepts in Hindi grammar.
2. To acquire the ability to master translation skills
3. To develop writing skills for official documentation – Letter, Banking terminologies

### Course Outcomes:

C.O. No.	Upon the completion of this course, students will be able to	PSOs Addressed	Cognitive Level
CO 1	Understand the writing skills of novelist - Premchand	F,G	K1,K4
CO 2	Understand the basics of navras, vrith and alankars	B,D	K1,K2
CO 3	Understand the history of Hini Literature – modern and medieval	A,C	K3,K5
CO 4	Apply and analyse administrative Hindi	A,C	K5
CO 5	Writing skills - Essay	B,C,D	K4,K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, K6 – Create

### UNIT I

#### NOVEL

1. Nirmala

### UNIT II

#### POETICS

#### KavyaPradeep

1. Ras - Navras
2. Chand – Rola, Doha, Soratta
3. Alankar – Anupras, Upama, Roopak

### UNIT III

#### HISTORY OF HINDI LITERATURE

1. Reethikal – Visheshatha, Pramukh Kavi – Bihari Lal



2. Adhunik Kaal – Chaya Vaad – Pramukh Kavi
3. Gadya Sahithya – Bharadendu, Prem Chand

#### UNIT IV

##### ADMINISTRATIVE HINDI

#### UNIT V

##### ESSAY WRITING

(General Topics – Paryavaran Aur Pradooshan, Bhoomandalikaran Aur Hindi, Varthaman Yug Aur Technique, Nari Ki Desha Aur Disha, Desh Vikas Mein Yuva Peedi Ka Yogdaan)

##### Text book:

1. Nirmala – Premchand – Published by Gyan Bharathi Prakashan, Dariabad, Allahabad
2. Kavya Pradeep – Ram Bhaori Shukla – Published by Lok Bharathi Prakashan, Pehli Manzil, Darbari Building, Mahatma Gandhi Maarg, Allahabad
3. Hindi Sahithy ka Saral Ithihas – Viswanath Tripathi – Published by Orient Publication Private Limited, Himayath Nagar, Hyderabad

##### Books for Reference:

1. Hindi Vathayan – Dr. K M Chandra Mohan – Published by Viswavidyalay Prakashan, Varanasi
2. Essay Writing – General Topics

##### Mapping with POs

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	S	S	S	S	S	S	S	M
CO 2	S	S	M	S	M	S	S	S
CO 3	S	S	S	S	S	S	M	S
CO 4	S	S	S	S	S	S	S	S
CO 5	S	S	M	S	S	S	L	S
CO 6	S	S	S	S	M	M	S	S

S – Strong, M – Medium, L – Low





# ENGLISH

## VISION AND MISSION OF DEPARTMENT:

### VISION:

- To offer students adequate communication skills to prepare them for their professional needs in the globalized scenario prevalent today.

### MISSION:

- To impart zestfully and resourcefully the four skills of LSRW

### PREAMBLE:

Language is the primary source of communication. It is the method through which we share our ideas and thoughts with others. Moreover, English is the only language spoken all over the world. As a result every curriculum teaches English as a second language. Given the fact that language proficiency is integral to the learning process TANSCHÉ has focused on quality higher education. So COMMUNICATIVE ENGLISH I & II are so designed for the students to acquire LSRW skills and introduced in I & II Semester respectively. The course syllabi for III and IV Semesters are also designed accordingly along with the evaluation component (with effect from 2021- 2022 onwards)

### PROGRAMME OUTCOMES – PO

At the end of the course students will be able to

- PO1:** Imbibe moral, ethical, and cultural values through various forms of literature.
- PO 2:** Enable the learner to communicate effectively and appropriately in real life situation.
- PO3:** Able to think, speak, and write independently using grammatical forms and Vocabulary.
- PO4:** Improve their writing and reading fluency skills through extensive reading.
- PO5:** Develop their pronunciation by studying the sounds of language.

### PROGRAMME SPECIFIC OUTCOME: PSO

At the end of the course students will be able to:

- PSO1:** Provide the students with an ability to build and enrich their communication skills.
- PSO2:** Critically analyse and appreciate poetry, prose, fiction and play.
- PSO3:** Enhance sufficient practice in Vocabulary, Grammar, Comprehension.
- PSO4:** Study the Phonetic symbols for correct pronunciation.
- PSO5:** Spot language errors and correct them.



**GENERAL ENGLISH -- PROSE, POETRY, DRAMA, GRAMMAR,  
LANGUAGE STUDY & ORAL COMMUNICATION SKILLS**

**UNIT I - PROSE**

1. Give us a Role Model – A.P.J. Abdul Kalam.
2. The Best Investment I have ever made – A.J. Cronin
3. Seven Good Habits – Robin Sharma
4. How much Land does a Man Need - Leo Tolstoy

**UNIT II – POETRY**

1. 1. Anxiety – A.K. Ramanujam
2. Incident on the French Camp – Robert Browning.
3. Stopping by the woods – Robert Frost
4. Still I raise – Maya Angelo

**UNIT III - DRAMA - Select scenes from William Shakespeare**

1. Antony and Cleopatra – Death Scene of Cleopatra – Act V, Scene II
2. Macbeth – Sleep Walking Scene – Act V, Scene I
3. King Lear – Heath, before a Hovel – Act III, Scene IV.

**UNIT IV – GRAMMAR**

1. Transformation of Sentences
2. Synthesis of Sentences
3. Spot the Error

**UNIT V – LANGUAGE STUDY AND ORAL COMMUNICATION**

1. Phonetics – Vowel sounds
2. Dialogue Writing
3. One word Substitution
4. Report writing.

**COURSE OUTCOMES:** At the end of the course students will be able to

Course Outcomes		Cognitive level
CO1	Use English accurately across the curriculum	K1, K2, K3
CO2	Attained enhanced vocabulary and improved language skills	K2, K3, K4



CO3	Analyse and interpret prescribed text	K2, K4
CO4	Conceptualize the Shakespearean drama in the prescribed text	K2, K4
CO5	Gain proficiency in LSRW skills	K1, K2, K3, K4, K6

K1- Remember, K2- Understand, K3- Apply ,K4- Analyse , K5- Evaluate,K6- Create

### MAPPING OF COURSE OUTCOMES WITH PROGRAMME OUTCOMES

CO/ PO	PO1	PO2	PO3	PO4	PO5	POS1	POS2	POS3	POS4	POS5
CO1	S	M	S	S	S	S	M	S	M	S
CO2	M	S	M	M	M	M	M	M	S	M
CO3	M	S	M	S	M	S	M	S	M	S
CO4	S	M	S	M	M	S	S	M	S	M
CO5	M	M	M	S	M	S	S	M	S	M

S – Strongly correlated, M – Moderately Correlated, w- weakly correlated, No Correlation - 0

### E- LINKS

1. [https:// www.msuniversity.ac.in](https://www.msuniversity.ac.in)
2. <https://www.bdu.ac.in>
3. <https://www.scribd.com>
4. <https://www.goodreads.com>
5. <https://casenglishdepartment.wordpress.com>
6. <https://www.poetryfoundation.org>
7. <https://www.britannica.com>
8. <https://englishgrammar.org>



## INORGANIC CHEMISTRY II

### Course Objectives

The primary objective of this course are to

- Gain Knowledge on acids, bases and non-aqueous solvents.
- Study about d and f-block elements.
- Know the principle and extraction of metals and compounds.
- Acquire knowledge on halogens and noble gases.
- Study on errors and analysis of data related to it.

### UNIT I MODERN CONCEPT ACIDS AND BASES AND NON-AQUEOUS SOLVENTS

#### Modern Concepts of Acids and Bases

Arrhenius Concept – Brownsted - Lowery theory – Lewis Concept – Soft and Hard Acids – Soft and Hard Bases – SHAB Principle – Solvent System – Lux – Flood definition – Usanovic Concept.

Non – Aqueous Solvents

Classification of Solvents – General properties of solvents – Self ionization and leveling effect – Reactions in liquid ammonia, Liquid sulfur dioxide, Liquid hydrogen fluoride.

### UNIT II CHEMISTRY OF d AND f BLOCK ELEMENTS

**d-Block Elements** General Characteristic of Transition metals , Metallic character, oxidation states, size, density, melting and boiling points, ionization energy, colour, magnetic properties, reducing properties, catalytic properties, complex formation and alloy formation. Difference between first and other two rows.

**f-Block Elements:** General Characteristics of f- block elements – Comparative study of lanthanides and actinides – Electronic configuration, oxidation states, colour, spectral and magnetic properties – Lanthanide contraction and its consequences.

### UNIT III METALLURGY

Mineral resources of India – Principles of metallurgy – Methods of metal extraction : Concentration – Froth flotation, Gravity separation, Magnetic separation, Calcination, Roasting and Smelting – Refining

of metals : Zone refining, Van-Arkel DeBoer refining and Electrolytic refining.

Preparation properties and uses: Extraction of metals and its important compounds : Cr, Mn, Zr, Th and U.  $K_2Cr_2O_7$ ,  $KMnO_4$ ,  $ZrOCl_2$ ,  $ThO_2$ ,  $UO(CH_3COO)_2$  .

### UNIT IV HALOGEN FAMILY AND NOBLE GASES

Basic properties of Halogen – Oxidation states and oxidizing power – Electropositive



Character of iodine

Interhalogen compounds: Preparation, properties and Structures of ClF, ICl<sub>3</sub>, BrF<sub>5</sub>, IF<sub>7</sub> – Pseudohalogens – Cyanogen (CN)<sub>2</sub>. Thiocyanogen (SCN)<sub>2</sub> and Azidocarbon disulphide (SCSN<sub>3</sub>)<sub>2</sub>.

Noble Gases : Inert gases – position in the periodic table – General Characteristics - Uses – Structure and shaper of xenon compounds : XeF<sub>2</sub>, XeF<sub>4</sub>, XeF<sub>6</sub>, XeOF<sub>2</sub>, XeOF<sub>4</sub>.

Clathrates : Preparation, Properties and Uses.

## UNIT V ERRORS AND STATISTICAL ANALYSES

Errors : Definition – Types of errors – Random and Systematic errors – Methods of detection and elimination of systematic errors – Error distribution curves - Accuracy and Precision.

Statistical treatment of error analysis : Definition and explanation with examples of important terms : Mean, Median, Mode, Range, Deviation, Mean deviation, Relative mean deviation, Standard deviation, Coefficient of variation and Variance – Student's t-test -F-test Confidence levels - Rejection criteria - Q test– Curve fitting – Method of least squares -Correlation Coefficient – Significant figures and computational rules.

### Text Books

1. B.R. Puri, L.R. Sharma and K.C.Kalia, Principles of Inorganic chemistry, 28th edition, Vallbha Publication, New Delhi, 2004.
2. R.D. Madan, Modern, Inorganic chemistry, Chand S & Company, 2nd edition, New Delhi, 2002.
3. D. A. Skoog, D. M. West and Holler, Analytical Chemistry: An Introduction, 6th edition, Saunders College Publishing .

### Reference Books

1. F.A. Albert cotton, Advanced Inorganic Chemistry, Geofferey Wilkinson, Carlos, Murillo, Manfred, Bochman John- Wiley & Sons, New York, 1998.
2. J.E.Huheey, and A. Ellen Keiter, L. Richard Keiter, Inorganic Chemistry, 4th edition, Pearson Education Pvt Ltd. Harper Collens College publishers, Singapore, 2004.
3. Gary D. Christian, Analytical Chemistry, 6th edition, John Wiley & Sons.



**COURSE OUTCOMES**

COURSE OUTCOMES		COGNITIVE LEVEL
CO1	Explain the basic concepts of acids and bases and analyze the general characteristics of non-aqueous solvents.	K5, K4
CO2	Compare the general characteristics of d and f block elements and select the suitable transition and inner transition elements for specific uses.	K2, K1
CO3	Elaborate the Principle and Procedure of metal extraction and identify most useful compounds of metals.	K6, K3
CO4	Discuss the various compounds of halogens and noble gases	K6
CO5	Summarize the methods to analyze data in the experiments	K2

K 1 –Remember K 2 – Understand K 3 - Apply K 4 – Analyze K 5 –Evaluate K 6 - Create

**Mapping of COs with POs & PSOs:**

CO/PO/ PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	S	M	S	L	S	M	M	S	M	S	M	L	M
CO2	S	S	S	M	S	M	L	S	L	M	S	S	M
CO3	S	S	S	M	L	S	S	S	S	S	M	M	S
CO4	S	M	M	S	M	S	L	M	S	M	L	S	M
CO5	S	M	L	S	M	L	M	M	L	M	S	M	S

S – Strongly Correlated ; M – Medium Correlated ; L – Low Correlated



## MAJOR PRACTICAL IV

### Course Objectives

- To enable the students to understand various procedures in salt analysis.
- To create an awareness on ecofriendly approach in salt analysis

### Qualitative analysis of inorganic salt mixture containing two acidic and two basic radicals.

#### 1. Acidic radicals

Non-Interfering acidic radicals

Carbonate, Nitrate, Sulphate and Chloride

Interfering acidic radicals

Borate, Fluoride, Oxalate and Phosphate.

#### 2. Basic radicals

Group I : Lead

Group II : Copper, Cadmium, Bismuth.

Group IV : Cobalt, Nickel, Manganese, Zinc

Group V : Barium, Strontium, Calcium

Group VI : Magnesium, Ammonium.

Internal – 50 marks

25 marks - Regularity

25 marks – Average of best five salt mixtures in regular class work

External -50 marks

10 marks – Record (atleast five salt mixtures )\*

40 marks – Analysis (10 marks for each radical)

\*Experiments done in the class alone should be recorded

(Students having a bonafide record only should be permitted to appear for the practical examination)

### Text Books

1. V.V. Ramanujam, Inorganic Semi Micro Qualitative Analysis, 3rd edition, The National Publishing Company, Chennai, 1974.
2. Vogel's Text Book of Inorganic Qualitative Analysis, 4th edition, ELBS, London, 1974.

### Reference Books

1. I.V.K.Ahluwalia, Sunitha Dhingra, Adarsh Gulate College Practical Chemistry, Universities Press (India) Pvt Ltd Reprint 2008.
2. Sundaram, Krishnan, Raghavan, Practical Chemistry (Part III), S. Viswanathan Co. Pvt., 1996.
3. O.P. Pandey, D.N Bajpai, S. Gini, Practical Chemistry, for I, II & III BSc. Students. S.Chand & Company Ltd, Reprint 2009.



**COURSE OUTCOMES**

COURSE OUTCOMES		COGNITIVE LEVEL
CO1	Define acidic and basic radicals and list out the anions and cations to be analyzed	K1
CO2	Discuss the principle of qualitative analysis and apply the principle for the analysis of given salt mixture..	K6, K3
CO3	Analyse systematically the given salt mixture and determine the acidic and basic radicals present in it.	K4, K5

K 1 –Remember K 2 – Understand K 3 - Apply K 4 – Analyze K 5 –Evaluate K 6 - Create

**Mapping of COs with POs & PSOs**

CO/PO /PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	S	M	L	S	M	M	L	S	M	M	S	L	M
CO 2	S	M	S	M	S	S	M	S	S	S	M	M	S
CO 3	M	S	S	S	M	S	M	S	S	S	M	L	S

S – Strongly Correlated ; M – Medium Correlated ; L – Low Correlated

**PHARMACEUTICAL CHEMISTRY****Course Objectives**

The primary objectives of this course are to

- Learn drug terminology and common diseases.
- Know common drugs.
- Study the mechanism of drugs action and metabolism of drugs.
- Acquire Knowledge on important diseases and its treatment.
- Learn the chemicals in medicine and medicinal plants.

**UNIT I DRUG TERMINOLOGY AND COMMON DISEASES**

Drug, Pharmacy, Pharmacology, Pharmacophore, Pharmacognosy, Therapeutics, Toxicology, Chemotherapy.

Common Diseases

**Insect Borne Disease:** Malaria and Filariasis

**Airborne Disease :** Diphtheria, whooping Cough, Influenza, Common cold and Tuberculosis.





**Waterborne Disease** : Cholera, Typhoid and Dysentery.

Digestive disorder – Jaundice – Respiratory disorder – Asthma- Nervous system disorder – Epilepsy-Peptic Ulcer.

## **UNIT II COMMON DRUGS**

Antibiotics, Antipyretics, Analgesics, Anti-inflammatory agents, Sedatives, Antiseptics & Disinfectants, Antihistamines, Tranquilizers, Hypnotics, and Antidepressant Drugs – Definition, examples, uses and Side effects.

## **UNIT III MECHANISM OF DRUGS ACTION AND METABOLISM OF DRUGS**

Mechanism of drugs Action – Absorption, Drug delivery, Drug excretion – Metabolism of drugs – Chemical pathways of drug metabolism – Phase – I (Oxidative, Reductive and Hydrolytic reaction and Phase – II (Conjugate reactions). Physiological effects of different functional groups in drugs – Biological role of Na, K, Ca, Cu and Zn.

## **UNIT IV VITAL AILMENTS AND TREATMENTS**

Blood pressure – Causes, control and treatment – antihypertension drugs – antianginal agents – Cardiovascular drugs – Cardio acglycosides, Vasodilators.

Anemia – Causes and control – Antianemic drugs.

Diabetics – Causes and control – Hypo glycemc drugs – Insulin

Cancer : Causes and treatment – Antineoplastics drugs – Antimetabolite.

## **UNIT V MEDICALLY IMPORTANT COMPOUNDS AND MEDICINAL PLANTS**

**Medically Important compounds** : Milk of magnesia, Sodium bicarbonate, Aluminium hydroxide gel, Dried Aluminium hydroxide gel, Ferrous fumerate, Ferrous gluconate, Ferrous sulphate, Ferric ammonium citrate.

**Medicinal plants:** Vallarai, Kizhanelli, Thumbai, Hibiscuss, Adadodai, Tnoothuvallai, Nochi, Thulasi, Aloe vera,- Chemical constituents and Medicinal uses.

### **Text Books**

1. S.Lakshmi, Pharmaceutical chemistry, S.Chand and sons, New Delhi, 2011.
2. Jayashree Gosh, A text book of Pharmaceutical chemistry, 3rd edition, S.Chand and company Ltd., New Delhi 2008.

### **Reference Books**

1. S.C.Rastogi, Biochemistry, Tata McGraw Hill Publishing Co. 1993.
2. Rasheeduz Zafar – Medicinal Plants of India – CBS Publishers and Distributers, 2000.



3. Medicinal Chemistry, G.R.Chatwal, Himalaya Publishing House, New Delhi, 2002.

### COURSE OUTCOMES

COURSE OUTCOMES		COGNITIVE LEVEL
CO1	List out common diseases and explain the reasons.	K1, K5
CO2	Summarize the common drugs and specify its (function) action.	K2
CO3	Analyze drugs action and metabolism.	K4
CO4	Explain different chronic diseases and its treatment	K5
CO5	Find the chemicals to treat health disorder and elaborate various medicinal plants to treat disease.	K1, K6

K 1 –Remember K 2 – Understand K 3 - Apply K 4 – Analyze K 5 –Evaluate K 6 - Create

### Mapping of COs with POs & PSOs:

CO/PO/ PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	M	L	M	M	S	S	L	M	L	L	S	M	L
CO2	S	M	S	S	M	S	L	S	M	S	M	S	M
CO3	S	S	S	S	M	S	L	S	S	S	M	L	M
CO4	M	S	M	L	S	M	L	L	M	M	S	M	S
CO5	S	S	L	S	S	M	M	S	S	S	M	S	M

S – Strongly Correlated ; M – Medium Correlated ; L – Low Correlated

## INDUSTRIAL CHEMISTRY

### Course Objective

The main objectives of this course are to

- 1.Learn about water treatment methods.
- Know the uses of petroleum and petrochemical products.
- Study electrical insulating materials and batteries.
- Acquire knowledge in corrosion and its control.
- Know the chemicals in day to day life.

### UNIT I WATER TREATMENT

Introduction to sources of water – Hardness of Water – Temporary hardness – Permanent hardness – Disadvantages of hardness – Domestic, Industry, Steam generation in boilers – Effect of iron and manganese in water. Estimation of hardness



– EDTA method – Estimation of total hardness – O. Hehener's method (alkali titration method).

Water softening methods – Industrial purpose - Lime soda process, Zeolite process, Ion-Exchange – Demineralization – Deionization process. Mixed-bed deionization. Domestic purpose- Removal of suspended impurities - Removal microorganism – Chlorination. Reverse osmosis- Desalination.

## **UNIT II PETROLEUM AND PETROCHEMICAL INDUSTRY**

Liquified Petroleum, Natural gas, Compressed gas, Liquified Natural gas, Composition of crude petroleum- Refining and different types of petroleum products – Applications – Reforming petroleum and non-petroleum fuels : LPG, CNG, LNG, Biogas, fuel derived from biomass, Fuel from waste and Synthetic fuels - Recent advances in fuel technology – Power alcohols.

Petrochemicals and Applications: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and Xylene.

## **UNIT III ELECTRICAL INSULATING MATERIALS AND BATTERIES**

Electrical Insulating Materials –Dielectric properties –Requirements of electrical insulating materials –Classification of insulating materials –Electrical rigid insulators.

Battery :Primary and Secondary Batteries - Battery compounds and their roles, and characteristics of

battery- Working of following batteries: Lead Acid battery, Lithium battery, Solid state electrolyte battery, Fuel cell, Solar cell, Polymer cell.

## **UNIT IV CORROSION AND PROTECTIVE COATING**

**Corrosion** :Introduction – Economical aspects of corrosion- Chemical and electro chemical corrosion – Mechanism of corrosion – Control of corrosion - Cathodic and anodic protection.

**Protective Coating**: Paints and pigments – Formulation, Composition, and Related properties – Oil paints, Vehicle oils, Modified oils , Pigments, Toners and Lake pigments, Fillers, Thinners, Driers, Plasticizers, Enamels, Emulsifying agents – Anti skinning agents.

**Metallic Coating** : Removal of surface contaminants – removal of superficial corrosion products – Polishing – Galvanizing – Tinning – Electroplating.

## **UNIT V SMALL SCALE PREPARATIONS**

Preparation and uses of the following chemical substances-Safety matches, Agarbathis, Naphthalene balls, Wax candle, Shoe polish, Gum paste, Writing / fountain pen ink, Chalk / cryons, Plaster of paris, Silicon carbide crucible.



### **Text books**

1. B. K . Sharma, Industrial Chemistry, Goel Publishing House, sixteenth edition 2011.
2. R.M. Felder, R.W. Rousseau, Elementary Principles of Chemical Process, Wiley Publishers, New Delhi, 2015.
3. J. A. Kent(ed), Riegel"s Hand Book of Industrial Chemistry, CBS Publishers, New Delhi.
4. Handbook of Electrical and Electronic Insulating materials, A.J.Dekker.
5. The Chemistry of secondary batteries Faure, J.H,Gladstone.

### **Reference books**

1. O.P. Veramani , A. K.Narula, Industrial Chemistry, Galgotia Publication Pvt . Ltd, 2004.
2. P.C. Jain, M. Jain, Engineering Chemistry, 17th Edition Danpat Rai Publishing Company New Delhi, 2015.
3. R. Gopalan, D. Venkappayya, S, Nagarajan, Engineering Chemistry, Vikas Publications, 2004.
4. R.V. Sherve, Industrial Chemical Process, Tata Mc Graw Hill Publishing Company, 2005.



**COURSE OUTCOMES**

COURSE OUTCOMES		COGNITIVE LEVEL
CO1	Explain suitable water purification techniques.	K5
CO2	Summarize the fuels of petroleum and biofuels.	K2
CO3	Discuss the electrical insulating material and list out the commercial batteries and its uses.	K6, K1
CO4	Explain the corrosion and its prevention.	K5
CO5	Identify the chemicals used in day to day life.	K3

K 1 –Remember K 2 – Understand K 3 - Apply K 4 – Analyze K 5 –Evaluate K 6 - Create

**Mapping of COs with POs & PSOs:**

CO/PO/ PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	M	L	M	M	S	S	L	S	S	S	M	L	M
CO 2	S	M	S	S	M	S	L	M	S	M	L	M	S
CO 3	S	S	S	S	M	S	L	S	M	L	S	M	S
CO 4	M	S	M	L	S	M	L	S	S	M	M	L	S
CO 5	S	S	L	S	S	M	M	S	M	M	L	S	S

S – Strongly Correlated ; M – Medium Correlated ; L – Low Correlated



## ALLIED PHYSICS - II

### Course Outcome:

CO. No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	Apply Ohm's Law and construct the resistors in series & parallel	3	Ap
CO-2	Analyse the conversion of Galvanometer into Ammeter and Voltmeter	2	Cr
CO-3	Analyse the properties of magnetism and to classify the Dia, Para and Ferromagnetic materials	2	U
CO-4	Analyse Faraday's Law of Electromagnetic Induction and to determine the mutual induction using BG	2	An
CO-5	Identify and analyse the uses of junction diodes and to analyse the characterization of Zener diode and transistors	2	Re
CO-6	Evaluate the basic logic gates such as NAND, NOR, EX-OR, and to prove De-Morgan's Law	2	Ev
CO-7	Analyse the classification of nuclei and the properties of nucleus	3	Ap
CO-8	Analyse and apply the fundamental laws of radioactivity	2	Ev
CO-9	Demonstrate the projectiles and to calculate the time of flight	1	U
CO-10	Analyse and apply Galilean and Lorentz transformation equations	3	Ap

### PREAMBLE:

- To understand the basic principles and application of electricity
- To understand the basics concept of electromagnetism
- To understand the fundamental concepts of digital electronics, nuclear physics, mechanics and relativity

### Unit I: Electricity

Current and current density – Expression for current density – Ohm's law – Resistors in series and in parallel – I-V characteristic of a resistor – Color coding – Conversion of a galvano meter into an ammeter and voltmeter – Kirchoff's laws – Application of Kirchoff's laws in Wheat stone network– sensitiveness of bridge.

### Unit II: Electromagnetism

Magnetism: Definition of magnetic induction B, Magnetic field intensity H, Intensity of magnetization M – Properties of Dia, Para and Ferro magnetic materials.



Electromagnetism: Faraday's law of electromagnetic induction–Lenz's law – Expression for induced current and charge–Self inductance–Self inductance of along solenoid – Mutual inductance – Coefficient of coupling – Determination of mutual inductance using BG.

### **Unit III: Electronics**

Junction diodes - forward and reverse bias-diode characteristics - Zener diode –VI characteristic of a Zenerdiode – Transistors – Characteristics of a transistor (common emitter mode only). Digital Electronics: Decimal and binary numbers – binary to decimal and decimal to binary -Binary addition – Binary subtraction by 1's and 2's complement method – Basic logic gates OR,AND, NOT (Symbol, Boolean equation, truth table, circuit and working) – NAND, NOR, EX-OR(Symbol, Boolean equation, truth table only) – DeMorgan's theorem.

### **Unit IV: Nuclear physics**

Introduction – Classification of nuclei – General properties of nucleus – Nuclear size, Nuclear mass, Nuclear density, Nuclear charge, Nuclear spin & Nuclear magnetic dipole moments–Mass defect – Binding energy – Binding energy curve – Nuclear forces – Properties – Fundamental laws of radioactivity

### **Unit V: Mechanics and Relativity**

Projectiles – Time of flight – Range on the horizontal plane – Greatest height attained by the projectile–Path of the projectile–Relativity: Frames of references – Postulates of special theory of relativity – Galilean & Lorentz transformation equations – Length contraction – Time dilation.

### **Books for study**

1. Electricity and Magnetism – R.Murugesan
2. Modern physics – R.Murugesan
3. Principle of Electronics – V.K.Mehta
4. Digital principles and applications - Albert Paul Malvino & Donald P.Leach
5. Mechanics – D.S.Mathur

### **Books for Reference**

1. Modern Physics- Seghal Chopra & Seghal, Sultan chand 1998 Electricity and Magnetism -K.K. Tiwari (S.Chand&Co.)
2. Electronic fundamentals and applications – John D. Ryder–Prentice Hall
3. Electronic principles – Malvino
4. Electricity and Magnetism – Vasudeva



## ALLIED PRACTICAL-II

(6 experiments compulsory)

1. Potentiometer - calibration of voltmeter (low range)
2. Potentiometer – calibration of ammeter
3. Series resonance circuit
4. Parallel resonance circuit
5. Basic logic gates using discrete components – AND,OR,NOT
6. Zener diode - Diode characteristics
7. Absolute determination of mutual inductance–BG
8. Tangent galvanometer – Horizontal earth’s magnetic induction

## BASIC PHYSICS-II

### Course Outcome:

CO.No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO-1	Recall the structure of nuclei	1	Re
CO-2	Explain the properties of alpha, beta and gamma rays	1	Un
CO-3	Enumerate the applications of para, dia and diamagnetic materials	7	Ap
CO-4	Analyse the role of superconductors in the present technology	3	An
CO-5	Weigh the use of Laser technology in medicinal field	7	Ev
CO-6	Explain the postulates of special theory of relativity	7	Cr
CO-7	Differentiate between analog and digital circuits	3	An
CO-8	Design a logic circuit for the addition of two binary numbers	7	Cr

### Preamble:

- Objective of the paper is to gain knowledge on Basic principles of Physics

### UNIT I: NUCLEAR PHYSICS

Introduction - nuclear structure - properties of nucleus - packing fraction - binding energy - nuclear forces - Radio activity - properties of alpha, beta and gamma rays - radio carbon dating - nuclear fission - nuclear fusion





## **UNIT II: MAGNETIC MATERIALS**

Classification of magnetic materials - para-dia and ferromagnetic materials - properties –applications - crystalline and amorphous materials – conductors – insulators – superconductors - properties – applications

## **UNIT III: LASERS**

Introduction – absorption – spontaneous emission – stimulated emission - population inversion - general laser system – He - Ne laser - CO 2 laser - applications.

## **UNIT IV: RELATIVITY**

Introduction - reference frames - postulates of the special theory of relativity - length contraction - time dilation (no derivation) - Quantum mechanics - dual nature of wave and radiation – de - Broglie waves

## **UNIT V: NUMBER SYSTEMS**

Number systems in digital electronics-binary, decimal and hexadecimal numbers – inter conversions - binary addition and subtraction — binary coded decimal - logic gates

### **Books for study and Reference**

1. Modern Physics - R.Murugesan, S. Chand & Co
2. Electricity and Magnetism - R. Murugesan (S. Chand & Co.)
3. Digital principles and applications - Albert Paul Malvino & Donald P.Leach
4. Mechanics and mathematical physics- R.Murugesan - S Chand & Co. Pvt. Ltd., New Delhi



## அறிமுகத்தமிழ்

### அலகு- 1 : செய்யுள் பகுதி

1. கடவுள் வாழ்த்து
2. கல்வி:
3. அறம்
4. ஆத்திசூடி
5. ஓடி விளையாடு பாப்பா
6. பசுவும் கன்றும் பாடல்

### குறிப்பு:- மனப்பாடப்பகுதி

1. கடவுள் வாழ்த்து
2. கல்வி
3. அறம்
4. ஆத்திசூடி

### அலகு-2: கதை வாசித்து கதை சொல்லல்

1. பணிமிருந்தும் பட்டினி
2. அறிவால் வெல்லுவேன்

### அலகு-3 : பொதுக்கட்டுரை

1. ஒன்றுபட்டால் உண்டு வாழ்வு
2. வாய்மையே வெல்லும்

### அலகு -4 : சொற்பொருள் அறிதல்

### அலகு- 5: மொழித்திறன் பயிற்சி



# COMPUTERS FOR DIGITAL ERA

## Objectives:

1. To create the awareness about the digital India among the student community.
2. To make the student to understand the role of computer in the day to day living.
3. To create the awareness about the e-learning and security issues.

## Unit I

### FUNDAMENTALS OF COMPUTERS

The role of computers in the modern society – Types of Computers and their specifications – Server – Desk Top Computers - Lap Top – Tablet – Smart Phones - Block diagram of Digital Computer –Working Principle of Computer, I/O Devices – Central Processing Unit – Types of Memory - Display – Port – UPS – Setting up and Maintenance of Computer.

## Unit II

### TYPES OF SOFTWARE AND OFFICE AUTOMATION

Types of Software with examples – System Software – Application Software – Utility Software - Operating System – Basics on Windows – Introduction to Android –Application Software - Free Open source software – Database and its applications – Office Automation Software – applications of Microsoft Word – Microsoft Power Point – Microsoft Excel.

## Unit III

### INTERNET AND MOBILE APPLICATIONS

Introduction to computer networks – LAN – WAN – MAN – Wired and wireless network – Wi Fi Networks - Network Devices – Modem – Switch – Router – Broad Band – Leased Lines- Internet – WWW – URL- Browser – e-mail – SMS – MMS - Client Server Computing - Cloud – Public and Private cloud – Mobile Applications.

## Unit IV

### E – GOVERNANCE IN INDIA

E-Governance initiative by the Government – Digital India Platform – Agencies enabling Digital India - Electronic Payment and Receipt – Digital Locker – e-district service – electronic signature service – Digital AIIMS – India BPO Scheme – Integrated Nutrient Management – GIS – Mobile Seva App Store- GARV- Grameen Vidyutikaran



**Unit V****E – LEARNING AND MOOC**

E – Learning – Digital Library – E- Journals – Introduction to MOOC – Edex – Course era etc - SWAYAM – NPTEL – Cyber Security – Virus – Malware – Network Security - Hacking – Big Data – Data Analytics – Social Networks – Social Media Analytics- Introduction to IT Act.

➤ **10 Hours Practical Sessions are to be allotted for Computer & Mobile Applications**

**Suggested List of Exercises:**

1. Setting up of computers – Connecting I/O device, UPS, CPU, Printers, Mouse, Key Boards, Pen Drives, etc. (Mandatory)
2. Minor fault findings.
3. Preparing a word Document and saving, copying files, deleting files, renaming files, etc. (Mandatory)
4. Preparing slides – Animation – Slide Transition – Back Ground Changing – Word Art , etc. (Mandatory)
5. Preparing Mark Sheet with Excel - Calculating First Class, second class, etc. (Mandatory)
6. Browsing – Searching for documents – e-mail id creation - Useful mobile apps – downloading. (Mandatory)
7. Data/Wi-Fi Connectivity and Exchanging of Data.
8. Electronic Payment – Online Application Processing
9. Browsing for NPTEL/ SWAYAM Courses
10. Browsing the useful e-learning sites

**Learning Outcomes:**

At the end of the course the students will be able to:

1. apply the computing technology in their day to day life
2. create awareness regarding digital India initiatives to their surroundings
3. identify the areas where he can extend the digital computing for their benefits.

**Text Book:**

1. E- Materials of Manonmaniam Sundaranar University on “Computer for Digital Era”, <http://msuniv.ac.in>



**References:**

1. Andrew S. Tanenbaum, Computer Networks, 4th Edition, Eastern Economy Edition, PHI Private Ltd, New Delhi, 2003.
2. Gautam Shroff, Enterprise Cloud Computing, Technology, Architecture, Applications, Cambridge University Press, First Edition, 2010.
3. Reza B'Far, Mobile Computing Principles, Cambridge University Press, First Edition, 2005.
4. Charles P Pfleeger, Shari Lawrence Pfleeger, Security in Computing, I Edition, Pearson Education, 2003.
5. <https://swayam.gov.in>
6. <http://www.digitalindia.gov.in/content/social-media-analytics>

Scheme of Examination	
Internal – 25 Marks	External – 75 Marks
Internal Break Up - 15 for Continuous Assessment Test (CAT) + 5 for Assignment + 5 for Seminar. 3 CATs ( Two tests on Theory and one on Practical )are to be conducted	

