



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 2024-2025 onwards)



Semester-II				
Part	Subject Status	Subject Title	Subject Code	Credit
I	LANGUAGE	TAMIL/MALAYALAM/HINDI		3
II	ENGLISH	ENGLISH		3
III	CORE	GENERAL CHEMISTRY-II		5
III	CORE	QUALITATIVE ORGANIC ANALYSIS		3
III	ELECTIVE	MATHEMATICS / ZOOLOGY		5
		ALLIED ZOOLOGY		3
		LAB ON ALLIED ZOOLOGY		2
IV	SEC 2	DAIRY CHEMISTRY		1
IV	SEC 3	ROLE OF CHEMISTRY IN DAILY LIFE		1
IV	NAAN MUDHALVAN	CAMBRIDGE COURSE - ENGLISH / *COSMETICS AND PERSONAL GROOMING		2



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



PART I – TAMIL

பொதுத்தமிழ் 2

தமிழ் இலக்கிய வரலாறு 2

அலகு 1: தமிழ் இலக்கிய, இலக்கண வரலாறு அறிமுகம்.

1. சிற்றிலக்கியம்: குறவஞ்சி, கலம்பம், உலா, பரணி, பள்ளு, பிள்ளைத்தமிழ், தூது, அந்தாதி.
2. தனிப்பாடல் அறிமுகம்
3. இக்கால இலக்கியம்: கவிதை, சிறுகதை, நாடகம், உரைநடை, திராவிட இயக்கம் வளர்த்த தமிழ்

அலகு 2 சிற்றிலக்கியமும், தனிப்பாடலும்

சிற்றிலக்கியம்:

1. கலிங்கத்து பரணி-விருந்தினரும் வரியவரு நெருங்கி யுண்ணரும் - முதல் - கேட்பாரைக் காண்மின் காண்மின் - வரை
2. திருக்குற்றாலக் குறவஞ்சி - வானரங்கள் கனிகொடுத்து
3. முக்கூடற் பள்ளு - ஆற்று வெள்ளம் நாளை வரத்
4. அபிராமி அந்தாதி - கலையாத கல்வியும் குறையாத வயதும் (பதினாறு செல்வங்கள்)
5. திருவரங்கக் கலம்பம் - மறம் - பிள்ளைப் பெருமாள் ஐயங்கார்-பேசவந்த தூத செல்லரித்த ஓலை சொல்லுமோ
6. தமிழ்விடு தூது முதல் பத்து கண்ணிகள்

தனிப்பாடல்

1. வான்குருவி யின்கூடு - ஒளவையார்
2. ஆமணக்குக்கும் யானைக்கும் சிலேடை: முதிருக்கும் கொம்பசைக்கும் மூரித்தண்டே-காளமேகப் புலவர்
3. இம்பார் வான் எல்லை இராமனையே பாடி - வீரராகவர்
4. நாராய் நாராய் முத்தப் புலவர்

அலகு 3 இக்கால இலக்கியம் - 1

1. பாரதியார் பாரத சமுதாயம் வாழ்கவே
2. பாரதிதாசன் - சிறுத்தையே வெளியில் வா
3. நாமக்கல் கவிஞர் - கத்தியின்றி
4. தமிழ் ஒளி - மீன்கள் (அந்தி நிலா பார்க்க வா)
5. ஈரோடு தமிழன்பன் - எட்டாவது சீர் (வணக்கம் வள்ளுவ)

சிறுகதைகள்

1. புதுமைப்பித்தன் - கடிதம்
2. ஜெயகாந்தன் - வாய்ச் சொற்கள் (மாலை மயக்கம் தொகுப்பு)
3. ஆர். சூடாமணி - அந்நியர்கள்

உரைநடை :

1. மு. வ கடிதங்கள் - தம்பிக்கு நூலில் முதல் இரண்டு கடிதங்கள்



அலகு 4 இக்கால இலக்கியம் 2

1. தந்தை பெரியார் - திருக்குறள் (மாநாட்டு) உரை
2. பேரறிஞர் அண்ணா - இரண்டாம் உலகத் தமிழ் மாநாட்டு உரை
3. கலைஞர் மு. கருணாநிதி - தொல்காப்பிய பூங்கா-எழுத்து-முதல் நூற்பா கட்டுரை

நாடகம் /திரைத்தமிழ்:

1. வேலைக்காரி - திரைப்படம்
2. ராஜா ராணி - சாக்ரடீஸ் - ஓரங்க நாடகம்

இதழியல் தமிழ்:**முரசொலி கடிதம்**

1. செம்மொழி வரலாற்றில் சில செப்பேடுகள்

அலகு 5 மொழிப் பயிற்சி

சொல் வேறுபாடு / பிழை தவிர்த்தல்

வாசிப்பது - வாசிப்பாளர்

சுவர் - சுவரில்

வயிறு - வயிற்றல்

கோயில் - கோவில்

கரறுப்பு - கருப்பு

இயக்குநர் - இயக்குனர்

சில்லறை - சில்லரை

முறித்தல் - முரித்தல்

மனம் - மனசு - மனது

அருகில் - அருகாமையில்

அக்கரை - அக்கறை

மங்கலம் - மங்களம்

பயிற்சி:

1. பிழையான சொற்களை ஒரு பத்தியில் கொடுத்து அந்தந்தப் பிழையான சொற்களைச் சரியாக எழுதச் செய்தல்
2. சிறிய பத்தி ஒன்றை ஆங்கிலத்தில் கொடுத்து அதனைத் தமிழில் மொழிபெயர்க்க வைத்தல்

Text Books:

1. பிழையான சொற்களைச் சரியாக எழுதச் செய்தல்
2. சிறிய பத்தி ஒன்றை ஆங்கிலத்தில் கொடுத்து அதனைத் தமிழில் மொழிபெயர்க்க வைத்தல்

Reference Books:

- மு. வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்ய அக்காதமி, புதுடெல்லி
- மது. ச. விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
- தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
- தமிழ் இளகிய வரலாறு - முனைவர் சிற்பி பாலசுப்ரமணியன், முனைவர்.சொ. சேதுபதி
- புதி யதமிழ் இலக்கிய வரலாறு - முனைவர் சிற்பி பாலசுப்ரமணியன், நீல. பத்மநாபன்

Web Sources:

- இணைய தமிழ் நூலகம் - சென்னை நூலகம் - Online Tamil Library - ChennaiLibrary.com
- [முகப்பு - சிறுகதைகள் \(sirukathaigal.com\)](http://முகப்பு - சிறுகதைகள் (sirukathaigal.com))
- www.tamilvirtualuniversity.org
- [Buy tamil books online 10% to 50% discount, Tamil Novels, Tamil Audio Books online - Buy tamil books online - Established 2010 \(noolulagam.com\)](http://Buy tamil books online 10% to 50% discount, Tamil Novels, Tamil Audio Books online - Buy tamil books online - Established 2010 (noolulagam.com))
- www.katuraitamilblogspot.com



MALAYALAM

PAPER- II Office Communication Malayalam

Learning Objectives

- To give compressive view of communication and its scope and importance in official communication and business communication
- To recall the official writing styles
- To understand different kinds of letter drafting
- To Generalize office keeping and data management
- To differentiate the structural and content variations both official and non-official communication
- To compare the different style of letters based on domains
- To Conceptualize the different trends in computer network and social media

UNITS I

This unit introduces basic communication skills in Malayalam. Salutation, Discourse markers, formal and informal communication strategies, principles of communication, reading and analysis are also introduced

Language-oral and written-importance of languages-formal and informal – communication style in written communication-principles of written communication Text-messages-Email-letter drafting- different types of letter drafting personal letters- -Business letters Official letters—letter to the editor memorandums- Bio data-Reports-press conference-business proposal

UNIT II

This unit introduces - word processing and Editing text Auto correct spell check & grammar check, undo & redo Text formatting Changing case, drop caps, coloring & highlighting text, adding special characters, bullets & numbering

Document formation compositional and typographical ways. Advanced page layout in word Borders, box, shading, page fills & back ground Module and Table & columns Creating tables Inserting tables from the menu & tool bar, drawing tables Manipulating tables Selecting tables elements, inserting & deleting columns & rows, adjusting table properties, are introduced . This unit introduces the Printing word documents Using print preview. Practical knowledge in different fonts and Unicode

UNIT III

This Unit Introduces blog writing, technical writing, content editing, Proof reading, news making, advertisement writing (Writing for career)



UNIT IV

Official language- Malayalam

Detailed study-

1. Malayalam nammude mathru bhasha.- Bharana bhasha prasnangal- M.V.Thomas,State Institute of languages.
2. Bharanam janakeeya bhashayil- Bharana bhasha prasnangal M.V.Thomas-State Institute of languages
3. Deseeyodgrathanam pradesika bhashakaliloode -Bharana bhasha prasnangal M.V.Thomas,State Institute of languages
4. Bhasha samraajyam srishtikkum--- Bhashayum bharanabhashayum Dr.Ezhumattoor Raja raja Varmma ,State Institute of languages
5. Swathanthryathinte Kodiyadayalam- Bhashayum bharanabhashayum Dr.Ezhumattoor Raja raja Varmma, State Institute of languages
6. Bharanaghatana vyavasthakal- Bhashayum bharanabhashayum- Dr.Ezhumattoor Rajaraja Varmma, State Institute of languages
7. Malayala dinaghoshavum Bharanabhashavaraghoshavum Bhashayum bharanabhashayum-Dr.Ezhumattoor Rajaraja Varmma, State Institute of languages

UNIT V

This unit introduces Malayalam for Competitive Exams. Reading comprehension, reasoning , inferential comprehension, analogical creations(Competitive Malayalam) Malayalam for language Specific Exams for writing UPSC, PSC exams

Reading List (Print and Online)

1. Bharana bhasha prasnangal- M.V.Thomas-State Institute of languages
2. Business Communication for Success: Publisher: University of Minnesota Libraries Publishing
3. Vanijyaparamaya kathidapadukal,G.R.Pilla .State Institute of languages
4. Bhashayum bharanabhashayum-Dr.Ezhumattoor Rajaraja Varmma,



HINDI

Kahani, Ekanki aur Vyakaran

Course Objectives

The Main Objectives of this course are to:

- Introduction to Hindi fiction
- Teaching of social values through stories and skits
- Practical application of grammar

Unit I

Hindi Katha-Sahitya: Parichay

- Kahani ke Tatva
- Hindi ke Pramukh kahanikaro ka Parichay
- Ekanki ke Tattva
- Hindi ke Pramukh Ekankikaro ka Parichay

Unit II

Hindi Kahaniya

- Premchand – Bade Ghar ki Beti
- Malathi Joshi – Vo Tera Ghar Yah Mera Ghar
- Pita - Gyanranjan

Unit III

Hindi Ekanki

- Lakshmi ka Swagat – Upendranath Ashk
- Vibhajan – Vishnu Prabhakar
- Maa Baap – Sri Vishnu

Unit IV

Vyakaran

- Kriya Visheshan
- Sambandh Bodhak
- Samuchay Bodhak
- Vismayadi Bodhak aadi shabdo ka prayog

Unit V

Pratiyogi Pariksha par aadharit Nimnalikhit Vishayo se sambandhit Prashikshan Karya

- Tamil Bhasha: Mahakavi Bharatiyar
- Sanket Vikas dwara Lekhan kala aur Kahani Lekhan ka Vikas
- Gadyansh dekhkar sahi Shirshak chunna
- Pathit Vyakaran par aadharit Vakya rachna
- Vibhinna Pratiyogi parikshao ke bare mein suchna pradan dena

Reference Books

1. Aath Ekanki Natak – Ed. Dr. Ramkumar Verma
2. Das Ekanki

Related Online Contents (MOOCs, SWAYAM, NPTEL, YouTube, Websites, etc.)

1. Lokpriya Kahaniya: <https://www.hindwi.org/sangrahaalay/100-best-storiesin-hindii>
2. Vo Tera Ghar Ye Mera Ghar:
http://gadyakosh.org/gk/%E0%A4%B5%E0%A5%8B_%E0%A4%A4%E0%A5%87%E0%A4%B0%E0%A4%BE_%E0%A4%98%E0%A4%B0_%E0%A4%AF%E0%A5%87_%E0%A4%AE%E0%A5%87%E0%A4%B0%E0%A4%BE_%E0%A4%98%E0%A4%B0_%E0%A4%AE%E0%A4%BE%00%A4%B2%E0%A4%A4%E0%A5%80_%E0%A4%9C%E0%A5%8B%E0%A4%B6%E0%A5%80
3. <https://hindistory.net/>



Part II English

GENERAL ENGLISH - II

Learning Objectives

- To make students realize the importance of resilience
- To enable them to become good decision makers
- To enable them to imbibe problem-solving skills
- To enable them to use tenses appropriately
- To help them use English effectively at the work place.

UNIT I

RESILIENCE

Poem

- 1.1 Don't Quit – Edgar A. Guest
- 1.2 Still Here – Langston Hughes

Short Story

- 1.3 Engine Trouble – R.K. Narayan
- 1.4 Rip Van Winkle – Washington Irving

UNIT II

DECISION MAKING

Short Story

- 2.1 The Scribe – Kristin Hunter
- 2.2 The Lady or the Tiger - Frank Stockton

Poem

- 2.3 The Road not Taken – Robert Frost
- 2.4 Snake – D. H Lawrence

UNIT III

PROBLEM SOLVING

Prose life Story

- 3.1 How I taught My Grandmother to Read – Sudha Murthy

Autobiography

- 3.3 How frog Went to Heaven – A Tale of Angolo
- 3.4 Wings of Fire (Chapters 1,2,3) by A.P.J Abdul Kalam

UNIT IV

Tenses

- 4.1 Present
- 4.2 Past
- 4.3 Future
- 4.4 Concord

UNIT V

English in the Workplace

- 5.1 E-mail – Invitation, Enquiry, Seeking Clarification
- 5.2 Circular
- 5.3 Memo
- 5.4 Minutes of the Meeting



Text Books (Latest Editions)**References Books**

1. Martin Hewings. Advanced English Grammar. Cambridge University Press, 2000
2. SP Bakshi, Richa Sharma. Descriptive English. Arihant Publications (India) Ltd., 2019.
3. Sheena Cameron, Louise Dempsey. The Reading Book: A Complete Guide to Teaching Reading. S & L. Publishing, 2019.
4. Barbara Sherman. Skimming and Scanning Techniques, Liberty University Press, 2014.
5. Phil Chambers. Brilliant Speed Reading: Whatever you need to read, however. Pearson, 2013.
6. Communication Skills : Practical Approach Ed. Shaikh Moula Ramendra Kumar. Stories of Resilience, Blue Rose Publications, 2020.

Web Sources

1. Langston Hughes. Still Here
<https://poetryace.com/im-still-here>
2. R. K. Narayan. Engine Trouble
<http://www.sbioaschooltrichy.org/work/Work/images/new/8e.pdf>
3. Washington Irving. Rip Van Winkle
<https://www.gutenberg.org/files/60976/60976-h/60976-h.htm>
4. Frank Stockton. The Lady or the Tiger <https://www.gutenberg.org/ebooks/396>

GENERAL CHEMISTRY-II

Objectives of the course

This course aims at providing an overall view of the

- Chemistry of acids, bases and ionic equilibrium
- Properties of s and p-block elements
- Chemistry of hydrocarbons
- Applications of acids and bases
- Compounds of main block elements and hydrocarbons

UNIT-I Acids, bases and Ionic equilibria

Concepts of Acids and Bases - Arrhenius concept, Bronsted-Lowry concept, Lewis concept; Relative strengths of acids, bases and dissociation constant; dissociation of poly basic acids, ionic product of water, pH scale, pH of solutions; Degree of dissociation, common ion effect, factors affecting degree of dissociation; acid base indicators, theory of acid base indicators – action of phenolphthalein and methyl orange, titration curves - use of acid base indicators;

Buffer solutions – types, mechanism of buffer action in acid and basic buffer, Henderson-Hasselbalch equation;



Salt hydrolysis - salts of weak acids and strong bases, weak bases and strong acids, weak acids and weak bases - hydrolysis constant, degree of hydrolysis and relation between hydrolysis constant and degree of hydrolysis;

Solubility product-determination and applications; numerical problems

Involving the core concepts.

Unit-II Chemistry of s-Block Elements

Hydrogen: Position of hydrogen in the periodic table. Alkalimetal: Comparative study of the elements with respect to oxides, hydroxides, halides, carbonates and bicarbonates. Diagonal relationship of Li with Mg. Preparation, properties and uses of NaOH, Na_2CO_3 , KBr, KClO_3 alkaline earth metals. Anomalous behaviour of Be.

Chemistry of p-Block Elements (Group 13 & 14)

Preparation and structure of diborane and borazine. Chemistry of borax. Extraction of Al and its uses. Alloys of Al.

Comparison of carbon with silicon. Carbon-di-sulphide—Preparation, properties, structure and uses. Percarbonates, per mono carbonates and per dicarbonates.

UNIT-III Chemistry of p-Block Elements (Group 15-18)

General characteristics of elements of Group 15; chemistry of $\text{H}_2\text{N}-\text{NH}_2$, NH_2OH , NH_3 and HNO_3 . Chemistry of PH_3 , PCl_3 , PCl_5 , POCl_3 , P_2O_5 and oxy acids of phosphorous (H_3PO_3 and H_3PO_4).

General properties of elements of group 16 - Structure and allotropy of elements - chemistry of ozone - Classification and properties of oxides - oxides of sulphur and selenium – Oxy acids of sulphur (Caro's and Marshall's acids).

Chemistry of Halogens: General characteristics of halogen with reference to electronegativity, electron affinity, oxidation states and oxidizing power. Peculiarities of fluorine. Halogen acids (HF , HCl , HBr and HI), oxides and oxy acids (HClO_4). Inter-halogen

compounds (ICl , ClF_3 , BrF_5 and IF_7), pseudohalogens [$(\text{CN})_2$ and $(\text{SCN})_2$] and basic nature of Iodine.

Noble gases: Position in the periodic table. Preparation, properties and structure of XeF_2 , XeF_4 , XeF_6 and XeOF_4 ; uses of noble gases – clathrate compounds.

UNIT-IV

Hydrocarbon Chemistry-I

Petroproducts: Fractional distillation of petroleum; cracking, isomerisation, alkylation, reforming and uses.

Alkenes-Nomenclature, general methods of preparation – Mechanism of elimination reactions – E_1 and E_2 mechanism-factors influencing – stereochemistry – orientation – Hofmann and Saytzeff rules. Reactions of alkenes – addition reactions – mechanisms



– Markownikoff's rule, Kharasch effect, oxidation reactions–hydroxylation, oxidative degradation, epoxidation, ozonolysis; polymerization.

Alkadienes

Nomenclature - classification – isolated, conjugated and cumulated dienes; stability of conjugated dienes; mechanism of electrophilic addition to conjugated dienes - 1, 2 and 1, 4 additions; free radical addition to conjugated dienes– Diels–Alder reactions – polymerisation – polybutadiene, polyisoprene (natural rubber), vulcanisation, polychloroprene.

Alkynes

Nomenclature; general methods of preparation, properties and reactions; acidic nature of terminal alkynes and acetylene, polymerisation and isomerisation.

Cycloalkanes: Nomenclature, Relative stability of cycloalkanes, Bayer's strain theory and its limitations. Conformational analysis of cyclohexane, mono and di substituted cyclohexanes.

Geometrical isomerism in cyclohexanes.

UNIT-V

Hydrocarbon Chemistry-II

Benzene: Source, structure of benzene, stability of benzene ring, molecular orbital picture of benzene, aromaticity, Huckel's $(4n+2)\pi e^-$ rule and its applications. Electrophilic substitution reactions - General mechanism of aromatic electrophilic substitution - nitration, sulphonation, halogenations.

Friedel-Craft's alkylation and acylation. Mono substituted and disubstituted benzene -Effect of substituent–orientation and reactivity.

Polynuclear Aromatic hydrocarbons: Naphthalene – nomenclature, Haworth synthesis; physical properties, reactions – electrophilic substitution reaction, nitration, sulphonation, halogenation, Friedel – Crafts acylation & alkylation, preferential substitution at o-,p- or m- position – reduction, oxidation – uses. Anthracene – synthesis by Elbs reaction, Diels – Alder reaction and Haworth synthesis; physical properties; reactions - Diels-Alder reaction, preferential substitution at C-9 and C-10; uses.

Recommended Text

1. Madan R D, Sathya Prakash, (2003), Modern Inorganic Chemistry, 2nded, S.Chand and Company, New Delhi.
2. Sathya Prakash, Tuli G D, Basu S K and Madan R D, (2003), Advanced Inorganic Chemistry, 17th ed., S. Chand and Company, New Delhi.
3. Bahl B S, Arul Bhal, (2003), Advanced Organic Chemistry, 3rded., S.Chand and Company, New Delhi.
4. Tewari K S, Mehrothra S N and Vishnoi N K, (1998), Text book of Organic Chemistry, 2nded., Vikas Publishing House, New Delhi.



- Puri B R, Sharma L R, (2002), Principles of Physical Chemistry, 38th ed., Vishal Publishing Company, Jalandhar.

Reference Books

- Maron S Hand Prutton CP, (1972), Principles of Physical Chemistry, 4th ed., The Macmillan Company, New York.
- Barrow GM, (1992), Physical Chemistry, 5th ed., Tata Mc Graw Hill, New Delhi.
- Lee J D, (1991), Concise Inorganic Chemistry, 4th ed., ELBS William Heinemann, London.
- Huheey J E, (1993), Inorganic Chemistry: Principles of Structure and Reactivity, 4th ed., Addison Wesley Publishing Company, India.
- Gurudeep Raj, (2001), Advanced Inorganic Chemistry Vol – I, 26th ed., Goel Publishing House, Meerut.
- Agarwal OP, (1995), Reactions and Reagents in Organic Chemistry, 8th ed., Goel Publishing House, Meerut.

Website and e-learning source

- https://onlinecourses.nptel.ac.in/http://cactus.dixie.edu/smblack/chem1010/lecture_notes/4B.html
- <http://www.auburn.edu/~deruija/pdareson.pdf> <https://swayam.gov.in/course/64-atomic-structure-and-chemical-bondingMOOCcomponents>
- <http://nptel.ac.in/courses/104101090/> Lecture 1: Classification of elements and periodic properties <http://nptel.ac.in/courses/104101090/>

QUALITATIVE ORGANIC ANALYSIS

Objectives of the course

This course aims at providing knowledge on

- Laboratory safety
- Handling glass wares
- Analysis of organic compounds
- Preparation of derivatives.
- Study the principle of the experiment.

UNIT-I

Safety rules, symbols and first-aid in chemistry laboratory

Basic ideas about Bunsen burner, its operation and parts of the flame. Chemistry laboratory glassware – basic information and uses.

Unit-II

Qualitative Organic Analysis

Preliminary examination, detection of special elements -nitrogen, sulphur and halogens Aromatic and aliphatic nature, Test for saturation and unsaturation,



identification of functional groups using solubility tests

Confirmation of functional groups

- Monocarboxylic acid, dicarboxylic acid
- Monohydric phenol, polyhydric phenol
- aldehyde, ketone, ester
- carbohydrate (reducing and non-reducing sugars)
- primary, secondary, tertiary amine
- monoamide, diamide, thioamide
- anilide, nitrocompound
- Preparation of derivatives for functional groups.

Reference Books

1. Venkateswaran, V.; Veeraswamy, R.; Kulandaivelu, A.R. Basic Principles of Practical Chemistry, 2nd ed.; Sultan Chand: New Delhi, 2012.
2. Manna, A.K. Practical Organic Chemistry, Books and Allied: India, 2018.
3. Gurtu, J.N; Kapoor, R. Advanced Experimental Chemistry (Organic), Sultan Chand: New Delhi, 1987.
4. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Vogel's Textbook Of Practical organic Chemistry, 5th ed.; Pearson: India, 1989.

Website and e- learning Source

1. <https://www.vlab.co.in/broad-area-chemical-sciences>

VECTOR CALCULUS AND FOURIER SERIES

Objectives of the Course

- To know the concepts of vector differentiation and vector integration.

UNIT I

Vector differentiation–Gradient–Divergence and curl.

UNIT II

Evaluation of double and triple integrals

UNIT III

Vector integration–Line, surface and volume integrals.

UNIT IV

Green's, Stoke's and Divergence theorems (without proof)– Simple problems.



UNIT V

Fourier series–Even and odd functions–Half range Fourier series.

Recommended Text

1. S.Arumugam and A. Thangapandi Isaac, Allied Mathematics Paper-II, New Gamma Publishing House, Palayamkottai, 2012.
2. T.K.Manicavachagom Pillay, Calculus(VolII), S.Vishvanathan Printer and Publisher PVT.LTD, 2012.

Reference Books

1. S.Arumugam and others, Analytical Geometry 3D & Vector Calculus, New Gamma Publishing House, Palayamkottai, 2017.
2. J. C. Susan, Vector Calculus(4th Edition), Pearson Education, Boston, 2012.
3. Murray Spiegel, Vector analysis, Schaum Publishing company, New York, 2009.

Website and e-Learning Source

1. <https://nptel.ac.in>

ALLIED ZOOLOGY - II**Course Objectives**

- To enable students to learn basic concepts relating to aspects of respiratory, circulatory, excretory nervous and sensory physiology.
- To enable students to comprehend the processes involved during development.
- To enable students to learn basic concepts of immunity and the working of immune organs and familiarize them with the recommended vaccination schedule
- To enable students to comprehend the basic concepts of human genetics and patterns of inheritance
- To enable students to learn about aspects of animal behaviour such as foraging, courtship, nest construction, parental care and learning

UNIT I

Respiration - Respiratory pigments and transport of gases. Mechanism of blood clotting. Types of excretory products –Ornithine cycle. Structure of neuron – Conduction of nerve impulse, Mechanism of vision and hearing.

UNIT II

Fertilization, Cleavage, Gastrulation and Organogenesis of Frog; Placentation in mammals



UNIT III

Immunity Innate and Acquired - Active and Passive; Antigens and Antibodies; Immunological organs – responses in humans; Vaccination schedule

UNIT IV

Human Genetics: Human Chromosomes – Sex Determination in Humans; Patterns of Inheritance: Autosomal Dominant, Autosomal Recessive, X-linked, Y-linked, Multiple Allelic and Polygenic; Genetic Counselling

UNIT V

Animal Behaviour: Foraging, Courtship Behaviour, Shelter and Nest Construction, Parental Care, Learning Behaviour

Text Books (Latest Editions)

1. Verma P.S. & Agarwal – (1997), Developmental Biology, Chordata embryology S. Chand & Co.
2. Michael D. Breed and Janice Moore, (2012), Animal Behaviour, Academic Press, USA,

Reference Books (Latest editions, and the style as given below must be strictly adhered to)

1. Owen, J. A., Punt, J. & Stranford, S. A. (2018), Kuby Immunology, New York: W.H. Freeman & Company
2. Klug, W. S., Cummings, M. R. & Spencer, C (2016), Concepts of Genetics. (12th ed.). New Jersey: Pearson Education
3. Mathur, R. (2014), Animal Behaviour. Meerut: Rastogi.
4. David McFarland, (1985), Animal Behaviour, Longman Scientific & Technical, UK.
5. Harjindra Singh, (1990), A Text Book of Animal Behaviour, Anomol Publication

ALLIED ZOOLOGY LAB COURSE - II

Learning Objectives

- To understand the vital physiological functions of our body like respiration and circulation.
- To identify and compare the embryological developmental stages in frog
- To understand the different immune system and its components of our body and gain knowledge about immunization schedule.
- To compare the basic concept of genetic inheritance
- To analyse the different pattern of behaviour and its physiology

UNIT I

1. Examination and analysis of Ammonia. Urea and Uric acid
2. Estimation of haemoglobin using haemometer



UNIT II

Observation of models, charts and diagrams: Human heart, haemoglobin, neuron, eye, Snellen chart for vision test and ear, Human karyotype, Haemophilia, Colour Blindness, Hypertrichosis, Down's syndrome, Turner's syndrome, Klinefelters's syndrome;

UNIT III

SPOTTERS- Slides and Specimen Frog: egg, Cleavage, blastula, gastrula- yolk plug stage; any two placenta

UNIT IV

1. Examination of blood group- Demonstration
2. Immunization schedule by WHO

UNIT V

Record / Observation Note (SUBMISSION IS MANDATORY)

Text Books (Latest Editions)

1. Verma P.S. & Agarwal (2004), Developmental Biology, Chordata embryology, S. Chand & Co.
2. Widmaier, E.P., Raff, H. and Strang, K.T. (2008), Vander's Human Physiology, XI Edition., McGraw Hill., 770 PP
3. Abhijit Dutta, (2009), Experimental biology: A Laboratory Science, Narosa, New Delhi.
4. Roitt, M, Peter J. Delves, Seamus J. Martin And Dennis R. Burton, (2017), Essential Immunology, 13th Edition, Wiley-Blackwell Publishing, Usa,

Reference Books (Latest editions, and the style as given below must be strictly adhered to)

1. Owen, J. A., Punt, J. & Stranford, S. A. (2018), Kuby Immunology, New York: W.H. Freeman & Company
2. Klug, W. S., Cummings, M. R. & Spencer, C (2016), Concepts of Genetics. (12th ed.). New Jersey: Pearson Education
3. Mathur, R. (2014), Animal Behaviour. Meerut: Rastogi.

DAIRY CHEMISTRY**Objectives of the course**

This course aims at providing an overall view of the

- Chemistry of milk and milk products
- Processing of milk
- Preservation and formation of milk products.



UNIT-I**Composition of Milk**

Milk-definition-general composition of milk- constituents of milk - lipids, proteins, carbohydrates, vitamins and minerals –physical properties of milk - colour, odour, acidity, specific gravity, viscosity and conductivity -Factors affecting the composition of milk - adulterants, preservatives with neutralizer- examples and their detection-estimation off at, acidity and total solids in milk.

UNIT-II**Processing of Milk**

Microbiology of milk – destruction of micro-organisms in milk, physico-chemical changes taking place in milk due to processing - boiling, pasteurization – types of pasteurization - Bottle, Batch and HTST (High Temperature Short Time) – Vacuum pasteurization – Ultra High Temperature Pasteurization.

UNIT -III**Major Milk Products**

Cream - definition - composition - chemistry of creaming process - gravitational and centrifugal methods of separation of cream-estimation off at incream. Butter-definition -composition - theory of churning – desi butter - salted butter, estimation of acidity and moisture content in butter. Ghee –major constituents –common adulterants added to ghee and their detection–rancidity-definition-prevention-antioxidants and synergists- Natural and synthetic.

UNIT-IV**Special Milk**

Standardised milk - definition - merits - reconstituted milk - definition –flow diagram of manufacture - Homogenised milk - flavoured milk – vitaminised milk - toned milk – Incitation milk-Vegetable toned milk-humanized milk-condensed milk-definition, Composition and nutritive value.

UNIT-V**Fermented and other Milk Products**

Fermented milk products–fermentation of milk-definition, conditions, cultured milk -definition of culture-example, conditions-cultured cream, butter milk-Bulgarious milk-acidophilous milk–Yoheer Indigeneous products-khoa and chhena definition- Ice cream -definition-percentage composition-types-ingredients-manufacture of ice-cream, stabilizers -emulsifiers and their role-milk powder-definition- Need for making milk powder-drying process-types of drying.

Recommended Text

1. K.Bagavathi Sundari, Applied Chemistry, MJP Publishers, first edition, 2006.
2. K.S. Rangappa and K.T.Acharya, Indian Dairy Products, Asia Publishing House New Delhi, 1974.
3. Text book of dairy chemistry, M.P. Mathur, D. Datta Roy, P. Dinakar, Indian Council of Agricultural Research, 1 st edition, 2008.
4. A Text book of dairy chemistry, Saurav Singh, Daya Publishing house, 1st edition, 2013.
5. Textbook of dairy chemistry, P.L.Choudhary, Bio-Green book publishers,2021.

Reference Books

1. Robert Jenness and S.Patom, Principles of Dairy Chemistry, S.Wiley, NewYork, 2005.
2. F.P.Wond, Fundamentals of Dairy Chemistry, Springer, Singapore,2006.
3. Sukumar De, Outlines of Dairy Technology, Oxford University Press, NewDelhi, 1980.
4. P.F.Fox and P.L.H. Mcsweeney, Dairy Chemistry and Biochemistry, Springer, Second edition, 2016.
5. Dairy chemistry and biochemistry, P.F.Fox, T.Uniacke-Lowe, P.L.H. McSweeney, J.A.O Mahony, Springer, Second edition,2015.

Website and e-learning source

1. e-pathshala
2. <https://www.agrilcareer.com-pdf>

ROLE OF CHEMISTRY IN DAILY LIFE

Objectives of the course

This course aims at providing an overall view of the

- Importance of Chemistry in everyday life
- Chemistry of building materials and food
- Chemistry of Drugs and pharmaceuticals

UNIT-I

General survey of chemicals used in everyday life. Air - components and their importance; photosynthetic reaction, air pollution, green - house effect and the impact on our life style. Water - Sources of water, qualities of potable water, soft and hard water, methods of removal of hardness-water pollution

Unit-II

Building materials - cement, ceramics, glass and refractories - definition, composition and application only. Plastics - polythene, PVC, bakelite, polyesters, melamine-formaldehyde resins-preparation and uses only.

UNIT-III

Food and Nutrition - Carbohydrates, Proteins, Fats - definition and their importance as food constituents – balanced diet – Calories minerals and vitamins (sources



and their physiological importance). Cosmetics—tooth paste, face powder, soaps and detergents, shampoos, nailpolish, perfumes- general formulation and preparations – possible hazards of cosmetic use.

UNIT-IV

Chemicals in food production – fertilizers - need, natural sources; urea, NPK fertilizers and super phosphate. Fuel—classification-solid, liquid and gaseous; nuclear fuel examples and uses.

UNIT-V

Pharmaceutical drugs - analgesics and antipyretics - paracetamol and aspirin. Colour chemicals-pigments and dyes-examples and applications. Explosives - classification and examples.

Recommended Text

1. Food chemistry, H.K. Chopra, P.S.Panesar, Narosa publishing house, 2010.
2. A textbook of pharmaceutical chemistry by Jaya shree Ghosh, S Chand publishing, 2012.
3. S.Vaithyanathan, Textbook of Ancillary Chemistry; Priya Publications, Karur, 2006.
4. B. K, Sharma, Industrial Chemistry; GOEL publishing house, Meerut, sixteenth edition, 2014.Introduction to forensic chemistry, Kelly M. Elkins, CRC Press Taylor & Francis Group, 2019.
5. Jayashree Ghosh, Fundamental Concepts of Applied Chemistry, S. Chand & Co. Publishers, second edition, 2006.

Reference Books

1. Randolph. Norris Shreve, Chemical Process Industries, McGraw-Hill, Texas, fourth edition, 1977.
2. W.A. Poucher, Joseph. A. Brink, Jr. Perfumes, Cosmetics and Soaps, Springer, 2000.
3. A.K.De, Environmental Chemistry, New Age International Public Co.,1990.

COSMETICS AND PERSONAL GROOMING

Objectives of the course

This course aims at familiarizing the students with

- Formulations of various types of cosmetics and their significance
- hair, skin and dental care
- makeup preparations and personal grooming



UNIT- I Skin care

Nutrition of the skin, skincare and cleansing of the skin; face powder–ingredients; creams and lotions – cleansing, moisturizing all purpose, shaving and sunscreen (formulation only); Gels – formulation and advantages; astringent and skin tonics – key ingredients, skin lightness, depilatories.

UNIT-II Haircare

Shampoos–types–powder, cream, liquid, gel –ingredients; conditioner –types–ingredients

Dental care

Toothpastes–ingredients–mouthwash

UNIT-III Makeup

Base–foundation–types–ingredients; lipstick, eyeliner, mascara, eyeshadow, concealers, rouge

UNIT-IV Perfumes

Classification - Natural– plant origin–parts of the plant used, chief constituents; animal origin–ambergris from whale, civetone from civetcat, musk from muskdeer; synthetic –classification emphasizing- characteristics– esters – alcohols – aldehydes – ketones

UNIT-V Beauty treatments

Facials - types – advantages – disadvantages; face masks – types; bleach -types– advantages– disadvantages; shaping the brows; eyelash tinting; perming – types; hair colouring and dyeing ; permanent waving – hair straightening; wax types – waxing; pedicure, manicure - advantages – disadvantages

Recommended Text

1. Thankamma Jacob,(1997)Foods, drugs and cosmetics –A consumer guide, Macmillan publication, London.

Reference Books

1. Wilkinson JBE and Moore RJ, (1997) Harry’s cosmeticology, 7th ed.,Chemical Publishers, London.
2. George Howard, (1987) Principles and practice of perfumes and cosmetics, Stanley Therones, Chettenham.

Website and e-learning source

1. <http://www.khake.com/page75.html>
2. Net.foxsm/list/284

