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 2023-2024 onwards)

Semester-II				
Part	**Subject Status**	**Subject Title**	**Subject Code**	**Credit**
I	Language I	TAMIL/ MALAYALAM/ HINDI	E1TL21/ E1MY21/ E1HD21	3
II	Language II	ENGLISH	E2EN21	3
III	Core	GENERAL CHEMISTRY–II	EMCH21	5
III	Core	QUALITATIVE ORGANIC ANALYSIS AND PREPARATION OF ORGANIC COMPOUNDS	EMCHP2	3
III	Elective	ALLIED ZOOLOGY PAPER II/ MATHEMATICS	EEZO21/ EEMA21	3
III	Elective	ALLIED ZOOLOGY PRACTICAL II	EEZOP2	2
IV	SEC	DAIRY CHEMISTRY	ESCH21	2
IV	SEC	COSMETICS AND PERSONAL CARE PRODUCTS	ESCH22	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 **I 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)**

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

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

- **Classification**
  a) First Class with Distinction : CGPA $\geq$ 7.5*****
  b) First Class : CGPA $\geq$ 6.0
  c) Second Class : CGPA $\geq$ 5.0 and $<$ 6.0
  d) Third Class : CGPA$<$ 5.0

Part – I TAMIL

Learning Objectives:

- முதலாமாண்டுப் பட்ட வகுப்பு மாணவர்களுக்குத் தமிழ் மொழி இலக்கியங்களை அறிமுகம் செய்தல்
- தமிழ் இலக்கியப் போக்குகளையும், இலக்கணங்களையும் மாணவர் அறியுமாறு செய்து அவர்களின் படைப்பாற்றலைத் தூண்டுதல்
- தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்

அலகு 1:

தமிழ் இலக்கிய வரலாறு அறிமுகம்.

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

அழகு 2

சிற்றிலக்கியமும், தனிப்பாடலும்

சிற்றிலக்கியம்:

1. கலிங்கத்து பரணி-விருந்தினருக்கு வறியவரும் நெருங்கியுண்ண முதல் கேட்பாரைக் காண்மின் காண்மின் வரை (5 பாடல்கள்)
2. திருக்குற்றாலக் குறவஞ்சி - வானரங்கள் கனிகொடுத்து
3. முக்கூடற் பள்ளு - ஆற்று வெள்ளம் நாளை வரத்
4. அபிராமி அந்தாதி - கலையாத கல்வியும் குறையாத வயதும் (பதினாறு செல்வங்கள்)
5. திருவரங்கக் கலம்பகம் - மறம் பேசவந்த தூது செல்லரித்த ஓலை சொல்லுமோ (பிள்ளைப் பெருமாள் ஐயங்கார்)
6. தமிழ்விடு தூது -முதல் பதுக் கண்ணிகள்

தனிப்பாடல்;

1. வான்குருவி யின்கூடு - ஔவையார்
2. ஆமணக்குக்கும் யானைக்கும் சிலேடை - முதிருக்கும் கொம்பசைக்கும் மூரிதண்டேந்தி - காளமேகப் புலவர்
3. இம்பர் வான் எல்லை இராமனையே பாடி - வீரராகவர்
4. நாராய் நாராய் - சத்தி 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
5. ஈரோடு தமிழன்பன் - எட்டாவது சீர் (வணக்கம் வள்ளுவ - தொகுப்பு)

சிறுகதைகள்:

1. புதுமைப்பித்தன் - கடிதம்
2. ஜெயகாந்தன் - வாய்ச் சொற்கள் (மாலை மயக்கம் - தொகுப்பு)
3. ஆர். சூடாமணி - அந்நியர்கள்
4. உரைநடை:
5. 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 - நூற்பா கட்டுரை

நாடகம்/திரைத்தமிழ்:

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

இதழியல் தமிழ்:

முரசொலி கடிதம்

1. செம்மொழி வரலாற்றில் சில செப்பேடுகள்

அலகு 5 மொழி பயிற்சி

சொல் வேறுபாடு/பிழை தவிர்த்தல்

- வாசிப்பது - வாசிப்பவர்
- சுவர் - சுவரில்
- வயிறு - வயிற்றில்
- கோயில் - கோவில்
- கருப்பு - கறுப்பு
- இயக்குநர் - இயக்குனர்
- சில்லறை - சில்லரை
- முறித்தல் - முறிதல்
- மனம் - மனசு - மனது
- அருகில் - அருகாமையில்
- அக்கரை - அக்கறை
- மங்கலம் - மங்களம்

பயிற்சி:

- பிழையான சொற்களை ஒரு பத்தியில் கொடுத்து அந்தப் பிழையான சொற்களைச் சரியாகச் எழுதச் செய்தல்
- சிறிய பத்தி ஒன்றை ஆங்கிலத்தில் கொடுத்து அதனைத் தமிழில் மொழிபெயர்க்க வைத்தால்.

Text Books

Reference Books

1. மு. வரதராசன், தமிழ் இளகிய வரலாறு, சாகித்ய அக்காதெமி, புதுடெல்லி.
2. மது.ச. விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
3. தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
4. தமிழ் இலக்கிய வரலாறு - முனைவர். சிற்பி பாலசுப்ரமணியம், நீல. பத்மநாபன்
5. தமிழ் இலக்கிய வரலாறு - டாக்டர் எ.கா. பெருமாள்
6. தமிழ் இலக்கிய வரலாறு - முனைவர். ப. ச. ஏசுதாசன்
7. தமிழ் இலக்கிய வரலாறு - ஸ்ரீ குமார்
8. வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு - பாக்கியமேரி
9. தமிழ் பயிற்றும் முறை, பேராசிரியர் ந. சுப்புரெட்டியார் - மணிவாசகர் - பதிப்பகம், சிதம்பரம்

Web Sources:

https://www.chennailibrary.com/
https://www.sirukathaigal.com/
https://www.tamilvirtualuniversity.org/
https://www.noolulagam.com/
https://www.katuraitamilblogspot.com/

PART I MALAYALAM

Course Objectives

1. To give compressive view of communication and its scope and importance in official communication and business communication

Unit I:

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

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.

Unit III

This unit introduces the 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 IV

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

Unit V

This unit introduces Malayalam for Competitive Exams. Reading comprehension, reasoning, inferential comprehension, analogical creations(Competitive Malayalam)

Unit VI

Malayalam for language Specific Exams for writing UPSC, PSC Exams

Recommended Text:

1. Bharanabhasha: The State language Institute Business Communication for Success: Publisher: University of Minnesota Libraries Publishing

PART I HINDI - Kahani, Ekanki aur Vyakran

Course Objectives

The Main Objectives of this course are these courses are to

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

Unit I

Hindi Katha-Sahitya: Parichay

1 Kahani ke Tatva
2. Hindi ke Pramukh kahanikaro ka Parichay
3. Ekanki ke Tattva
4. Hindi ke Pramukh Ekankikaro ka Parichay

Unit II

Hindi Kahaniya

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

Unit III

Hindi Ekanki

1 Lakshmi ka Swagat – Upendranath Ashk
2 Vibhajan – Vishnu Prabhakar
3 Maa Baap – Sri Vishnu

Unit IV

Vyakaran

1 Kriya Visheshan
2 Sambandh Bodhak
3 Samuchay Bodhak
4 Vismayadi Bodhak aadi shabdo ka prayog

Unit V

Pratiyogi Pariksha par aadharit Nimnalikhit Vishayo se sambandhit Prashikshan Karya

1 Tamil Bhasha: Mahakavi Bharatiyar
2 Sanket Vikas dwara Lekhan kala aur Kahani Lekhan ka Vikas
3 Gadyansh dekhkar sahi Shirshak chunna
4 Pathit Vyakaran par aadharit Vakya rachna
5 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-stories-inhindii
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%E0%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

Learning Objectives

- LO1 To make students realize the importance of resilience
- LO2 To enable them to become good decision makers
- LO3 To enable them to imbibe problem-solving skills
- LO4 To enable them to use tenses appropriately
- LO5 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.ShaikhMoulaRamendra 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 Tigerhttps://www.gutenberg.org/ebook

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, 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. **Alkalimetals**: 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, Na2CO3, KBr, KClO3alkalineearthmetals.Anomalous behavior of Be.

Chemistry of p-Block Elements (Group13&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, permonocarbonates and perdicarbonates.

UNIT-III

Chemistry of p-Block Elements (Group15-18)

General characteristics of elements of Group15; chemistry of H2N-NH2, NH2OH, NH3 and HNO3. Chemistry of PH3, PCl3, PCl5, POCl3, P2O5 and oxyacids of phosphorous (H3PO3andH3PO4).

General properties of elements of group16 – Structure and allotropy of elements - chemistry of ozone - Classification and properties of oxides – oxides of sulphur and selenium – Oxyacids of sulphur (Caro's and Marshall's acids).

Chemistry of Halogens: General characteristics of halogen with reference to electro - negativity, electron affinity, oxidation states and oxidizing power. Peculiarities of fluorine. Halogen acids (HF, HCl, HBr and HI), oxides and oxy acids (HClO4). Inter-halogen compounds (ICl, ClF3, BrF5 and IF7), pseudohalogens [(CN)2 and (SCN)2] and basic nature of Iodine.

Noble gases: Position in the periodic table. Preparation, properties and structure of XeF2, XeF4, XeF6 and XeOF4; uses of noble gases – clathrate compounds.

UNIT-IV

Hydrocarbon Chemistry-I

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

Alkenes-Nomenclature, general methods of preparation – Mechanism of elimination reactions – E1and E2 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 (naturalrubber), vulcanisation, polychloroprene.

Alkynes

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

Cycloalkanes: Nomenclature, Relativestability of cycloalkanes, Bayer's strain theory and its limitations.

Conformational analysis of cyclohexane, mono and disubstituted cyclohexanes.

Geometrical isomerism in cyclohexanes.

UNIT-V

Hydrocarbon Chemistry-II

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

Friedel-Craft's alkylation and acylation. Monosubstituted 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 - Alderreaction, preferential substitution at C-9 and C-10; uses.

Recommended Text

1. Madan RD, Sathya Prakash,(2003),Modern InorganicChemistry,2nded, S.Chand and Company, NewDelhi.
2. Sathya Prakash, Tuli G D,Basu S K and Madan R D, (2003), Advanced Inorganic Chemistry, 17th ed., S.Chand and Company, NewDelhi.
3. Bahl BS, Arul Bhal, (2003), Advanced Organic Chemistry, 3rd ed., S. Chand and Company, NewDelhi.
4. Tewari KS, Mehrothra SN and Vishnoi NK, (1998), Textbook of Organic Chemistry, 2nd ed., Vikas Publishing House, NewDelhi.
5. Puri BR, Sharma LR, (2002), Principles of Physical Chemistry, 38th ed.,Vishal Publishing Company, Jalandhar.

Reference Books

1. Maron SH and Prutton CP, (1972), Principles of Physical Chemistry, 4th ed., The Macmillan Company, Newyork.
2. Barrow GM, (1992), Physical Chemistry, 5th ed., Tata Mc Graw Hill, NewDelhi.
3. Lee JD, (1991), Concise Inorganic Chemistry, 4th ed., ELBS William Heinemann, London.
4. Huheey JE, (1993), Inorganic Chemistry: Principles of Structure and Reactivity, 4th ed., Addison Wesley Publishing Company, India.
5. Gurudeep Raj, (2001), Advanced Inorganic Chemistry Vol–I, 26th ed., Goel Publishing House, Meerut.
6. Agarwal OP, (1995), Reactions and Reagents in Organic Chemistry, 8th ed., Goel Publishing House, Meerut.

Website and e-learning source

1. https://onlinecourses.nptel.ac.in
2. http://cactus.dixie.edu/smblack/chem1010/lecture_notes/4B.html
3. http://www.auburn.edu/~deruija/pdareson.pdf
4. https://swayam.gov.in/course/64-atomic-structure-and-chemical-bonding

QUALITATIVE ORGANIC ANALYSIS AND PREPARATION OF ORGANIC COMPOUNDS

Objectives of the course

This course aims at providing knowledge on

- laboratory safety
- handling glasswares
- analysis of organic compounds
- preparation of organic compounds

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–basis 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

- monocarboxylicacid, dicarboxylicacid
- monohydricphenol, polyhydricphenol
- aldehyde, ketone, ester
- carbohydrate (reducing and non-reducing sugars)
- primary, secondary, tertiaryamine
- monoamide, diamide, thioamide
- anilide, nitro compound
- Preparation of derivatives for functional groups

UNIT III

Preparation of Organic Compounds

i. Nitration-picricacid from Phenol
ii. Halogenation-p-bromoacetanilide from acetanilide
iii. Oxidation-benzoicacid from Benzaldehyde
iv. Microwave assisted reactions in water:
v. Methyl benzoate to Benzoicacid
vi. Salicylicacid from Methyl Salicylate
vii. Rearrangement-Benzil to Benzilic Acid
viii. Hydrolysis of benzamide to Benzoic Acid

Separation and Purification Techniques (Not for Examination)

1. Purification of organic compounds by crystallization (fromwater/alcohol) and distillation
2. Determination of melting and boiling points of organic compounds.
3. Steam distillation – Extraction of essential oil from citrus fruits/ eucalyptus leaves.
4. Chromatography (anyone) (Group experiment)
   (i) Separation of aminoacids by Paper Chromatography
   (ii) Thin Layer Chromatography – mixture of sugars/ plant pigments/ permanganate dichromate.
   (iii) Column Chromatography- extraction of carotene, chlorophyll and xanthophyll from leaves/Separation of anthracene- anthracenepicrate.
5. Electrophoresis–Separation of aminoacids and proteins. (Demonstration)
6. Isolation of case in form milk/ Determination of saponification value of oil or fat/ Estimation of acetic acid from commercial vinegar.(Any one Group experiment) (4, 5 & 6–not for ESE)

Reference Books

1. Venkateswaran, V.; Veeraswamy, R.; Kulandaivelu, A.R. Basic Principles of Practical Chemistry, 2nd ed.; Sultan Chand: NewDelhi, 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: NewDelhi, 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

Allied Zoology II

Learning 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 Counseling

UNIT V

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

Text Books (Latest Editions)

1. Verma P.S. & Agarwal - Developmental Biology, Chordata embryology S. Chand & Co.

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

1. Owen, J. A., Punt, J. & Stranford, S. A. - Kuby Immunology. New York: W.H. Freeman & Company
2. Klug, W. S., Cummings, M. R. & Spencer, C - Concepts of Genetics. (12th ed.). New Jersey: Pearson Education
3. Mathur, R.- Animal Behaviour. Meerut: Rastogi.
4. Verma P. S. & Agarwal Developmental Biology, Chordata embryology S.Chand & Co.

LAB ON ALLIED ZOOLOGY-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 bodyand 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, Snellan chart for vision test and ear

UNIT III

SPOTTERS- Slides and Specimen

Frog: egg, blastula, gastrula- yolk plug stage; any two placenta

UNIT IV

CHARTS- Human karyotype, Haemophilia, Colour Blindness, Hypertrichosis, Down's syndrome, Turner's syndrome, Klinefelters's syndrome;
Examination of blood group- Demonstration

UNIT V

Immunization schedule by WHO

Text Books (Latest Editions)

1. Verma P.S. & Agarwal - 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, 576 PP.

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

1. Owen, J. A., Punt, J. & Stranford, S. A. - Kuby Immunology. New York: W.H. Freeman & Company.
2. Klug, W. S., Cummings, M. R. & Spencer, C - Concepts of Genetics. (12th ed.). New Jersey: Pearson Education
3. Mathur, R.- Animal Behaviour. Meerut: Rastogi.
4. Verma P.S. & Agarwal – Developmental Biology, Chordata embryology S.Chand & Co.

ALLIED MATHEMATICS II - 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. Dr.S.Arumugam & others- Allied Mathematics Paper-II ,New Gamma Publishing House, Palayamkottai, 2012.
2. T.K.ManicavachagomPillai–Calculus (VolII), S.Vishvanathan Printer and Publisher PVT.LTD(2012)

Reference Books

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

Website and e-Learning Source

1. https://nptel.ac.in

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 of fat, 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 of fat in cream. 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 tonedmilk – 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, buttermilk –Bulgarious milk – acidophilous milk – Yoheer Indigeneous products – khoa and chhena definition – Icecream – 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. DattaRoy, P.Dinakar, Indian Council of Agricultural Research, 1st edition, 2008.
4. A Textbook 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.OMahony, Springer, Second edition, 2015.

Website and e-learning source

1. e-pathshala

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, skin care 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

Hair care

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

Dental care

Tooth pastes – ingredients – mouth wash

UNIT III

Make up

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

UNIT IV

Perfumes

Classification - Natural – plant origin – parts of the plant used, chief constituents; animal origin – amber gries from whale, civet one from civet cat, musk from musk deer; 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 cometics – A consumer guide, Macmillan publication, London.

Reference Books

1. Wilkinson J B E and Moore R J, (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