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-I				
Part	**Subject Status**	**Subject Title**	**Subject Code**	**Credit**
I	LANGUAGE I	TAMIL/MALAYALAM/HINDI		3
II	LANGUAGE II	ENGLISH		3
III	CORE	GENERAL CHEMISTRY–I		5
III	CORE	QUANTITATIVE INORGANIC ESTIMATION (TITRIMETRY) AND INORGANIC PREPARATIONS		3
III	ELECTIVE COURSE EC1	ZOOLOGY PAPER – I/ ALLIED MATHEMATICS I		3
III		ZOOLOGY PRACTICAL – I		2
IV	SEC	SKILL ENHANCEMENT COURSE		2
IV	FC	FOUNDATION COURSE		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

பொதுத்தமிழ் – 1

தமிழியல் கல்வி ஆதார வளங்கள்

Learning Objectives

- தமிழ் பயிலும் மாணவர்கள் தமிழியல் தொடர்பாக உள்ள ஆதார வளங்களை அறிதல்
- தமிழ்மொழியைச் சரியாக உச்சரிக்கவும், பிழைகளின்றி எழுதவும் கற்றுக்கொள்ளுதல்
- பயன்பாடு தமிழ் இலக்கணத்தை மொழியியல் ஆங்கில இலக்கண ஒப்பீட்டுடன் கற்றுக்கொண்டு சமகாலப் பொறுத்தப்பட்டோடு திருமுறைப் பயன்படுத்துதல்
- தமிழியல் வள ஆதாரங்கள் கிடைக்கும் இடம், அவற்றைப் பயன்கொள்ளும் முறை முதலியவற்றை மாணவர்கள் அறிந்து பயன்பெற அவர்களை ஆற்றுப்படுத்ததுதல்
- தொழில்நுட்ப அறிவைப் பெறுவதோடு ஆதார வளங்களை மாணவர்களே உருவாக்கும் முனைப்பப் பொறுத்தல்

Unit I தமிழைப் பிழையின்றி பேசுதலும் எழுதுதலும்

பேசுதல் திறன்: உரிய ஒலிப்புடன், உரிய உணர்ச்சி வெளிப்பட, பொருளுணர்வுக்கு ஏற்றாற்போல் குரல், ஏற்ற இறக்கத்துடன் தங்கு தடையின்றி, இயல்பாகப் பேசுதல், தமக்கான நடையை உருவாக்கிக் கொள்ளுதல்

1. குறிப்பிட்ட தலைப்பில் பேசுதல்
2. உரையாடுதல்
3. உரையாற்றுதல்
4. கலந்துரையாடுதல்
5. கருத்தாடல்
6. அறிக்கை வாசித்தல்
7. தொகுத்துரைத்தல்
8. செய்யுள், உரை நயங்களை எடுத்துக்கூறும் திறன்
9. வேண்டுகோள் விடுக்கும் முறை
10. நிகழ்வுகளை ஒருங்கிணைத்தல்
11. அறிக்கை வாசித்தல்
12. நிகழ்ச்சி வருணை கூறுதல்
13. நேர்காணல் நடத்துதல்
14. செய்திகள், கருத்துகள், நூல்கள் ஆகியவற்றைத் திறனாய்வு செய்து பேசுதல்

எழுதல் திறன்: பொதுத் தமிழில், எழுத்து வழக்குச் சொற்களைப் பயன்படுத்தி, பிழைகளின்றி (சந்திப் பிழை, மயகொலிப் பிழை, குறில்-நெடில் பிழை, தொடர்ப் பிழை) உரிய நிறுத்தக் குறிகளுடன் தெளிவாகப் பொருள் விளங்கத் தமக்கான நடையில் குறிப்பிட்ட தலைப்பில் எழுதுதல்

1. உரையாடல்
2. உரையாற்றுதல்
3. கலந்துரையாடல்

4. விவாதித்தால்
5. அறிக்கை தயாரித்தல்
6. கட்டுரை எழுதுதல்
7. செய்யுள் உரைநயங்களை எழுதுதல்
8. எழுத்துமொழியில் தெளிவாக விண்ணப்பித்தால் (விண்ணப்பம் நிரப்புதல்/எழுதுதல்)
9. நிகழ்ச்சி நிரல் தயாரித்தல்
10. அறிக்கை எழுதுதல்
11. நிகழ்வரிகை தயாரித்தல்
12. முழக்கத் தொடர்கள் எழுதுதல்
13. செய்திகள், கருத்துகள் நூல்கள் ஆகியவற்றை திறனாய்வு செய்து எழுதுதல்

Unit II: பயன்பாட்டுத் தமிழ் இலக்கணமும் மொழிப பயிற்சியும்

மாற்றுப்பெயர்கள்-மாற்றுப்பெயர்களும் விகுதிகளும்(நான் - ஏன், நீ - ஆய்,நாம், நங்கள் - ஓம், நீங்கள்-ஈர்கள், அவன்-ஆன், அவள்-ஆள் =, அவர்-ஆர், அவர்கள்-அர்கள்/அர், அது/இது-அது,அவை/இவை-அன)-பெயர்ச்சொல் வேற்றுமை ஏற்றல் - வினைச்சொல்லும் எதிர்மறை விகுதிகளும் (இறந்தகாலம்: இல்லை/நிகழ்/ எதிர்: மாட்டு),

Unit III: தொல்லியலும் அகழாய்வுகளும்

கல்வெட்டுகள் - செப்பேடுகள் - சுவடிகள் - நாணயங்கள் - பிற ஆவணங்கள் - நூல்கள்- இதழ்கள் – நூலகங்கள் - அருங்காட்சியங்கள் - அகழ் வைப்பகங்கள் ஆகியன குறித்து அறிமுகம்-அவற்றில் மொழிப் பயன்பாடு

Unit IV: மின்னணுக் கருவிகளில் தமிழை பயன்பாடு

செல்பேசி, கணினி மற்றும் மின்னணுக் கருவிகளில் தமிழை உள்ளிடுதல் - தமிழ் 99 தட்டச்சு முறையில் தமிழைத் தட்டச்சு செய்தல்-கூகுள்(gboard) கூகுள் ட்ரான்ஸ்லேட்டர்(google translator), கூகுள் லென்ஸ்(lens) போன்றவற்றில் தமிழ் பயன்பாடு

Unit V: மின் நூல்கள் - தமிழ் இணையதளங்கள் - செயலிகள்

மின் நூல்கள் - மின் நூலகங்கள் - மின் இதழ்கள் - பேசும் புத்தகங்கள் (audio books) - விக்கிப்பீடியா - தமிழ் விக்சனரி - மின் அகராதிகள் - தமிழ் இணையக் கிழவிகழகம் - தமிழ்மொழி தொடர்பான இணையதளங்கள் வலைப்பூக்கள் (இலக்கியம் சார்ந்தவை - பொதுவானவை) இருபத்தொன்றாம் நூற்றாண்டுத் திறன்கள் 21st Century Skills: Learning Skills (1.Critical Thinking, 2.Creative Thinking, 3.Collaborating, 4.Communicating), Literacy Skills (5.Information, 6.Media, 7.Technology), Life Skills(Flexibility, 9.initiative, 10. Social Skills, 11.Productivity, 12.Leadership)

Text Books

- தமிழில் நாமும் தவறில்லாமல் எழுதலாம் - பொற்றோ, பூம்பொழில் வெளியீடு, சென்னை, 2012
- கணினித் தமிழ்- இல. சுந்தரம், விகடன் பிரசுரம், சென்னை, 2022
- சுவடியியல் - பூ. சுப்பிரமணியன், உலகத் தமிழராயிச்சி நிறுவனம், சென்னை,1991

Reference Book

1. வைகை நதி நாகரிகம்)கீழடி குறித்த பதிவுகள்) - வெங்கடேசன், விகடன் பிரசுரம் சென்னை, 2018
2. நல்ல தமிழில் எழுதுவோம் - என். சொக்கன், கிழக்கு பதிப்பகம், சென்னை 2016
3. தமிழ்நடைக் கையேடு - மொழி அறக்கட்டளை, அடையாளம் பதிப்பகம், திருச்சி 2004
4. அடிப்படைத் தமிழ் இலக்கணம்- எம்.ஏ. -நு:மான் , அடையாளம், திருச்சி 2013.
5. இக்காலத் தமிழ் இலக்கணம்-பொற்கோ, பூம்பொழில் வெளியீடு, சென்னை, 2006
6. தவறின்றித் தமிழ் எழுதுவோம் - ம.நன்னன், ஏகம் பதிப்பகம் சென்னை 2006
7. நல்ல தமிழ் இலக்கணம் செ. சீனி நைனா முகம்மது, அடையாளம் பதிப்பகம், திருச்சி 2013
8. புதிய தமிழ்ப்புணர்ச்சி விதிகள் - செ சீனி நைனா முகம்மது, அடையாளம் பதிப்பகம், திருச்சி 2013
9. இணையம் கற்போம் - மு. இளங்கோவன் - வயல்வெளிப் பதிப்பகம், புதுச்சேரி 2010
10. தமிழ்க் கணினி இணையப் பயன்பாடுகள் - துரை. மணிகண்டன், கமலினி பதிப்பகம், தஞ்சாவூர்,2012
11. சொல் வழக்குக் கையேடு-பா.ரா. சுப்பிரமணியன், மொழி அறக்கட்டளை, சென்னை 2017
12. ஒரு பண்பாட்டின் பயணம்: சிந்துமுதல் கங்கை வரை - ஆர்.பாலகிருஷ்ணன், ரோஜா முத்தையா நூலகம், சென்னை, 2023

Websites

- https://www.tamilvu.org/
- https://www.tamildigitallibrary.in/
- https://www.tamiluniversity.ac.in/english/library-2/digital-library/
- https://www.tamilelibrary.org/
- http://www.projectmadurai.org/
- https://www.tamilvu.org/ta/library-libcontnt-273141
- https://www.tamildigitallibrary.in/

MALAYALAM – I
PROSE, COMPOSITION AND TRANSLATION

Unit I
This unit focuses on Translation: Word level and syntactic level and also discuss the writing style of Essay. It introduces the proverbs, paraphrasing in Malayalam

Unit II
This units briefs the importance of Nalukettu in the history of Malayalam literature. The following unit examines thecharacteristics of the novel chapter ways. Chapter First to 10

Unit III
Remaining Chapters are introduced and discussed.

Unit IV This unit focuses on Marappavakalum Mattu Kadhakalum by Karur. It also introduces the story

Story 1 Marappavakal- Discussion
Story II Uthuppante Kirnar
Story III Kalchakaram
Story IV Poovamabhazham
Story V Vallakkaran
Story VI Chekuthan
Story VII Mothiram

Unit V Story VIII Safety Pin

Story IX Aranhaanam
Story X Kuta nannakkaanuntoo
Story XI Chudala thengu
Story XII Ampala parmbil
Story XIII Ezhunnallathu Duty
Story XIV Pisachinte Kuppayam

Reading List (Print and Online)

1. Malayala Sahithya Charithram – Dr. K.M.George (Ed.)
2. Cherukadha Innale Innu - M.Achuthan
3. Kadha Thedunna Kadha - N.Prabhakaran
4. M.T. Vakkinte Vismayam – V.R.Sudheesh
5. Kadhayum Kalavum –K.S.Ravikumar
6. Malayala Novalilee Desakaalangal- E. Ramkrishnan
7. Maranunna Malayala Noval- K.P. Appan
8. Andhanaya Daivam- P.K.Rajasekharan
9. Shyalee shilppam- Dr.K.M. Prabhakra Varir
10. Bhasha gadhyam- C.V. Vasudeva Bhattathiri
11. Karur Kadha patanam- M.M.Basheer

Recommended Texts

1. NALUKKETTU (NOVEL) : M.T. VASUDEVAN NAIR
2. MARAPPAVAKALUM MATTU KADHAKALUM (SHORT STORIES): KAROOR

HINDI I

Unit I

Buniyadi Hindi

- Swar
- Vyanjan
- Barah Khadi
- Shabd aur
- Vakya Rachna

Unit II

Hindi Shabdavali

- Rishto ke Naam
- Gharelu padartho ke Naam

Unit III

Vyakaran

- Sadharan Vakya aur Sangya
- Sarvanam
- Visheshan
- Kriya aadi shabdo ka prayog

Unit IV

Chote Gadyansh ka Pathan

- Bacho ki Kahaniya
- Patra-Patrikao mein prakashit Gadyansho ka Pathan

Unit V

Nibandh

- Sant Tiruvalluvar
- E.V.R Thandai Periyar
- Naari Sashaktikaran
- Paryavaran Sanrakshan
- Vibhinna pratiyogi parikshao ke bare mein jaankari dena

Pratiyogi priksha par adharit nibandho dwara bhasha ki kshamta badhane vale prashikshan kary.

Reference Books

1. Hindi ke Avyay Vakyansh – Chaturbhuj Sahay
2. Subodh Hindi Vyakaran – Phoolchand Jain
3. Sankshipt Hindi Vyakaran – Kamta Prasad
4. Vyavaharik Hindi – Nagappa
5. Abhinav Hindi Vyakran – Nagappa
6. Saral Hindi Vyakaran – Shyamchandra Kapur
7. Vyakaran Pradeep – Ramdev
8. Laghu Bal Kathaye – Ramashankar
9. Manoranjak Kahaniya – Premchand
10. CONCISE GRAMMAR OF THE HINDI LANGUAGE - H.C Scholberg
11. Hindi Grammar – Edwin Greaves

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

1. fr#oYyqoj%
https://bharatdiscovery.org/india/%E0%A4%A4%E0%A4%BF%E0%A4%B0%E0%A5%81%E0%A4%B5%E0%A4%B2%E0%A5%8D%E0%A4%B2%E0%A5%81%E0%A4%B5%E0%A4%B0#:~:text=%E0%A4%A4%E0%A4%BF%E0%A4%B0%E0%A5%81%E0%A4%B5%E0%A4%B2%E0%A5%8D%E0%A4%B2%E0%A5%81%E0%A4%B5%E0%A4%B0%20(%E0%A4%85%E0%A4%82%E0%A4%97%E0%A5%8D%E0%A4%B0%E0%A5%87%E0%A4%9C%E0%A4%BC%E0%A5%80%3A%20Thiruvalluvar)%20%E0%A4%A6%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%BF%E0%A4%A3,%E0%A4%AA%E0%A4%BF%E0%A4%A4%E0%A4%BE%20%E0%A4%AE%E0%A5%87%E0%A4%82%20%E0%A4%B5%E0%A4%BF%E0%A4%B6%E0%A5%8D%E0%A4%B5%E0%A4%BE%E0%A4%B8%20%E0%A4%B0%E0%A4%96%E0%A4%A4%E0%A5%87%20%E0%A4%A5%E0%A5%87%E0%A5%A4

2. bZ-os-jkelkeh
https://hi.wikipedia.org/wiki/%E0%A4%AA%E0%A5%87%E0%A4%B0%E0%A4%BF%E0%A4%AF%E0%A4%BE%E0%A4%B0#:~:text=%E0%A4%87%E0%A4%B0%E0%A5%8B%E0%A4%A1%20%E0%A4%B5%E0%A5%87%E0%A4%82%E0%A4%95%E0%A4%9F%20%E0%A4%A8%E0%A4%BE%E0%A4%AF%E0%A4%95%E0%A4%B0%20%E0%A4%B0%E0%A4%BE%E0%A4%AE%E0%A4%BE%E0%A4%B8%E0%A4%BE%E0%A4%AE%E0%A5%80%20(17,%E0%A4%B5%E0%A4%BE%E0%A4%B2%E0%A5%87%20%E0%A4%B9%E0%A4%BF%E0%A4%A8%E0%A5%8D%E0%A4%A6%E0%A5%81%E0%A4%A4%E0%A5%8D%E0%A4%B5%20%E0%A4%95%E0%A4%BE%20%E0%A4%B5%E0%A4%BF%E0%A4%B0%E0%A5%8B%E0%A4%A7%20%E0%A4%A5%E0%A4%BE%E0%A5%A4

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https://www.hindikiduniya.com/essay/women-empowermentessayinhindi/#:~:text=%E0%A4%AE%E0%A4%B9%E0%A4%BF%E0%A4%B2%E0%A4%BE%20%E0%A4%B8%E0%A4%B6%E0%A4%95%E0%A5%8D%E0%A4%A4%E0%A4%BF%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%95%E0%A5%8D%E0%A4%AF%E0%A4%BE%20%E0%A4%B9%E0%A5%88%20%3F&text=%E0%A4%AE%E0%A4%B9%E0%A4%BF%E0%A4%B2%E0%A4%BE%20%E0%A4%B8%E0%A4%B6%E0%A4%95%E0%A5%8D%E0%A4%A4%E0%A4%BF%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%95%E0%A5%8B%20%E0%A4%AC%E0%A5%87%E0%A4%B9%E0%A4%A6%20%E0%A4%86%E0%A4%B8%E0%A4%BE%E0%A4%A8,%E0%A4%B8%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%AE%20%E0%A4%AC%E0%A4%A8%E0%A4%BE%E0%A4%A8%E0%A4%BE%20%E0%A4%AE%E0%A4%B9%E0%A4%BF%E0%A4%B2%E0%A4%BE%20%E0%A4%B8%E0%A4%B6%E0%A4%95%E0%A5%8D%E0%A4%A4%E0%A4%BF%E0%A4%95%E0%A4%B0%E0%A4%A3%20%E0%A4%B9%E0%A5%88%E0%A5%A4

4. i;kZoj.k laj{k.k%
a. https://hi.wikipedia.org/wiki/%E0%A4%AA%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B5%E0%A4%B0%E0%A4%A3_%E0%A4%B8%E0%A4%88%E0%A4%B0%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%A3#:~:text=%E0%A4%AA%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B5%E0%A4%B0%E0%A4%A3%20%E0%A4%B8%E0%A4%82%E0%A4%B0%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%A3%20%E0%A4%95%E0%A4%BE%20%E0%A4%B8%E0%A4%AE%E0%A4%B8%E0%A5%8D%E0%A4%A4%20%E0%A4%AA%E0%A5%8D%E0%A4%B0%E0%A4%BE%E0%A4%A3%E0%A4%BF%E0%A4%AF%E0%A5%8B%E0%A4%82,%E0%A4%AA%E0%A5%83%E0%A4%A5%E0%A5%8D%E0%A4%B5%E0%A5%80%20%E0%A4%B8%E0%A4%AE%E0%A5%8D%E0%A4%AE%E0%A5%87%E0%A4%B2%E0%A4%A8'%20%E0%A4%86%E0%A4%AF%E0%A5%8B%E0%A4%9C%E0%A4%BF%E0%A4%A4%20%E0%A4%95%E0%A4%BF%E0%A4%AF%E0%A4%BE%20%E0%A4%97%E0%A4%AF%E0%A4%BE%E0%A5%A4

b.http://gadyakosh.org/gk/%E0%A4%86%E0%A4%88%E0%A4%AF%E0%A5%87!_%E0%A4%AA%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%4%BE%E0%A4%B5%E0%A4%B0%E0%A4%A3_%E0%A4%AC%E0%A4%9A%E0%A4%BE%E0%A4%8F%E0%A4%81_/_%E0%A4%85%E0%A4%A8%E0%A5%8D%E0%A4%A4%E0%A4%B0%E0%A4%BE_%E0%

PART II ENGLISH

Learning Objectives

- To enable learners to acquire self awareness and positive thinking required in various life situations.
- To help them acquire the attribute of empathy
- To assist them in acquiring creative and critical thinking abilities
- To enable them to learn the basic grammar
- To assist them in developing LSRW skills

Unit I SELF-AWARENESS (WHO) & POSITIVE THINKING(UNICEF)

Life Story

1.1 Chapter 1 from MalalaYousafzai, I am Malala

1.2 An Autobiography or The Story of My Experiments with Truth (Chapters 1, 2 & 3) M.K.Gandhi

Poem

1.3 Where the Mind is Without Fear – Gitanjali 35 – Rabindranath Tagore

1.4 Love Cycle – Chinua Achebe

Unit II EMPATHY

Poem

2.1 Nine Gold Medals – David Roth

2.2 Alice Fell or poverty – William Wordsworth

Short Story

2.3 The School for Sympathy – E.V. Lucas

2.4 Barn Burning – William Faulkner

Unit III CRITICAL & CREATIVE THINKING

Poem

3.1 The Things That Haven't Been Done Before – Edgar Guest

3.2 Stopping by the Woods on a Snowy Evening – Robert Frost

Readers Theatre

3.3 The Magic Brocade – A Tale of China

3.4 Stories on Stage – Aaron Shepard (Three Sideway Stories from Wayside School" by Louis Sachar)

Unit IV Part of Speech

4.1 Articles

4.2 Noun

4.3 Pronoun

4.4 Verb

4.5 Adverb

4.6 Adjective

4.7 Preposition

Unit V Paragraph and Essay Writing

5.1 Descriptive
5.2 Expository
5.3 Persuasive
5.4 Narrative

Reading Comprehension

Text books (Latest Editions)

1. MalalaYousafzai. I am Malala, Little, Brown and Company, 2013.
2. M.K. Gandhi. An Autobiography or The Story of My Experiments with Truth (Chapter – I), Rupa Publications, 2011.
3. Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings): A Collection of Prose Translations Made by the Author from the Original Bengali. MacMillan, 1913.
4. N.Krishnasamy. Modern English: A Book of Grammar, Usage and Composition Macmillan, 1975.
5. Aaron Shepard. Stories on Stage, Shepard Publications, 2017.
6. J.C. Nesfield. English Grammar Composition and Usage, Macmillan, 2019.

Web Resources

1. Malala Yousafzai. I am Malala (Chapter 1) https://archive.org/details/i-am-malala
2. M.K Gandhi. An Autobiography or The Story of My Experiments with Truth(Chapter-1)- Rupa Publication, 2011 https://www.indiastudychannel.com/resources/146521-Book-Review-An-Autobiography-or-The-story-of-my-experiments-with- Truth.aspx
3. Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings)https://www.poetryfoundation.org/poems/45668/gitanjali-35
4. Aaron Shepard. Stories on Stage, Shepard Publications, 2017 https://amzn.eu/d/9rVzlNv
5. J C Nesfield. Manual of English Grammar and Composition. https://archive.org/details/in.ernet.dli.2015.**44179**

GENERAL CHEMISTRY-I

Objectives

The course aims at giving an overall view of the

- various atomic models and atomic structure
- wave particle duality of matter
- periodic table, periodicity in properties and its application in explaining the chemical behaviour
- nature of chemical bonding, and
- fundamental concepts of organic chemistry

UNIT I

Atomic structure and Periodic trends

History of atom (J.J.Thomson, Rutherford); Moseley's Experiment and Atomic number, Atomic Spectra; Black-Body Radiation and Planck's quantum theory - Bohr's model of atom; The Franck-Hertz Experiment; Interpretation of H- spectrum; Photoelectric effect, Compton effect; Dual nature of Matter- De- Broglie wavelength- Davisson and Germer experiment Heisenberg's Uncertainty Principle; Electronic Configuration of Atoms and ions- Hund's rule, Pauli' exclusion principle and Aufbau principle; Numerical problems involving the core concepts.

Unit II

Introduction to Quantum mechanics

Classical mechanics, Wave mechanical model of atom, distinction between a Bohr orbit and orbital; Postulates of quantum mechanics; probability interpretation of wave functions, Formulation of Schrodinger wave equation - Probability and electron density-visualizing the orbitals -Probability density and significance of Ψ and Ψ2.

Modern Periodic Table

Cause of periodicity; Features of the periodic table; classification of elements - Periodic trends for atomic size- Atomic radii, Ionic, crystal and Covalent radii; ionization energy, electron affinity, electronegativity-electronegativity scales, applications of electronegativity.

Problems involving the core concepts

UNIT-III:

Structure and bonding - I

Ionic bond

Lewis dot structure of ionic compounds; properties of ionic compounds; Energy involved in ionic compounds; Born Haber cycle – lattice energies, Madelung constant; relative effect of lattice energy and solvation energy; Ion polarization – polarising power and polarizability; Fajans' rules - effects of polarisation on properties of

compounds; problems involving the core concepts.

Covalent bond

Shapes of orbitals, overlap of orbitals – σ and Π bonds; directed valency - hybridization; VSEPR theory - shapes of molecules of the type AB2, AB3, AB4, AB5, AB6 and AB7

Partial ionic character of covalent bond-dipole moment, application to molecules of the type A2, AB, AB2, AB3, AB4; percentage ionic character- numerical problems based on calculation of percentage ionic character.

UNIT-IV:

Structure and bonding - II

VB theory – application to hydrogen molecule; concept of resonance - resonance structures of some inorganic species – CO2, NO2, CO32-, NO3- ; limitations of VBT; MO theory - bonding, antibonding and nonbonding orbitals, bond order; MO diagrams of H2, C2, O2, O2+, O2-, O 2-N2, NO, HF, CO;CO 2 magnetic characteristics, comparison of VB and MO theories.

Coordinate bond: Definition, Formation of BF3, NH3, NH4+, H3O+ properties

Metallic bond-electron sea model, VB model; Band theory-mechanism of conduction in solids; conductors, insulator, semiconductor – types, applications of semiconductors

Weak Chemical Forces - Vander Waals forces, ion-dipole forces, dipole-dipole interactions, induced dipole interactions, Instantaneous dipole-induced dipole interactions. Repulsive forces; Hydrogen bonding – Types, special properties of water, ice, stability of DNA; Effects of chemical force, melting and boiling points.

UNIT-V:

Basic concepts in Organic Chemistry and Electronic effects

Types of bond cleavage – heterolytic and homolytic; arrow pushing in organic reactions; reagents and substrates; types of reagents - electrophiles, nucleophiles, free radicals; reaction intermediates – carbanions, carbocations, carbenes, arynes and nitrynes.

Inductive effect - reactivity of alkyl halides, acidity of halo acids, basicity of amines; inductomeric and electromeric effects.

Resonance – resonance energy, conditions for resonance - acidity of phenols, basicity of aromatic amines, stability of carbonium ions, carbanions and free radicals, reactivity of vinyl chloride, dipole moment of vinyl chloride and nitrobenzene, bond lengths; steric inhibition to resonance.

Hyper conjugation - stability of alkenes, bond length, orienting effect of methyl group, dipole moment of aldehydes and nitro methane

Types of organic reactions- addition, substitution, elimination and rearrangements

Recommended Text

1. Madan, R. D. and Sathya Prakash, Modern Inorganic Chemistry, 2nded.; S. Chand and Company: New Delhi, 2003.
2. Rao, C.N. R. University General Chemistry, Macmillan Publication: New Delhi, 2000.
3. Puri, B. R. and Sharma, L. R. Principles of Physical Chemistry,
4. 38thed.;Vishal Publishing Company: Jalandhar, 2002.
5. Bruce, P. Y. and PrasadK. J. R. Essential Organic Chemistry, Pearson Education: New Delhi, 2008.
6. Dash UN, Dharmarha OP, Soni P.L. Textbook of Physical Chemistry,
7. Sultan Chand & Sons: New Delhi,2016

Reference Books

1. Maron, S. H. and Prutton C. P. Principles of Physical Chemistry,4thed.;
2. The Macmillan Company: Newyork,1972.
3. Lee, J. D. Concise Inorganic Chemistry, 4th ed.; ELBS William Heinemann: London,1991.
4. Gurudeep Raj, Advanced Inorganic Chemistry, 26thed.; Goel Publishing House: Meerut, 2001.
5. Atkins, P.W. & Paula, J. Physical Chemistry, 10th ed.; Oxford University Press:New York, 2014.
6. Huheey, J. E. Inorganic Chemistry: Principles of Structure and Reactivity,
7. 4th ed .; Addison, Wesley Publishing Company: India,1993.

Website and e-learning source

1. https://onlinecourses.nptel.ac.in
2. http://www.mikeblaber.org/oldwine/chm1045/notes_m.htm
3. http://www.ias.ac.in/initiat/sci_ed/resources/chemistry/Inorganic.html
4. https://swayam.gov.in/course/64-atomic-structure-and-chemical-bonding
5. https://www.chemtube3d.com/

Quantitative Inorganic Estimation (titrimetry) and Inorganic Preparations

Objectives

This course aims at providing knowledge on

- laboratory safety
- handling glasswares
- Quantitative estimation
- preparation of inorganic compounds

Unit I

Chemical Laboratory Safety in Academic Institutions

Introduction - importance of safety education for students, common laboratory hazards, assessment and minimization of the risk of the hazards, prepare for emergencies from uncontrolled hazards; concept of MSDS; importance and care of PPE; proper use and operation of chemical hoods and ventilation system; fire extinguishers-types and uses of fire extinguishers, demonstration of operation; chemical waste and safe disposal.

Common Apparatus Used in Quantitative Estimation (Volumetric)

Description and use of burette, pipette, standard flask, measuring cylinder, conical flask, beaker, funnel, dropper, clamp, stand, wash bottle, watch glass, wire gauge and tripod stand.

Principle of Quantitative Estimation (Volumetric)

Equivalent weight of an acid, base, salt, reducing agent, oxidizing agent; concept of mole, molality, molarity, normality; primary and secondary standards, preparation of standard solutions; theories of acid-base, redox, complexometric, iodimetric and iodometric titrations; indicators – types, theory of acid–base, redox, metal ion and adsorption indicators, choice of indicators.

Unit II

Quantitative Estimation(Volumetric)

Preparation of standard solution, dilution from stock solution Permanganometry

Estimation of sodium oxalate using standard ferrous ammonium sulphate Dichrometry

Estimation of ferric alum using standard dichromate (external indicator) Estimation of ferric alum using standard dichromate (internal indicator)

Iodometry

Estimation of copper in copper sulphate using standard dichromate

Argentimetry

Estimation of chloride in barium chloride using standard sodium chloride/ Estimation of chloride in sodium chloride (Volhard's method)

Unit III Complexometry

Estimation of hardness of water using EDTA Estimations

Estimation of iron in iron tablets Estimation of ascorbic acid.
Preparation of Inorganic compounds- Potash alum
Tetraammine copper (II) sulphate Hexammine cobalt (III) chloride Mohr's Salt

Recommended Text

1. Venkateswaran, V.; Veeraswamy, R.; Kulandivelu, A.R. Basic Principles of Practical Chemistry,2nd ed.; Sultan Chand &Sons: New Delhi, 1997.
2. Nad, A. K.; Mahapatra, B.; Ghoshal, A.; An advanced course in Practical
3. Chemistry, 3rd ed.; New Central Book Agency: Kolkata, 2007.

Reference Books:

1. Mendham, J.; Denney, R. C.; Barnes, J. D.; Thomas, M.; Sivasankar, B.;
2. Vogel's Textbook of Quantitative Chemical Analysis, 6th ed.; Pearson Education Ltd: New Delhi, 2000.

Website and e-learning source Web References:

1. http://www.federica.unina.it/agraria/analytical-chemistry/volumetric- analysis
2. https://chemdictionary.org/titration-indicator/

Allied Zoology I

UNIT I

Diversity of Invertebrates–I

Principles of taxonomy. Criteria for classification–Symmetry and Coelom–Binomial nomenclature. Classification of Protozoa, Coelenterata, Helminthes and Annelida upto classes with two examples.

UNIT II

Diversity of Invertebrates–II

Classification of Arthropoda, Mollusca and Echinodermata upto class level with examples.

UNIT III

Diversity of Chordates–I

Classification of Prochordata, Pisces and Amphibia upto orders giving two examples.

UNIT IV

Diversity of Chordates–II

Classification of Reptilia, Aves and Mammalia upto orders giving two examples.

UNIT V

Animal organization

Structure and organization of

i. Earthworm
ii. Rabbit
iii. Prawn

Text Books (Latest Editions)

1. Ekambaranatha Iyer, -Outlines of Zoology Viswanathan Publication

References Books

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

1. Ekambaranatha Iyar and T. N. Ananthakrishnian - A Manual of Zoology Invertebrata–Vol I: Viswanathan Publishers.
2. EkambaranathaIyar and T.N.Ananthakrishnan,-A Manual of Zoology-Invertebrata – Vol II: Viswanathan Publishors.
3. Ekambaranatha Iyar and T.N.Ananthakrishnan,-A Manual of Zoology : Chordata Viswanathan Publishers.
4. Jordan E.L. and P.S. Verma-Invertebrate Zoology, S.Chand & Co.

Web Resources

1. www.sanctuaryasia.com
2. www.iaszoology.com

LAB ON ALLIED ZOOLOGY-I

UNIT I

DISSECTION:

1. Cockroach - digestive system
2. Cockroach - nervous system
3. Fish -digestive system

UNIT II

MOUNTING:

1. Mouth parts- Cockroach
2. Mouth parts - Mosquito
3. Scales -Placoid, Cycloid and Ctenoid
4. Prawn appendages

UNIT III

SPOTTERS- Paramecium, Plasmodium, Scypha, Leucosolenia, Corals. Taenia

solium –entire, Ascaris male and female. Earthworm, Prawn ,Scorpion, Pila, Starfish,

UNIT IV Amphioxus, Shark, Frog, Calotes, Pigeon feather, Rabbit,

UNIT V Field visit – Study of fauna in the campus

Text Books (Latest Editions)

1. Ekambaranatha Iyyar and T. N. Ananthakrishnan, 1995 A manual of Zoology Vol.I (Part 1, 2) S. Viswanathan, Chennai
2. Ganguly, Sinha an d A dhikari , 2 0 11 . Biology of Animals: Volume I, New Central Book Agency; 3rd revised edition. 1008 pp.
3. Sinha, Chatterjee and Chattopadhyay, 2 0 1 4. Advanced Practical Zoology, Books & Allied Ltd; 3rd Revised edition, 1 07 0 pp.
4. Lal ,S. S, 2016 . Practical Zoology Invertebrate, Rastogi Publications.
5. Verma, P. S. 2010. A Manual of Practical Zoology: Invertebates, S Chand, 4 97pp.
6. Lal S S, 2009. Practical Zoology Vertebrate, Rajpal and Sons Publishing, 484pp.

References Books

1. (Latest editions, and the style as given below must be strictly adhered to)
2. Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). The Invertebrates: A New Synthesis, III Edition, Blackwell Science.
3. Barnes, R.D. (1982). Invertebrate Zoology, V Edition. Holt Saunders International Edition.
4. Barrington, E.J.W. (1979). Invertebrate Structure and Functions. II Edition, E.L.B.S. and Nelson
5. Boradale, L.A. and Potts, E.A. (1961). Invertebrates: A Manual for the use of Students. Asia Publishing Home.
6. Lal, S.S. 2005. A text Book of Practical Zoology: Invertebrate, Rastogi, Meerut

Web Resources

1. https://nbb.gov.in/
2. http://www.agshoney.com/training.htm
3. https://icar.org.in/
4. http://www.csrtimys.res.in/
5. http://csb.gov.in/
6. https://iinrg.icar.gov.in/
7. https://www.nationalgeographic.com/animals/invertebrates/

ALLIED MATHEMATICS I
ALGEBRA AND DIFFERENTIAL EQUATIONS

Objectives

- To explain the simple concepts of the theory of equations and to find the roots of the equations by using techniques in various methods.

UNIT-I:

Theory of Equations – Formation of Equations – Relation between roots and coefficients – Reciprocal equations.

UNIT-II:

Transformation of Equations –Approximate solutions to equations –Newton‟s method and Horner‟s method.

UNIT-III:

Matrices – Characteristic equation of a matrix – Eigen values and Eigen vectors – Cayley Hamilton theorem and simple Problems.

UNIT-IV:

Differential equation of first order but of higher degree – Equations solvable for p, x, y – Partial differential equations –formations – solutions –Standard form Pp+Qq=R.

UNIT-V:

Laplace transformation–Inverse Laplace transform.

Recommended Text

1. Dr.S.Arumugam & Isaac – Allied Mathematics Paper- I, New Gamma Publishing House (2012), Palayam Kottai.

Reference Books

1. Narayanan.S and T.K.Manikavachagam Pillai-Differential Equations and its applications, S.Viswanathan Printers Pvt.Ltd,2006.
2. T.Veerarajan-Algebra and Trigonometry- Yes Dee Publishing Pvt.Ltd.,(2009)

Website and e-Learning Source

1. https://nptel.ac.in

FOOD CHEMISTRY

Objectives

This course aims at giving an overall view of the

- Types of food
- Food adulteration and poisons
- Food additives and preservation

UNIT I

Food Adulteration

Sources of food, types, advantages and disadvantages. Food adulteration - contamination of wheat, rice, milk, butter etc. with clay stones, water and toxic chemicals -Common adulterants, Ghee adulterants and their detection. Detection of adulterated foods by simple analytical techniques.

Unit-II

Food Poison

Food poisons - natural poisons (alkaloids - nephrotoxin) - pesticides, (DDT, BHC, Malathion) -Chemical poisons - First aid for poison consumed victims

UNIT-III

Food Additives

Food additives -artificial sweeteners – Saccharin - Cyclomate a n d Aspartate Food flavours -esters, aldehydes and heterocyclic compounds – Food colours – Emulsifying agents – preservatives -leavening agents. Baking powder – yeast – tastemakers – MSG - vinegar.

UNIT-IV

Beverages

Beverages-soft drinks-soda-fruit juices-alcoholic beverages - examples. Carbonation-addiction to alcohol– diseases of liver and social problems

UNIT-V

Edible Oils

Fats and oils - Sources of oils - production of refined vegetable oils - preservation. Saturated and unsaturated fats - iodine value - role of MUFA and PUFA in preventing heart diseases-determination of iodine value, RM value, saponification values and their significance.

Recommended Text

1. Food chemistry, H.K. Chopra, P.S. Panesar, Narosa publishing house, 2010.

2. Jayashree Ghosh, Fundamental Concepts of Applied Chemistry, S. Chand & Co. Publishers, second edition, 2006.
3. Food Chemistry, Dr.L .Rakesh Sharma, Evince pub publishing, 2022.
4. Food processing and preservation, G. Subbulakshmi, Shobha A Udipi, Pdmini S Ghugre, New age international publishers, second edition, 2021.

Reference Books

1. H.D.Belitz, Werner Grosch, Food Chemistry Springer Science & Business Media, 4th Edition, 2009.
2. M.Swaminathan, Food Science and Experimental Foods, Ganesh and Company, 1979.
3. Hasenhuettl, Gerard.L.; Hartel, Richard. W. Food Emulsifiers and their applications Springer New York 2nd ed. 2008.
4. Food Chemistry, H.-D.Belitz, W.Grosch, P.Schieberle, Springer, fourth revised and extended edition, 2009.
5. Principles of food chemistry, John M.de Man, John W. Finley, W. Jefferey
6. Hurst, Chang Yong Lee, Springer, Fourth edition, 2018.

Website and e-learning Source

1. https://onlinecourses.nptel.ac.inhttp://cactus.dixie.edu/smblack/chem1010/lec

Foundation Course

Objectives

This course aims at providing an overall view of the

- atom structure and electronic configuration
- types of chemical bonding characters
- different states of mater and their general properties
- nomenclature of and isomerism in organic compounds
- basic concepts of spectroscopy

UNIT-I

Structure of atom and periodic classification of Elements and properties.

Atom structure-Fundamental particles-Atomic mass- Atomic number – Isotopes – Isobars – Isotones – Orbitals-Quantum number and their significance. Shapes of s,p and d orbitals- Rules governing electronic configuration in various its atomic orbitals.

Periodic table-periodic laws (Mendeleev and Mosley)- Classification of elements into s,p, d and f-blocks .Metals-Non metals-Periodic properties-Concept, Variation and factors affecting various periodic properties-Inert pair effect.

Unit-II

Chemical Bonding

Definition- Types of chemical bond-Ionic bond- Ion polarization - Dipole moment and Percentage of ionic character-Covalent bond-Definition –Postulates of Valence bond theory and Concept of hybridization (sp, sp2 ,sp3 , sp3d, sp3d2, dsp2, d2sp3) – Magnetic properties –

Paramagnetic – Diamagnetic-Ferromagnetic. Co-ordinate covalent bond-Definition – Examples-Co-ordination compounds (basic concepts only).

UNIT-III

Nomenclature and Isomerism in Organic compounds

Carbon compounds- Uniqueness of carbons- Classification of hydrocarbons - IUPAC Nomenclature of Organic compounds

Isomerism: Structural and Stereoisomerism

Structural Isomerism: Chain isomerism, Functional isomerism, Positional isomerism and Meta isomerism. Stereoisomerism: Geometrical and Optical isomerism-Chiral molecule- Enantiomers-Diastereomers- Meso compounds-Racemic mixture.

UNIT-IV

States of Matter

Gaseous state: Kinetic theory of gases- Ideal and Non-ideal gases- Ideal gas equation-Deviation of ideal gas from ideal behavior -vander Waal's equation and Liquification of gases.

Liquids :Intermolecular forces, Vapour pressure and Boiling point of liquid - Surface tension –Viscosity- Factors affecting surface tension and viscosity.

Solids: Definition - Characteristics of solids- Amorphous and Crystalline solids - Space lattice and unit cells - Close packed structure of solids-Radius ratio rule.

UNIT V Introduction to Spectroscopy

Electromagnetic radiation- General characteristics of Wave – Wavelength – Frequency – Amplitude – Wave number - Electromagnetic spectrum- Absorption and Emission spectrum- Quantization of Energy level - Selection rule - Intensity of the Spectral lines –Width of Spectral lines. Types of spectroscopy: Microwave spectroscopy, Infrared spectroscopy, UV-Visible spectroscopy, Nuclear Magnetic Resonance spectroscopy, Electron spin resonance spectroscopy.

Text Books

1. B.R Puri, L.R.Sharma, K.C. Kalia, Principles of Inorganic chemistry, Milestone Publishers and Distributors, New Delhi, 2012.

2. B.R. Puri and L.R.Sharma, 38th edition, Vishal Publishing company, Jalendar 2002.
3. K.S, Tewari, S.N. Mehrothra and N.K.Vishnoi, Text book of Organic Chemistry, 2nd edition Vikas publishing House, New Delhi, 1998.

Reference books

1. R.D. Madan, Sathya Prakash, Mordern Inorganic chemistry 2nd edition, S.Chand and company, New Delhi, 2003.
2. B.S.Bhal, ArunBhal, Advanced Organic chemistry, 3rd edition, S.Chand and company, New Delhi, 2003.
3. U.N.Dash, O.P.Dharmarha, P.L.Soni, Textbook of Physical Chemistry, Sultan Chand & sons, New Delhi, 2016.
4. Y.R.Sharma Organic spectroscopy Principles and Chemical applications, S.Chand&Company PVT Ltd ,2002.
5. C.N.Banwell, Fundamentals of spectroscopy Tata McGraw Hill, 1983.

Website and e-learning Source

1. https://onlinecourses.nptel.ac.inhttp://cactus.dixie.edu/smblack/chem1010/lec