VIVEKANANDA COLLEGE

College with Potential for Excellence
(Residential & Autonomous-A Gurkula Institute of Life-Training)
(Affiliated to Madurai Kamaraj University)
Re-accredited with ‘A’ Grade (CGPA 3.59 out of 4) by NAAC

TIRUVEDAKAM WEST
MADURAI DISTRICT – 625 234

POST GRADUATE AND RESEARCH
DEPARTMENT OF CHEMISTRY

B.Sc. CHEMISTRY
SYLLABUS

Choice Based Credit System

(For those who joined in June 2015 onwards)

(2017-2020 Batch)
ABOUT THE COLLEGE

Vivekananda College was started by Founder-President Swamiji Chidbhabvanandhaji Maharaj of Sri Ramakrishna Tapovanam, Tirupparaithurai, Trichy in 1971 on the banks of the river Vaigai which is blissfully free from the noise and hurry, the crowds and distraction of the city.

Vivekananda College is a residential college functioning under Gurukula pattern. It is Man-making education that is imparted in this institution, Culture, character and curriculum are the three facets of ideal education that make man a better man. This is possible only when the teacher and taught live together, The Gurukula system of Training is therefore a humble and systematic attempt in reviving the age old GURUGRIHAVASA for wholesome education, Attention to physical culture, devotion to duty, obedience to teachers, hospitality to guests, zest for life, love for the nation, and above all, humility and faith in the presence of God etc. are the values sought to be inculcated. All steps are taken to ensure the required atmosphere for the ideal life training.

Vivekananda College, Tiruvedakam West, Madurai District-625 234 is an aided college established in 1971 and offers UG and PG courses. This College is affiliated to the Madurai Kamaraj University, Madurai. The College was reaccredited with ‘A’ grade (CGPA 3.59 out of 4.00) by NAAC in September 2015. The college was awarded College with Potential for Excellence by UGC in 2016.

VISION AND MISSION

Our Vision: To raise an army of neo-graduates steeped in the hoary culture of the motherland and dedicated to serving her as potential leaders in the manifold spheres of national effort.

Our Mission: A harmonious enrichment of physical, emotional and intellectual facets of a student’s personality to bring out his inherent PERFECTION.

OBJECTIVES OF THE INSTITUTION

1. To inculcate spiritual, ethical, moral and social values in all disciplines of study.
2. Simultaneous education of the Hand, Heart and Head. Only a sound body can hold a sound mind.
3. Provide opportunities for all round development of the students and excellence in higher education, research and extension in different disciplines.
4. Disseminate the findings of research to the community to facilitate its development.
5. To provide society citizens of sterling character.
6. To cater the needs of the educationally backward people – the most backward, scheduled caste and tribe.
I. Eligibility For Admission
Admission to B.Sc. – Chemistry Programme is open to candidates with +2 pass with Maths, Physics, Chemistry, Biology, Botany and Zoology as main subjects.

For B.Sc.- Chemistry course offered in the college, a pass in the Higher Secondary Examination conducted by the Government of Tamil Nadu or an examination accepted as equivalent there to by the Syndicate of the MKU, subject to such conditions as may be prescribed therefore.

II. Duration
The course is for a period of three years. Each academic year shall comprise of two semesters viz. Odd and Even semesters. Odd semesters shall be from June to November and Even Semesters shall be from December to April. There shall be not less than 90 working days which shall comprise 450 teaching clock hours for each semester (Exclusive of the days for the conduct of university end-semester examinations) for each semester.

III. CBCS System
All Programmes offered in the college are run on Choice Based Credit System (CBCS). It is an instructional package developed to suit the needs of students to keep pace with developments in higher education and the quality assurance expected of it in the light of liberalization and globalization in higher education.

IV. Semesters
An academic year is divided into two semesters. In each semester, courses are offered in 15 teaching weeks. Each week has 30 working hours spread over 6 days a week.

V. Credits
The term 'Credit' refers to the weightage given to a course, usually in relation to the instructional hours assigned to it. The total minimum credits, required for completing the B.Sc. Programme is 140.

VI. Course
Each Course is to be designed variously under lectures / laboratory / seminar / practical training / assignments to meet effective teaching and learning needs.

VII. Examinations
i). There shall be examinations at the end of each semester, for odd semesters in the month of October / November; for even semesters in April/May. A candidate who does not pass the examination in any course(s) shall be permitted to appear in such failed course(s) in the subsequent examinations to be held in October / November or April/May.

ii). A candidate should get registered for the first semester examination. If registration is not possible owing to shortage of attendance beyond condonation limit / regulations prescribed or belated joining or on medical grounds, the candidates are permitted to move to the next semester. Such candidates shall re-do the missed semester after the completion of the programme.

VIII. Condonation
Students must have 75% of attendance in each paper for appearing the examination. Students who have 65% to 74% of attendance shall apply for condonation in the prescribed form with the prescribed fee. Students who have 50% to 64% of attendance shall apply for condonation in prescribed form with the prescribed fee along with the Medical Certificate. Students who have below 50% of attendance are not eligible to appear for the examination. They shall compensate the shortage after the completion of the programme.
IX. Question Paper Pattern

Time: 3 Hours
Maximum Marks: 75

SECTION-A (10 X 1 =10 Marks)

Answer All Questions
(1-5) Multiple Choice
(6-10) Fill in the blanks
Two questions from each unit

SECTION-B (5 X 7 = 35 Marks)

Answer All Questions
(11-15) Questions shall be in the format of either (a) or (b)
One question from each unit

SECTION-C (3 X 10 = 30 Marks)

Answer any THREE Questions
(16-20) One question from each unit.

X. Evaluation:

Performance of the students are evaluated objectively. They will be assessed continuously through Internal Assessment System and finally through summative (end) semester examination. To assess internally, there will be three examinations conducted centrally with duration of two hours for each paper. In addition to continuous evaluation, the summative semester examination, which will be a written examination of three hours duration, would also form an integral component of the evaluation. Evaluation is done both internally and externally. The ratio of marks to be allotted to continuous internal assessment and to end semester examination is 25 : 75.

The pattern of internal valuation shall be:
Test: 20 Marks (the average of best two tests out of three tests)
Assignment: 5 marks
Total: 25 marks.

In respect of practical papers, the ratio of marks to be allotted to internal assessment and to summative (end) semester examination is 40 : 60. The internal marks will be calculated on the basis of marks secured at the model examination and marks awarded for the preparation of practical note book. The external marks will be calculated on the basis of the marks awarded by the internal examiner and the external examiner at the summative semester examination.

XI. Passing Minimum

There is no passing minimum for Internal Assessment. The passing minimum for external Examinations shall be 27 out of 75 marks and passing minimum for a paper is 40%.

XII. Classification of Students

Candidates who have secured not less than 40% of marks in each paper shall be declared to have passed in that paper. Candidates who obtain 40% and above but below 50% shall be declared to have passed in Third Class. Candidates who obtain 50% and above but below 60% of the aggregate marks in Part-III shall be declared to have passed in Second Class and those who obtain 60% of marks and above shall be placed in the First Class. Candidates who obtain 75% and above shall be declared to have passed in Distinction provided he has not re-appeared for any paper during the course of the study.

XIII. Failed Candidates

A candidate who has arrears in any paper in a semester examination will be permitted to proceed to the next semester classes. A candidate who has arrears may appear again in these failed papers at the November/April examinations. The internal assessment marks already obtained by him shall be carried over for the subsequent appearance also.
XIV. Improvement of Internal Marks

The student desirous of improving the internal assessment marks may request the Head of the Department. After obtaining permission from the Staff Council Meeting by the Head, the student may write improvement examinations in consultation with the course teacher. The marks obtained (when it is more than the previous marks) will be submitted to the Controller of Examinations for further adoption.

XV. Study Tour

Students are expected to participate in the field visit and the study tours organized by the department. Though study tour/field trip carries no credit, it is compulsory for the students to attend whereby the students can get an opportunity to gain practical knowledge. As such, observational visit to selected social welfare organizations, industries, trade centres, exhibitions, places of historical importance and the like will be considered as extra-curricular activities.

HISTORY OF THE POST GRADUATE AND RESEARCH DEPARTMENT OF CHEMISTRY

The undergraduate Department of Chemistry was started in the year 1981 and elevated as Postgraduate department in the year 2003. From the year 2005 the department has become a full fledged research centre as approved by the Madurai Kamaraj University, Madurai. The department glorified its ventures by conducting 24 MTCs (Modern Trends in Chemistry) seminars /symposia, from 1993. In addition to the teaching activities, the department is known for its research works in thrust areas like Green Chemistry, Coordination Chemistry, Supramolecular Chemistry, Bioinorganic Chemistry, Corrosion Science and Photochemistry. There are four major research projects have completed one funded by CSIR and the other three supported by UGC. One minor project funded by UGC is being carried out.

We have endowed with the following state of the art instruments:

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<th>S.No</th>
<th>Name of Equipment</th>
<th>Model or Make</th>
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VIVEKANANDA COLLEGE –TIRUVEDAKAM WEST, MADURAI

Statement of Vision The Chemistry Department is dedicated to

- Provide a comprehensive, relevant curriculum to the students of chemistry department
- Produce knowledgeable graduates for careers in academia, industry and government,
- Conduct significant research in chemistry,
- Promote the collegial exchange of ideas, independent thought and the highest ethical standards.

Statement of Mission:

The mission of Department of Chemistry is to advance the chemical sciences through the education of students by providing them with quality classroom, research and service opportunities. With a high standard for excellence in all three areas the department will produce students who are knowledgeable in chemistry and can think critically.

In support of our mission the Chemistry Department faculty members strive to:

- Act as mentors to students through advising them in research.
- Teach students the value of cross-disciplinary thinking by providing them with educational and research opportunities between chemistry and other fields of study.
- Promote innovative curriculum development while exposing students to advanced instrumentation and technology.
- Foster multi-disciplinary curriculum development to provide students with a breadth of course options in Forensic Chemistry, Biochemistry, Natural Product Chemistry, Environmental Science, Polymer Science and Chemical Education.
- Encourage community engagement by providing students with service-learning and community-based research opportunities.
- Serve as good role models to students for safe and ethical professional behaviour.
- Encourage students to value diversity and to develop a global perspective through international experiences in chemistry.

Mission Statements:

The mission of the Department of Chemistry is to create and maintain programs of excellence in the areas of research, education and public outreach. Our goals are (1) continue to attract, develop and retain world-renowned faculty, (2) maintain state of the art research and teaching facilities, (3) recruit outstanding graduate students, (4) provide innovative, dedicated classroom instruction at both the graduate and undergraduate levels, and (5) communicate the excitement of chemistry to the public at large. To help us accomplish these goals we remain dedicated to a core set of values: excellence in teaching and research, respect for all members of the Department and University, diversity in our students, faculty and staff and service to the citizens of the world.

SCHEME OF EXAMINIATION

5
(For those who join in June 2015 and after)

**FIRST SEMESTER**

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**TOTAL** **30 18**

**SECOND SEMESTER**

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Note: Practical Examinations – 07CP23 – 3 Hrs
### THIRD SEMESTER

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Note: Practical Examinations – 07CP33 – 3 Hrs

### FOURTH SEMESTER

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Note: Practical Examinations – 07CP43 – 4 Hrs;
### FIFTH SEMESTER

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Note: Practical Examinations – 07CP54 – 6 Hrs; 07CP55 – 4 Hrs

### SIXTH SEMESTER

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Note: Practical Examinations – 07CP63 – 6 Hrs
பகுதி -1 - பாடத்தினம்
(2017-2018 ஆண்டு கல்விப்பாட்டில் பதினாறாம் கட்டடத்தில் பாடத்தினம்)

PART-I: Language Tamil Subject

| Subject Title: தமிழ் கலியாயியும் வான்கல் கல்விகள் - பகுதி:1 |
|-------------------------------|-----------------|-----------------|-----------------|
| Subject Code: PILT11          | Hours per week: 6 | Credit: 3       |
| Seasonal Marks: 25            | Summative marks: 75 | Total Marks: 100 |

பாடபாடல்:

அந்தால்: 1 குறிப்பிட்டியது: நெய்யாற்றுக்கதை

1. பாடங்கள் கலியாயியும்
   1. குறிப்பிட்டியது (கவிக்குருத் புராணங்கள்)
   2. புராணங்கள் கவிக்குருத் (கவிக்குருத் புராணங்கள்)

2. பாடத்தினம் கலியாயியும்
   1. குறிப்பிட்டியது (கவிக்குருத் புராணங்கள்)
   2. புராணங்கள் கவிக்குருத் (கவிக்குருத் புராணங்கள்)

3. சைவத் திருநாவுறுத்துகள்
   குறிப்பிட்டியது (சீராய்ப்பாடல்கள் போன்றாக)

4. சேர்த்துக்கு அழிபை
   குறிப்பிட்டியது (சீராய்ப்பாடல்கள் போன்றாக)

5. மாது பொழுதுபோக்கள்
   குறிப்பிட்டியது (சீராய்ப்பாடல்கள் போன்றாக)

அந்தால்: 2 குறிப்பிட்டியது: புராணங்களியும்

6. குறிப்பிட்டியது: கவிக்குருத் புராணங்கள்
7. குறிப்பிட்டியது: கவிக்குருத் புராணங்கள் (சீராய்ப்பாடல்கள்)
8. குறிப்பிட்டியது: சைவகுறிப்பிட்டியது (சீராய்ப்பாடல்கள்)
9. குறிப்பிட்டியது: சைவகுறிப்பிட்டியது (சீராய்ப்பாடல்கள்)
10. குறிப்பிட்டியது: சைவகுறிப்பிட்டியது (சீராய்ப்பாடல்கள்)
11. குறிப்பிட்டியது: சைவகுறிப்பிட்டியது (சீராய்ப்பாடல்கள்)
12. குறிப்பிட்டியது: சைவகுறிப்பிட்டியது (சீராய்ப்பாடல்கள்)

அந்தால்: 3 குறிப்பிட்டியது: சிறுநாட்டுக் கல்விகள்

சி.தி.ல் கல்விகளியும் (கவிக்குருத் புராணங்கள்)
அதாவ: 4 குறிப்பிட்டு தலைக்காலம் - நூற்றாண்டு

1. புதிய தலைக்காலம்
2. கால்நடைக்காலம்
3. பானை தலைக்காலம்
4. பானை தலைக்காலம்
5. வாய்ப்பட்டு பிண்மை தலைக்காலம்
6. வாய்ப்பட்டு பிண்மை தலைக்காலம்

அதாவ: 5 குறிப்பிட்டு தலைக்காலம் பல்லவனின் குறிப்பிட்டு

(அ) 1. பாறைகளைக் குறிப்பிட்டு விளக்கம் அலங்காரங்கள்
2. பாறைகளைக் குறிப்பிட்டு விளக்கம் அலங்காரங்கள்

(ஆ) பாறைகளைக் குறிப்பிட்டு - பிராந்தியம் வருந்து கதுக்கள் - பிராந்தியம் வருந்து கதுக்கள் - பிராந்தியம் வருந்து கதுக்கள் - பிராந்தியம் வருந்து கதுக்கள் - பிராந்தியம் வருந்து கதுக்கள் - பிராந்தியம் வருந்து கதுக்கள்

பாரதோ தலைக்காலம்

1. குறிப்பிட்டு தலைக்காலம் குறிப்பிட்டு (குறிப்பிட்டு தலைக்காலம்)
2. குறிப்பிட்டு தலைக்காலம் குறிப்பிட்டு (குறிப்பிட்டு தலைக்காலம்)

பாரதோ தலைக்காலம்

1. பாரதோ தலைக்காலம் (குறிப்பிட்டு தலைக்காலம்)
2. பாரதோ தலைக்காலம் (குறிப்பிட்டு தலைக்காலம்)
3. பாரதோ தலைக்காலம் வருந்து - பாரதோ தலைக்காலம்
4. பாரதோ தலைக்காலம் வருந்து - பாரதோ தலைக்காலம்
DEPARTMENT OF SANSKRIT
B.A. / B.Sc. PART-I – LANGUAGE SANSKRIT SYLLABUS: SEMESTER – I:

PAPER – I

(For those who join in June 2017 and After)

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FUNDAMENTAL GRAMMAR & HISTORY OF SANSKRIT LITERATURE -I

Following portions for Grammar:
Declension of the following nouns and pronouns:
UNIT-I Akărânta Mascular, Ākărânta Faminine & Akărânta Neuter.
Asmad and Yuşmad šabdâs
Conjugation of the following verbs in present, past & future tense
Bhav, paṭh, Vad, Gacch, Vas, Driś (Paś), Krīḍ Dhāv
UNIT-II & III History of Sanskrit Literature:
a) Vedas and Purāṇâs
b) Ithâsâ

c) Court Epics – Mahâkâvyas
UNIT –IV
Translation:
a) From Sanskrit to English:
Passages exercises 2, 3 and 4 from the prescribed texts.
b) From English to Sanskrit:
Passages exercises 1, 2 and 3 from the prescribed texts.
UNIT – V.
Transliteration
a)Devanaagari to IPS. b) IPS to Devanaagari

Prescribed text: “SĀHITYA RASAKANĀI”

(Published by A.M.G. Publications, Madurai – 625 016)
Sanskrit Sri Patamala Book 1: Publication: Sanskrit Educational Society,
Madras – 18.

A short history of Sanskrit Literature (Published by A.M.G. Publications,
Madurai – 625 016) year of publication- 1996
PART II – Paper I

Subject Title: Communicative English

Subject Code: P2LE11

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Sessional Marks: 25

Summative Marks: 75

Total Marks: 100

Objectives: Total number of hours per semester: 75 Hrs

- To develop listening and speaking skills
- To increase the vocabulary of students
- To improve reading skills
- To develop competency in grammar
- To develop continuous writing

Unit – I - Listening, Speaking and Reading Components 15 Hrs

1. Rabindranath Tagore – Cabuliwallah
2. Khushwant Singh – Karma
3. R.K. Narayan – Sweets for Angels
4. K.A. Abbas – Sparrows

Unit – II 15 Hrs

- Sentences, Clauses, and Phrases
- Pronouns
- Adjectives
- Some Common Adjectives and Adverbs
- Parts of Speech
- Determiners
- Verbs
- Nouns
- Articles
- Adverbs

Unit – III Composition 15 Hrs

- Letter writing – Formal Letters & Informal Letters
- Descriptive Writing – General topics (Paragraph)

Unit – IV - Extensive Reading: Short Stories 15 Hrs

- Young Naren - by Brahamachari Amal.
  [From “A Simple life of Swami Vivekananda”
  Advaita Ashrama, Kolkata]
- A Story of Initiation - by Sri Aurobindo Society.
  From “Stories and Anecdotes from the Mother”
  Pondicherry.
- Glory At Twilight - by Bhabani Bhattacharya
- The Martyr’s Corner - by R.K. Narayan

Unit – V - Translation 15 Hrs

Translation of Sentences and Stories from Tamil to English / English to Tamil
(Passages will be supplied)

Reference Book:

B.Sc. Chemistry CBCS Syllabus – SEMESTER - I
(For those who joined in June 2015 and after)

PART III – Core Subject Theory – I

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<td><strong>Sessional Marks:</strong> 25</td>
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Objectives:

To enable the students
- To understand the structure of polyelectronic atoms
- To gain basic knowledge about quantum chemistry
- To familiar with fundamentals of periodic properties
- To gain basic knowledge of colloids
- To understand the theory of adsorption

UNIT I: ATOMIC STRUCTURE 12 Hrs


UNIT II: BASIC QUANTUM MECHANICS 12 Hrs

Schrodinger wave equation (derivation only) - interpretation of \(\Psi\) and \(\Psi^2\) – eigen function – eigen values – quantum numbers – Zeeman effect – atomic orbitals – shapes of orbitals - representation of angular radial parts – nodal planes and character – Aufbau principle – Hund’s rule – Pauli’s exclusion principle and Stark effect.

UNIT III: PERIODIC PROPERTIES AND CHEMICAL BONDING – I 12 Hrs


UNIT IV: COLLOIDS 12 Hrs

UNIT V: ADSORPTION AND CATALYSIS


Catalysis: Definition-various types of classifications – characteristics of catalysis, theories of catalysis – promoters and poisons, enzyme catalysis, acid-base catalysis and autocatalysis with suitable examples – applications.

Text Books:


Reference Book:

B.Sc. Chemistry CBCS Syllabus - SEMESTER - I
(For those who joined in June 2015 and after)

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**Objectives:**

- To enable the students
  - To know about the fundamental concept of organic chemistry.
  - To understand the various types of reaction intermediates
  - To study the alkane, alkene and alkyne
  - To know about the chemistry of aromaticity and aromatic electrophilic substitution reaction

**UNIT I: NOMENCLATURE AND ISOMERISM**


**UNIT II: ELECTRON DISPLACEMENT EFFECTS**

Inductive effect – electromeric effect – mesomeric effect – hyperconjugative effect – homolytic fission and heterolytic fission – definition, structure, formation and stability of carbonium ion, carbanion and free radicals, electrophilic reagents – nucleophilic reagents. Types of reactions: substitution, addition, elimination and rearrangement reactions.

**UNIT III: ALKANE, ALKENE AND ALKYNE**


**UNIT IV: AROMATICITY**

Aromaticity – modern theory of aromaticity – conditions for aromaticity – Huckel’s rule \{(4n+2) rule\} – resonance and resonance energy in benzene – structure of benzene - preparation and properties of benzene.

**UNIT V: AROMATIC ELECTROPHILIC SUBSTITUTION REACTIONS**


**Text Book:**


**Reference Book:**

Objective:

To enable the students

To acquire skill in semi-micro inorganic qualitative analysis

Analysis of mixture containing two cations and two anions of which one is an interfering ion using semi micro method.

Cations:

Lead, bismuth, copper, cadmium, antimony, iron (II & III), aluminium, zinc, manganese, cobalt, nickel, barium, strontium, calcium, magnesium and ammonium.

Anions:

Carbonate, sulphate, nitrate, chloride, bromide, fluoride, oxalate, borate, phosphate, arsenite, and arsenate.

( Summative practical examination: At the end of second semester)

Text book:

1. Dr. V. V. Ramanujam, Inorganic semimicro qualitative analysis, The National Publishing Company.

Reference Book:

PART III: Allied Subject

**Subject Title:** Allied Physics – I

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Hours per week</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>06AT01</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

**Sessional Marks:** 25  
**Summative Marks:** 75  
**Total Marks:** 100

**Objectives:**
- To learn about acoustics of buildings
- To know about elasticity, viscosity and Surface tension
- To get a knowledge in electricity and magnetism.
- To provide a good foundation in optics.

**UNIT I: Waves and Oscillations**

Simple Harmonic Motion – Composition of two Simple Harmonic Motions in a straight line- Composition of two Simple Harmonic Motions of equal time periods at right angles- - Melde’s Experiment – Ultrasonics- production – application and uses- – Reverberation – Absorption coefficient - Acoustics of buildings – factors affecting the acoustics of buildings- Sound distribution in an auditorium

**UNIT II: Properties of Matter**


**Viscosity:** Streamline flow and turbulent flow – Coefficient of viscosity - Derivation of Poiseulle’s formula.

**Surface Tension:** Introduction- experimental determination of surface tension – Jaeger’s method.

**UNIT III: Thermal Physics**


**Unit IV: Electricity and Magnetism**


**Unit V: Geometrical Optics**

Text Book:
   Unit I: 1.1 to 1.3, 1.9, 1.11 to 1.19.
   Unit II: 2.1 to 2.7, 2.12, 2.14, 2.15, 2.17, 2.24, 2.29
   Unit III: 3.15 to 3.21
   Unit IV: 4.1, 4.4 to 4.6, 4.15 to 4.20
   Unit V: 5.1, 5.2, 5.4, 5.6, 5.14, 5.16, 5.18 to 5.20, 5.22, 5.27

Reference Books:
1. Electricity and Magnetism - R. Murugeshan - Reprint with correction 2008
B.Sc. Chemistry CBCS Syllabus - SEMESTER - I  
(For those who joined in June 2015 and after)

<table>
<thead>
<tr>
<th>PART IV- Non Major Elective Paper I</th>
<th>Subject Title : Food Chemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Code: 07NE11</td>
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<tr>
<td>Sesssional Marks: 25</td>
<td>Credit: 2</td>
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<tr>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
</tr>
</tbody>
</table>

Objectives:

To enable the students

- To know about the concept of food adulteration.
- To understand the various types of food poison
- To know about the food materials & their preservations

UNIT I: INTRODUCTION TO FOOD SCIENCE  6 Hrs


UNIT II: FOOD ADULTERATION  6 Hrs


UNIT III: FOOD POISON  6 Hrs


UNIT IV: FOOD ADDITIVES  6 Hrs


UNIT V: FOOD TECHNOLOGY  6 Hrs


Text Book:


Reference Books:

<table>
<thead>
<tr>
<th><strong>PART-1: Language Tamil Subject</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subject Title:</strong> Tamil Language, Tamil Literature</td>
</tr>
<tr>
<td><strong>Subject Code:</strong> P1LT21</td>
</tr>
<tr>
<td><strong>Hours per week:</strong> 6</td>
</tr>
<tr>
<td><strong>Credit:</strong> 3</td>
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<tr>
<td><strong>Seasonal Marks:</strong> 25</td>
</tr>
<tr>
<td><strong>Summative marks:</strong> 75</td>
</tr>
<tr>
<td><strong>Total Marks:</strong> 100</td>
</tr>
</tbody>
</table>

### மப்பட்டினம்

1. குறிப்பிட்டு விளக்கக் குறிப்பிட்டு குறிப்பிட்டு
2. குறிப்பிட்டு பொருள்த்து குறிப்பிட்டு
3. மைகள் தொடருமையும்
4. குறிப்பிட்டு தொடருமைக்கு குறிப்பிட்டு
5. குறிப்பிட்டு தொடருமையும் மாணவர்களுக்கு குறிப்பிட்டு

### மப்பட்டினி வருமானத்திற்கு

1. குறிப்பிட்டு விளக்கக் குறிப்பிட்டு பு. மாணவுக்கு குறிப்பிட்டு (சு.சுற்றுலை
2. குறிப்பிட்டு பொருள்த்து குறிப்பிட்டு (ச.சுற்றுலை
3. மைகள் தொடருமையும் - மப்பட்டினியை
1. பொருள் பொருள்த்து குறிப்பிட்டு
2. மைகள் தொடருமையும்
3. மைகள் தொடருமையும்
4. மைகள் தொடருமையும் (சு.சுற்றுலை, மைகள் தொடருமையும், மைகள் தொடருமையும், மைகள் தொடருமையும், மைகள் தொடருமையும்)

4. குறிப்பிட்டு தொடருமைக்கு குறிப்பிட்டு
1. பொருள் பொருள்த்து குறிப்பிட்டு
2. மைகள் தொடருமையும்
3. மைகள் தொடருமையும்
4. மைகள் தொடருமையும் (சு.சுற்றுலை, மைகள் தொடருமையும்)
DEPARTMENT OF SANSKRIT
B.A. / B.Sc. PART-I – LANGUAGE SANSKRIT SYLLABUS: SEMESTER – II:
PAPER – II
(For those who join in June 2017 and After)

<table>
<thead>
<tr>
<th>PART – I Sanskrit Paper II</th>
</tr>
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<tbody>
<tr>
<td>Subject Title: Poetry Grammar &amp; History of Sanskrit Literature – II</td>
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<tr>
<td>Subject Code: P1LS21</td>
</tr>
<tr>
<td>Sessional Marks: 25</td>
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</tbody>
</table>

POETRY

Selected portions from the prescribed text: Kaliviḍambanam & Sabhāraṇjanaśatakam - Published by SADGUNA PUBLICATIONS

Kaliviḍambanam
Cidambaram (TN)

Unit I. scholars and Teachers Verse No. 1-10,

Unit II. Astrologers & Physicians V. 14-30

Unit III. Relatives & Pseudo monks Vv. 41-50, 84-93.

Sabhāraṇjanaśatakam

Unit IV Wisdom and it’s acquisition Vv. 1-12


Prescribed text:
LYRICS & CHAMPU KAVYAS
A short history of Sanskrit Literature
(Published by A.M.G. Publications, Madurai – 625 016 Page No. 51 – 60, 42 – 45) year of publication- 1996

Kaliviḍambanam & Sabhāraṇjanaśatakam
Published by SADGUNA PUBLICATIONS
PART II – Paper I

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Hours per week:</th>
<th>Credit:</th>
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<tbody>
<tr>
<td>P2LE21</td>
<td>5</td>
<td>3</td>
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</table>

Sessional Marks: 25  Summative Marks: 75  Total Marks: 100

Objectives: Total number of hours per semester: 75 Hrs

- To develop listening, speaking and reading skills
- To develop Information and Communication Technology (ICT) skills
- To develop presentation skills
- To develop competency in grammar

Unit – I Listening, Speaking and Reading Components 15 Hrs

Prose

1. MY VISIONS FOR INDIA - A.P.J. ABDUL KALAM
2. Mahatma Gandhi - V.S.Srinivasa Sastri
3. The Secret of Work - Swami Vivekananda
4. The Golden Age of Cricket - Neville Cardus
5. Tree Speaks - C. Rajagopalachari

Unit – II Language Study 15 Hrs
- Tenses and Their Uses
- Concord or Agreement
- Conditional Sentences
- Active and Passive Voice
- Preposition

Book: *A Textbook of English Grammar and Usage* by K.V. Joseph

Unit – III Composition 15 Hrs
- Letter writing – Informal Letters
- Hints Development
- Descriptive Writing

Unit – IV Extensive Reading: Short Stories 15 Hrs

Extensive Reading
1. Upper Division Love - Manohar Malgonkar
2. The Tiger in the Tunnel - Ruskin Bond
3. A Devoted Son - Anitha Desai
4. The Lost Child - Mulk Raj Anand
5. The Cask of Amantilado - Edgar Allan Poe

Unit – V Translation 15 Hrs
- Translation of Sentences and Stories from Tamil to English/English to Tamil
  (Passages will be supplied)
B.Sc. Chemistry CBCS Syllabus - SEMESTER II
(For those who joined in June 2015 and after)

<table>
<thead>
<tr>
<th>PART III – Core Subject Theory – III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Title: Inorganic and Organic Chemistry – I</td>
</tr>
<tr>
<td>Subject Code: 07CT21</td>
</tr>
<tr>
<td>Sessional Marks: 25</td>
</tr>
</tbody>
</table>

Objectives:
- To enable the students
  - To understand the theory of chemical bonding
  - To know about the halogen derivatives of aliphatic halogen compound
  - To gain basic knowledge about organometallic reagents
  - To have basic idea of aromatic halogen compound

UNIT I: CHEMICAL BONDING –II

- VB theory - overlapping of orbitals (s-s, s-p and p-p)-sigma and pi bonds – hybridisation – sp, sp² and sp³ hybridisation with suitable examples. MO theory – bonding – antibonding orbitals – bond order – bond strength – application of MOT to H₂, O₂ and N₂ molecules. VSEPR theory – application to H₂O, NH₃ and CH₄ molecules.

UNIT II: ALIPHATIC HALOGEN COMPOUNDS

- Preparation, properties and uses of – methyl chloride – chloroform-carbon tetrachloride – relative reactivity of alkyl halides – reaction and mechanism of SN₁, SN₂, E₁ and E₂ with reference to alkyl halides.

UNIT III: ALIPHATIC AND AROMATIC ALCOHOLS


UNIT IV: ORGANOMETALLIC REAGENTS

- Organometallic reagents – preparations, properties and synthetic applications Grignard reagent – preparations and synthetic applications of dialkyl zinc – preparations, properties and uses of tetraethyl lead (TEL)

UNIT V: ALIPHATIC AND AROMATIC HALOGEN DERIVATIVES

- Preparation and properties of vinyl chloride, allyl iodide – preparation of westron, freon and chloroprene – preparations and properties of chlorobenzene, benzyl chloride.

Text Books:

Reference Books:

B.Sc. Chemistry CBCS Syllabus - SEMESTER II
(For those who joined in June 2015 and after)

<table>
<thead>
<tr>
<th>PART III – Core Subject Theory – IV</th>
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<tbody>
<tr>
<td><strong>Subject Title:</strong> Physical Chemistry – I</td>
</tr>
<tr>
<td>Subject Code: 07CT22</td>
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<tr>
<td>Sessional Marks: 25</td>
</tr>
</tbody>
</table>

Objectives:

To enable the students
- To understand the essentials of nuclear chemistry
- To have basic idea of solid state chemistry
- To gain basic knowledge about crystallographic systems
- To study in detail about liquid state & liquid crystals

UNIT I: NUCLEAR CHEMISTRY I 12 Hrs


UNIT II: NUCLEAR CHEMISTRY II 12 Hrs


UNIT III: SOLID STATE 12 Hrs


UNIT IV: CRYSTALLOGRAPHIC SYSTEMS 12 Hrs

Bravais lattices – Simple cubic, face centered cubic and body centered cubic – Applications of X-rays to the study of crystal structures – Bragg’s equation – Powder method – Rotating crystal method – Determination of interplanar distance and wavelength of x-rays.
UNIT V: TYPES OF CRYSTALS AND LIQUID STATE  12 Hrs


b) Vitreous state and liquid crystals – Types of liquid crystal and applications – Disorders in the liquid state.

Text Book:

Reference Book:
B.Sc. Chemistry CBCS Syllabus - SEMESTER II
(For those who joined in June 2015 and after)

<table>
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<tr>
<th>PART III – Core Subject Practical</th>
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<tbody>
<tr>
<td>Subject Title: <strong>Inorganic Qualitative Analysis</strong></td>
</tr>
<tr>
<td>Subject Code: 07CP23</td>
</tr>
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<td>Sessional Marks: 40</td>
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</table>

**Objectives:**

To enable the students

*To acquire skill in semi-micro inorganic qualitative analysis*

Analysis of mixture containing two cations and two anions of which one is an interfering ion using semi micro method.

**Cations:**

Lead, bismuth, copper, cadmium, antimony, iron (II & III), aluminium, zinc, manganese, cobalt, nickel, barium, strontium, calcium, magnesium and ammonium.

**Anions:**

Carbonate, sulphate, nitrate, chloride, bromide, fluoride, oxalate, borate, phosphate, arsenite, and arsenate.

(Registrative practical examination: At the end of second semester)

**Text book:**

1. Dr. V. V. Ramanujam, Inorganic semimicro qualitative analysis, The National Publishing Company.

**Reference Book:**

UNIT I: PHYSICAL OPTICS


UNIT II: ATOMIC PHYSICS

Vector atom model – Quantum numbers associated with the vector atom model – the Pauli’s exclusion principle – magnetic dipole moment due to spin – the stern and gerlach experiment.

Unit III: NUCLEAR PHYSICS:

Models of nuclear structure – mass defect – binding energy – ionization chamber - nuclear fission-energy released in fission- atom bomb – Nuclear reactor – Nuclear fusion – Distinction between fission and fusion.

UNIT IV: ELEMENTS OF RELATIVITY


UNIT V: ELECTRONICS

Light Emitting Diode (LED) – Zener Diode- experiment to study the characteristics of the zener diode – zener diode as voltage regulator – Logic Gates – AND gate – OR gate- the NOT gate – the NAND gate –NAND gate is a universal gate- the NOR gate –NOR gate is universal gate – Boolean algebra – Postulates and theorem of Boolean algebra - De Morgan’s theorem.

Text Book:


Unit I: 6.2 to 6.4, 6.8, 6.10, 6.12, 6.14, 6.19, 6.20
Unit II: 7.1, 7.2, 7.4, 7.7, 7.8
Unit III: 8.1, 8.3, 8.4, 8.6, 8.8, 8.9, 8.12, 8.13, 8.14
Unit IV: 10.1 to 10.4, 10.11 to 10.21
Unit V: 9.1 to 9.7, 9.9

Reference Books:
1. Electricity and Magnetism - R. Murugeshan - Reprint with correction 2008

B.Sc. Chemistry Allied Physics CBCS Syllabus - SEMESTER – II
(For those who joined in June 2016 and after)

<table>
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<th>PART – III : Allied Physics Practical</th>
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<tr>
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<td>Sessional Marks: <strong>40</strong></td>
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</table>

(Any fourteen experiments)

1. Non-Uniform Bending – Pin and Microscope
2. Non-Uniform Bending – Optic lever
3. Uniform Bending – Pin and Microscope
4. Uniform Bending – Optic lever
5. Compound Pendulum
6. Torsion Pendulum
7. Sonometer – Verification of Laws (1st law & 2nd law)
8. Viscosity by Stoke’s method
9. Newton’s rings – Determination of Radius of curvature
10. Air wedge – Thickness of a paper
11. Spectrometer – Refractive Index
12. Spectrometer – Grating - Normal incidence
13. Carey Foster Bridge
14. Diode Characteristics
15. Zener Diode Characteristics
16. Logic Gates – AND, OR, NOT
PART IV - Non Major Elective

<table>
<thead>
<tr>
<th>Subject Title</th>
<th>Medicinal Chemistry – Vaccine Preventable Diseases</th>
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<tbody>
<tr>
<td>Subject Code</td>
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<tr>
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<td>Credit</td>
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<tr>
<td>Sessional Marks</td>
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<tr>
<td>Summative Marks</td>
<td>75</td>
</tr>
<tr>
<td>Total Marks</td>
<td>100</td>
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</tbody>
</table>

Objectives:

To enable the students

- To know about the fundamental concepts of medicinal chemistry
- To understand the vaccine preventable diseases
- To know about the epidemic diseases

UNIT I: INTRODUCTION


UNIT II: SCIENCE OF DRUGS

The science of medicinal chemistry: Introduction, from concept to market. Drug targets: enzymes, receptors, carrier proteins, structural proteins, nucleic acids, lipids, carbohydrates.

UNIT III: VACCINES

Introduction of vaccination – epidemiology, clinical features, prevention and control of (i) Mumps (ii) Rubella and (iii) Hepatitis.

UNIT IV: EPIDEMIC DISEASES

Epidemiology, clinical features, prevention and control of

(1) Typhoid (ii) Cholera and (iii) Meningococcal meningitis.

UNIT V: COMMON BODY AILMENTS


Text Book:


Reference Books:

1. PGDMCH-4, Child health – Indira Gandhi National Open University School of Health Sciences.
PART-I: Language Tamil Subject

<table>
<thead>
<tr>
<th>Subject Title: வழக்குத் தமிழ் பொருளியல் - பகுதி:3</th>
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<tbody>
<tr>
<td>Subject Code: P1LT31</td>
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<td>Seasonal Marks: 25</td>
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</table>

மாணவர்கள்

அதை 1 நோக்கு கல்வி நிறுவனம்

1. கலந்து காட்டுதல் - புதுக்கோட்டைக் காலத்து
2. பலாக்கி கையல் - பெண்கள் தொடர் அறிவியல் காலத்து
3. மூலக்கை கையல் - மேல் கண்டுபிடிப்புக் காலத்து
4. மூலக்கை கையல் - கையல் குறிப்பிட்டுக்காலத்து
5. மூலக்கை கையல் - முழுமையும் சிற்றுக்காலத்து

அதை 2 நோக்கு கல்வி நிறுவனம்

1. கால வலை - காலத்து வலை வலை (குறிப்பிட்டு வலை)
2. கால வலை - பலாக்கி வலை வலை (பிள்ளை வலை)
3. கால வலை - குறிப்பிட்டு (10 பாலாக்கி)
4. கால வலை - குறிப்பிட்டு (10 பாலாக்கி குறிப்பிட்டு வலை)
5. கால வலை - குறிப்பிட்டு (10 குறிப்பிட்டு குறிப்பிட்டு வலை)

அதை 3 காலம் - கலந்து காலம் காலம்

அதை 4 கால வலைவரிசை அறிவியல்

1. அறிவியல் (பலாக்கி, முழுமை வலை, முழுமை வலை, பிள்ளை வலை, முழுமை வலை, முழுமை வலை)
2. முழுமை வலை (சிற்றுக்காலம், குறிப்பிட்டு வலை)
3. முழுமை வலை - தில்லை வலை (பிள்ளை வலை - பிள்ளை வலை)

அதை 5 கால வலைவரிசை அறிவியல் பலாக்கிகளின்

1. காலம் குறிப்பிட்டு அறிவியல்
2. பலாக்கி குறிப்பிட்டு அறிவியல்
3. பிள்ளை வலை வலை - குறிப்பிட்டு வலை - குறிப்பிட்டு வலை

பாடத்தியல்
1. கருநாள் செய்யும் பொருள் (கருநாள் குழாய் பொருள்)
2. நந்தை - கொள்ளகமாக என்னைத் தந்து (பழக பாலில்மைலும்).

பாரம்பரிய நூற்றாண்டு

1. கருநாள் கிளைக்கிய என்னை (பழகம் பாலில்மை)
2. கருநாள் கிளைக்கிய என்னை (பழகம் பாலில்மை)
**DEPARTMENT OF SANSKRIT**

B.A. / B.Sc. PART-I – LANGUAGE SANSKRIT SYLLABUS: SEMESTER – III:

**PAPER – III**

(For those who join in June 2017 and After)

| Subject Title: Prose, Poetics & History of Sanskrit Literature – III |
|-------------------------|-------------------|-------------------|
| Subject Code: PILS31 | Hours per week: 6 | Credit: 3        |
| Sessional Marks: 25   | Summative Marks: 75 | Total Marks: 100 |

**PROSE**

Following portions from the prescribed text: ‘SAHITYA RASA KANA’
- Published by J.M. Publications, Madurai.

**UNIT I & II**

1. Gurubhakti
2. Māṭaṅga-caritam
3. Samsargajādoṣagunā bhavanti
4. Akarnahrudayo gardabhaḥ
5. Śukanāsopadeśaḥ

**POETICS**

**UNIT III & IV**

**ALAŃKĀRA (POETICS) FROM THE TEXT BOOK: SĀHITYA RASAKANĀḤ:-**

**UPAMĀ, ANANVAYA, UTPREKŚĀ, ATIŚAYOKTI, ULLEKHĀ, VYATIREKA, SAMĀSOKTI, ŚLEṢA, ARTHĀNTARANYĀSA.**

**HISTORY OF LITERATURE**

**UNIT V**

Prose Romance,
Historical Kavyas, Popular Tales.

Prescribed text:
A short history of Sanskrit Literature
(Published by A.M.G. Publications, Madurai – 625 016, Page No. 35 – 40, 40 – 44, 45 - 50) year of publication- 1996
Objectives:  

Total number of hours per semester: 60 hours

- To make students read and appreciate English Plays
- To make students appreciate English poetry
- To motivate students to face Competitive Examinations
- To develop continuous writing in English
- To make students read extensively

Unit I – One Act Plays

1. The First and the Last - John Galsworthy
2. Remember Caesar - G. Devoit
3. The Sheriff’s Kitchen - Ronald Gow
4. The Boatswain’s Mate - W.W. Jacobs and H.C. Sargent

Unit II – Poems

1. Githanjali (Poem 50) - Rabindranath Tagore
2. The Earthen Goblet - Harindranath Chattopadhyaya
3. La Belle Dame sans Mercy - John Keats
4. Fidelity - William Wordsworth
5. The Tiger and the Deer - Sri Aurobindo

Unit III Objective English

- Comprehension
- Spotting the Errors
- Sentence rearrangement
- Sentence Fillers
- Cloze test or Numbered Gaps


Unit – IV Composition

- Dialogue Writing
- Paragraph Writing

Unit – V Intensive Reading (Great Speeches)

Swami Vivekananda – Addresses at the Parliament of Religions
1. Response to Welcome,
2. Why We Disagree,
3. Religion Not the Crying Need of India,
4. Paper on Hinduism,
5. Address at the Final Session

Text: Swami Vivekananda’s Chicago Address, Ramakrishna Tapovanam Printing School.
Part-III - Core Subject Theory V

<table>
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<th>Hours per week: 4</th>
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<tbody>
<tr>
<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
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</tbody>
</table>

Objectives:

To enable the students
- To understand the principle of volumetric analysis
- To gain basic knowledge about metallurgy
- To know about the phenols and polynuclear compounds
- To learn the basic idea of aliphatic and aromatic aldehydes and ketones

UNIT I: PRINCIPLE OF VOLUMETRIC ANALYSIS 12 Hrs


UNIT II: METALLURGY 12 Hrs


UNIT III: PHENOLS AND POLYNUCLEAR COMPOUNDS 12 Hrs


UNIT IV: ETHERS, THIO ALCOHOLS AND THIO ETHERS 12 Hrs

UNIT V: ALIPHATIC AND AROMATIC ALDEHYDES AND KETONES 12 Hrs

Mechanism of nucleophilic addition – reactivity of carbonyl group – preparation and properties of acetaldehyde and ethyl methyl ketone – importance of flavouring agents – veratraldehyde.

UNSATURATED AND HYDROXYALDEHYDES AND KETONES


AROMATIC ALDEHYDES AND KETONES

Preparations and properties of benzaldehyde, acetophenone, benzophenone and quinones.

Text Books:


Reference Book:

B.Sc. Chemistry CBCS Syllabus - SEMESTER III
(For those who joined in June 2015 and after)

<table>
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<td>Summative Marks: <strong>75</strong></td>
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<tr>
<td>Total Marks: <strong>100</strong></td>
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Objectives:

To enable the students

- To have basic idea of gaseous state chemistry
- To gain basic knowledge in thermodynamics
- To understand the theory of chemical equilibrium

UNIT I: GASEOUS STATE

12 Hrs


UNIT II: THERMODYNAMICS-I

First Law of Thermodynamics

12 Hrs

Definition of thermodynamic terms: system, surroundings – types of systems, intensive and extensive properties – state and path functions and their differentials – thermodynamic process – concept of heat and work.


UNIT III: THERMODYNAMICS-II

Second law of thermodynamics

12 Hrs

Need for the second law-different statements of the second law-Carnot cycle and efficiency-Carnot’s theorem. Thermodynamic scale of temperature. Entropy as state function – entropy as a function of pressure and volume – entropy changes of an ideal gas – physical significances of entropy – Clausius inequality – entropy as criteria of spontaneity and equilibrium. Gibbs function (G) and Helmholtz function (H) as thermodynamics quantities. Gibbs-Helmholtz equation.
UNIT IV: THIRD LAW OF THERMODYNAMICS  


UNIT V: CHEMICAL EQUILIBRIUM  


Text Book:


Reference Book:

A double titration involving the making up of the solution to be estimated and the preparation of a primary standard of solution.

LIST OF EXPERIMENTS

I. ACIDIMETRY AND ALKALIMETRY
   1. Estimation of Na₂CO₃
   2. Estimation of NaOH / KOH
   3. Estimation of H₂SO₄ / HCl.

II. REDOX TITRATIONS
   a. Permanganimetry
      1) Estimation of ferrous ion
      2) Estimation of oxalic acid
   b. Dichrometry
      1) Estimation of ferrous ion.(FAS / FS)

III. IODOMETRY AND IODIMETRY
   1) Estimation of potassium dichromate
   2) Estimation of potassium permanganate

Reference Book:

Objective

❖ To develop the skill of solving problems.

Unit – I:

Trigonometry – expression for \( \sin n\theta, \cos n\theta \) and \( \tan n\theta \) – expression for \( \sin^n \theta \) and \( \cos^n \theta \) – expansion of \( \sin\theta, \cos\theta \) and \( \tan\theta \) as a series in ascending powers of \( \theta \) – hyperbolic functions and inverse hyperbolic functions.

Unit – II:

Differential calculus – differentiation methods – successive differentiation (up to second order derivative only, omit Leibnitz theorem).

Unit – III:

Integral calculus – properties of definite integrals – reduction formula for \( \int \sin^n x \, dx, \int \cos^n x \, dx \) and \( \int \sin^m x \cos^n x \, dx \) only – double and triple integrals (simple problems).

Unit IV:


Unit V:

Line and surface integrals – Green’s theorem, Stoke’s theorem and Gauss’ divergence theorem (statements only) – verifications (simple problems).

Text book:

1. Ancillary Mathematics by Dr. S. Arumugam & Issac. Vol I – IV (Relevant Chapters), New Gamma Publishing House, Palayamkottai

Reference:

Part – III : Allied Subject Theory

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<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
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</tbody>
</table>

Objectives
To enable the students to

- Fundamental course that provides basic understanding of biology of invertebrate and chordate.
- Study of salient features of invertebrates and chordates

Unit-I
b. Outline classification of Invertebrates and the salient features of the Phyla with examples
c. Outline classification of Chordates upto classes giving examples

Unit – II
a. Feeding and digestion in Amoeba, Hydra and Frog.
b. Respiration in Amoeba, Cockroach
c. Gills in Fish and Lungs in bird.

Unit – III
a. Circulatory system in Paramecium, Earthworm and Calotes.
b. Locomotion in Amoeba, Paramecium and Earthworm
c. Flight mechanism in Pigeon.

Unit – IV
a. Nervous system of Earthworm
b. Human brain and ear
c. Receptors – photoreceptors of Euglena, insects and man

Unit – V
a. Excretion in Amoeba and Earthworm
b. Excretion in Man-Structure of kidney and urine formation.
c. Reproductive system of Rabbit.

Text Books:

Reference Books:
PART – IV : Skill Based Subject

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<tr>
<th>Subject Title : Biomolecules and Pharmaceutical Chemistry</th>
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<td>Sessional Marks : 25</td>
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Objectives:

To enable the students

- To have basic idea of protein and nucleic acids
- To understand the theory enzyme
- To gain basic knowledge in medicine

UNIT I: PROTEINS AND NUCLEIC ACIDS 6 Hrs

Preparation and properties of amino acids – properties of proteins – structure of proteins – nucleic acids – nucleotides, nucleosides – different types of DNA and RNA.

UNIT II: ENZYMES 6 Hrs

Nomenclature and classification of enzyme – specificity – enzyme action, Fischer – Lock and key model.

UNIT III: ANAESTHETICS 6 Hrs


Thiopental sodium, advantages and disadvantages of cocaine and benzocaine (structure and therapeutic use only).

UNIT IV: ANALGESIC, ANTIPYRETIC AND ANTI INFLAMMATORY 6 Hrs

AGENTS


Anti-inflammatory: paracetamol, naproxen and ibuprofen (medicinal uses and structure only).

UNIT V: ANTISEPTICS AND DISINFECTANTS 6 Hrs


Reference Books:

UNIT 1 : VEGETABLE FIBRES AND ANIMAL FIBRES  
6 Hrs

Definition-classification of textile fibres – essential and desirable properties of textile fibres – Cotton fibre – Physical and chemical properties, Jute-Purification; physical and chemical properties of jute, silk and wool

UNIT 2: REGENERATED AND SYNTHETIC FIBRES  
6 Hrs


UNIT 3: PREPARATORY PROCESS PRIOR TO DYEING  
6 Hrs


UNIT 4: PRINCIPLES OF BLEACHING  
6 Hrs


UNIT 5: PRINCIPLES OF DYEING  
6 Hrs


Reference Books:
PART-I: Language Tamil Subject

<table>
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<tr>
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<th>Subject Code: PILT41</th>
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<td>Summative marks: 75</td>
<td>Total Marks: 100</td>
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பாட்டாணுத்தம்

அட்ச: 1  குளிர்ப் பாடல் தினகாலம் (புந்தைபணி)
அட்ச: 2  குளிர் பாடல் தினகாலம் (அக்கிளிணிக்)
அட்ச: 3  குளிர் கருப்பு தினகாலம்
அட்ச: 4  குளிர் தினகாலம்
அட்ச: 5  குளிர் தினகாலம் வரலாறு பாடல்கள்.

மாணவிக்கோடை நடவடிக்கைகள்

அட்ச : 1  குளிர் பாடல் தினகாலம் (புந்தைபணி)
அட்ச : 2  குளிர் பாடல் தினகாலம் (அக்கிளிணிக்)

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<tr>
<td>2. குளிர்குடியரசன் (அகிலார் - 49)</td>
</tr>
<tr>
<td>3. குளிர்குடியரசன் (அகிலார் - 71)</td>
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<tr>
<td>4. புந்தைபணி தடுக்கு</td>
</tr>
<tr>
<td>5. புந்தைபணி தடுக்கு</td>
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அட்ச : 3  குளிர் கருப்பு தினகாலம்

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<tbody>
<tr>
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<tr>
<td>2. குளிர் கருப்பு தினகாலம் (அகிலார் - 49)</td>
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<tr>
<td>3. குளிர் கருப்பு தினகாலம் (அகிலார் - 71)</td>
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அட்ச : 4  குளிர் தினகாலம் (பந்தை)

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<tbody>
<tr>
<td>1. பந்தைபணி - பந்தைபணி (பந்தை - 12 பேன்பகுதி)</td>
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<tr>
<td>2. பந்தைபணி - பந்தைபணி (பந்தை - 12 பேன்பகுதி)</td>
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அட்ச : 5  குளிர் தினகாலம் வரலாறு பாடல்கள்.

<table>
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<th>வரலாறு</th>
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<tbody>
<tr>
<td>1. குளிர் தினகாலம் வரலாறு</td>
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<tr>
<td>2. குளிர் தினகாலம் வரலாறு</td>
</tr>
</tbody>
</table>

மாணவ குழந்தை

<table>
<thead>
<tr>
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</thead>
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<tr>
<td>1. குளிர் தினகாலம் வரலாறு (குளிர் தினகாலம் வரலாறு)</td>
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DEPARTMENT OF SANSKRIT
B.A. / B.Sc. PART-I – LANGUAGE SANSKRIT SYLLABUS: SEMESTER – IV:

PAPER – IV
(For those who join in June 2017 and After)

<table>
<thead>
<tr>
<th>PART - I Sanskrit Paper IV</th>
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<tbody>
<tr>
<td>Subject Title: Drama And History of Sanskrit Literature – IV</td>
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<tr>
<td>Subject Code: PILS41 Hours per week: 4 Credit: 2</td>
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<tr>
<td>Sessional Marks: 25 Summative Marks: 75 Total Marks: 100</td>
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</table>

60 hours to Drama, 30 hours to Spoken Sanskrit.

**DRAMA**

Following portions from the prescribed text: ‘SĀHITYA RASAKANĀI’
- Published by J.M. Publications, Madurai.

Unit I, II, III
1. Kāṇḍābhāra of Bhāsa

Unit IV
History of Drama Literature
A short history of Sanskrit Literature

(Published by A.M.G. Publications, Madurai – 625 016
Page No. 59 – 75) year of publication- 1996

Unit V

30 HOURS OF ORAL TRAINING DEVELOPING THE COMMUNICATION SKILLS THROUGH THE SANSKRIT LANGUAGE.
PART II – Paper I

Subject Title: English through Classics

<table>
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<tr>
<th>Subject Code: P2LE41</th>
<th>Hours per week: 4</th>
<th>Credit: 3</th>
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<td>Sessional Marks: 25</td>
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Objectives: Total number of hours per semester: 60 hours

- To motivate students to read and understand English prose
- To make students appreciate English poetry
- To enable students to face Competitive Examinations in English
- To develop continuous writing of the students
- To make students read extensively.

Unit I - Prose

1. Building Self Confidence - by Norman Vincent Peale (Personality Development) From, English for Enrichment, Edited by Prof. K. Chellappan.
2. Sport- A Modern Hunting Ritual - by Desmond Morris (Essay), From, English for Enrichment, Edited by Prof. K. Chellappan.
4. She is Dancing Back in Life - by Deborach Cowley (A True Life Story) From, English for Enrichment, Edited by Prof. K. Chellappan.
5. Within Without - Rabindranath Tagore.

Unit II – Poems

1. Kali the Mother - Swami Vivekananda
2. Lochinvar - Walter Scott
3. Yossouf - James Russell Lowell
4. The Daffodils - William Wordsworth
5. Much Madness - Emily Dickinson
6. The Woman Who is ……(XCII) - Kabir Das
7. Stopping by Woods on a Snowy Evening - Robert Frost

Unit III - Objective English

- Sentence Completion
- Synonyms

Unit IV - Composition

- Descriptive writing - Topics on Personal Experience
- Resume Preparation
- SMS and E-Mail Preparation and sending.

Unit V Extensive Reading: Four Scenes from Shakespeare’s plays.
1. The Merchant of Venice. Act IV – Scene I – Portia’s Speech.
Part III- Core Subject Theory VII

<table>
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<th>Subject Code</th>
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Sessional Marks: 25  Summative Marks: 75  Total Marks: 100

Objectives:

To enable the students

- To know about the Carboxylic acids
- To have basic idea of Carbohydrates
- To understand the theory of Physical properties
- To have gain knowledge about Distribution law

UNIT I: MONO CARBOXYLIC ACIDS  12 Hrs

Aliphatic acids: Preparation and properties of formic acid and acetic acid - structural effect on strength of carboxylic acids.

Halogen substituted acids: Preparation and properties of monochloro, dichloro, trichloro acetic acids. Inference of halogen atom on the strength of acids.

Hydroxy acids: General methods of preparation and properties of glycolic acid and lactic acid. Action of heat on α, β and γ-hydroxy acids.

Amino acids: Preparation and properties of glycine and alanine.

Aromatic acids: Preparation and properties of benzoic acid-salicylic acid-anthranilic acid.

UNIT II: ALDEHYDIC AND KETONIC ACIDS  12 Hrs

Preparation and properties of glyoxalic acid and acetoacetic acid. Decarboxylation of keto acid-synthetic application of malonic ester, acetoacetic ester and keto-enol tautomerism.

UNIT III: CARBOHYDRATES  12 Hrs


UNIT IV: PHYSICAL PROPERTIES AND CHEMICAL CONSTITUTION  12 Hrs

Surface tension and chemical constitution-use of parachor in elucidating structure-viscosity and chemical constitution-Dunstan rule-molar viscosity-
Rhecohore - dipole moment - determination of dipole moment - dipole moment and molecular structure - dipole moment and ionic character - molar refraction and chemical constitution - optical activity and chemical constitution - magnetic properties - paramagnetic substances - diamagnetic substances.

UNIT V: DISTRIBUTION LAW


Text Books:

Reference Books:
B.Sc. Chemistry CBCS Syllabus – SEMESTER-IV
(For those who joined in June 2015 and after)

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<th>Part III- Core Subject Theory VIII</th>
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**Objectives:**

To enable the students
- To have basic idea of silicates
- To familiar with basic concept of halogens
- To have gain about acid base concept
- To know about inorganic reagents and basic idea of electron deficient

**UNIT I: SILICONES AND SILICATES**  
12 Hrs


**UNIT II: HALOGENS**  
12 Hrs


**UNIT III: HARD AND SOFT ACIDS AND BASES (HSAB)**  
12 Hrs


**Non-Aqueous Solvents:** Definition-types of non aqueous solvents - physical properties of a non aqueous solvent, reaction in non-aqueous solvents with reference to liquid NH$_3$ and liquid SO$_2$.

**UNIT IV: INORGANIC REAGENTS**  
12 Hrs

Organic reagents in inorganic analysis- advantages- disadvantages-dimethyl glyoxime, aluminox, thiourea, uranyl zinc acetate, Rhodamine-B, cupron, Magneson, alizarin, EDTA – estimation of magnesium and nickel using EDTA.

**UNIT V: ELECTRON DEFICIENT COMPOUNDS**  
12 Hrs

Tetra boranes – penta borane 9 – penta borane -11 hexaborane -10, decaborane 14 (structure only).

Text Books:

2. Selected topics in Inorganic Chemistry by Malik, Tuli, and Madan, Sultan Chand & Sons, New Delhi, First Edition - 2006

Reference Books:

2. Text book of Modern inorganic chemistry Dr.R.D. Madan, Sultan Chand & Sons, New Delhi, Third edition -2011
B.Sc. Chemistry CBCS Syllabus - **SEMESTER IV**
*(For those who joined in June 2015 and after)*

### Part III- Core paper Practical

<table>
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<th>Subject Title: <strong>Organic preparation and Estimation</strong></th>
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**Objectives:**
- To enable the students
- To apply theoretical knowledge to laboratory work
- To develop skill in volumetric analysis

**ORGANIC PREPARATION**

1. Nitration
   - a) Picric acid from phenol
   - b) Dinitro benzene from nitrobenzene

2. Bromination: p-bromoacetanilide from acetanilide

3. Hydrolysis: Benzoic acid from ethyl benzoate (or) benzamide

4. Acetylation / Benzoylation
   - a) Acetanilide from aniline
   - b) benzanilide from aniline

5. Oxidation: Benzoic acid from benzaldehyde

6. Glucosazone from glucose

**ORGANIC ESTIMATION**

1. Estimation of Phenol (Bromination method)
2. Estimation of aniline (Bromination method)

**Reference Book:**

B.Sc. Chemistry Allied Mathematics CBCS Syllabus - SEMESTER - IV
(For those who joined in June 2013 and After)

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<th>PART – III : Allied Subject Theory</th>
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<td>Hours per week: 6</td>
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<td>Sessional Marks: 25</td>
</tr>
<tr>
<td>Summative Marks: 75</td>
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<tr>
<td>Total Marks: 100</td>
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</table>

Objective:
- To develop the skill of Knowledge in Mathematics and Solving problems

UNIT I:

UNIT II:
Second order linear differential equations with constant coefficients – methods of finding particular integrals for the funtions of the type $e^{ax}$, $cos ax$, $sin ax$, $x^n$, $e^{ax}v$ – second order linear differential equations with variable coefficients.

UNIT III:

UNIT IV:

UNIT V:
Fourier series – Fourier series for even and odd funtions – half range Fourier cosine and sine series.

Text Book:
1. Ancillary Mathematics by Dr.S.Arumugam & Issac. Vol I – IV (Relevant Chapters ), New Gamma Publishing House, Palayamkottai

Reference Book:
Objectives

To enable the students to

- Knowledge on viral, bacterial, fungal, protozoan and helminthes disease and their control.
- Entrepreneurial avenues in Sericulture, Fish culture, Vermiculture, Mushroom and Apiculture.

Unit I
a. Structure of a typical virus
b. Brief account on Viral diseases
c. Polio, Rabies and AIDS.

Unit II
a. Structure of typical Bacteria
b. Brief account on Bacterial diseases
c. Cholera, Tuberculosis and Tetanus.

Unit III
a. Fungal diseases – Ringworm and Black piedra
b. Protozoan diseases – Amoebic dysentery and Malaria
c. Helminth parasites – Ancylostoma and Wucheraria

Unit IV
b. Fish culture – Scope and Importance – Types of culture – Identification of common edible fishes - Induced breeding - common diseases and control – maintenance of fish pond.
c. Vermiculture – Features of exotic and indigenous species – rearing and culturing – Characteristics of Vermicast and Vermiwash – Economics of vermiculture

Unit V
a. Biogas production – characteristic features of biogas – production of biogas – uses
b. Mushroom culture – nutritive and medicinal value – Morphology of Indian oyster mushroom – cultivation of paddy straw mushroom - advantages


Text Book:


Reference Books

2. Gupta 2003. Vermicomposting for sustainable agriculture, Agrobios (India), Jodhpur
B.Sc. Chemistry Allied Zoology CBCS Syllabus - SEMESTER - IV
(For those who join in June 2015 and after)

<table>
<thead>
<tr>
<th>Part – III : Allied Subject Practical</th>
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<tr>
<td>Subject Code: <strong>09AP03</strong></td>
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<tr>
<td>Subject Title: <strong>PRACTICAL-I</strong></td>
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<tr>
<td>Hours per week: <strong>2</strong></td>
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<td>Credit: <strong>1</strong></td>
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<tr>
<td>Sessional Marks: <strong>40</strong></td>
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<td>Summative Marks: <strong>60</strong></td>
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<tr>
<td>Total Marks: <strong>100</strong></td>
</tr>
</tbody>
</table>

**Objectives**

To enable the students to

- **Identification of all classes of invertebrates and vertebrates.**
- **Unrevealing anatomical features of invertebrate and chordate**

1. Observation of the following -Spotters
   - *Paramecium*- conjugation
   - *Obelia* (entire)
   - *Hydra* (entire)
   - *Taenia* (entire)
   - Scolex of *Taenia*
   - *Ascaris* male and female
   - *Nerises* (entire)
   - *Penaeus*
   - *Pila* (entire) and shell of Fresh water mussel)
   - Starfish (entire)
   - Amphioxus, *Balanoglossus, Scoliodon*
   - Cobra, Viper, Pigeon
   - Skull of Pigeon dorsal and ventral view
   - Pectoral girdle of pigeon
   - Fore and hind limb of Frog
   - Synsacrum of bird

2. Simple staining of Bacteria from milk and sewage water.
3. Mounting of mouth parts of Mosquito, Housefly and Honey bee.
4. Identification of *Ascaris* (male & female) and Tapeworm.
5. Identification of egg, larva, pupa and adult of silk moth.
6. Dissection to show silk glands.
7. Common appliances used in silkworm rearing and apiculture.
8. Visit to Biogas production, Mushroom culture and Fish culture centres.

**ANCILLARY SUMMATIVE PRACTICAL EXAMINATIONS**

**QUESTION PAPER PATTERN**

Practical – I Animal Organisation, Biology and Human Welfare (09AP03)

Time: 3 hrs

Maximum Marks: 60

1. Major Practical 20
2. Minor Practical 15
3. Spotters (5 x 4) 20
4. Record 5
Total 60

B.Sc. Chemistry CBCS Syllabus - SEMESTER IV
(For those who joined in June 2015 and after)

<table>
<thead>
<tr>
<th>Part – IV : Skill Based Subject Theory</th>
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<tbody>
<tr>
<td>Subject Title: Chemistry in Action</td>
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<td>Subject Code: 07SB4A   Hours per week: 2   Credit: 2</td>
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<td>Sessional Marks: 25   Summative Marks: 75   Total Marks: 100</td>
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Objectives:
To enable the students
❖ To have basic idea of chemistry in action
❖ To understand the theory electron microscopy
❖ To gain basic knowledge in Petroleum

UNIT I:
Primordial Helium and the Big Bang Theory – The importance of units – Distribution of elements on Earth and in living System – Chemical fertilizers – An undesirable precipitation reaction – Breathalyzer – metal from the sea – Scuba diving and the Gas laws – Super cold atoms – Making snow and inflating a Bicycle Tyre

UNIT II:

UNIT III:

UNIT IV:
The thermodynamics of a rubber band – Bacteria power – Dental filling Discomfort – Recycling Aluminium – Metallic hydrogen – Synthetic gas from coal – Ammonium nitrate – The explosive fertilizer – Coordination compounds the living systems – Cisplatin – the anticancer drug – Nature's Own fission reactor

UNIT V:
UNIT I: ORIGIN OF SOIL

(6 Hrs)


UNIT 2: PHYSICAL PROPERTIES OF SOIL

(6 Hrs)

Physical properties of soil-soil texture and textural classification- pore space- bulk density, particle density- soil structure and soil colour –surface area-soil colloids. Soil reaction- Ion exchange reaction – cation exchange-anion exchange –Buffering capacity- hydrogen ion concentration- determination of pH values- Factors affecting soil pH.

UNIT 3: CHEMISTRY ASPECTS OF SOIL

(6 Hrs)


UNIT 4: PLANT NUTRIENTS

(6 Hrs)


UNIT 5: PESTICIDES, FUNGICIDES AND HERBICIDES

(6 Hrs)

Reference Book:

B.Sc. Chemistry Part-II English CBCS Syllabus - SEMESTER – V
(For those who join in June 2015 and After)

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<th>PART II – Paper I</th>
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<td>English for Career Development</td>
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<tr>
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<tr>
<td>P2LE51 / P2CE51</td>
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<td>Hours per week:</td>
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<td>Total Marks:</td>
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Total number of hours: 15 hours

Objectives:
- To make students face Competitive Examinations with confidence
- To train students in writing book reviews
- To make them write reports, resolutions, minutes
- To make them prepare agenda for meeting.
- To make students read books on Personality Development

Unit I
- Comprehension

Unit II
- Spotting the Errors
- Sentence Improvement
- Voice
- Preposition
- Cloze Test or Numbered Gaps

Text Book:
Objective English for Competitive Examinations, Hari Mohan Prasad

Unit III
- Book Reviews

Unit IV
- Report-Writing
- Preparation of Agenda, Resolutions, Minutes

Unit V
Extensive Reading – Self study – How to win Friends and Influence People
– Dale Carnagie, Vermilian, London
B.Sc. Chemistry CBCS Syllabus - SEMESTER - V
(For those who joined in June 2015 and after)

<table>
<thead>
<tr>
<th>PART- III : Core Based Subject</th>
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<tbody>
<tr>
<td>Subject Title : Organic Chemistry – II</td>
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<tr>
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Objectives:

To enable the students

- To know about the Carboxylic acids
- To have basic idea of nitrogen compounds
- To predict the conformer of acyclic and cyclic compounds
- To have gain about stereochemistry

UNIT I: DICARBOXYLIC ACID AND ITS DERIVATIVES  12 Hrs

Aliphatic dicarboxylic acids: Preparation and properties of malonic acid-succinic acid and adipic acid.

Unsaturated dicarboxylic acid: Preparation and properties of maleic and fumaric acids – geometrical isomerism exhibited by maleic and fumaric acid.

Hydroxy acids: Preparation and properties of tartaric acid-optical isomerism exhibited by tartaric acid.

Aromatic dicarboxylic acids: Preparation and properties of phthalic acid and its derivatives – phthalic anhydride and phthalimides.

UNIT II: NITROGEN CONTAINING COMPOUNDS-I  12 Hrs

Aliphatic nitrogen compounds: General methods of preparation and properties of methyl cyanide and isocyanides-distinction between cyanide and isocyanide – tautomerism by nitro compounds.


UNIT III: NITROGEN CONTAINING COMPOUNDS-II  12 Hrs

Aliphatic diazo compounds: Preparation, properties and structure of diazomethane and diazoacetic ester.

Aromatic nitrogen compounds: Preparation and properties of nitrobenzene. Reduction of aromatic nitro compounds. Preparation and properties of aromatic amino compounds aniline and toluidines. Diazonium chloride.
UNIT IV: STEREOCHEMISTRY  

12 Hrs


UNIT V: CONFORMATIONAL ANALYSIS OF ACYCLIC AND CYCLOALKANES  

12 Hrs

Conformational study of ethane, n-butane and 1,2-dichloroethane - relative stability of cycloalkanes from cyclopropane up to cyclooctane - Bayer's strain theory – limitations and its modification. Conformational analysis of cyclohexane, cyclohexanone and decahls.

Text Book:


Reference Books:

B.Sc. Chemistry CBCS Syllabus - SEMESTER - V
(For those who joined in June 2015 and after)

PART- III : Core Based Subject

<table>
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<td>Total Marks</td>
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Objectives:
To enable the students
❖ To understand the basic concept of coordination chemistry
❖ To know about the Analytical chemistry
❖ To gain basic knowledge about Bio-inorganic chemistry

UNIT I: COORDINATION CHEMISTRY – I 15Hrs

Limitations of VB theory.

UNIT II: COORDINATION CHEMISTRY – II 15 Hrs


UNIT III: COORDINATION CHEMISTRY – III 15 Hrs

Labile and inert complexes – crystal field effects on substitution reaction rates. Substitution reaction of cobalt (III) and platinum complexes – trans effect. Associative and dissociative mechanism - conjugate base. Inner sphere and outer sphere electron transfer reactions.

UNIT IV: ERROR ANALYSIS AND THEORY OF ANALYTICAL CHEMISTRY 15 Hrs

**UNIT V: BIOINORGANIC CHEMISTRY**

Introduction – essential and trace elements in biological systems — function and toxicity of the following elements in biological system – F, Na, Al, Mg, Cl, K, Ca, Cr, Mn, Cu, Zn, Ni, Co, As, Mo, Cd, Sn, Hg, and Pb. Problems in biological systems – agriculture – biochemistry of iron- haemoglobin and myoglobin as oxygen carriers – metals in medicine – metals used in diagnosis and chemotherapy with particular reference to anticancer drugs.

**Text Books:**

2. Selected topics in Inorganic Chemistry by Malik, Tuli, and Madan, Sultan Chand & Sons, New Delhi, First Edition - 2006

**Reference Books:**

OBJECTIVES:

To enable the students

- To understand the basic concept of Electrochemistry
- To gain basic knowledge about Photochemistry
- To gain basic knowledge of Phase rule

UNIT I: ELECTRICAL CONDUCTANCE


UNIT II: ELECTROCHEMICAL CELLS

equilibrium constant from EMF data-concentration cells. Liquid junction potential and salt bridge.

UNIT III: APPLICATIONS OF EMF MEASUREMENTS 15 Hrs


UNIT IV: PHOTOCHEMISTRY 15 Hrs


UNIT V: PHASE RULE 15 Hrs

Statement and significance of the terms involved. Thermodynamic derivation of phase rule-comparison between the law of mass action and phase rule. Phase diagrams of one component and two component systems – phase diagrams of water, sulphur systems – Pb-Ag, KI/H₂O systems – Salt hydrate and freezing mixtures – Gas solid equilibria – Three component systems-partially miscible liquid pairs-two solid and one liquid systems.

Text Books:

**Reference Book**


B.Sc. Chemistry CBCS Syllabus - SEMESTER - V
(For those who joined in June 2015 and after)

<table>
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<tr>
<th>PART- III : Core Subject Practical</th>
<th>Subject Title : <strong>Gravimetric Estimations</strong></th>
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**Objectives:**

To enable the students

- To develop skill in gravimetric analysis

1. Estimation of Lead as Lead Chromate.
2. Estimation of Barium as Barium Chromate.
3. Estimation of Calcium as Calcium Oxalate monohydrate.
4. Estimation of Copper as Cuprous thiocyanate.

**Reference Book:**


B.Sc. Chemistry CBCS Syllabus - SEMESTER - V
(For those who joined in June 2015 and after)

<table>
<thead>
<tr>
<th>PART- III : Core Subject</th>
<th>Subject Title : <strong>Organic Analysis</strong></th>
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<tr>
<td>Subject code : 07CP55</td>
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<td>Summative Marks: 60</td>
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<td></td>
<td>Total Marks: 100</td>
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</table>

**Objectives:**

To enable the students

- To carry out the analysis of given organic compounds

Analysis of an organic compound containing one or two functional groups and confirmation by the preparation of a solid derivative – acids, phenols, aldehydes, ketone, esters, nitro compounds, amines (primary, secondary and
tertiary), aniline, aliphatic diamide, side chain and nuclear halogen compounds, diamide containing sulphur and monosaccharide.

**Reference Book:**


B.Sc. Chemistry CBCS Syllabus - SEMESTER - V
(For those who joined in June 2015 and after)

<table>
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<tr>
<th>PART- III : Elective Subject</th>
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<tbody>
<tr>
<td>Subject Title : <strong>Computer Application in Chemistry and Green Chemistry</strong></td>
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<td>Subject code : 07EP51</td>
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<td>Sessional Marks : 25</td>
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**Objectives:**

To enable the students

- To gain basic knowledge about computer application in chemistry
- To understand the basic concept of Green Chemistry

**UNIT I**

15 Hrs


**UNIT II**

15 Hrs

Memory unit – types of memory – Hardware – Software – Algorithm – Flowchart – Programming languages – Number system – Decimal – Binary system – Octal number system

**UNIT III**

15 Hrs

Salient features of windows and MS word for typing texts and equation in Chemistry – Tabular columns – Advanced concepts. Basic concept of creating and accessing databases using MS access – Significance of chemdraw – Drawing chemical structure and pasting them in the text.

**UNIT IV**

15Hrs


**UNIT V**

15 Hrs


**Text Books:**

Reading the document naturally:

2. Green Chemistry - Rashmi Sanghi & MM Srivastava, Narosa publishing House 2003

Reference Books:


B.Sc. Chemistry CBCS Syllabus - SEMESTER V – PAPER - III
(For those who joined June 2015 onwards)

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<th>PART- IV : Skill Based</th>
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<td>Subject Title : <strong>Drug Chemistry</strong></td>
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</table>

**UNIT: 1 DRUG CHEMISTRY** Drugs and the medicinal chemist the why and the wherefore: drug targets: why should drug work? Where do drugs work- cell structure-drug targets at the molecular level-Intermolecular bonding forces-Electro static and ionic bonds-hydrogen bonds-Van der waals interactions- Dipole-dipole interactions-Reppulsive interaction-role of water and hydrophopic interactions- Drug targets: Lipids as drug targets-carbohydrates as drug targets.proteins and nucleic acid as drug targets.


**UNIT: 4** Synthetic Narcotics: Analgesia and Addiction – A Natural High: The Brain’s Own Opiates – Some Chemistry of the Nervous System – Brain Amines: Depression and Mania – Antianxiety Agents – Stimulant Drugs: Amphetamines

**UNIT: 5** The “Mindbenders”: LSD – Marijuana: Some Chemistry of Cannabis – Drugs and Deception: Chemistry and Quality Control – The Placebo Effect

Reference Book:

B.Sc. Chemistry CBCS Syllabus - SEMESTER - V
(For those who joined in June 2015 and after)

<table>
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<tr>
<th>PART – IV : Skill Based Subject</th>
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<tr>
<td>Subject Title : <strong>Industrial Chemistry Preparation</strong></td>
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Subject code : **07SB5B**  | Hours per week : **2**  | Credit : **2** |
Sessional Marks : **25**  | Total Marks : **25** |

**Objectives:**

To enable the students
- To develop skill in industrial chemistry preparations

**List of Experiments**

1. Preparation of Cleaning Powder
2. Preparation of Mixed Fruit Jam
3. Preparation of Washing Powder
4. Preparation of Fountain Pen Ink
5. Preparation of Liquid Blue
6. Preparation of Syrup
7. Preparation of White Phenyl
8. Preparation of Black Phenyl
9. Preparation of Lipstick
10. Preparation of Nail polish
11. Preparation of Shampoo

*Study material will be provided*
UNIT I: INTRODUCTION TO POLYMERS

UNIT II: PHYSICAL PROPERTIES AND REACTIONS OF POLYMERS
Properties: Glass transition temperature (Tg)- Definition – Factors affecting Tg-relationships between Tg and molecular weight and melting point. Importance of Tg. Molecular weight of polymers: Number average, weight average, sedimentation and viscosity average molecular weights. Molecular weights and degree of polymerisation. Reactions: hydrolysis – hydrogenation – addition – substitutions-cross-linking vulcanization and cyclisations reactions. Polymer degradation: Basic idea of thermal, photo and oxidative degradations of polymers.

UNIT III: POLYMERIZATION TECHNIQUES AND PROCESSING
Polymerisation techniques: Bulk, solution, suspension, emulsion, melt condensation and interfacial polycondensation polymerizations. Polymer processing: Calendering – die casting, rotational casting – compressing, injection moulding.

UNIT IV: CHEMISTRY OF COMMERCIAL POLYMERS
General methods of preparation, properties and uses of the following Polymers: Teflon, Polymethylmethacrylate. Polystyrene, PAN, polyesters, polycarbonates, Polyimides, (Kevlar), polyurethanes, PVC, epoxy resins, Rubber-styrene and neoprene rubbers, Phenol-formaldehydes and urea-formaldehyde resins.

UNIT V: ADVANCES IN POLYMERS
Reference Books:

B.Sc. Chemistry CBCS Syllabus - SEMESTER – V
(For those who joined in June 2015 and after)

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<td>Summative Marks: <strong>75</strong></td>
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<td>Total Marks: <strong>100</strong></td>
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2hrs/week 24hrs

Objectives
- Disseminate information of Environment of national and international issues
- Environmental consciousness creation among the students
- Facilitation of environmental leadership among students

Unit-I
- 5 hrs
  Introduction – Nature, scope and importance of Environmental studies – Natural Resources and conservation – forest, water and energy.

Unit-II
- 5 hrs
  Ecosystem – concept – structure and function, energy flow, food chain, food web and ecological pyramids

Unit-III
- 5hrs
  Biodiversity – definition, types – values – India, a mega diversity zone – Hotspots – Endangered and endemic species – threat to biodiversity and conservation

Unit-IV
- 5 hrs

Unit-V
- 4hrs

Text book:
Objectives:

- To make students face Competitive Examinations with confidence
- To prepare students to face interviews
- To make students familiar with books and authors in English literature
- To make students prepare resume
- To motivate students to participate in Group Discussion
- To make students read books on Personality Development

Unit – I

- Sentence Completion
- Sentence Fillers
- Synonym
- Antonym
- Idioms and Phrases
- Substitution

Unit – II

- Sentence Arrangement
- Jumbled sentences
- Paragraph Reconstruction
- Analogy

Text Book

Objective English for Competitive Examinations, Hari Mohan Prasad

Unit III

- Interview Skills – mock – interview.
Unit IV

- Debate, Group Discussion, Resume Writing
- Books and authors in English literature

B.Sc. Chemistry CBCS Syllabus - SEMESTER - VI
(For those who joined in June 2015 and after)

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Objectives:
To enable the students
- To know about the polymers
- To have basic idea on dyes
- To basic knowledge of Heterocyclic compounds
- To have gain about vitamins
- To familiarice with fundamental concept of Spectroscopy

UNIT I: POLYMERS 15Hrs
Polymers – Definition – Classification of polymerization reactions – Addition and condensation polymerization reactions – Types of polymers – Mechanism of cationic, anionic and free radical polymerization – Thermo and thermo setting polymers – Preparation of caprolactam, Nylon 66, Polyester, epoxide resin – Biomedical applications of polymers (elementary treatment) – Natural rubber and synthetic rubber – Properties of polymers – Conducting polymers (a brief study).

UNIT II: DYES AND MOLECULAR REARRANGEMENT 15Hrs
Dyes - Theory of color and constitution - Chromophore, auxochrome – Classification according to application and structure – Preparation and uses of azo dyes, methyl orange, malachite green and indigo dyes – Indigotin, anthraquinone dyes – Alizarin, phthalein dyes – Fluorescein.
Detailed mechanism of the following rearrangements: Wagner – Meerwin, Hofmann, Curtius, Beckman, Benzilic acid, Claisen, Benzidine, Fries and Orton rearrangements.

UNIT III: HETEROCYCLIC COMPOUNDS AND ALKALOIDS 15 Hrs
Heterocyclic compounds: Single ring heterocyclics – Nomenclature, preparation and properties of pyrrole, furan, thiophene and pyridine – Condensed
ring heterocycles – Nomenclature, preparation and properties of indole, quinoline and isoquinoline

**Alkaloids**: Definition, occurrence, extraction of alkaloids isolation – Properties and elucidation of structure and synthesis of coniine, piperine.

UNIT IV: TERPENES, VITAMINS, HORMONES AND CHEMOTHERAPY

**Terpenes**: Introduction, classification, occurrence, Isolation and general properties – Isoprene rule – Synthesis of citral, properties and structure of geraniol, limonene, menthol and camphor.

**Vitamins and Hormones**: Definition, classification and biological importance of thyroxine, ascorbic acid, thiamine, testosterone and progesterone (Structural elucidation & synthesis not required).

**Chemotherapy**: Definition, preparations and application of the following drugs: Sulpha drugs, sulphanilamide, sulphapyridine and sulphathiazole.

UNIT V: UV –VISIBLE, IR AND NMR SPECTROSCOPY


**IR Spectroscopy**: Molecular vibrations – Finger print region-Identification of functional groups and interpretation of IR spectra.

**NMR Spectroscopy**: NMR phenomenon – chemical shift – factors influencing chemical shift (electro negativity, anisotropic effect), spin-spin coupling – application of NMR to simple molecules like ethyl alcohol, ethyl bromide, acetaldehyde, 1,1,2-tribromoethane and toluene. Simple problems involving UV, IR and NMR data.

**Text Book**:


**Reference Book**

PART – IV Core Subject Theory X

Subject Title: Physical Chemistry - IV

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Objectives:

To enable the students

- To have basic concept of chemical kinetics
- To understand the concept of about Group theory
- To familiar with fundamental concept of Spectroscopy

UNIT I: CHEMICAL KINETICS

15 Hrs


UNIT II: GROUP THEORY

15 Hrs


UNIT III: MOLECULAR SPECTROSCOPY

15 Hrs

Electromagnetic radiation (EMR)-absorption and emission spectra – band

**UNIT IV: IR SPECTROSCOPY**

15 Hrs

Vibrational spectra – IR spectra of diatomic molecule – rotation vibration spectra of diatomic molecule – applications of IR spectroscopy. Raman spectra – comparison of Raman and IR spectra.

**UNIT V: NMR, ESR AND MASS SPECTROMETRY**

15 Hrs

- **Electron Spin resonance spectroscopy**: Principle of hyperfine splitting – ESR spectra of hydrogen and methyl radical.

**Text Books:**


**Reference Books:**

B.Sc. Chemistry CBCS Syllabus - SEMESTER - VI
(For those who joined in June 2015 and after)

<table>
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<th>PART- III : Elective Subject Practical</th>
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PHYSICAL CHEMISTRY EXPERIMENTS:

I. **Determination of Molecular weight by** a) Transition Temperature method [Na$_2$S$_2$O$_3$, 5H$_2$O].  b) Rast Macro method – Naphthalene as Solvent

II. **Phase diagram involving**
    a) Simple eutectic  
    b) Compound formation

III. **Critical solution temperature (CST)**
    Determination of CST of phenol – water system and effect of impurity on CST – Determination of Strength of NaCl.

IV. **Thermo Chemistry**
    Heat of solution – K$_2$Cr$_2$O$_7$, (NH$_4$)$_2$C$_2$O$_4$ and H$_2$C$_2$O$_4$.

V. **Partition Co-efficient experiments:**
    a) Study of the equilibrium constant for the reaction
       
       KI+I$_2$ ⇌ KI$_3$

    By determining the partition Co-efficient of I$_2$ between water an CCl$_4$
    Determination of strength of given KI.

VI. **Kinetics** Determination of relative strength of acids by hydrolysis of ester.

VII. **Conductivity** Determination of cell constant and conductivity titration between as acid and a base (HCl Vs NaOH)

**Reference Book:**

B.Sc. Chemistry CBCS Syllabus – SEMESTER - VI
(For those who joined in June 2015 and after)

<table>
<thead>
<tr>
<th>PART- III : Elective Subject Practical</th>
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<tbody>
<tr>
<td>Subject Title : Nano Chemistry</td>
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<tr>
<td>Subject code : 07EP62</td>
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<tr>
<td>Hours per week : 5</td>
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<td>Summative Marks: 75</td>
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Objectives:
To enable the students
- To know about the nanochemistry
- To study about the nanobiology and nano sensor

UNIT I : INVESTIGATING AND MANIPULATING MATERIALS IN THE NANO SCALE


UNIT II: SEMICONDUCTORS QUANTUM DOTS


UNIT III: NANOBIOLOGY


UNIT IV: NANSENSORS


UNIT V: NANOMEDICINE

Text Book:

Reference Book:

B.Sc. Chemistry CBCS Syllabus - SEMESTER - VI
(For those who joined in June 2016 and after)

<table>
<thead>
<tr>
<th>Subject Title</th>
<th>Chemistry and General Aptitude for Competitive Examination</th>
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<tbody>
<tr>
<td>Subject code</td>
<td>07SB6A</td>
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<tr>
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<tr>
<td>Credit</td>
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<tr>
<td>Sessional Marks</td>
<td>25</td>
</tr>
<tr>
<td>Summative Marks</td>
<td>75</td>
</tr>
<tr>
<td>Total Marks</td>
<td>100</td>
</tr>
</tbody>
</table>

Objectives:
To enable the students
- To recall basic/advanced chemistry to prepare for Entrance examination for higher studies
- To develop aptitude, mental ability and reasoning ability in order to prepare for various competitive exams like TNPSC and banking sector etc.
- To prepare for state level and national level competitive exams

UNIT 1: CHEMISTRY-I

Introduction – Branches of chemistry – The importance of chemistry

Matter and its nature – Classification – composition of earth – elements – compounds – some important elements and compounds – mixtures – Avogadro’s hypothesis and mole concept.

Chemical Reactions and the chemical equations – Balancing chemical equations – rate of reaction – energy changes in reactions.


Periodic Table of Elements – Periodic trends in properties.


Oxygen and Air – Composition of air – air and life – respirations (inhaled and exhaled Air).


UNIT 2: CHEMISTRY-II


Occurrence of Metals – Properties of metals – extractions of metals.

Petroleum and Natural Gas – Uses of various fractions – other fractions.

Iron and Steel – Rusting of iron – cement and glass.


Agricultural Chemistry – Chemical control – fertilisers.


Food Chemistry – Food additives.


Dyes; Basic concept of colour and constitution.

UNIT 3: CHEMISTRY-III


International Symbols for Units – The CGS System or cm-g-s – The MKSA system or m-kg-s – The Degree Kelvin – international systems of units (SI-Units) – the mole.

Carbohydrates – Classification – sugars – polysaccharides.

Nucleoproteins and Nucleic acids – The genetic code.


Fats – Soaps.

Important laws governing Gases, Liquids and Solutions – gases – colligative properties.

Bioterrorism.


Important concepts and topics.

UNIT 4: GENERAL APTITUDE-I

Numerical ability-Simplification-numbers-ratio and proportion-percentages-profit and loss-average and mixtures

UNIT 5: GENERAL APTITUDE-II

Mental ability-Time and work-simple interest and compound interest-geometry and mensuration-statistics-data interpretation-alpha-numeric reasoning-visual reasoning

Reference Books:

1. Objective Chemistry by M.Sivakumar Sura’s publication, 2005.
PART- IV:  Skill Based Subject

Subject Title : **Leather Chemistry**

<table>
<thead>
<tr>
<th>Subject code</th>
<th>Hours per week</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>07SB6B</td>
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<td>2</td>
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</table>

**Sessional Marks : 25  Summative Marks: 75  Total Marks:100**

**UNIT 1: INTRODUCTION TO LEATHER CHEMISTRY**

Importance of leather industry – scope of leather chemistry – distinction between hides, skins and leather – a detailed study of the structure and composition of hide and skins – Proteins and their characteristics – Anatomy and histology of protein constituents of leather.

**UNIT 2: TANNING PROCESSES**


**UNIT 3: CHEMISTRY OF TANNING**


**UNIT 4: PRESERVATION AND PROCESSING OF LEATHER**

Chemical methods of curing and presentation of hides and skins in acid and alkaline solutions. Principle of methods employed in curing, liming, deliming, bating and pickling – Process of dyeing leather- Use of mordants – Dyeing auxiliaries such as leveling, wetting and dispersing agents – Dye fixations.
UNIT 5: ENVIRONMENTAL IMPACT OF TANNERY INDUSTRIES & PROJECT WORK


Project: A small group project on collecting tannery effluents from various sources and their chemical analysis.

Reference Books:

2. Visit to a leather processing unit to understand the process of tanning and leather processing.
3. Visit to CLRI to have an idea of the research and development in leather industry.

B.Sc. Chemistry CBCS Syllabus - SEMESTER VI – PAPER III
(For those who joined June 2015 and after)

<table>
<thead>
<tr>
<th>Part-IV: Skill Based Subject</th>
<th>Subject Title: Dairy Chemistry</th>
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<td>Subject code: 07SB6C</td>
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<td>Credit: 2</td>
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<td>Summative Marks: 75</td>
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</table>

UNIT I: COMPOSITION OF MILK


UNIT II: PROCESSING OF MILK


UNIT III: MAJOR MILK PRODUCTS


UNIT IV: SPECIAL MILK


UNIT V: FERMENTED AND OTHER MILK PRODUCTS


**Reference Books:**

B.Sc. Chemistry CBCS Syllabus - **SEMESTER - VI** – **PAPER III**

(For those who joined June 2015 and after)

<table>
<thead>
<tr>
<th>PART- IV: Skill Based Subject</th>
<th>Subject code : 07SB6D</th>
<th>Hours per week : 2</th>
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<tbody>
<tr>
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<td>Sessional Marks : 25</td>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
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</table>

**UNIT I: INDUSTRIAL REQUIREMENTS**


**UNIT II: ENERGY**


**UNIT III: PETROCHEMICAL INDUSTRIES**

Crude oil – constitution and distillation – composition – of different distillates – pour points, depressants, drag reducers, viscosity reducers, ignition point, flash point octane number – cracking – catalysts used in petroleum industries – structure, selectivity and applications.

**UNIT IV: OILS, SOAPS AND DETERGENTS**


**UNIT V: OTHER INDUSTRIAL PRODUCTS**

Reference Books:
4. Steines H., ntroduction to Petrochemicals, Pergaman Press.

B.Sc. Chemistry CBCS Syllabus - SEMESTER VI
(For those who joined in June 2016 and after)

<table>
<thead>
<tr>
<th>Part – IV: Skill Based Subject</th>
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<tbody>
<tr>
<td>Subject Title: Water Analysis</td>
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<tr>
<td>Subject code: 07SB6E</td>
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<tr>
<td>Sessional Marks: 25</td>
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</tbody>
</table>

Objectives:
To enable the students
➢ To learn about the basic chemistry of water and water analysis

Name of the Experiments
1. Determination of total hardness of water sample
2. Determination of permanent hardness of water sample
3. Determination of temporary hardness of water sample
4. Estimation of chloride content in water
5. Estimation of alkalinity in water sample
6. Estimation of total suspended solids (TSS)
7. Estimation of total dissolved solids (TDS)
8. Determination of pH of the water sample
9. Determination of conductivity of the water sample
B.Sc. Chemistry CBCS Syllabus - SEMESTER VI
(For those who joined in June 2015 and after)

<table>
<thead>
<tr>
<th>Subject Title: Analytical Methods in Chemistry</th>
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<tr>
<td>Subject code: 07SB6F</td>
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<td>Sessional Marks: 25</td>
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</table>

Objectives:

To enable the students

- To learn about the theory of analytical chemistry
- To have an idea about the principles and applications of UV and CV
- To know about laboratory hygiene and safety

UNIT I: INTRODUCTION TO ANALYTICAL CHEMISTRY 6 Hrs

Types of analytical methods: Importance of analytical methods in qualitative and quantitative analysis: Chemical and instrumental methods – advantages and limitations of chemistry and instrumental methods

UNIT II: CHROMATOGRAPHY TECHNIQUES 6 Hrs

Thin layer chromatography – principle, choice of adsorbent and solvent, preparation of chromatoplates, \( R_f \)-values, factors affecting the \( R_f \)-values. Significance of \( R_f \)-values. Column chromatography – principle, types of adsorbents, preparation of the column, elution, recovery of substances and applications.

UNIT III: SPECTRO ANALYTICAL TECHNIQUES 6 Hrs

Principles – Beer – Lambert’s Law – verification of Beer Lambert’s law – qualitative (determination of \( \lambda_{max} \) values of simple organic compounds) and quantitative (determination of concentration of manganese, ferrous and nickel ions).

UNIT IV: ELECTROANALYTICAL CHEMISTRY 6 Hrs

Cyclic voltammetry basic principles- testing the reversibility of a reduction – oxidation process.

UNIT V: LABORATORY HYGIENE AND SAFETY 6 Hrs
Storage and handling of corrosive, flammable, explosive, toxic, carcinogenic and poisonous chemicals. Simple First aid procedures for accidents involving acids, alkales, bromine, burns and cut by glass. Threshold vapour concentration – safe limits. Waste disposal.

Reference Books:

B.Sc. Chemistry CBCS Syllabus - SEMESTER VI – PAPER III
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<table>
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<tr>
<th>PART- IV: Skill Based Subject</th>
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<td>Subject code : 07SB6G</td>
<td>Hours per week : 2</td>
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<td>Credit : 2</td>
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<td>Summative Marks: 75</td>
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</table>

UNIT I:


UNIT II:

Conformation of acyclic compounds: restricted rotation about single bonds – staggered conformation – eclipsed conformation.

UNIT III:

Conformation of cyclic compounds: Angle strain – cyclohexane – equatorial and axial bonds of cyclohexane conformational interconversions of cyclohexane – other cyclohexanes – bicyclic and polycyclic compounds.

UNIT IV:


UNIT V:


Reference Book:
B.Sc. Botany & Zoology Allied Chemistry CBCS Syllabus - SEMESTER I
(For those who joined in June 2015 and after)

<table>
<thead>
<tr>
<th>PART III – Allied Course Theory</th>
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<tr>
<td>Subject Title: Inorganic, Organic and Physical Chemistry</td>
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<tr>
<td>Subject Code: 07AT01</td>
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<td>Sessional Marks: 25</td>
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</table>

Objectives:

To enable the students
- To become familiar in to the basic Principles Of Titrimetry
- To gain basic knowledge about Organic basic principles
- To have gain the basic concept of intermediates
- To be familiar with catalysis

UNIT I: GENERAL PRINCIPLES OF TITRIMETRY 12 Hrs


UNIT II: ORGANIC BASIC PRINCIPLES I 12 Hrs


UNIT III: ORGANIC BASIC PRINCIPLES II 12 Hrs


UNIT IV: ORGANIC INTERMEDIATES 12 Hrs

UNIT V: CATALYSIS AND PHOTOCHEMISTRY 12 Hrs


Text Book:

1. Ancillary chemistry Dr. K.Ratinamuthu (Study material will be provided) Semester – I and II

Reference Books:

B.Sc. Botany & Zoology Allied Chemistry CBCS Syllabus - SEMESTER II
(For those who joined in June 2015 and after)

<table>
<thead>
<tr>
<th>Subject Title: Inorganic, Organic and Physical Chemistry – I</th>
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<tbody>
<tr>
<td>Subject Code: 07AT02</td>
</tr>
<tr>
<td>Sessional Marks: 25</td>
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</table>

Objectives:
   - To enable the students
     - To learn the basic Principles Of Titrimetry
     - To gain basic knowledge about pesticides
     - To have gain the basic concept of amino acids
     - To be basic concept of chemical bonding
     - To know about the pollution and the effect.

UNIT I: ACIDS AND BASES 12 Hrs


UNIT II: PESTICIDES, AND FUNGICIDES 12 Hrs


UNIT III: AMINOACIDS, PROTEINS AND VITAMINS 12 Hrs

2. Vitamins Classification and biological functions of vitamins A, B6, B12, C, D, E and K(Structural elucidation not required).

UNIT IV: CHEMICAL BONDING 12 Hrs

UNIT V: POLLUTIONS  12 Hrs

**Air pollution:** Definition – Composition of air – Chemical reactions occurring in air due to sunlight– Sources of air pollution – Classification and effects of air pollutants – Effects of CFC – Ozone layer- Green house effect.


**Text Book:**
1. Ancillary chemistry K.Ratinamuthu (Study material will be provided).

**Refference Books:**
PART III – Allied Course Theory – I

<table>
<thead>
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<th>Subject Code: 07AT01</th>
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Objectives:

To enable the students

- To learn the basic Principles of Titrimetry
- To gain basic knowledge about Chemical Bonding
- To understand the theory of Nuclear Chemistry
- To be familiar with Selected Organic Compounds

UNIT I: PRINCIPLES OF TITRIMETRY 12 Hrs


UNIT II: CHEMICAL BONDING – I 12 Hrs

V.B. Theory – postulates of V.B. Theory – application to the formation of simple molecules like H₂ and O₂ – Overlap of atomic orbitals – s-s, s-p and p-p overlap – principle of hybridization – sp, sp² and sp³ hybridisation.

UNIT III: CHEMICAL BONDING – II 12 Hrs

Valence shell electron pair repulsion theory (VSEPR theory).

M.O. Theory: Formation of Molecular orbitals – bonding, anti-bonding and non-bonding molecular orbitals – Molecular orbital diagrams for H₂, He₂ and O₂

UNIT IV: NUCLEAR CHEMISTRY 12 Hrs

3. Nuclear fission: Definition – application of fission – the principle of atom bomb.
5. Applications of radioactivity – In medicine, agriculture, industry and analytical fields – carbon dating.
UNIT V: STUDY OF SOME SELECTED ORGANIC COMPOUNDS 12 Hrs
Preparation, properties and uses of TNT, BHC, Aspirin, Phenolphthalein, Malachite green, Crown Ethers and Lithium Aluminium hydride

Text Book:
1. Ancillary chemistry Dr. K.Ratinamuthu (Study material will be provided) Semester I and II

Reference Books:

B.Sc. Physics Allied Chemistry CBCS Syllabus - SEMESTER II
(For those who joined in June 2014 and after)

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<td>Total Marks:</td>
<td>100</td>
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Objectives:
To enable the students
- To be familiar with fundamentals of periodic properties
- To gain basic knowledge about Photochemistry
- To understand the theory of Solid State
- To be familiar with Electrochemistry
- To gain basic knowledge about chromatography techniques

UNIT I: PERIODIC PROPERTIES AND CHEMICAL BONDING 12 Hrs
Periodic properties - interpretation of periodic properties of the elements in terms of their electronic configuration – atomic radius – van der Waals radius - ionic radius ionization potential – electron affinity - electronegativity – determination of electronegativity by Pauling and Mulliken’s methods.

UNIT II: PHOTOCHEMISTRY 12 Hrs

UNIT III: SOLID STATE 12 Hrs

UNIT IV: ELECTROCHEMISTRY 12 Hrs
UNIT V: CHROMATOGRAPHY TECHNIQUES 12 Hrs


Text Book:
1. Ancillary chemistry Dr. K.Ratinamuthu (Study material will be provided) Semester I & II.

Reference Books: