SRI SANKARA ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

ENATHUR, KANCHIPURAM – 631 561
CHOICE BASED CREDIT SYSTEM
DEPARTMENT OF CHEMISTRY

REGULATIONS

1. THE CBCS SYSTEM

All programmes (named after the core subject) mentioned earlier shall be run on **Choice Based Credit System (CBCS).** It is an instructional package developed to suit the needs of students to keep pace with the developments in higher education and the quality assurance expected of it in the light of liberalization and globalization in higher education.

2. ELIGIBILITY FOR ADMISSION

Candidates for admission to the first year of the Bachelor Degree shall be required to have passed the Higher Secondary Examinations (Academic or Vocational Stream) conducted by the Government of Tamil Nadu or an Examination accepted as equivalent thereof by the Academic Council of the Automomous College.

3. ELIGIBILITY FOR THE AWARD OF DEGREE

A Candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study in a Autonomous College for a period of not less than three academic years, passed the examinations of all the Six Semesters prescribed earning 140 credits in Parts-I, II, III, IV & V and fulfilled such conditions as have been prescribed therefore.

The parent university will award degrees to the students evaluated and recommended by autonomous colleges. The degree certificates will be in a common format devised by the university. The name of the college will be mentioned in the degree certificate, if so desired. The declaration of results was decided by the examination committee.

4. DURATION

Each academic year shall be divided into two semesters. The first academic year shall comprise the first and second semesters, the second academic year the third and fourth semesters and the third academic year the fifth and sixth semesters respectively.

The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year. There shall be not less than 90 working days for each semester exclusive of the days for the conduct of semester examinations.

In each semester, Courses are administered in 15 teaching weeks and another 5 weeks are utilized for evaluation and grading purposes. Each week has 30 working hours spread

over in a 5 day week. Depending upon the content and specialization, a course may have 1 to 6 credits.

5. COURSE OF STUDY

A Bachelor's programme consists of a number of courses. The term Course is used to indicate logical part of a subject matter of the programme. In each of Bacherlor's programmes, there will be a prescription of (i) language –I (Tamil, Sanskrit or other languages), (ii) language – II (English), (iii) a set of compulsory courses (called core subjects), some optional courses (called elective subjects) and projects, (iv) a set of courses recommended by UGC and TANSCHE (Advanced Tamil / Soft skill / Environmental Studies / Value education) and (v) Extension activities.

The detail of the Study for Bachelor Degree Courses shall consist of the following:

PART – I Language Courses (LC) [Tamil / Other Languages]

PART – II English Language Courses (ELC)

PART – III Core Subjects
Allied Subjects
Projects / Field work

PART – IV

1. (a) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two course (level will be at 6^{th} Standard).

(b) Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Advanced Tamil comprising of two courses.

(c) Others who do not come under a + b can choose non-major elective comprising of two courses.

2. Skill Based Subjects - Soft Skills

A candidate shall be eligible for the award of the degree only if he/she has undergone the prescribed courses on Soft Skills. For three years UG degree Programme, a candidate must undergo a minimum of 4 courses (4 x 2 = 8 credits). Papers will be finalized in due course.

3. Environmental Studies

A candidate shall be eligible for the award of the degree only if he/she has undergone the prescribed course on Environmental studies. For three years UG degree Programme, a candidate must undergo environmental studies during third semester of second year (2 credits). Syllabus is common to all UG courses.

4. Value Education

A candidate shall be eligible for the award of the degree only if he/she has undergone the prescribed course on value education. For three years UG degree Programme, a candidate must undergo value education during fourth semester of second year (2 credits). Paper will be finalized in due course.

PART – V Extension Activities

A candidate shall be awarded a maximum of 1 Credits for Complusory Extension Service. All the Students shall have to enrol for NSS /NCC/ NSO (Sports & Games) Rotract / Youth Red cross or any other service organizations in the college and shall have to put in Complusory minimum attendance of 40 hours which shall be duly certified by the Principal of the college before 31st March in a year. If a student LACKS 40 HOURS ATTENDANCE in the First year, he/she shall have to compensate the same during the subsequent years. Students those who complete minimum attendance of 40 hours in One year will get HALF A CREDIT and those who complete the attendance of 80 or more hours in Two Years will ONE CREDIT. Literacy and population Education Field Work shall be compulsory components in the above extension service activities. The working hours should not overlaps the normal teaching hours.

Student Advisor

All teachers of the department shall function as student advisors. There will be more or less an equal number of students assigned to each student advisor of a department. The student advisor will help the students in choosing core and elective courses of study. The student advisor shall be responsible for registration of courses (subjects) by his students. The student advisor will offer all possible student support services.

6. CREDITS

The term credit is used to describe the quantum of syllabus for various programmes in terms of periods of study. It indicates differential weightage given according to the contents duration of the courses in the curriculum design. The minimum credit requirement for a three year Bacherlor's programme shall be 140 credits. Each subject (course) is designed variously under lectures / tutorials / laboratory work / seminar / project work etc., to meet effective teaching and learning needs and credits are assigned suitably.

One credit for each lecture / tutorial / laboratory work / project work period per week shall be alloted. In practical, each credit should cover minimum of six experiments. Thus normally, in each of the subject, credits will be assigned on the basis of the lectures / tutorials / laboratory work / project work and other forms of learning in a 15 week schedule.

7. SCHEME OF EXAMINATION

There shall be continuous, comprehensive evaluation of students through internal and external examination. At least 2 internal examinations (Sessional Tests) per semester and 1 semester ending examination should be conducted.

Sessional Test I will he held during sixth week for syllabi covered till then. Sessional Test I will be a combination of a variety of tools such as class test, assignment, papr presentation etc., that would be suitable for the course. This required an element of openness. The students are to be informed in advance about the nature of assessment and the procedures. However the tests are compulsory. Test I may be for one hour duration. The pattern of question paper will be decided by the respective board of studies.

Sessional Test II will he held during eleventh week for syllabi covered between seventh and eleventh weeks. Sessional Test I will be a combination of a variety of tools such as class test, assignment, papr presentation etc., that would be suitable for the course. It will also have an element of openness. The students are to be informed in advance about the nature of assessment and the procedures. However the tests are compulsory. Test II may be for one

hour duration. The pattern of question paper will be decided by the respective board of studies.

Sessional Test I and Sessional Test II will carry 25% of marks of the entire course.

There will be one End Semester examination of 2 - 3 hours duration in each course. The End semester examination will cover all the syllabi of the course for 75% of Marks.

A dissertation may be offered in lieu of one / two papers / practicals. It shall be evaluated by two examiners one external and one internal appointed by the Controller of Examination. Wherever there is viva-voce, it shall be conducted by the common Viva Board consisting of the Chairman and internal members of the Boar of Examination in the concerned subject, internal guide and one external expert as approved by the Controller of Examinations.

End semester practical examinations shall be held before the theory examinations to benefit the students to undertake examinations of other departments.

Model Scheme for Science subjects

Course Component **Name of the course**	**Inst. Period**	**Credits**	**Exam Hours**	**Max. Marks**		
				C. Int. mark	**Ext. mark**	**Total**
PART-I **Language**	**4**	**4**	**3**	**25**	**75**	**100**
PART-II **English**	**4**	**4**	**3**	**25**	**75**	**100**
PART-III **Core subject :**	**6**	**6**	**3**	**25**	**75**	**100**
Core Practical	**3**	**3**	**3**	**40**	**60**	**100**
Allied Subject	**6**	**6**	**3**	**25**	**75**	**100**
Allied Practical	**3**	**3**	**3**	**40**	**60**	**100**
PART – IV 1. (a) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two course (level will be at 6th Standard). (b) Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Advanced Tamil comprising of two courses. (c) Others who do not come under a + b can choose non-major elective comprising of two courses.	**2**	**2**	**2**	**40**	**60**	**100**
2. Skill based subjects – Soft Skill	**2**	**2**	**2**	**40**	**60**	**100**
	30	**30**				**800**

For B.A / B.Sc. / B.C.A courses Part I, Part II and Part IV subjects will be provided to first to

fourth semesters. In fifth and sixth semesters only part III papers provided. Total of 30 hrs and 30 credits were to be maintained constantly for all semesters.

For B.Com / B.B.A courses Part I, Part II and Part IV subjects will be provided only to first and second semesters. In third to sixth semesters only part III papers provided. Total of 30 hrs and 30 credits were to be maintained constantly for all semesters.

Projects and Field works might be introduced in the sixth semester of any UG course by utilizing two core papers. Each project work / field work might be awarded with twelve credits and twelve hours per week.

Science Subject With Practicals for first to fourth semester for B.Sc.

Part I – Language	-	4 hrs	
Part II – English Language	-	4 hrs	
Part III Core subjects			
Core (Theory +Practicals)	-	9 hrs	(6 hrs Theory + 3hrs Practicals)
Allied (Theory +Practical)	-	9 hrs	(6hrs Theory + 3hrs Practicals)
Part IV - BasicTamil / Advanced Tamil/ Non-Major electives / ENVS / Value education	-	2hrs	
Soft skill	-	2hrs	
		30hrs	

Science Subject With Practicals for fifth and sixth semester for B.Sc.

Part III Core subjects			
Paper I (Theory +Practicals)	-	9 hrs	(6 hrs Theory + 3hrs Practicals)
Paper II (Theory +Practical)	-	9 hrs	(6hrs Theory + 3hrs Practicals)
Paper III	-	6 hrs	
Paper IV	-	6 hrs	
		30hrs	

1	Language	4 hours regular paper + 2 hours Part IV Tamil – Basic / Advanced /Non-major Elective	Until suitable steps are taken by the Govt. to provide adequate staff for handling the various programmes
2	English	4 hours regular paper + 2 hours for teaching Soft skills	

Students who have studied Tamil X or XII level but are pursuing non-tamil in their graduation may be given the option of either Advanced Tamil or Non-major Elective.

Question Paper Pattern for External Examination

SECTION – A (30 words)

10 out of 12 - 10 X 2 marks = 20 marks

SECTION – B (200 words)

5 out of 7 - 5 x 5 marks = 25 marks

SECTION – C (500 words)

3 out of 5	-	3x 10 marks	=	30 marks

		TOTAL		**= 75 marks**

The over and above the minimum credits of 140 can offer Add-on Courses to the students in various disciplines to enhance their employability. It is **optional and not compulsory.** The number of working hours per week for the students for getting the 140 prescribed credits should not exceed 30 hours of class per week and no faculty member should be allocated extra hours beyond the prescribed 16 lecture hours.

The following procedure be followed for Internal Marks

Theory Papers: Internal Marks 25

Continuous Internal Assessment (CIA)

Tests (2 out of 3)	= 10
Attendance*	= 5
Seminars / Class Participation	= 5
Assignments	= 5
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	25 marks

***Break-up Details for Attendance**

Below 60%	- No marks
60% to 75%	- 3 marks
76% to 90 %	- 4 marks
91% to 100%	- 5 marks

Practical: Internal Marks 40

Attendance	5 marks
Practical Test best 2 out of 3	30 marks
Record	5 marks
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	40 marks

Project: **Internal Marks 20**

Internal Marks	best 2 out of 3 presentations	20 marks
Viva		20 marks
Project Report		60 marks

Field work:

Each student is required to take up a field work in an industry for a period of 36 days and submit a report. The students would begin the field work activities in the beginning of the VI Semester and submit the report for evaluation by the Institute/college. The report shall not exceed 75 typed pages excluding tables, figures, bibliography and appendices. The report shall be valued by the Institute/College by constituting a committee headed by the Professor

and Head of Faculty/Department known as VIVA VOCE Exam Committee. The marks shall be distributed as follows:

Internal : 20 marks (by the faculty/department guide)
External (Viva and Report) : 80 marks (marks by the VIVA VOCE Exam Committee)
Total :100 marks

Necessary guidance will be given to the students for the completion of field work. Wherever the Committees are formed for external evaluation, an external examiner shall be appointed with the approval of the Head of the Institute/Colleges.

In order to motivate students to be free of rot learning, various mechanism of internal evaluation should be adopted such as group discussion, paper reading, home assignments and viva voce.

Details on the number of papers and credits per papers in different UG programmes

Sl. No.	Study Components	B.Sc.			
		Number of Papers	Credits per Paper	Total Credits	Total Weekly hours / 180 weekly hours (6 sem X 30hrs)
1.	Language Course (LC)	4	4	16	16
2.	English Language Course (ELC)	4	4	16	16
3.	Core Subject (CS)	12	4	48	72
4.	Core Practical	6	3	18	30
5.	Allied Course (AC)	4	4	16	24
6.	Allied Practical	2	3	6	6
7.	Part IV Courses:				
	a) Advanced Tamil / Non-major Elective	2	2	4	4
	b)Skill based courses	4	2	8	8
	c)Environmental Studies	1	2	2	2
	d) Value Education	1	1	1	2
8.	Part V: Extension activities	1	1	1	

9.	Part VI: Certificate courses	2	2	4	
	Total			**140**	**180**

8. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER

i. Candidates shall register their names for the First Semester Examination after the admission in UG Courses.

ii. Candidates shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination subject to the condition that the candidates should register for all the arrear subject of earlier semesters along the current (subsequent) Semester Subjects.

iii. Candidates shall be eligible to go to subsequent semester, only if they earn sufficient attendance as prescribed therefor by the Academic Council from time to time.
Provided in case of a candidate earning less than 50% of attendance in any one of the Semesters due to any extraordinary circumstances such as medical grounds, such candidates who shall produce Medical Certificate issued by the Authorised Medical Attendant (AMA), duly certified by the Principal of the college, shall be permitted to proceed to the next semester and to complete the Course of study. Such Candidates shall have to repeat the missed Semester by rejoining after completion of Final Semester of the course, after paying the fee for the break of study as prescribed by the Academic Council from time to time.

iv. 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 courses in the subsequent examinations to be held in October / November or April / May.

v. The results of all the examinations will be published through the college Website.

9. PASSING MINIMUM

A candidate shall be declared to have passed:

a) There shall be no Passing Minimum for Internal.

b) For External Examination, Passing Minimum shall be of 40 % (Forty Percentage) of the maximum marks prescribed for the paper for each Paper/Practical/Project and Viva-voce.

c) In the aggregate (External + Internal) the passing minimum shall be of 40%.

d) He/She shall be declared to have passed the whole examination, if he/she passes in all the papers and practicals wherever prescribed / as per the scheme of examinations by earning 140 CREDITS in Parts-I, II, III, IV & V. He/she shall also fulfill the extension activities prescribed earning a minimum of 1 Credit to qualify for the Degree.

10. CLASSIFICATION OF SUCCESSFUL CANDIDATES

PART- I TAMIL / OTHER LANGUAGES

TAMIL/OTHER LANGUAGES: Successful candidates passing the Examinations for the Language and securing the marks (1) 60 percent and above and (ii) 50 percent and above but below 60 percent in the aggregate shall be declared to have passed the examination in the FIRST and SECOND class, respectively. All other successful candidates shall be declared to have passed the examination in the THIRD Class.

PART – II ENGLISH

ENGLISH: Successful candidates passing the examinations for English and securing the

marks (i) 60 percent and above and (ii) 50 percent and above but below 60 percent in the aggregate shall be declared to have passed the examination in the FIRST and SECOND Class, respectively. All other successful candidates shall be declared to have passed the examination in the THIRD class.

PART – III consisting of CORE SUBJECTS, ALLIED SUBJECTS, PROJECT with three courses:
Successful candidates passing the examinations for Core Courses together and securing the marks (i) 60 percent and above (ii) 50 percent and above but below 60 percent in the aggregate of the marks prescribed for the Core courses together shall be declared to have passed the examination in the FIRST and SECOND Class respectively. All other successful candidates shall be declared to have passed the examinations in the THIRD Class.

PART – IV consisting of sub items 1 (a), (b) & (c), 2, 3 and 4
Successful Candidate earning of 2 credits for each paper SHALL NOT BE taken into consideration for Classification/Ranking/ Distinction.

PART – V EXTENTION ACTIVITIES
Successful Candidate earning of 1 credit for extension activities SHALL NOT BE taken into consideration for Classification/Ranking/ Distinction.

11. RANKING

Candidates who pass all the examinations prescribed for the Course in the FIRST APPEARANCE ITSELF ALONE are eligible for Ranking / Distinction.
Provided in the case of Candidates who pass all the examinations prescribed for the Course with a break in the First Appearance due to the reasons as furnished in the Regulations 8(iii) category are only eligible for Classification.

12. APPEARANCE FOR IMPROVEMENT

Candidates who have passed in a theory paper / papers are allowed to appear again for theory paper / papers only once in order to improve his/her marks, by paying the fee prescribed from time to time. Such candidates are allowed to improve within a maximum period of 12 semesters counting from his/her first semester of his/her admission. If candidate improve his marks, then his improved marks will be taken into consideration for the award of Classification only. Such improved marks will not be counted for the award of Prizes / Medals, Rank and Distinction. If the candidate does not show improvement in the marks, his previous marks will be taken into consideration**.** No candidate will be allowed to improve marks in the Practical, Project, Viva-voce, and Field work.

13. CONDONATION

Students must have 75% of attendance in each course for appearing the examination. Students who have 74% to 70% of attendance shall apply for condonation in the prescribed form with the prescribed fee Rs.200/-. Students who have 69% to 60% of attendance shall apply for condonation in prescribed form with the prescribed fee along with the Medical Certificate. Students who have below 60% of attendance are not eligible to appear for the examination. They shall re-do the semester(s) after completion of the programme.

14. RETOTALING

Candidates are permitted to apply for retotaling within 10 days from the date of publication of results. The student should submit request for retotaling in the prescribed format.

15. PHOTOCOPY OF ANSWER SCRIPT

Candidates are permitted to apply for obtaining a photocopy of answer paper within 20 days from the date of publication of results. The student should submit request for photocopy of answer script in the prescribed.

16. REVALUATION

Candidates are permitted to apply for revaluation after obtaining a photocopy of answer paper within 30 days from the date of publication of results. The student should submit request for revaluation in the prescribed format.

17. MALPRACTICE

Any malpractice by the students debars them from subsequent appearance based on the decision of the examination committee. In all cases of malpractice their conduct certificates will indicate malpractice.

18. EVALUATION AND GRADING SYSTEM

The performance of a student in each course is evaluated in terms of percentage of marks with a provision for conversion to grade points (GP). Evaluation for each course shall be done by a continuous internal assessment by the concerned course teacher as well as by an end semester examination and will be consolidated at the end of the course.

The term grading system indicates a Ten Point Scale of evaluation of the performances of students in terms of marks obtained in the Internal and External Examination, grade points and letter grade.

Once the marks of the Internal and end-semester examinations for each of the courses are available, they will be added. The marks thus obtained will then be graded as per details provided in Table.

The sum of total performance in each semester will be rated by **Grade Point Average (GPA)** while the continuous performance from the second semester onwards will be marked by **Cumulative Grade Point Average (CGPA).** These two are calculated by the following formulae.

$$GPA = \frac{\text{Sum of [Credits acquired x Grade points]}}{\text{Sum of Credits acquired}}$$

For the calculation of Grade Point Average (GPA), G_i is the grade point awarded; C_i is the credit units earned for the i^{th} course.

$$CGPA = \frac{\sum_{i=1}^{n} C_i GP_i}{\sum_{i=1}^{n} C_i}$$

where 'C_i' is the Credit earned for the Course i in any semester ; 'G_i' is the Grade Point obtained by the student for the Course i and 'n' is the number of Courses **passed** in that or **CGPA** = GPA of all the Courses starting from the first semester to the current semester.

Note: The GPA and CGPA shall be calculated separately for the following five parts:

Part I: Language Course; Part II: English Language Course and Part III: Core Cs, Allied Cs, Part IV: NME, SBC, ES, VE, Part V: Extension activities.

Conversion of Marks to Grade Points and Letter Grade (Performance in a Course /Paper)

RANGE OF MARKS	GRADE POINTS	LETTER GRADE	DESCRIPTION
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction
70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Average
40-49	4.0-4.9	C	Satisfactory
00-39	0.0	U	Re-appear
ABSENT	0.0	AAA	ABSENT

CGPA	GRADE	CLASSIFICATION OF FINAL RESULT
9.5-10.0	O+	First Class - Exemplary *
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction *
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	

7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
4.5 and above but below 5.0	C+	Third Class
4.0 and above but below 4.5	C	
0.0 and above but below 4.0	U	Re-appear

* The candidates who have passed in the first appearance and within the prescribed semester of the UG Programme (Major, Allied and Elective courses alone) are eligible.

The grade card / mark sheet issued at the end of the semester to each student will contain the following:

a. the marks obtained for each course registered in the semester
b. the credits earned for each course registered for that semester
c. the performance in each course by the letter grade point obtained
d. the Grade Point Average (GPA) of all the courses registered for that semester and
e. from the second semester onwards, the Cumulative Grade Point Average (CGPA) of all the courses and
f. the class and grade of the student in the final CGPA

19. TRANSITORY PROVISION

Candidates who have undergone the course of study prior to the academic year 2015-2016 will be permitted to appear for the examinations under those Regulations for a period of TWO years i.e. upto and inclusive of April - May 2017 Examinations. Thereafter, they will be permitted to appear for the examination only under the Regulations then in force.

SYLLABUS
(With effect from the academic year 2015-2016)
ALLIED CHEMISTRY
SYLLABUS FOR B.SC BIOTECHNOLOGY
II SEMESTER

UNIT- I: STRUCTURE OF ATOMS

Dalton's Atomic theory- Subatomic particles- concepts of atoms and molecules- symbols for elements- electronic configuration of atoms- isotopes- shapes of atomic orbitals- periodic table- periodic classification- periodicity- valency- chemical bond.

UNIT- II: MATERIALS ON EARTH

Properties of gas, liquid, solid, compound, mixtures, solutions, colloids, suspension- Acids, bases and salts- Conductors and non-conductors.

UNIT- III: CHANGES AROUND US

Slow and fast changes- reversible and irreversible reactions- exothermic and endothermic reactions- condition of chemical reactions- types of chemical reactions- mole concept and stoichiometry in chemical reaction- order of chemical reaction- technique used to determine chemical reactions.

UNIT- IV: ORGANIC CHEMISTRY AND ENERGY

Organic compounds- classification- functional groups- aromatic, aliphatic, hetero cyclic compounds- alkanes in gasoline- fuel from biogas, coal, hydrogen.

UNIT- V: Chemistry in living world

Physical and chemical properties of amino acids and proteins- properties and kinetics of enzymes- thermodynamics.

RECOMMENDED TEXTS:

1. Mathews, P. 1996. Advanced chemistry, Cambridge University Press, Low PrizeEdition., Oxford.
2. Lee, J.D. 2001. Inorganic Chemistry. Blackwell Science., London.
3. Negi, A.S., and Anand. 2001. A text book of physical chemistry. Taj Press.,New Delhi.
4. Sony, P.L. 2000. A text book inorganic Chemistry. Sultan Chand & Sons., NewDelhi.

REFERENCE BOOKS:

1. Voet, D. and Voet, J.G. 1995. Biochemistry, 2nd edition. John Wiley and Sons,Inc., New York.
2. Lehninger, A.L., Nelson D.L., and Cox, M.M. 1993. Principles of Biochemistry. 2nd edition. CBS Publishers & Distributors, Delhi.
3. Amend, J.R., Mundy, B.P. and Armld, M.T. 1990. General Organic & BiologicalChemistry. Saunders College Publishing., London.
4. Greenwood, N.N. and Earnshaw, A. 1989. Chemistry of the Elements. MaxwellMacmillan intl. Ed., London.

5. Cotton, F.A and Wilkinson, G. 1989. Inorganic Chemistry. John Wiley and Sons,Inc., NewYork.
6. Finar, I.L. 1986. Organic Chemistry. Volume 1 & 2, ELBS., London.

WEBSITES:

http://dir.yahoo.com/Science/Chemistry/
http://www.chemistry.mcmaster.ca/faculty/bader/aim/

SYLLABUS FOR B.SC PHYSICS
III SEMESTER

UNIT 1: NUCLEAR CHEMISTRY

Fundamental particles of nucleus, isobars, isotones and isomers – Differences between chemical reactions; fusion and fission – Radio active series, group displacement law – Mass defect, derivation of 1amu = 931 MeV – nuclear binding energy and calculation – Applications of radio isotopes – carbon dating, and medicinal applications.

UNIT 2: INDUSTRIAL CHEMISTRY

Fuels- Classification-gaseous fuels like water gas, producer gas, liquefied petroleum gas, gobar gas, Compressed natural gas - Fertilizers- Classification –urea ,Ammonium sulphate, superphosphate, Triple super phosphate, potassium nitrate- manufacture and uses - Silicones - Preparation, properties and applications.

Hardness of water: temporary and permanent hardness, disadvantages of hard water - Softening of hard water - Zeolite process, demineralization process and reverse osmosis - Purification of water for domestic use: use of chlorine, Ozone and UV light - Definition and determinations of BOD and COD.

UNIT 3: FUNDAMENTALS OF ORGANICHEMLSTRY

Classificiation of organic compounds -.Hybridization in methane, ethane, acetylene, benzene - classification of reagents - electrophiles, nucleophiles and free radicals - Classification of reactions addition, substitution, elimination, condensation and polymerisation - Polar Effects - Inductive effect, resonance, hyper-conjugation, steric effect - Keto-enol tautomerism – electrophilic substitution mechanism in benzene (Nitration and Sulphonation) – Heterocyclic compounds - Preparation, properties and uses of furan, Thiophene, pyrrole and pyridine.

UNIT 4: THERMODYNAMICS

Definition of Certain terms - system, surrounding, reversible and irreversible process – Limitations of I Law Need for II Law - Different Statements of II Law - Carnot cycle - Efficiency - Carnot Theorem - Thermodynamic Scale of Temperature - Entropy- Definition Unit and change of entropy for phase transformation Free energy nature of Process in terms of Free energy and entropy - Statement of Third Law.

UNIT 5: CHEMICAL KINETICS

Rate of chemical reaction- Differential rate expression - order and molecularity - Integrated rate expression for first, second, and zero order reactions Half-life period— Effect of temperature on rate - Activation energy . Arrhenius equation - Arrhenius reaction rate theory - Homogeneous and heterogeneous catalysis. Photochemistry - Statement of Grothus - Draper Law, Stark Einstein'sLaw, Quantum Yield. Hydrogen chlorine reaction (elementary idea only) Photosynthesis, Photsensitisation, Phosphorescence, Fluorescence, Chemiluminiscence - Definition with examples.

BOOK FOR REFERENCE

1. Dr. Veeraiyan V., Texf book of Ancillary Chemistry, Highmount Publishing house, Chenha-14. Edition - 2008. (Both In Tamil and English)
2. Vaithyanathan S. and Others, Texf book of Ancillary Chemistry, Priya Publications, Karur-2. Edition-2006.

3. Soni P.. and Others, Texf book of Organic chemistry, Sultan Chand and Company, New Delhi, Edition - 2006.
4. 8oni P. and Others, Texf book of Inorganic Chemistry, Sultan Chand*and Company, New Delhi, Edition - 2006.
5. Puri B.R., Sharma and Pathania, Text book of Physical Chemistry, Vishal Publishing Co., New Delhi. Edition-2006.
6. Dara S.S., Texf book of Environmental chemistry and Pollution Control.- S.Chand and Co., NewDelhl, Edition 2006.

SYLLABUS FOR B.SC PHYSICS
IV SEMESTER

Unit1: CO-ORDINATION CHEMISTRY

Definition of terms - Classification of Ligands - Nomenclature - Chelation - EDTA and the application – Werner's Theory - Effective Atomic Number - Pauling's theory- Postulates - Applications to $[Ni(CO)_4]$, $[Ni(CN)_4]^{2-}$, $[Co(CN)_6]^{3-}$ Merits and Demerits of Werner and Pauling's theory - Biological Role of haemoglobin and Chlorophyll (elementary idea only) - Applications of coordination compounds in qualitative analysis and Quantitative analysis like Separation of copper and cadmium ions; Nickel and cobalt ion; Identification of metal ions like cu, Fe and Ni. Estimation of Ni using DMG and Al using Oxine.

Unit 2: BIOMOLECULES

Classifications preparation and reactions of glucose and fructose. Discussion of open and ring structure of glucose. Mutarotation Interconversion of glucose to fructose and vice versa - Preparation and properties of sucrose Properties of starch, cellulose and derivatives of cellulose - Diabetes - causes and control :measures RNA and DNA (elementary idea only) - Amino acids :Classification, preparation and properties of alanine - preparation of dipeptide using Bergman method.

Unit 3: PHASE DIAGRAM

Phase rule: Definition of terms, application of phase rule to water system - Reduced phase rule and its application to Pb-Ag system. Freezing mixtures Completely miscible and partially miscible liquid systems - upper and lower critical solution temperatures

Unit 4: ELECTROCHEMISTRY

Galvanic cells – emf - standard electrode potential - reference electrodes - electrochemical series and its applications - Determination of pH using electrometric method - Electroplating process -Nickel and Chrome plating - Different type of cells - primary cell, Secondary cell and fuel cells -Corrosion and methods of prevention, .Conductometric titrations - hydrolysis of salts. Derivation of Kh - Definition of pH and its determination by colorimetric method. Buffer solution - Henderson's equation. Applications of pH and buffer in biological processors and industries - Corrosion and its prevention.

Unit 5: ANALYTICAL CHEMISTRY

Introduction to Qualitative and Quantitative Analysis - Principle of volumetric analysis - Separation techniques - extraction - distillation - crystallization— Chromatographic separations - Principles and applications of column , paper, thin layer, gas-liquid and ion-exchange.

BOOKS FOR REFERENCE

1. Dr. Veeraiyan V., Text book of Ancillary Chemistry, Highmount Publishing house, Chenna-14. Edition -206o. (Both in Tamil and English)
2. Vaithiyanathan S. and Others, Text book of Ancillary Chemistry, Priya Publications, Karur-2. Edition -2006.
3. Soni P.L and Others, Text book of Organic chem/sfry, Sultan Chand and Company, New Delhi, Edition-2006.
4. Soni P.L. and Others, Textbook of Inorganic Chemistry, Sultan Chand and Company, New Delhi, Edition -2006.

5. Puri B.R., Sharma and Pathania, text book of Physical Chemistry, Vishal Publishing Co., New Delhi. Edition-2006.
6. Dara S.S., Texf book of Environmental chemistry and Pollution Control.- S.Chand and Co., NewDelhi,Edition 2006.

SYLLABUS FOR B.SC BIOCHEMISTRY
I SEMESTER

UNIT1: NUCLEAR CHEMISTRY

Fundamental particles Of Nuclear Isotopes, Isobars, Isotones and Isomers - Differences between chemical reactions and nuclear reactions: Fusion and fission -Radio active series, group displacement law - Mass defect - Applications of radioisotopes carbon dating, rock dating and medicinal applications.

UNIT 2: INDUSTRIAL CHEMISTRY

Fuels- Classification-gaseous fuels like water gas, producer gas, liquefied petroleum gas, gobar gas, Compressed natural gas -Fertilizers- Classification - urea, Ammonium sulphate, superphosphate, Triple super phosphate, potassium nitrate- manufacture and uses - Silicones - Preparation, properties and applications. Hardness of water: Temporary and permanent hardness, disadvantages of hard water -Softening of hard water - Zeolite process, demineralization process and reverse osmosis - Purification of water for domestic use: use of chlorine, Ozone and UV light - Definition and determinations of BOD and COD.

UNIT 3: FUNDAMENTALS OF ORGANIC CHEMISTRY

Classification of organic compounds - Hybridization in methane, ethane, acetylene, benzene -Classification of reagents - electrophiles, nucleophiles and free radicals - Classification of reactions - addition, substitution, elimination, condensation and polymerisation - Polar Effects-Inductive effect, resonance, hyper-conjugation, steric effect - Keto-enol tautomerism – electrophilic substitution mechanism in benzene (Nitration and Sulphonation)

UNIT 4: CHEMISTRY OF SOME USEFUL ORGANIC COMPOUNDS

Preparation and uses of CH_2Cl_2, $CHCl_3$, CCl_4, CF_2Cl_2. BHC, DDT and Teflon - Heterocyclic compounds) - Introduction to heterocyclics - Chemistry of furan, thiophene, pyrrole, pyridine and their uses

UNIT 5: PHOTOCHEMISTRY.

Introduction to Photochemistry - statement of Grothus - Draper Law, Stark-
Einstein's Law, Quantum yield. 'Hydrogen-Chlorine reaction (Elementary ideaonly) Photosynthesis, photosensitization, phosphorescence, Fluorescence, Chemiluminiscence-Definition with examples.

BOOKS FOR REFERENCE

1. Dr .Veeraiyan V., Text book of Ancillary Chemistry, Highmount Publishing house, Chennai-14. Edition-2006. (Both in Tamil and English)
2. Vaithyanathan S. and Others, Textbook of Ancillary Chemistry, Priya Publications, Karur-2. Edition-2006.
3. Soni P.L. and Others, Textbook of Organic chemistry, Sultan Chand and Company, New Delhi, Edition-2006.
4. Soni P.L. and Others, Text book of Inorganic Chemistry, Sultan Chand and Company, New Delhi, Edition-2006.
5. Puri B.R., Sharma and Pathania, Text book of Physical Chemistry, Vishal Publishing Co., New Delhi. Edition-2006.

6. Dara S.S., Text book of Environmental chemistry and Pollution Control.- S.Chand and Co., NewDelhi, Edition 2006.

SYLLABUS FOR B.SC BIOCHEMISTRY
II SEMESTER

UNIT 1: CO-ORDINATION CHEMISTRY

Definition of terms-classification of ligands -Nomenclature- chelation - EDTA and its Applications –Werner's Theory-Effective Atomic Number- Pauling's Theory-Postulates-Applications to $[Ni(CO)_4]$, $[Ni(CN)_4]^{2-}$, $[Co(CN)_6]^{3-}$ Merits and demerits of Werner and Pauling's Theory-Biological role of haemoglobin and chlorophyll, (Elementary idea only)-Applications of coordination compounds in qualitative and quantitative analysis like separation of copper and cadmium ions; Nickel and cobalt ions; identification of metal ions like Cu, Fe and Ni-Estimation of Nickel using DMG and estimation of Aluminium using Oxine.

UNIT 2: CARBOHYDRATES

Classification, preparation and reactions of glucose and fructose Discussion of open and ring structure of glucose, mutarotation. Inter conversion of glucose to fructose and vice versa -Preparation and properties of sucrose. Properties of starch, cellulose and derivatives of cellulose -Diabetes - Causes and control measures.

UNIT 3: PROTEINS

Amino acids-Classifications, Preparation and properties of alanine -Preparation of dipeptide using Bergman method - Proteins –Classification according to composition, biological functions and shape - Denaturation and colour reactions of Proteins - Primary and secondary structure of Proteins -Nucleic acids: DNA and RNA-Their components and biological functions.

UNIT 4: ELECTROCHEMISTRY

Galvanic Cells - emf - standard electrode potential - reference electrodes electrochemical series and its applications - Determination of pH using electrometric method -Electroplating process -Nickel and Chrome plating - Different type of cells - primary cell, Secondary cell and fuel cells -Corrosion and methods of prevention. Conductometric titrations - hydrolysis of salts- Derivation of Kh - Definition of pH and it's determinations by colorimetric method - Buffer solution –Henderson's equation. Applications of pH and buffer in biological processors and industries –Corrosion and its prevention.

UNIT 5: ANALYTICAL CHEMISTRY

Introduction to Qualitative and Quantitative Analysis - Principle of volumetric analysis -Separation techniques - extraction - distillation - crystallization - Chromatographic separations - Principles and application of column, paper, thin layer, gas-liquid and ion-exchange.

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3. 8oni P.L. and Others, Text book of Organic chemistry, Sultan Chand and Company, New Delhi, Edition-2006.
4. Soni P.L. and Others, Text book of Inorganic Chemistry, Sultan Chand and Company, New Delhi, Edition-2006.

5. Puri B.R., Sharma and Pathariia, Text book of Physical Chemistry, Vishal Publishing Co., New Delhi. Edition - 2006.
6. Dara S.S., Text book of Environmental chemistry and Pollution Control-
7. S.Chand and Co., New Delhi, Edition - 2006.

ALLIED CHEMISTRY PRACTICALS

COMMON FOR MATHEMATICS AND NONMATHEMATICS STUDENTS

VOLUMETRIC ANALYSIS

1. Estimation of Sodium hydroxide using standard Sodium Carbonate.
2. Estimation of Hydrochloric acid using standard Oxalic acid.
3. Estimation of Ferrous sulphate using standard Mohr's salt
4. Estimation oxalic acid using standard Ferrous Sulphate.
5. Estimation of Potassium permanganate using standard Sodium hydroxide.
6. Estimation of Magnesium using EDTA.
7. Estimation of Ferrous iron using diphenylamine as internal indicator.

ORGANIC ANALYSIS

Dectection of Elements (N,S, Halogens) To distinguish between aliphatic and aromatic Saturated and unsaturatedcompounds. Functional group tests for phenol, acids (mono, di) aromatic primaryamine, amide, aldehyde & Carbohydrate Glucose. Systematic analysis of organic compounds containing one functional group and characterization by confirmatory test.(Phenol/cresol, cinnamic acid, benzoic acid, phthalicacid,Succinicacid,benzamide, urea, glucose, benzaldehyde & aniline).

REFERENCE

Basic Principles of practical Chemistry: Venkateswaran,Veerasamy & Kulandaivel, S.Chand &Co.