



# SACRED HEART COLLEGE (AUTONOMOUS)

Tirupattur – 635 601, Tamil Nadu, S.India

Resi : (04179) 220103

College : (04179) 220553

Fax : (04179) 226423

Ready for  
Every Good Work

A Don Bosco Institution of Higher Education, Founded in 1951 \* Affiliated to Thiruvalluvar University, Vellore \* Autonomous since 1987

Accredited by NAAC (4<sup>th</sup> Cycle – under RAF) with CGPA of 3.31 / 4 at 'A+' Grade

## M.Sc. Chemistry

Sem	Sub	Title of the paper	Ins Hrs	Cr	CA Mks	Sem Mks	Total
I	Core	Organic Chemistry - I	4	4	25	75	100
	Core	Inorganic Chemistry - I	4	4	25	75	100
	Core	Physical Chemistry - I	5	4	25	75	100
	Core Practicals	Organic Practicals - I	4	-	-	-	-
		Inorganic Practicals - I	4	-	-	-	-
		Physical Practicals - I	4	-	-	-	-
Elective - I	1. Inorganic Photo Chemistry 2. Heterocyclic Chemistry 3. Material Science	4	4	25	75	100	
II	Core	Organic Chemistry - II	4	4	25	75	100
	Core	Inorganic Chemistry - II	4	4	25	75	100
	Core	Physical Chemistry - II	5	4	25	75	100
	Elective - II	1. Polymer Chemistry 2. Green Chemistry 3. Bio-organic Chemistry	4	4	25	75	100
	SSP	Reagents in Organic Chemistry	0	2*			
	Core Practicals	Organic Practicals – I	4	4	40	60	100
		Inorganic Practicals – I	4	4	40	60	100
Physical Practicals – I		4	4	40	60	100	
III	Core	Organic Chemistry - III	4	4	25	75	100
	Core	Inorganic Chemistry - III	4	4	25	75	100
	Core	Physical Chemistry - III	5	4	25	75	100
	Elective - III	1. Analytical Chemistry 2. Pharmaceutical Chemistry 3. Research Methodology	5	4	25	75	100
	Core Practicals	Organic Practicals - II	4	-	-	-	-
		Inorganic Practicals - II	4	-	-	-	-
		Physical Practicals - II	4	-	-	-	-
IV	Core	Modern Organic Chemistry	4	4	25	75	100
	Core	Advanced Inorganic Chemistry	4	4			
	Core	Spectroscopy	5	4	25	75	100
	Core Practicals	Organic Practicals - II	4	4	40	60	100
	Human Rights	Human Rights	2	1			100
		Inorganic Practicals - II	4	4	40	60	100

		Physical Practicals - II	4	4	40	60	100
	SEP	Project Work Advanced analytical technique/BMT	5	5	20 Viva	80 Thesis	100
	SSP	Chemical Sciences For CSIR- UGC-NET/JRF/ GATE		2*			
		TOTAL	120	90+6			2200

**Required Credits = 90 (89 + 1-HR)**

**Additional credits for Chemistry students = 6\* Credits**

**1. 2+2 credits from parent department**

Self-Study Paper (CSIR/SET – Objective Type Questions) : 2\* Credits

Self-Study Paper (Reagents in Organic Chemistry) : 2\* Credits

**2. Additional credits (Chemistry, Bio-chemistry and Physics department)**

Inter Discipline Course (IDC) : 2\*Credits

**Advanced Analytical Techniques / BMT**

- Classes will be taught outside the class hours
- Based on the demand the course fee may be fixed

**Regulations for Inter Disciplinary Course [IDC]**

**IDC- AAT / Biochemical and Microbial Techniques**

Credit : 2\*Credits  
Hours : 30 Hrs (20+10)  
Semester : II Year [Sem III & Sem IV]  
Evaluation Pattern : Test-I and Test-II [each 25 Marks]  
Maximum Marks : 50 Marks  
Minimum Marks : 25 Marks

**Regulations for Self-Study Paper [SSP]**

**(Reagents in organic Chemistry and CSIR/SET – Objective Type Questions)**

Credit : 2\*Credits  
Semester : II and IV Semester  
Evaluation Pattern : one Test  
Maximum Marks : 100 Marks  
Minimum Marks : 50 Marks

## Sacred Heart College (Autonomous), Tirupattur District

### 1.2.1 List of New Courses

Department: M. SC. CHEMISTRY

#### SYLLABUS

S. No	Course Code	Course Name
1.	CH917C	Research Methodology

**Semester - III Elective - III Research Methodology 4 Hours/week (4 Credits)**  
**CH 917 C**

#### Objectives

- To understand the modern techniques used in the research
- To get the idea about the thesis and paper writing in the research area

#### Unit - I: Introduction

The nature of research: Definitions, aims, objectives-principles and problems-ethics in science-the appraisal of scientific work. Problems and hypothesis in research: identification of problems, sources, factors influencing selection of problems-development and testing of hypothesis.

#### Unit - II: Modern research methods

Modern research methods: reaction techniques to include discussion of different types of reaction vessels, modes of addition of reagents and mixing. Case studies illustrating special techniques such as high dilution, vacuum line reactions, reactions aided by azeotropic distillation, recycling pyrolysis, soxhlet extractions, continuous reactions, reactions at low temperatures, reactions in non-aqueous media and molten salts. Isolation techniques to include discussion of extraction, crystallization, sublimation, distillation, Chromatography-column, thin layer and ion exchange chromatography.

#### Unit - III: Survey of literature

Survey of literature including patents: Chemical nomenclature and literature-primary sources secondary sources including reviews, treatises, and monographs,-literature searching-review of work relevant to the chosen problems. Reviews: Annual and quarterly reviews, general reviews.

#### Unit - IV: Data Analysis

Data Analysis: Frequency distributions, the binomial distribution, the Poisson distribution and normal distribution – describing Data, population and sample, mean, variance, standard deviation. Hypothesis testing, levels of confidence and significance, test for an outlier, testing variances, means t-Test, paired t-Test – Analysis – of variance (ANOVA) –

Correlation and Regression – Curve fitting, Fitting of linear equations, simple linear cases. General polynomial fitting, linearizing transformations, exponential function fit – r and its abuse – Basic aspects of multiple linear regression analysis.

### **Unit - V: Thesis Writing**

Writing a thesis of paper: the general format-page and chapter format-the use of quotations-footnotes and figures-referencing-appendices- references. Abbreviations used in scientific writing, ASAP Alerts, CA Alerts, SciFinder, ChemPort, Science Direct, STN International. Google, scholar, Scopus-Journal home pages.

### **References**

1. Goode, William J., and Natt, Paul K. Methods in social research, International Student edition, McGraw-Hill Co, and Kogakusha Ltd., 1995.
2. Bates, R.N and Schoofer, J.P., Research Techniques in Organic Chemistry, Prentice Hall
3. B. E. Cain, The Basis of Technical Communicating, ACS., Washington, D.C., 1988.
4. J. W. Best, Research in Education, 4th ed. Prentice Hall of India, New Delhi, 1981.
5. H. F. Ebel, C. Bliefert and W.E. Russey, The Art of Scientific Writing, VCH, Weinheim, 1988.
6. J. Gibaldi, and W.S. Achtert, Handbook for writers of Research Papers; 2nd ed.; Wiley Eastern, 1987.
7. Joseph, Methodology for Research; Theological Publications, Bangalore, 1986.
8. R. L. Dominoswki, Research Methods, Prentice Hall, 1981.
9. H. M. Kanare, Writing the Laboratory Notebook; American Chemical Society: Washington, DC, 1985.
10. C.R Kothari, Research Methodology, New Age International publishers, 2<sup>nd</sup> Edn; 2009.

### **Learning Outcomes:**

- The research methods, survey of literature and data analysis were understood by the students
- Thesis writing method was also learned by them through the available packages