

*Progressive Education Society's*  
**Modern College of Arts, Science and Commerce (Autonomous),**  
**Shivajinagar, Pune -05**

**(An Autonomous College Affiliated to Savitribai Phule Pune University)**

## **Framework of Syllabus**

**For**

**M.Sc. (Analytical Chemistry)**

(Based on NEP 2020 framework)

(To be implemented from the Academic Year 2023-24)

### Semester 1 (First Year)

Course Type	Code	Course	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
<b>Major Mandatory (4 + 4+4+2)</b>	23ScCheP111	Major Paper 1 (Theory)	Fundamentals of Physical Chemistry I	4	4	50	50	100
	23ScCheP112	Major Paper 2 (Theory)	Molecular Symmetry and Main group Chemistry	4	4	50	50	100
	23ScCheP113	Major Paper 3 (Practical)	Lab Course on 23ScCheP111 & 23ScCheP112	4	4	50	50	100
	23ScCheP114	Major Paper 4 (Theory)	Basic Organic Chemistry	4	2	25	25	50
<b>Major Electives (4)</b>	23ScCheP121	Major Elective (T+P)	Organic Reactions (T + P)	6	4	50	50	100
<b>Major Electives (4)</b>	23ScCheP122	Major Elective (T+P)	Analytical Methods (T + P)	6	4	50	50	100
<b>RM (4)</b>	23ScCheP131	RM Section 1	Research Methodology Basics & Research in Chemistry	2	4	50	50	100
		RM Section 2		2				
<b>OJT(4)</b>		–	–	–	–	–	–	–
<b>Total</b>				26	22	275	275	550

### Semester 2 (First Year)

Course Type	Code	Course	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
<b>Major Mandatory (4 + 4+4+2)</b>	23ScCheP211	Major Paper 1 (Theory)	Molecular Spectroscopy and Nuclear Chemistry	4	4	50	50	100
	23ScCheP212	Major Paper 2 (Theory)	Coordination and Bioinorganic Chemistry	4	4	50	50	100
	23ScCheP213	Major Paper 3 (Practical)	Lab Course on 23ScCheP211 & 23ScCheP212	4	4	50	50	100
	23ScCheP214	Major Paper 4 (Theory)	Organic Spectroscopy	4	2	25	25	50
<b>Major Electives (4)</b>	23ScCheP221	Major Elective (T+P)	Synthetic Organic Chemistry (T + P)	6	4	50	50	100
<b>Major Electives (4)</b>	23ScCheP222	Major Elective (T+P)	Analytical Chemistry (T + P)	6	4	50	50	100
<b>RM (4)</b>	-	–	–	–	–	–	–	–
	-	–	–	–				
<b>OJT(4)</b>	23ScCheP241	OJT	On Job Training	8	4	50	50	100
<b>Total</b>				30	22	275	275	550

### Semester 3 (Second Year)

Course Type	Code	Course	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
<b>Major Mandatory (4 + 4+4+2)</b>	23ScCheP311	Major Paper 1 (Theory)	Advanced Electrochemical Analytical Methods	4	4	50	50	100
	23ScCheP312	Major Paper 2 (Theory)	Sophisticated Analytical Techniques	4	4	50	50	100
	23ScCheP313	Major Paper 3 (Practical)	Lab Course on Analytical Chemistry I	4	4	50	50	100
	23ScCheP314	Major Paper 4 (Theory)	Photochemistry, Free radicals and Pericyclic Reactions	4	2	25	25	50
<b>Major Electives (4)</b>	23ScCheP321	Major Elective (T+P)	Pharmaceutical Analysis (T + P)	6	4	50	50	100
<b>Major Electives (4)</b>	23ScCheP322	Major Elective (T+P)	Geochemical & Alloy analysis (T + P)	6	4	50	50	100
<b>RP (4)</b>	23ScCheP351	RP	Research Project	8	4	50	50	100
<b>OJT(4)</b>	-	-	-	-	-	-	-	-
<b>Total</b>				30	22	275	275	550

### Semester 4 (Second Year)

Course Type	Code	Course	Course / Paper Title	Hours / Week	Credit	CIA	ESE	Total
<b>Major Mandatory (4 + 4+4+2)</b>	23ScCheP411	Major Paper 1 (Theory)	Analytical Spectroscopy	4	4	50	50	100
	23ScCheP412	Major Paper 2 (Theory)	Catalyst Characterization Techniques	4	4	50	50	100
	23ScCheP413	Major Paper 3 (Practical)	Lab Course on Analytical Chemistry II	4	4	50	50	100
<b>Major Electives (4)</b>	23ScCheP421	Major Elective (T+P)	Toxicology & Food Analysis (T + P)	6	4	50	50	100
<b>Major Electives (4)</b>	23ScCheP422	Major Elective (T+P)	Safety in Chemical Laboratory (T + P)	6	4	50	50	100
<b>RP (4)</b>	23ScCheP451	RP	Research Project	12	6	75	75	150
<b>OJT(4)</b>	-	-	-	-	-	-	-	-
<b>Total</b>				30	22	275	275	550

OJT : On Job Training: Internship/Apprenticeship

FP : Field Project

RM: Research Methodology

RP: Research Project