Hindi Vidya Prachar Samiti's

Ramniranjan Jhunjhunwala College

Of Arts, Science & Commerce

(Autonomous College)

Affiliated to
UNIVERSITY OF MUMBAI

Syllabus Framework as per LOCF

Program: M.Sc. ANALYTICAL CHEMISTRY

Program Code: RJSPGCHEA

(CBCS 2020-2021)

Syllabus Framework as per LOCF

TABLE OF CONTENTS

Syllabus Framework as per LOCF

THE PREAMBLE

Why Chemistry?

Everything present on this earth is made up of chemicals and chemicals are composed of atoms, ions and molecules. The basic knowledge of elements present in nature is essential to know its working, importance and applications. Chemistry is the study of science that deals with constituents of matter like atoms molecules, ions etc.; and its properties, structure, behaviour, and interactions among them. Since everything is made up of atoms and molecules, we can see the chemistry all around us. Today, chemistry has grown into a very diverse field. There is a significant overlap between chemistry and other branches of science, for example, biochemistry (chemistry and biology), physical chemistry (chemistry and physics), medicinal chemistry (medicine and chemistry), chemical engineering (chemistry and engineering) etc.

It is generally considered that chemistry is boring and complicated, but this is not true. It is because of chemistry many of our daily activities are achieved. Soaps, detergents, pills, plastics, clothes, food, colours, and many others are some of the products of chemistry.

Why Chemistry at R J College?

The department of Chemistry at R J College is the department as old as the college itself. It started in 1963, the inception year of the college and since then has remained as the centre of academic activities for the subject. With a legacy of more than six decades, today the department offers both UG and PG programs in the subject of Chemistry with more than one specialization at post graduate level and is affiliated to recognize by the University of Mumbai. Like all other undergraduate courses offered at undergraduate program in science, even the subject of Chemistry offers vertical mobility to students for M.Sc. and PhD in Chemistry.

There are value added courses across disciplines for horizontal mobility of students. Field trips, mini projects, hands on training sessions, lectures, laboratory experimentation, lecture-based learning, industry visits etc. motivate students to explore more in terms of applications of the subject. Under autonomy, the department has made curriculum more robust by incorporating skill-based learning and value added course that imparts practical knowledge of the subject to the students. Department of Chemistry is one of the few departments who runs more than one value added course in a year and is able to attract students from other disciplines of science enrolling for these courses. Department of Biotechnology (DBT), New Delhi has identified Chemistry Department of R J College as DBT Star Status Department which has further strengthened our hands in being able to provide hands on training to the students to satisfy their curiosity and inculcate research aptitude

Our Curriculum, Your Strength

The syllabus for Chemistry for the total six semesters is meticulously designed so as to make students understand the basics and advances of chemistry. One entire semester in PG program is dedicated to internship. This gives students an exposure to work away from the campus in the industrial set up, production set up or pharmaceutical or health care organization. Field trips and industrial visits generate love for chemical and materials science. Over the years, department has been able to develop linkages with premier research institutes in the city like BARC, IIT Bombay, ICT, etc. Our illustrious alumni are given a platform to remain in constant touch with our every new batch of students in providing them guidance in their studies and assisting in the internship and placement.

PROGRAM OUTCOMES OF GENERAL UNDERGRADUATE DEGREE PROGRAMS

Students of all undergraduate degree programme at the time of graduation will be benefited will be able to

Critical Thinking

Comprehend the matter they come across and be capable to take a sound viewpoint about things which will highlight their intellectual acumen as well as enable them to look at the world through multiple lenses

Effective communication

Listen, speak, read and write. They should communicate properly by conveying their thoughts. They will use technology for communication. They will be able to network with people with all available channels. They will be developing communication skills in English, Hindi and a local language would be an added advantage.

Social Interaction

Respect each other and should be able to resolve conflicts and help in reaching amicable solution. They should be able to work in diverse teams. They should be able to distinguish when and what is socially acceptable.

Responsible citizen

Contribute to Nation development through social service, being empathetic and sympathetic to fellow beings. Honesty and Integrity, Ethics Recognize different values and systems and respect them. In decision making moral values should be given prime importance.

Environmental and Sustainability

Environmental issues would be considered and problem solving with sustainable development would be chosen

Life Long learning

Enjoy learning in every situation.

Syllabus Framework as per LOCF

Programme Specific Outcome M.Sc. ANLYTICAL CHEMISTRY Program with

After successful completion of two-year M.Sc. degree program in Analytical Chemistry ,a student should be able to:

PO1:	**Understand basic concept of analytical chemistry, utilize the theoretical knowledge to solve the problems of real world, and work with advances in all disciplines of chemical sciences including materials science.**
PO2:	Solve the problem and also think methodically, independently and draw a logical conclusion. Apply scientific thinking to develop scientific temperament and the scientific knowledge to design, carry out, record, analyze and apply the results of chemical reactions.
PO3:	Work with green routes of chemistry to minimize the adverse effect on the environment, society, and development outside the scientific community.
PO4:	To inculcate the scientific temperament in the students and outside the scientific community. PO-6. Use modern techniques, state-of-the- art equipment, and Chemistry software.

PSO1:	Students will acquire the knowledge of theoretical Chemistry supported with practical.
PSO2:	To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.
PSO3:	Identify chemical formulae and solve numerical problems.
PSO4:	Use modern chemical tools, Models, Chem-draw, Charts and Equipments.
PSO5:	Proper understanding of applied chemistry in the field of material science, medicine and dyes.
PSO6:	Understand good laboratory practices(GLP), standard operating procedure(SOP) and safety in laboratory and industry.
PSO7:	Inculcate the research oriented thinking and skills.
PSO8:	Will be able to handle the sophisticated instruments/equipments and interpret the data.

Syllabus Framework as per LOCF

Chemistry PG ANALYTICAL CHEMISTRY Core Course Programme Outcome

PROGRAMME OUTCOME	Part-I Sem-I				Part-I Sem-II				Part-II Sem-III				Part-II Sem-IV			
	RJSPGCHE101	RJSPGCHE102	RJSPGCHE103	RJSPGCHE104	RJSPGCHE201	RJSPGCHE202	RJSPGCHE203	RJSPGCHE204	RJSPGCHEA301	RJSPGCHEA302	RJSPGCHEA303	RJSPGCHEA304	RJSPGCHEA401	RJSPGCHEA402	RJSPGCHEA403	RJSPGCHEA404
Core Competency	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Critical Thinking	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Analytical Reasoning	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Research Skills	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Problem Solving	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Team Work	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Teaching Learning Process

The teaching learning process in the learning outcomes based curriculum framework in the subject of Botany is designed to develop the cognitive skills of every learner. The course offers the requisite skills for a professions and jobs in Botany. All courses have practical's as an integral part which promotes the learner to acquire the requisite skills for employment by experiential learning.

An interesting combination of teaching learning processes is adopted in which the teacher and learners are actively involved.

Some of the salient teaching learning processes are

- Class lectures
- Presentations
- Group Discussion, workshops
- Peer teaching and learning
- Flipped classroom, project based learning, quiz, seminars, exhibitions, posters.
- Practical's experimental design planning, analysis, interpretation, application of knowledge gained, field projects, mini projects
- Technology enabled self-learning
- Internships

The effective teaching strategies would address the requirements of leaner to learn at their own pace. The teaching pedagogy adopted to ensure inculcate higher order skills in the learner. The entire program is also designed to foster human values, environmental consciousness for an equable society. The teaching learning processes adopted would aim at participatory pedagogy.