Hindi Vidya Prachar Samiti's

Ramniranjan Jhunjhunwala College

Of Arts, Science & Commerce

(Autonomous College)

Affiliated to
UNIVERSITY OF MUMBAI

Mapping of the courses to Employability

Program: B.Sc. CHEMISTRY

Program Code: RJSUCHEM

(CBCS 2020-2021)

Mapping of the courses to Employability

Mapping of the courses to Employability / Entrepreneurship / Skill Development

Name of the Program: B.Sc. CHEMISTRY

Class	Course Name	Course Code	Topics focusing on Employability / Entrepreneurship / Skill development	Employability / Entrepreneurship / Skill development
FYB Sc	Chemistry	RJSUCHE101	Chemical Thermodynamics - Improves the problem solving abilities and employability in industries handle systems involving exchange of heat, energy and work. Atomic Structure & Periodic table: understanding of the atomic structure & periodic properties of different elements along with problem solving skills and Provides vast scope in the field of research IUPAC nomenclature of organic compounds: The students learn to identify organic molecules, knowledge of its molecular structure provides opportunities in the field of synthetic chemistry.	
		RJSUCHE102	Chemical Kinetics & Liquid State: Improves their problem solving skills and helps in understanding reaction mechanisms. Provides employment as a chemist in manufacturing units. Comparative chemistry of main group elements & Oxides of C,N,S w.r.t. environmental aspects . Students learn to synthesis inorganic compounds Understanding the properties of elements along with the knowledge of environmental chemistry has wide research opportunities.	

Mapping of the courses to Employability

			Understanding bonding in organic compounds, Reactive Intermediates and General mechanism of the following types of reaction. Students develop logical, scientific and technical skill that can be used in many jobs as a chemist. They understand the details of reaction mechanisms, bond fission, importance of transition state and intermediate & the stereo chemical aspects
F.Y. B Sc	Chemistry	RJSUCHE201	Gaseous State, Chemical Equilibria and Thermodynamic Parameters Develop logical reasoning skills to increase the yields in industrial processes. Concept of Qualitative Analysis, Acid – Base Theories To acquire skills in qualitative analysis, to identify cations and anions through specific tests and knowledge on acid base chemistry. Provides employment in fields related to metal testing's. Chemistry of Alkanes, alkenes and alkynes (up to 6 carbons) and Aromaticity. Skills to prepare alkanes, alkenes & alkynes & acquire knowledge about pericyclic reaction and Electrophilic substitution reaction of aromatic compound. Job opportunities as synthetic Chemistry in Chemical industries
		RJSUCHE202	Ionic Equilibria, Molecular Spectroscopy -I, Solid State Chemistry Students understand the composition and electronic structure of matter through spectroscopy and to develop their research skills in investigating matter at atomic and molecular scales.

Mapping of the courses to Employability

			Types of Chemical Bonds, oxidation-Reduction Chemistry: Understand the concept of bonding in molecules and knowledge about oxidation state rules and to carry out redox reactions. Stereochemistry II and Functional group interconversion Students learn to represent 3-dimensional structure on papers, knowledge about cis trans isomerism in cycloalkanes & energy of various conformations of simple molecules and functional group interconversions. Provides job opportunities in Pharma industries.
S Y B Sc	Chemistry	RJSUCHE301	CHEMICAL THERMODYNAMICS-II & ELECTROCHEMISTRY-II Enhances the Skill to understand thermal chemistry and provides Scope for employment as electrochemist. Chemical Bonding: Students understand about ionic bonding and the orbital approach in covalent bonding. Develop skills to correlate the electronic structure of molecules with their properties, providing wide scope in research applications. IUPAC nomenclature of aromatic system. Students learn the method of naming aromatic compounds thereby understand their structure & properties. This helps them to carry out the synthesis of various aromatic substances,
		RJSUCHE302	Chemical kinetics-II & Solutions. Selected topics on p block elements Skill to understand the bonding, properties and extraction of certain selected p block elements and to

	provide job opportunities in ore and alloy industries. Stereochemistry –III Students learn the configuration of stereoisomers, understand the reactivity of carbonyl compounds & study the mechanism of reactions. This provides them the skill to synthesis stereoisomeric compounds which are important in the field of pharmaceutical chemistry.
RJSUCHE303	Introduction to Analytical Chemistry, Classical Methods of Analysis-Titrimetric Methods, Statistical Treatment of Analytical Data-Students learn to quantify a chemical substance by lab technique and to interpret analytical data. This Provides greater scope of employment as analytical chemist in Chemical industries and in research organizations. Analytical Instrumental Methods-I Students learn to handle instruments like spectrophotometer and provide employment in Chemical laboratories and research institutions. sources of organic compounds. Students learn different sources of organic compounds and their applications, fermentation process w.r.t biomass, to calculate a five-day BOD test and treatment of liquid effluents. Provides employment as environmental and a biochemist.

Mapping of the courses to Employability

S Y B Sc	Chemistry	RJSUCHE401	Photochemistry, Nuclear Chemistry-I, Basics of quantum chemistry Skills imparted to work in varied field, as they gain knowledge on the diverse areas of modern-day applications from the above topics Transition elements and coordination chemistry. Students understand the properties and applications of transition metals and coordination complexes. Synthesis of certain complexes (catalyst) which can be used to alter the rate of chemical reactions. Aromatic Amino Compounds and Heterocyclic Chemistry Students acquire the skill to synthesize the variety of organic compounds from diazonium salt and knowledge on heterocyclic chemistry. Employability as Synthetic chemist.
		RJSUCHE402	Solid State & Catalysis Skills acquired to understand the properties and structure of solids and its application in varied fields. Provides research opportunities and employability in the field of chemical technology. Ions in aqueous medium, Chemistry of Volatile Oxides and Oxo-acids. To study the acid base properties of ions in aqueous medium and uses of Oxo acids. Aromatic carboxylic acids Students will be able to understand the reactivity's of aromatic carboxylic acids & sulphonic acids.

Mapping of the courses to Employability

		RJSUCHE403	Statistical Treatment of Analytical Data–& Separation Technique-Chromatography, Instrumental Methods-II & Separation techniques-Solvent Extraction, Metallurgy and toxicology. Students learn to handle instruments, Principles of metallurgy and separation techniques and environmental toxicology. Employability in the research institutes and metal industries
T Y B Sc	Chemistry	RJSUCHE501	1. Molecular spectroscopy 2. Chemical thermodynamics, Chemical kinetics 3. Nuclear Chemistry 4. Surface Chemistry & Colloidal state Employability in the field of Nuclear plants, Chemical processing industries and in research fields.
		RJSUCHE502	Chemical Bonding Solid State Chemistry Chemistry of elements (Inner transition elements) and Some selected topics: Non-aqueous Solvents, Interhalogen, Pseudo halogens and Chemistry of Xenon Employability as Inorganic material Chemist with focus on synthesis of novel materials and their characterization.
		RJSUCHE503	Mechanism of organic reactions, Photochemistry, Stereochemistry, Agrochemicals, Heterocyclic chemistry, IUPAC nomenclature, Organic Synthesis, Spectroscopy and Natural Products. Employability in the field of organic synthesis and structural elucidation,

Mapping of the courses to Employability

			skills to handle spectroscopic instruments
		RJSUCHE504	1.Introduction to quality concepts, chemical calculations and sampling, 2. Classical methods of analysis (titrimetry). 3. Optical methods 4. Methods of separation Skills to interpret data obtained after chemical analysis, Knowledge on separation techniques and employability in chemical industries based on separation processes.
T Y B Sc	Chemistry	RJSUCHE601	1. NMR & ESR 2. Basics of Quantum Chemistry & Renewable Energy Resources. 3. Electrochemistry 4. Polymers Employability in Chemical industries involving synthesis of polymers, inorganic materials, fuel cells, electrocatalyst etc, renewable energy jobs in solar and wind sectors,. Skills to handle spectroscopy to quantify the samples,
		RJSUCHE602	Co-ordination Chemistry: Properties of Coordination compounds. Organometallic Chemistry & catalysis. Nanomaterials. Students understand coordination compounds, crystal field theory, metal ligand complexes, their applications and nano chemistry.
		RJSUCHE603	Stereochemistry II, Amino acids & Proteins, Molecular Rearrangement, Carbohydrates, Spectroscopy II, Nucleic Acids, Polymer, Catalysts and Reagents. Students understand stereochemistry of reactions, amino acids and proteins with emphasis on nomenclature and properties. Mechanistic aspects of molecular rearrangement and

Mapping of the courses to Employability

			selected name reactions.4Introduction to carbohydrate chemistry w.r.t. mono-saccharides with 5 & 6 carbons including reactions and stereochemical aspects.
		RJSUCHE604	1.Electro analytical techniques 2.Methods of separation – II 3.Food and cosmetics analysis 4.Thermal methods and analytical method validation Employability in the field of food and cosmetic industries, chemical industries employing separation process, in electro chemical and thermal plants.
T Y B Sc	Chemistry	RJSUCHEAC505	Skills acquired to synthesis certain drugs and dye stuffs
T Y BSc		RJSUCHEAC605	Drugs and Dyes, Employability in chemical industries manufacturing pharmaceutical products and dyes.
F.Y.B.Sc	Chemistry	RJSUCHEPR101,	Characterization of organic compounds containing C, H, O, N, S, X (minimum six compounds) Students will understand the structure, properties & reactions of organic compounds, this will also help to understand the functional group inter-conversions.
		RJSUCHEPR102	Gravimetric Analysis Students develop the skill of quantifying a chemical compound.
		RJSUCHEPR201	Qualitative analysis: Semi-micro qualitative analysis of water soluble mixtures containing two cations and two anions. (Scheme of analysis should avoid use of sulphide ion in any form for precipitation/separation of cations.) Skill developed to identify cations and anions in a given mixture. Provides career opportunities in metal testing Chemical units, in quality assurance and quality control.

Mapping of the courses to Employability

		RJSUCHEPR202	1) Purification of solid organic compounds by recrystallization. 2) Commercial analysis by volumetry Students learn to purify an organic compound and also to quantify a given chemical by employing titration technique. Provides scope for employment in analytical laboratories.
S.Y.B.Sc	Chemistry	RJSUCHEPR301	Quantitative chemical analysis & calculation of percentage error of the experimental results. Skills to analyse the chemical substances quantitatively and to interpret the data obtained.
		RJSUCHEPR302	1.Semi-micro inorganic qualitative analysis of a sample containing two cations and two anions. 2. Estimation of Iron and estimation of lead by volumetric: Improves the skills in qualitative and quantitative analysis
		RJSUCHEPR303	Organic Estimation and Organic preparation. Skill developed to synthesise organic compounds and to quantify them.
S.Y.B.Sc	Chemistry	RJSUCHEPR401	Skill development (Preparation of acidic and basic buffer solutions & calculation of percentage error of the experimental results).
		RJSUCHEPR402	Volumetric Estimation and Inorganic preparations Students learn both qualitative and quantitative lab techniques.
		RJSUCHEPR403	Identification of organic compounds and Derivatisation of an organic compound with a given functional group. Students learn to Identify organic compounds containing bifunctional groups and to prepare organic derivatives, purification, drying and MP determination.

Mapping of the courses to Employability

T.Y.B.Sc	Chemistry	RJSUCHEPR501	Determination of order of a reaction; adsorption isotherm; potentiometry & pHmetry. Students learn to handle instruments and perform chemical experiments.
		RJSUCHEPR502	inorganic preparations and volumetric estimations. Students learn to synthesize metal- ligand complexes, as well as learn to estimate the metal content in a given commercial sample. Employability in the field of research and metal extraction plants.
		RJSUCHEPR503	Separation of solid-solid mixture Develop skills in organic separation of solid mixtures using chemical methods.
		RJSUCHEPR504	Skills to handle instruments like colorimeter and flame photometer, to estimate metal content in a given sample by complexometry, Employability in the field of water and effluent treatment plants, research organizations, metal extraction units etc.
T.Y.B.Sc	Chemistry	RJSUCHEPR601	Students learn to handle instruments and analytical techniques. (Viscometry, potentiometry, colorimetry & conductometry)
		RJSUCHEPR602	Inorganic Preparations & Complexometric Titrations: Students learn the technique of qualitative analysis by complexometric titrations and synthesis of metal-ligand complexes (quantitative preparations).
		RJSUCHEPR603	Employability in handling instruments in for various analysis in chemical industries and research institutions.
		RJSUCHEPR604	Employability in handling instruments in for various analysis in chemical industries and research institutions.

Mapping of the courses to Employability

T.Y.B.Sc	Applied Component	RJSUCHEACPR505	Skills acquired to synthesis certain drugs and dye stuffs
T.Y.B.Sc	Applied Component	RJSUCHEACPR605	Employability in chemical industries manufacturing pharmaceutical products and dye stuffs.