!! न हि ज्ञानेन सदृशं ! पवित्रमिह विद्यते !!

Shriram Shikshan Sanstha's

Shriram Mahila Vidnyan Mahavidyalaya, Paniv

Tals.: Malshiras, Dist.: Solapur, 413113

(Affiliated to S. N. D. T. Women's University, Mumbai)

Department of Chemistry (PG)

Course outcome (COs)

Name of the Class	Course Title	Course Outcome
M. Sc. I. General Chemistry (Sem.-I)	**Fundamentals of Analytical Chemistry**	**After completion of course learners can know about:** ➢ **Analytical Basics:** a) Analytical chemistry b) Sampling c) Chemo metrics Topics to be covered in the form of numerical problems ➢ **Volumetric Methods of Analysis** ➢ **Separation Methods:** a) Solvent extraction b) Solid Phase Extraction c) Planer Chromatography d) HPTLC conversion of TLC to quantitative measurements, densitometric detectors, fluorimetric detectors. ➢ **Statistics**: Fundamentals of Analytical Chemistry
	Food and Biochemical Analysis	**After completion of course learners can know about:** a) Regulations & Legislation of Food b) Food Additives & Preservatives c) Food Quality Parameters. d) Biochemical analysis food e) Body profile: Liver profile, Renal profile, Thyroid profile. f) Food analysis
	Environmental Science	**After completion of course learners can know about:** ➢ Air pollution ➢ Water pollution ➢ Methods of control of air pollution: ➢ Methods of control of water pollution:

		➢ Sampling & analysis of air and water pollutants: ➢ Radiation pollution ➢ Environmental toxicology
	Drug Laws & Packaging	**After completion of course learners can know about:** ➢ Legislation and Regulation of Drug ➢ Prevention of Food Adulteration Act & Rules (PFA 1954 ➢ Statutory status of pharmacopoeia: ➢ Pharmacopoeia ➢ Food Standard Laboratories ➢ Packaging materials
	Lab Course:	**After completion of course learners can know about:** • Preparation and Standardization of commonly used titrants, Acid-base titration, redox titration, complex metric titration, Precipitation titration, Non-aqueous titrations. • Separation and estimation of elements • Milk and Milk Products, Tea, Coffee, Honey, Preservatives. Jam, Jelly, Squash, Edible Oil, Pickle, Sauce, Vinegar
M. Sc. I. General Chemistry (Sem.-II)	**Electro Analytical and Spectroscopic Methods**	**After completion of course learners can know about:** ➢ **Electro Analytical Methods- I** a) Potentiometry b) Ion Selective electrodes ➢ **Electro analytical methods- II** a) Polarography b) Stripping Methods of analysis c) Coulometry d) UV-Visible molecular Absorption Spectroscopy e) Atomic absorption Spectrometry f) Molecular IR absorption Spectroscopy g) Emission Spectroscopic methods h) Molecular Fluorescence spectroscopy i) Flame emission spectroscopy j) Turbidimetry and Nephlometry
	Pharmaceutical Analysis	**After completion of course learners can know about** a) Active Pharmaceutical Ingredients (API) and drug products b) Dosage form c) Control release formulation

		d) Introduction to Pharmacopoeia and its importance e) Application of analytical techniques in pharmaceutical industries f) Assay of main classes of drugs Chemotherapeutic agents g) Dissolution and Disintegration h) Quality Assurance (QA), Quality Control (QC) - Change control management, Out of specifications (OOS), Deviation reporting, Stability studies (QA Pharma), Quality control, laboratory responsibilities, routine controls, Calibration of instruments, Standard test procedures.
	Cosmetics Formulation & Quality Control	**After completion of course learners can know about** a) Introduction cosmetics b) Herbal Cosmetics products c) Test methods for cosmetic products d) Quality control of Cosmetics raw materials e) Analysis of cosmetics
	Research Methodology	**After completion of course learners can know about** a) Fundamental Laboratory Techniques b) The investigative approach c) Analysis and presentation of data d) Statistical Packages for Social Science (SPSS) Workshop. e) Chemical safety f) Disaster Management:
	Lab Course:	**After completion of course learners can know about** • Colorimetric analysis of elements, Mixture, Simultaneous estimation of metals, pk value of indicator by Spectrophotometry. • Colorimetric analysis of elements, Mixture, Simultaneous estimation of metals, pk value of indicator by Spectrophotometry. • Assay of alkaloids, Vitamins, Antibiotics, Sulpha drugs, Anta-acids, Anti-bacterial. • Dissolution test, Disintegration test, Weight variation test, Test for uniformity of content.
M. Sc. II (Sem. -III)	**Advanced Chromatography and Spectroscopic Methods**	**After completion of course learners can know about** ➢ **Column Chromatography I** a) Gas chromatography ➢ **Column chromatography II** a) High performance Liquid Chromatography (HPLC) ➢ **Advanced Spectroscopic Methods I** a) Mass spectrometry b) Atomic Emission Spectroscopy Inductively Coupled Plasma c) Nuclear Magnetic Resonance d)

		Advanced Spectroscopic Methods II a) Raman spectroscopy b) Hyphenated Methods i. Gas Chromatography – Mass Spectrometry (GC-MS) ii. Gas Chromatography – IR Spectrometry (GC-IR) iii. Liquid Chromatography – Mass Spectrometry (LC-MS) iv. Tandem Mass Spectrometry (MS-MS) v. Inductively Coupled Plasma – Mass Spectrometry (ICP-MS).
	Organic Analysis	**After completion of course learners can know about** a) UV-visible Spectroscopy b) IR-Spectroscopy c) CNMR d) Mass Spectroscopy e) Functional group analysis f) Nanotechnology g) Organic synthesis h) Organic trace analysis i) Micro-elemental analysis of C,H,N,O and halogens.
	Microbiological Methods of Analysis	**After completion of course learners can know about** a) Introduction of Microorganisms b) Staining method c) Viruses d) Bacteria e) Culturing of Microorganism f) Control of microorganism g) Food borne diseases h) Water-borne diseases i) Airborne diseases:
	Medicinal Chemistry	**After completion of course learners can know about** a) Antiseptic and disinfectants b) Chemotherapeutic agents; thermotherapy of acid fast infection (Anti-tubercular and anti- leprotic agents) c) Chemotherapeutic agents of parasitic infection, antimalarials, anti-amoebic, anti-trypanosomiasis and antihelmintic agents d) Antifungal agents e) Anti-viral agents f) Anti-neoplastic agents. g) Antibiotics h) Sulphonamides i) Diuretics j) Hypoglycemic agents k) Diagnostic agents and pharmaceutical aids l) Miscellaneous drugs like anticoagulants and antilipemic agents. m) Drugs acting on central nervous system

		n) Drugs acting on nervous system:
	Lab Course:	**After completion of course learners can know about** Spectroscopic determination of elements, Standard addition method and method of least squares, extractive photometry, photometric titration. • Fluorometric determinations of organic compounds by Calibration curve, standard addition method. • Flame photometric determination of alkali metals by calibration curve method. • Identification: Alcoholic, phenolic carbonyl, carboxylic, ester, nitro, amino group, amide group, degree of unsaturation, hydrocarbons, olefins using sample spectra. • Estimation: Amines, phenols, aldehydes, ketones, Ester, amide, Carboxylic compounds.
M. Sc. II (Sem.-IV)	**Advanced Analytical Techniques**	**After completion of course learners can know about** ➢ Advanced Electro-analytical methods a) Amperometric Titrations b) Biamperometric Titrations c) Modified Polarographic Methods ➢ Thermal & Radioactive methods of analysis a) Thermal methods (TGA, DTA & DSC) ➢ Thermometric Titrations a) Radio analytical Methods b) Isotope dilution method: Principle, Applications. ➢ Photo Acoustic Spectroscopy (PAS) ➢ Surface Analytical Techniques ➢ Surface spectroscopic methods ➢ Auger electron spectroscopy ➢ Scanning Electron Microscopy ➢ Computers in Analytical chemistry ➢ Green Analytical Methods
	Lab Course:	**Learners can know about:** ➢ Conductometric titration of acids, bases, mixture of acids. pH metric titration of mixture of acids and selection of indicators for volumetric titration, pH metric titration of polybasic acids. ➢ Thermometric titrations of acids/bases ➢ Water Analysis of samples for hardness, dissolved oxygen, residual chlorine content ➢ Analysis of Cosmetics intermediates.