M.Sc., INDUSTRIAL CHEMISTRY

Industrial chemistry: The Science of today is technology of tomorrow. The manufacturing art concerned with the transformation of matter into useful materials in useful amounts with cutting edge research thrust areas. Usually this transformation of available materials into more desirable ones involves some kind of process following a method.

Preamble :

Industrial chemistry is the branch of chemistry which applies physical and chemical. processes towards the transformation of raw materials into products that are of benefit to the modern applications helps to the society. The core courses in Industrial Chemistry is designed to familiarize the students with the industrial processes involved in the commercial production of the products.

The main objective of a M.Sc., programme in Higher Education system is to prepare the students for the application of ideas to the society. The Industrial Chemistry is the process of development, optimization, and monitoring of fundamental chemical processes used in industry with basic as well as applied aspects of chemistry for transforming raw materials and precursors into useful commercial products for the betterment of society.

The current pattern is designed to provide a focused learning outcome-based syllabus at the M.Sc., level providing structured teaching-learning experiences catering to the needs of the students. Industrial Chemistry program provides a broad education within chemistry with applications of engineering, mathematical, and industrial applications management principles.

This course will prepare the students both academically and in terms of employability. The programme also inculcates various attributes at thepost graduate level. These attributes encompass values related to emotional stability, social justice, creative and critical thinking, well-being and various skills required for employability, thus preparing students for continuous learning and sustainability.

The curriculum based on learning outcomes of M.Sc., Industrial Chemistry offers knowledge of broad areas including analytical, organic, inorganic, physical, analytical, spectroscopy, unit operations, chemical, advanced and basic aspects including polymer chemistry and technology with pharmaceutical chemistry. They are also exposed to instructions and research projects in instrumental analysis, Nanochemistry, Chemical Spectroscopy, Organic Synthesis, Coordination and Organ Metallic Chemistry, Natural Product Chemistry, Solid State Chemistry, Polymer Chemistry and Composites, Environmental Chemistry and pollution & Monitoring control.

The courses define clearly the objectives and the learning outcomes, enabling students to choose the elective subjects broadening their skills in the field of Industrial chemistry. The course also offers skills to pursue research in the field of Chemistry and thus would produce best minds to meet the demands of society.

Programme Learning Outcome

The learning outcome - based approach for Industrial Chemistry is to design the curriculum framework to suit the requirements of the various industries. Industrial chemistry deals with commercial production of chemicals and related products from natural raw materials and their derivatives. The course structure has been designed to allow flexibility in program and course content development while at the same time maintaining a basic chemistry and applied chemistry with uniformity in structure in comparison with other universities across the country. It enables humanity to experience the benefits of chemistry when we apply it in the exploitation of materials and energy. The present course gives students ability to employ critical thinking and efficient problem solving skills in the core areas of chemistry including analytical, Inorganic, organic and physical chemistry with applied aspects.

Programme Specific Outcome

Industrial Chemistry offers the synergism of basic concepts of Chemistry with Industrial applications. The main objective of this course is to produce M.Sc., graduates with enhanced skills, knowledge and depth research aptitude to carry out higher studies or research and development in the various industrial areas.

The course of Industrial Chemistry prepares the students for immediate entry to the workplace or Industries with sound theoretical, experimental knowledge in the area of requirements and it may be in the health, energy, environment, foods, cosmetics, polymers and related multidisciplinary required fields with broad perception of chemical sciences. Overall, the course offers basic foundation in chemistry, biological, physiccal and maths which enables the students to understand the concepts in chemical processing, engineering and industrial development.

It provides technical and managerial skills in industrial development and management. Students are able to learn and gain experience to enable them to venture into the industrial field and public sectors. The degree also allows them to pursue Ph.D. programme in Industrial chemistry and related areas.

- develop ability to scale up chemical products and techniques developed at laboratory to the industrial level. It also helps the students to do beyond chemistry knowledge into the world of industrial professionals.
- Advanced knowledge of fundamentals of industrial chemistry with enhanced command over modern scientific methods, techniques and chemical processes equipped with environment safety measures.

- Cultivate independent thinking and able to integrate knowledge from other disciplines to fit into various industrial areas.
- Advanced knowledge of fundamentals of industrial chemistry
- with enhanced command over modern scientific methods, techniques and
- chemical processes equipped with environment safety measures.

Graduate Attributes

Graduates with a degree in Industrial Chemistry can pursue various careers such as research and development, quality control, production management, or technical sales. In addition, they can work in multiple industries, from pharmaceuticals, cosmetics, petrochemicals, and food and beverage.

The depth knowledge of basic and applied areas of Industrial Chemistry able to employ skills in the basic areas of Industrial chemistry (analytical, organic, inorganic, physical and material). Students will become efficient in managerial skills, able to employ analytical reasoning, problems solving and interpretation and documentation of laboratory experiments at a level suitable to succeed at an entry-level position in chemical industry. Capability to demonstrate knowledge and understanding of major chemistry concepts, theoretical principles and experimental findings and ability to use modern instrumentation techniques with chemical analysis and separation. Cultivate independent thinking and able to integrate knowledge from other disciplines to fit into various industrial areas. Below are *few of the examples* where a M.Sc., graduate with Industrial Chemistry Degree can expect a suitable position.

The departments below require Research and Development, Quality control, Quality Assurance, production /manufacturing chemists

Overall, there are vast areas, where a successful M.Sc., graduate with industrial chemistry degree is able to suit himself for positions. After successful completion of the Degree, the student can enroll for higher education for a PhD degree in the subject, which further creates wide range of job opportunities such as Scientist working in Academia or Industries, and or as Professors in Universities.

Sl. No.	Industries	Positions (Department wise)
1	Textile Industry	Dyeing, Fabric, Manufacturing Departments
2	Paints and Enamels	Colour generating, mixing, quality,production
3	Cement/Ceramic Industry	Kiln Operator for Cement manufacturing Plant
4	Polymer Industry	Quality Control, R&D, Production, Chemists
5	Pharmaceutical Chemistry	Quality Control, R&D, Production, Chemists
6	Fertilizer Industries	Chemist (Fertilizer Plants)
7	Material Chemistry	Development of Batteries
8	Electronic industries	Developing silicon materials
9	Metallurgy	Gold, Silver, platinum, etc
10	Food Industry	Quality Control, R&D, Production, Chemists

KUVEMPU UNIVERSITY

Department of PG Studies in Industrial Chemistry

Shankaraghatta

New CBCS Scheme Course Pattern

Sem	Theory Code	Max Marks 100		Credits Hrs/ Week	Credits Points	Practical Code	Max Marks 50	Credits Hrs/ Week	Credits Points	Total Credits per semester
		Theory 75	IA + 25							
I	IC.HC: 1.01	75	25	4	4	IC.HC : 1.05	40+10	4	2	22
	IC.HC: 1.02	75	25	4	4	IC.HC : 1.06	40+10	4	2	
	IC.HC: 1.03	75	25	4	4	IC.HC : 1.07	40+10	4	2	
	IC.HC: 1.04	75	25	4	4					
II	IC:HC: 2.01	75	25	4	4	IC:HC: 2.05	40+10	4	2	24
	IC:HC: 2.02	75	25	4	4	IC:HC: 2.06	40+10	4	2	
	IC:HC: 2.03	75	25	4	4	IC:HC: 2.07	40+10	4	2	
	IC:HC: 2.04	75	25	4	4					
	Elective	40	10	2	2					
III	IC:HC: 3.01	75	25	4	4	IC.HC : 3.04	40+10	4	2	24
	IC:HC: 3.21	75	25	4	4	IC.HC : 3.05	40+10	4	2	
	IC:SC: 3.03	75	25	4	4	IC.HC : 3.06	40+10	4	2	
	IC:SC: 3.04	75	25	4	4					
	Elective	40	10	2	2					
IV	IC HC: 4.01	75	25	4	4	IC HC: 4.04	40+10	4	2	20
	IC SC: 4.31	75	25	4	4	IC HC: 4.05	40+10	4	2	
	IC SC: 4.23	75	25	4	4	Project	75+25	4	4	
										90
	Personality Development Programme								2	06
	Communication Skills								2	
	Computer Skills								2	
										96

1st Semester : Theory papers

IC.HC: 1.01 Analytical & Separation Techniques

IC HC: 1.02 Inorganic Chemistry-I

IC HC: 1.03 Organic Chemistry I

IC HC: 1.04 Physical Chemistry-I

Practical

IC.HC: 1.05 Inorganic Chemistry

IC HC: 1.06 Organic Chemistry

IC HC: 1.07 Physical Chemistry

2nd Semester

Theory papers

IC: HC: 2.01: Spectroscopic Techniques

IC HC: 2.02: Inorganic Chemistry - II

IC HC: 2.03: Organic Chemistry-II

IC HC: 2.04: Physical Chemistry - II

Elective

Practical

IC.HC: 2.05 Inorganic Chemistry
IC HC: 2.06 Organic Chemistry
IC HC: 2.07 Physical Chemistry

3rd Semester

Theory papers

IC HC: 3.01: Chemical process principles
IC HC: 3.02: Advanced Organic and Medicinal chemistry
IC SC: 3.03: Polymer Chemistry and Technology
IC SC: 3.04: Pollution monitoring and control
Elective

Practical

IC.HC: 3.05 Preparation, Separation and Estimation
IC HC: 3.06 Technical Analysis-I
IC HC: 3.07 Technical Analysis-II

4th Semester

Theory papers

IC HC: 4.01: Unit Operations
IC SC: 4.02: Organo Metallic and Bioinorganic Chemistry
IC SC: 4.03: Advanced Analytical Techniques

Practical

IC HC: 4.04: Commercial Analysis
IC HC: 4.05: Experiments in Polymer Chemistry
IC HC: 4.06: Project work and Viva-voice

Industrial Chemistry

Knowledge	Skills/Attitude	Jobs/Employability
• Knowledge with respect to the concepts and methodologies in chemistry. • To execute the challenges associated with subjects of various disciplines of chemistry. • In depth understanding of the major fields in chemistry like Inorganic, Organic, Physical, Analytical, and related fields. • Experimental knowledge • Creative aptitude to work independently and start up new ventures in the fields of application.	• Ability to communicate accurately, reliably, orally and develop written skills • Able to use IT effectively to communicate and perform key work functions • Ability to use the knowledge and techniques a) To analyse chemical information b) To evaluate the appropriateness of different approaches (Chemical, Analytical, Spectral, etc.) in solving problems related to chemical sciences • To offer solutions to the problems in chemical sciences • Able to identify and organize the work priorities and manage them effectively • To exercise the personal responsibility and decision-making abilities • Working effectively with others i.e., to indulge in team work to achieve the shared	Chemistry graduates have opportunities in following areas such as • Pharmaceuticals • Neutraceuticals • Cosmoceuticals • Educational Institutions • Pharma Industry • Forensic Institutes • Research/Institutions • Chemical Industry (Processing Chemist, Research Chemist, etc.) • Laboratory Technicians and Testing Laboratories • Oil refineries and related Industries • Mettellurgy • Cement Industry

	goal with other discipline and background individuals The ability to identify and address their own learning needs in changing circumstances Commitment to ethical practise Being flexible and adaptable Willing to attend different points of view before arriving to decision	Paper and Pulp industries Agro Industry Radiologist Jobs in Public Sectors like Banking, Railways, Forest department, Mining, and many other laboratories where chemistry is needed

Job opportunities in Industrial Chemistry

Knowledge	Skills	Job
• Labelling of samples • Verification of sample dates • Notifying the sample date • Proper protection for sample keeping	• Documentation recording • Good communication skills • Work as per Standard operating procedure	Sample in charge
• Engaurd the warehouse	• Good communication skills • Proper maintain of documentation • Work as per Standard operating procedure	Manager

• Knowledge about chemicals • Keeping proper ventilation • Should know about basic chemistry • Beware of Hazardous chemicals	• Handling of hazardous chemicals • Proper maintain of documentation • Work as per Standard operating procedure	In charge of Chemical Store
• Collection of receipts • Recording of Time and date • Proper English communication	• Follow Goods Manufacturing Process procedures • Good communication skills • Proper maintain of documentation • Work as per Standard operating procedure	Receipt collector (Plant).
• Scale up reactions • Production of large scale materials • Handle laboratory equipment and supplies safely and effectively	• Knowledge of chemistry • Follow Goods Manufacturing Process procedures • Document laboratory activities for reference purposes	Production department
• Plan and manage the Rota for chemist cover within area(s) of responsibility	• Follow Good Manufacturing Process procedures • Document laboratory activities for reference purposes • Good communication skills • Proper maintain of documentation • Work as per Standard operating procedure	Cluster officer
• Scale up reactions • Production of large scale materials	• Follow good manufacturing processprocedures • Document laboratory activities for reference purposes	Officer (Production)

• Handle laboratory equipment and supplies safely and effectively		
• Routine analysis of Samples • Perform Titrametric analysis • Wet analysis like ROI(Residue on Ignition), LOD(Loss on drying).	• Knowledge of analytical chemistry • Follow good manufacturing process procedures • Document laboratory activities for reference purpose	Analyst
• Monitoring the chemical reactions • Perform chemical synthesis in small scale	• Knowledge about organic chemistry • Knowledge about basics of chemistry • Should know preliminary safety precautions	Chemist
• Monitoring the Lab temperature, humidity. • Keeping documentation as per standard operating procedure • Checking of lab hygine	• Knowledge about basics of chemistry • Follow good manufacturing process procedures • Document laboratory activities for reference purposes	Lab manager
• Handling of Equipment's • Handling of bulk plant equipment's.	• Basic knowledge about Instruments • Proper maintain of documentation • Work as per standard operating procedure	Operator
• Routine and non-routine analysis of samples	• Knowledge about analytical chemistry • Knowledge of Acid, bases and salts • Basic computing knowledge	Titration specialist

	• Basic knowledge about Instruments • Proper maintain of documentation	
• To recommend pricing and product positioning strategy based on market trends and competitors strategy. • To launch new products or existing products to new markets. • Training of sales force and provide technical support.	• Must have capability in selection of Products (Analytical Instruments Related Items) as per the Customer s application. Experience in handling analytical Instruments • Knowledge of analytical Chemistry • Must have Good Communication Presentation Skills.	Field executive

Knowledge	Skills	Job
• Routine analysis of Samples • Perform Titrametric analysis • Wet analysis like Residue on ignition, Loss on drying	• Knowledge of analytical chemistry • Knowledge about basics of chemistry • Follow good manufacturing process procedures • Document laboratory activities for reference purposes	• Lab technician • Wet Lab analyst
• Scale up reactions • Production of large scale materials • Handle laboratory equipment and supplies safely and effectively	• Knowledge of Chemistry • Follow good manufacturing processprocedures • Document laboratory activities for reference purposes	• Production assistant

• Sampling and testing of water samples. • Analysis of trace elements present in water. • Hardness of water testing. • Turbidity analysis.	• Knowledge of analytical techniques. • Document laboratory activities for reference purposes	• Chemist (Water plant)
• Monitoring the chemical reactions • Perform chemical synthesis in small scale	• Knowledge about organic chemistry • Knowledge about basics of chemistry • Should know preliminary safety precautions	• R&D monitors
• Routine analysis of Samples • Perform Titrametric analysis • Wet analysis like Residue on ignition , Losson drying. • Handling of Analytical instruments	• Knowledge of analytical chemistry • Knowledge about basics of chemistry • Follow Good Manufacturing Processprocedures • Document laboratory activities for reference purposes	• Analyst trainee
• Routine analysis of Samples • Perform Titrametric analysis • Wet analysis like Residue on ignition , Losson drying.	• Knowledge of analytical chemistry • Knowledge about basics of chemistry • Follow Good Manufacturing Processprocedures • Document laboratory activities for reference purposes	• Junior executive

• Maintain and update good manufacturing process compliant along with state-of-the-art analytical laboratories. • Coordinate pharmaceutical-related activities for all products. • Prepare, update and maintain reports on basis of scientific deductions. • Develop and present well-structured technical presentations inclusive of R and D reports, quality investigation reports and regulatory filing documents. • Interpret all Master Manufacturing Formula documents and perform with production on entire process development.	• Ensure to follow current Good Laboratory Process, CGMP(current good manufacturing process) guidelines with respect to work safety and practices. • Train laboratory staff about usage of analytical and equipment techniques. • Evaluate raw, midway, final product along with stability samples as per given guidelines. • Ensure to qualify, explain and maintain all laboratory equipment's. • Write, revise and prepare standard operating procedures as required.	• Good manufacturing process trainee officer
• Drug coding	• Computer knowledge with chemistry skills	• Pharmacy Assistant
• Routine analysis of Samples • Perform Titrimetric analysis • Wet analysis like Residue on ignition, Losson drying	• Knowledge of analytical chemistry • Knowledge about basics of chemistry • Follow good manufacturing processprocedures	• Junior Analytical Chemist

• Handling of Analytical instruments	• Document laboratory activities for reference purposes	
• Engaurd the warehouse • Good English communication • Recording dispatch batches	• Good communication skills • Proper maintain of documentation • Work as per standard operating procedure	• Warehouse In charge
• Knowledge of Environmental chemistry • Must have knowledge in Air monitoring in Environmental Testing. • Well versed with all the equipment in the laboratory.	• Know the hazards of chemicals • Able to perform testing of air pollutants, soil pollutants and hazardous waste.	• Environment Health and Safety assistant
• Coordinate customer visits and audits. Assist in developing quality goals and improvement plans. • Track quality performance and initiate quality improvement plans. • Define and develop quality criteria- Define outgoing quality plan, work with production, product management and customer.	• Knowledge of analytical chemistry/chemistry • Follow good manufacturing processprocedures • Document laboratory activities for reference purposes	• Quality Assurance executive junior • Junior executive Clinical Labs

• Documentation and procedure compliance. Establish, review and revise quality procedures, establish training / development for quality inspectors and technician for the related products.		
• Routine and non routine analysis of Samples	• Knowledge of analytical chemistry • Knowledge about basics of chemistry • Follow Good Manufacturing Process procedures • Document laboratory activities for reference purposes	• Lab assistant Cosmetics and Perfume Industry • Lab assistant Fertilizer Plants
• Need to have a strong fundamental background in analytical chemistry. • Knowledge for analyzing drugs, DNA, trace, and toxicological evidence.	• Using scientific rules and methods to solve problems. • Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems. • Understanding written sentences and paragraphs in work related documents.	• Lab assistant Forensic Labs
• Knowledge of drugs and their effect. • The medical representative's responsibilities include persuading	• Proven medical sales experience. • Proficient in Microsoft Word, Excel, Outlook, and PowerPoint.	• Sales assistant (Medical representative)

potential customers to purchase company medications.	• Strong negotiation skills. • Excellent organizational skills. • Effective communication skills. • Exceptional customer service	

Knowledge	Skills	Jobs
• Knowledge about titrations. • Knowledge of inorganic chemistry. • Knowledge of spectroscopic technique.	• Develop and qualify new testing methods • Perform visual inspections of finished products • Identify and troubleshoot equipment problems • Receive and inspect raw materials • Perform validations or transfers of analytical methods in accordance with applicable policies or guidelines • Investigate or report questionable test results	Quality Control executive
• Knowledge of chemistry.	• Devising procedures to inspect and report quality assurance issues • Monitoring all operations that affect quality • Supervising and guiding inspectors, technicians and other staff	QualityAssurancee xecutive

• Knowledge of chemical hazardous and carcinogenicity.	• Expert in soil, water and air testing.	Environment Health and Safety officer
• Knowledge of named reactions and reagents, spectroscopic techniques and chromatographic techniques.	• Bigger scale reaction handling (production) • Troubleshoot.	Production Chemist
• Knowledge of named reactions and reagents. • Knowledge of spectroscopic techniques. • Knowledge of chromatographic techniques.	• Logical thinking ability. • Able to perform reactions from (mg scale to gram scale). • Spectral analyzing skills. • Troubleshoot.	Research assistant
• Knowledge of named reactions and reagents. • Knowledge of spectroscopic techniques. • Knowledge of chromatographic techniques.	• Reaction monitoring • Glassware washing	R&D Lab assistant
• Knowledge of Analytical chemistry	• Using a range of software, techniques and equipment to carry out research and analysis. • Analyzing and interpreting data.	Analyst (Validation)

	• Making sure that data is accurately recorded in accordance with guidelines. • Reporting and presenting results. • writing research papers, reports, reviews and summaries	
• Knowledge of pharmaceutical chemistry and plant materials • Knowledge of natural products	• Responsible for performing Organic standard prep and sample analysis • Run Gas Chromatography-ECD, GC-FID, GC-MS, HPLC instrumentation. • Preform data interpretation and reporting.	Chemist (nutraceutical's)
• Knowledge of Chemistry/ Industrial chemistry	• Approving or rejecting all components, drug product containers, closures, in-process materials, packaging material, labelling and drug products. • Review production records. • Ensure that if errors have occurred that they have been fully investigated. • Approving or rejecting drug products manufactured, processed, packed or held under contract by another company. • Approving or rejecting procedures or specifications.	Good manufacturing process Trainee

• Knowledge of Chemistry.	• Devising procedures to inspect and report quality assurance issues • Monitoring all operations that affect quality • Supervising and guiding inspectors, technicians and other staff	Quality Assurance Trainee
• Knowledge of drug design and development • Knowledge of surfactants	• Develop and qualify new testing methods • Perform visual inspections of finished products • Identify and troubleshoot equipment problems • Receive and inspect raw materials	Formulation Trainee
• Knowledge of named reactions and reagents, chromatographic techniques and separation.	• Able to perform reactions from (mg scale to gram scale). • Spectral analyzing skills. • Troubleshoot.	Chemist Fertilizer Industry
• Knowledge of Medicinal chemistry/Drug Discovery and Design.	• Capable of developing potent molecules • Able to do molecular docking • Able to perform molecular simulations	Drug Discovery & Development (CADD)
• Knowledge of chemistry • Knowledge of medicinal chemistry	• Ability tests bodily fluids and tissue samples during autopsies to determine the presence of toxins or chemicals.	Toxicology specialist.

• Knowledge Chemicals (hazardous, carcinogenic)	• Ability work in laboratories and use various methods to locate toxic levels of drugs or other poisons within the body.	
• Knowledge of chemistry/Biochemistry/Biology • Knowledge of enzymes, DNA, RNA.	• Expert in analyze non-biological trace evidence found at crime scenes in order to identify unknown materials and match samples to known substances. • Skill in analyzing drugs/controlled substances taken from scenes in order to identify and sometimes quantify these materials.	Forensic scientist

Knowledge	**Skills**	**Jobs**
• Knowledge of organic reactions and reagents. Knowledge in literature search. designing the schemes, maintaining reaction conditions, spectral analysis.	• Handling synthetic reactions. • Handling small scale reactions (mg scale). • Monitoring the reactions. • Purifying the compounds. • Communication skills	**R&D Chemist (Chemistry/Pharmaceutical chemistry**)
• Knowledge of Analytical chemistry • Routine sampling, analysis and documentation of pharmaceutical samples-	• Handling of Analytical Instruments such asHPLC, GC, etc. • Knowledge of chromatography and spectroscopy techniques.	**Quality Control Analyst (Raw materials)**

raw materials, intermediates, finished products and package materials. • Routine and non-routine analysis for raw materials, in process and finished formulations according to quality test procedures.	• Maintaining documentation of standard operating procedure. • Work as per the Standard operating procedure.	
• Analysis and documentation of pharmaceutical In-process samples, intermediates, finished products. • Responsible for analysis of In-process and Finished Product samples as per approved specification and standard testing procedures. • Responsible for analysis of Stability samples of Finished Products as per approved protocol.	• Experience of working to good manufacturing process • Handling of Analytical Instruments. • handling of chromatography and spectroscopy techniques. • Work as per the Standard operating procedure	**QC Analyst (In process and Finished products)**
• Developing and implementing quality control audit plans. • Identifying testing parameters for products.	• Proficiency in quality management software. • In-depth knowledge of industry standards. • Exceptional attention to detail. • Advanced organizational skills.	**QC Auditor**

• Evaluating production stages and testing the composition, appearance, and functionality of completed products. • Assigning team members to quality audits and overseeing there. • Training employees on quality standards and procedures work.	• Excellent leadership and communication skills	
• Knowledge of chromatography and spectroscopy. • Practical knowledge of analytical instruments (IR, FT-IR, HPLC, LCMS, GCMS, NMR).	• Ability to develop and validate new methods. • Logical and independent mind. • Systematic approach to tasks. • Theoretical knowledge of analytical techniques. • Excellent IT skills.	**Analytical R&D** chemist
• Knowledge of computational software and chemistry simulation techniques to help identify novel hits or leads against selected therapeutic targets, as well as to support medicinal chemistry lead optimization programs.	• Computer tool kits. • Skill of Programming language. • Skill to handle various workstations of CADD.	Drug Discovery & Design chemist (CADD- Computer Aided drug Design).
• Knowledge of computational chemistry. • Knowledge of *in silico* data analysis.	• Knowledge of Computer skills. • Programming language knowledge.	Cheminformatics data scientist

• Knowledge of Cheminformatics data analysis.		
• Lab formulation work to address product issues and product requirements. • Pilot scale coating work to address product issues and product requirements. • Full scale plant trials to address product issues and product requirements.	• Experience in formulation development and/or polymer science. • Experience in project management preferred but not essential. • Good communication skills. • Able to work individually and as part of a multi-disciplinary team.	**Plant Chemist**
• Sampling and testing of water samples. • Analysis of trace elements present in water. • Hardness of water testing. • Turbidity analysis.	• Knowledge of analytic techniques.	Chemist (Water sample testing)
• Professional judgment in regulatory, ecotoxicology, mammalian toxicology, occupational health safety and biochemistry and chemistry • Responsible for conducting risk assessments, support evaluation and authorization processes in order to ensure the regulatory compliant sale and transfer.	• Knowledge in Risk assessment with particular expertise in toxicity profile modeling. • Skillwith Q-SAR toolbox, and other related modeling tools**.**	Toxicologist

• The use of assessment methods/models as alternatives to animals and minimizes unnecessary animal testing without reducing the safety of human health and environment.		
• Using laboratory instrumentation to analyse samples	• Experience in Handling and Troubleshooting of Instruments like HPLC, GC-HS, UV and IR.	Analytical Lab technician
• Regulations, policies, or procedures and compliance matters. • Maintaining data in information systems or databases.	• Good communication skills since they need to interact with clients, staff members and other regulatory authorities • Ensure compliance with regulations • Identify and interpret relevant regulatory guidelines.	Regulatory affairs
• Operation of Liquid filling stations and liquid packaging as well as production of chemicals. • Operating all plant and equipment in a safe, environmentally compliant and efficient manner so as to maximize the sites potential profitability while complying with internal rules and policies and external regulations.	• Experience in a chemical plant environment. • Experience working on site.	Chemical process operator

• Managing the receipt/unloading of bulk raw materials, loading/dispatch of bulk product and packing out and labelling of products as required.		
• Research, analyze and synthesize new and existing materials for product, process development and applications. • Perform analytical and physical testing of rubber products and raw materials to provide support to Production and Quality	• Technically sound Chemistry skills with Polymer Chemist/Rubber Technologist.	**Polymer Chemist**
• Develop and present well-structured technical presentations inclusive of R and D reports, quality investigation reports and regulatory filing documents. • Resolve all complex analytical issues inclusive of validation and development of analytical procedures. • Ensure to transfer of new and current products as appropriate.	• Ensure to follow current Good Laboratory Practice, current good manufacturing process guidelines with respect to work safety and practices. • Train laboratory staff about usage of analytical and equipment techniques. • Evaluate raw, midway, final product along with stability samples as per given guidelines.	**Good manufacturing process chemist**

• Interpret Master Manufacturing Formula documents and perform with production on entire process development.		
• Persuading potential customers to purchase company medications, identifying prospective business opportunities for the company, and providing the relevant departments with customer feedback.	• Proven medical sales experience. • Proficient in Microsoft Word, Excel, Outlook, and PowerPoint. • Strong negotiation skills. • Excellent organizational skills. • Effective communication skills. • Exceptional customer service skills. • Persuasive and resilient.	**Medical Representative**
• Ensuring necessary product certification is created and passed to the sales department. • Performing laboratory tasks with due diligence in accordance with the Laboratory Training Manual and the priorities of the work schedule. • Strictly adhering to policies for Health and Safety, Quality and IT.· Ensuring all	• As a QC Technician, Good instrumentation hands on experience used in pharmaceutical industries.	**Quality Control Executive**

measuring equipment used has valid calibration.		
• Need to have a strong fundamental background in the natural sciences specially chemistry. • Knowledge for analyzing drugs, DNA, trace, and toxicological evidence.	• Systems Evaluation - Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system. • Monitoring - Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action. • Complex Problem Solving - Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions. • Judgment and Decision Making - Considering the relative costs and benefits of potential actions to choose the most appropriate one	**Forensic Chemist (Chemistry)**
• Knowledge of molecular and atomic structure of crystal. • Symmetry of crystals. • Interpret and understand x-rays.	• Ability to analyze data andvisualize structures in 3D. • Abilities in adapting and integrating computer software and Advanced mathematics and communication skills.	**Crystallographer**

• Working knowledge of the Heavy Atom Method and Patterson Techniques. • Molecular Replacement. • Understand structure refinement. • Knowledge of materials, including metals, gases and biological materials such as proteins, nucleic acids and viruses.	• Analytical skills to design experiments. • Computer skills. • Crystal-growing capabilities • Device maintenance, operation, and development.	
• Mastering the patent classification process Assigning classifications in accordance with the Cooperative Patent Classification rules and definitions Classifying applications related to specific technologies	Experience with intellectual property a plus. Exceptional analytical skills and attention to detail. The ability to use computer systems to perform research and classification operations.	Patent Classification specialists (Chemistry)
• Audit analytical testing of finished dosage pharmaceutical products and/or raw materials following analytical methodology for release in commercial and non-commercial purposes. • Knowledgeable in typical pharma analytical laboratory instrumentation including, but	• Manage constructive relationships with customer service agents in field virtually to ensure accuracy in consultant pay and account manager commissions. • Follow legal and client requirements to ensure collection and customer services calls are handled accurately and appropriately.	Quality Control Associate auditor II/Auditor I (Chemistry/Pharmaceutical chemistry)

not limited to HPLC/GC, spectrometry, dissolution, and balances.	• Review prerecorded sale and customer service interactions to identify trends to support business operations. • Performed other duties including ensuring customer satisfaction through problem resolution and excellent customer service. • Develop strategies to improve customer service and customer experience. • Managed assembly procedures for Ford Customer Service Division. • Created quality assurance program for customer service organization.	

CHAIRMAN

Dept of PG Studies in Industrial Chemistry