

ICH – Industrial Chemistry

Offered by the Department of Chemistry, University of Sri Jaywardenepura

Industrial Chemistry is the link between academic research and industrial scale physical and chemical processes which transform raw materials into products that are beneficial to mankind.

B.Sc. (Hons) Degree in Industrial Chemistry

Course code: ICH

Duration: 4 years

Subject combination: Please refer pages 227-228

For whom?

The main objective of the B.Sc. (Hons) degree in Industrial Chemistry program is to prepare the prospective students as industrial chemists and introduce them to the basic attitudes and skills that would be required for their work in industry.

Career opportunities

The B.Sc. (Hons) Degree in Industrial Chemistry, offered by the Department of Chemistry is aimed at training professionals in the field of chemistry to develop skills required of chemists who will be working in industry. The strong foundations laid by the program would enable the students seek employment at industries as R & D manager, bench scientist, technical support specialist, or quality control/quality assurance work. In addition to that, students also can acquire postgraduate qualifications from recognized universities which would lead to a career path in academia in universities and other institutions.

Course overview

The courses offered in the industrial chemistry honors degree program play an important role in the development of skills required of chemists who intended to be working in industry. In this regard, all courses are designed to bridge the industry-academia skill gap and also to introduce more applied chemistry into the degree program in addition to the courses that offer fundamentals of chemistry.

Course structure

The industrial chemistry honors degree students in their third year follow advanced theoretical courses in the core subject areas: organic, inorganic, physical and analytical chemistry, while fourth year students follow applied chemistry courses designed to address the needs of modern knowledge-based industries. Students in the fourth year are also required to carry out an

industrial process oriented research project. The research project helps the students to apply their chemistry knowledge to industrial processes. In addition, students enhance their scientific reasoning, research and analytical skills which prepare them to become chemists who have a good understanding of both chemistry and chemical engineering concepts. At the end of the research project, a dissertation is submitted for assessment, which is evaluated after an oral presentation followed by a *viva voce* examination.

Selection

Selection of the students to follow the B.Sc. (Hons) degree in industrial chemistry is based on the student performance in the first two academic years. The intake is typically limited to a maximum of 10 students.

Mode of instruction and assessment

The modules include lectures, tutorials, laboratory practical, industrial visits and individual and group projects and assignments. They are assessed through end-of-semester written examinations, practical tests, presentations and reports. There is an emphasis of analysis of real industrial problems to reinforce learning. For the practical class, assessment will include attendance, record book and a practical exam. A minimum of 80 % attendance will be an essential requirement for completing the practical component.

B.Sc. (Hons) Degree Course Units

FIRST YEAR

Semester I

ICH 110 1.0	Concepts in Inorganic Chemistry I	c
ICH 108 1.0	Organic Chemistry I	c
ICH 112 1.0	Main Group and Transition Elements	c
ICH 106 1.0	Structure and Properties of Matter	c
ICH 107 2.0	Practicals (Semester I and II)	a

Semester II

ICH 111 2.0	Introduction to Analytical and Nuclear Chemistry	c
ICH 109 1.0	Organic Chemistry II	c
ICH 103 1.0	Chemical Thermodynamics	c
ICH 107 2.0	Practicals (Semester I and II)	a

SECOND YEAR

Semester I

ICH 204	1.0	Electrochemistry	c
ICH 208	1.0	Quantum Chemistry	c
ICH 205	1.0	Chemistry of Heterocyclic and Bioorganic Compounds	c
ICH 211	1.0	Concepts in Inorganic Chemistry II	c
ICH 209	2.0	Practicals (Semester I and II)	a

Semester II

ICH 207	1.0	Phase Equilibria and Surface Chemistry	c
ICH 202	1.0	Chemistry of Coordination Compounds	c
ICH 203	1.0	Organic Spectroscopy	c
ICH 206	1.0	Chemical Kinetics	c
ICH 209	2.0	Practicals (Semester I and II)	a

THIRD YEAR

Semester I

ICH 351	1.0	Biochemistry for Industry I - Bioinformatics	c
ICH 352	1.0	Biochemistry for Industry II - Structural and Industrial Biochemistry	c
ICH 354	1.0	Physical Chemistry for Industry I - Chemical Thermodynamics	c
ICH 355	1.0	Physical Chemistry for Industry II - Solid State Chemistry	c
ICH 356	1.0	Statistical Methods and Applications	c
ICH 357	1.0	Industrial Electrochemistry	c
ICH 358	2.0	Organic Chemistry for Industry I - Physical Organic Chemistry	c
ICH 359	1.0	Current Trends in Green Chemistry	c
ICH 360	1.0	Spectroscopic Methods, Instrumentation and Applications I	c
ICH 362	1.0	Inorganic Chemistry for Industry - Catalysts and Catalyst Design	c
ICH 370	2.0	Molecular Modeling and Computer Aided Drug Designing	c
ICH 371	4.0	Industrial Chemistry Practical Course (Semester I and II)	a

Semester II

ICH 353	1.0	Biochemistry for Industry III - Industrial Biotechnology	c
ICH 361	1.0	Industrial Impact on the Environment	c
ICH 363	2.0	Organic chemistry for Industry II - Organic Synthesis and Applications	c
ICH 364	1.0	Spectroscopic Methods, Instrumentation and Applications - II	c
ICH 365	1.0	Spectroscopic Methods, Instrumentation and Applications - III	c
ICH 366	2.0	Analytical Chemistry for Industry I - Chromatographic Techniques	c
ICH 367	2.0	Analytical Chemistry for Industry II - Microscopic and scattering techniques	c
ICH 368	1.0	Physical Chemistry for industry III - Chemical Kinetics	c

ICH 369 2.0	Food Chemistry and Technology	c
ICH 371 4.0	Industrial Chemistry Practical Course (Semester I and II)	a

FOURTH YEAR

Semester I

ICH 451 1.0	Industrial Minerals I - Metallurgy	o
ICH 452 1.0	Industrial Minerals II - Gemology	o
ICH 453 1.0	Industrial Minerals III - Ceramics and Glass	o
ICH 454 1.0	Polymer Chemistry #	o
ICH 455 2.0	Industrial Waste Management	o
ICH 456 1.0	Rheology and Fluid Dynamics	o
ICH 457 1.0	Alternative Energy Sources and Energy Storage Devices	o
ICH 458 1.0	Quality Assurance and Accreditation	o
ICH 459 1.0	Nanotechnology and Applications in Industry	o
ICH 460 1.0	Medicinal Chemistry	o
ICH 461 1.0	Materials and Processing I - Paint and Coatings	o

Semester II

ICH 462 1.0	Materials and Processing II - Inorganic Polymeric Materials	o
ICH 463 1.0	Materials and Processing III - Engineering Plastics	o
ICH 464 1.0	Materials and Processing IV - Rubber and Latex Technology	o
ICH 465 1.0	Materials and Processing V - Fabric Preparation and Finishing	o
ICH 466 1.0	Fuel and Lubricant Technology	o
ICH 467 2.0	Fundamentals of process engineering	o
ICH 468 2.0	Petroleum Chemistry and Petrochemical Industry	o
ICH 469 1.0	Industrial Management and Marketing	o
ICH 470 1.0	Industrial Utilization of Medicinal and Aromatic Plants	o
ICH 471 1.0	Fundamentals of Agrochemistry and Agrochemical Industry	o
ICH 472 1.0	Polymer Blends and Composites	o
ICH 473 8.0	Industry Based Research Project and Industrial Visits (Semester I and II)	a

-a- compulsory

-c- core

-o- optional

-#- Students who have followed Polymer science and technology as a subject in the first two years are not allowed to follow this course.

Edited : 2018