MANGALORE UNIVERSITY
DEPARTMENT OF INDUSTRIAL CHEMISTRY

M. Sc. DEGREE PROGRAMME IN INDUSTRIAL CHEMISTRY
(Effective from the Academic Year 2021-22)

Two years Master Degree programme (Four Semesters) M.Sc. Industrial Chemistry (CBCS)

PREAMBLE

Revision of syllabi for the two years' Master Degree (Choice Based Credit System- Semester Scheme) Programme in Industrial Chemistry

PG BOS in Industrial Chemistry has revised and prepared the syllabi (CBCS based) for the PG course in Industrial Chemistry by giving certain guidelines to offer Hard Core, Soft Core and Open Elective courses with credits to each course amounting to **90** credits for the entire programme.

There are totally **9** theory courses, One semester Industrial project in IV semester are assigned as Hard Core courses with a total credits of 54. Students have to study 3 soft core courses each in I ,II and III semester. The choice has been given for the soft core courses in the I ,II and III semesters for Industrial chemistry post graduates. All 9 practical courses will be taught as soft courses with 2 credits for each courses in I and II semester where as III semester practical courses are given 3 credits. Total Soft core credits amount to 30. Board of Studies in Industrial chemistry has carefully chosen two Open Elective courses for the students from other disciplines, one each in II and III semester, with total credits of 6. Therefore, grand total credits for the programme = **90.**

A detailed skeleton of the entire programme is being tabulated for the benefit of the aspiring post graduates. Other important aspects such as University question paper pattern, internal assessment examinations, allotment of marks and the approximate dates of the internal examinations are being tabulated with a discussion in the BOS.

Program Objectives:

The M.Sc. Industrial chemistry course has an objective to impart knowledge of chemistry and hands-on experience to the students. The program includes an in-depth study on a number of areas in chemical sciences to which students are introduced at the core curriculum level, theoretical and experimental solutions to various problems and molding the students relevant to contemporary industries. The areas introduced by the department include agrochemicals, pharmaceutical chemistry and Petrochemicals. Beside the theoretical and laboratory based curriculum, students complete an advanced project in the final semester of the program at an industry.

The degree provides a solid foundation in the discipline of core chemical sciences, critical thinking and problem solving skills. During the academic program students also develop excellent written and oral communication skills, learn to work as a team and project management.

The objectives of this Postgraduate program include:

- To provide the highest level of education in chemical sciences and provide competent, creative and imaginative scholars.
- To encourage free will and objective oriented enquiry for knowledge.
- To make a significant contribution towards the development of skilled technical manpower. Thus cater to the need of growing demand of intellectual reservoir in the nation.
- The program is designed to achieve the objectives and to inculcate in the students concepts and intellectual skills, courage, integrity, awareness and sensitivity towards the needs and aspirations of the society.

Two-year Master's Degree Course (Four Semesters) M Sc Industrial Chemistry (CBCS)

Sl. No.	Semester	Hard core credits	Soft core credits	Open elective credits	No. of Practical Paper Project*	No. of Theory Paper	Total credits
1.	I Semester	12	9	-	3 (S)	3(H) +1(S)	21
2.	II Semester	12	9	3	3 (S)	3(H)+1(S)	24
3.	III Semester	12	12	3	3(S)	3(H)+1(S)	27
4.	IV Semester	18	---	--	Industrial Project (H)	-----	18
	Total	**54**	**30**	**6**			**90**

Description of course	Courses Hard Core/ Soft core	Teaching Hrs/week	Credits	Hrs. of exam	Max Marks: Exam + IA = Total
I SEMESTER					
ICH 401 : Inorganic Chemistry	H	4	**4**	3	70+30=100
ICH 402 : Organic Chemistry-I	H	4	**4**	3	70+30=100
ICH 403 : Physical Chemistry	H	4	**4**	3	70+30=100
ICS 404: Environment Health and Safety Measures	S	3	**3**	3	70+30=100
ICS 405: Paper and Textile technology	S				
ICP406 : Inorganic Chemistry Practicals-I	S	4	**2**	4	70+30=100
ICP 407 : Organic Chemistry Practicals-I	S	4	**2**	4	70+30=100
ICP 408 : Physical Chemistry Practicals-I	S	4	**2**	4	70+30=100
			21		**700**
II SEMESTER					
ICH451 : Analytical Chemistry	H	4	**4**	3	70+30=100
ICH452 : Advanced organic Chemistry	H	4	**4**	3	70+30=100
ICH453:Energy Systems, Colloids and Petrochemicals	H	4	**4**	3	70+30=100
ICS 454 : Chemical Engineering Technology	S	3	**3**	3	70+30=100
ICS 455: : Chemical analysis in agro and food industries	S				
ICP 456 : Techniques in quantitative analysis	S	4	**2**	4	70+30=100
ICP 457 : Estimations and extractions in organic chemistry	S	4	**2**	4	70+30=100
ICP 458 : Electroanalytical techniques	S	4	**2**	4	70+30=100
ICE 459 : Industrial Safety, Environmental and Electrochemical Sciences	OE	3	3	2	70+30=100
			24		**800**
III SEMESTER					
ICH 501 : Spectroscopic Techniques	H	4	4		70+30=100
ICH 502 : Industrial Catalysis and polymers	H	4	4	3	70+30=100
ICH 503: Synthetic, Heterocyclic and Medicinal Chemistry	H	4	4	3	70+30=100
ICS 504: Polymers and Soft materials	S	3	3	3	70+30=100
ICS 505: Computer aided drug design	S				
ICP 506: Synthesis of complexes, catalysts and estimation of alloys	S	6	3	5	70+30=100
ICP 507: Systematic qualitative analysis and identification of organic compounds	S	6	3	5	70+30=100
ICP 508: Synthesis, characterization and applications of Polymers and composites	S	6	3	5	70+30=100
ICE 509: Agriculture and Health care Chemicals	OE		3	2	70+30=100
			27		**800**
IV SEMESTER Project Work (4 Months) ICH 551 : Project Report ICH 552 : Viva-voce Examination	H		**18**		400+200 100
					Total= 700
			90		**Grand Total=3000**

BASIS FOR INTERNAL ASSESSMENT

Internal assessment marks in theory papers of I, II and III semesters shall be based on average of two tests conducted 10^{th} and 14^{th} weeks after the start of a semester.

- Internal assessment in I Semester shall be awarded as: 20 marks for Test and 10 marks for assignment written on a given industrially related topic.

- Internal assessment in II Semester shall be awarded as: 20 marks for Test and 10 marks for seminar for hard core subjects and assignment for softcore subjects.

- Internal assessment in III Semester shall be awarded as: 20 marks for Test and 40 marks for industrial visit report which will be equally distributed to three hard core and one soft core paper.

- Practical internal assessment marks shall be based on test (25) and record (5) for I semester. For II and III semesters IA shall be based on practical test (15 marks), Viva (10 marks) and record (5marks). The practical test may be conducted towards the end of the semester.

THEORY QUESTION PAPER PATTERN FOR HARD CORE, SOFT CORE AND OPEN ELECTIVE COURSES

Question Papers in all the four semesters shall consist of Parts A and B.

- **Part A** shall contain eight (8) very short answer objective type questions carrying 2 marks each drawn from all the four units of the syllabus (2 questions per unit). Five (5) questions are to be answered. There may be a maximum of two sub-divisions per question, carrying one (1) mark per sub-division.

- **Part B** shall contain eight (8) brief and/or long answer questions carrying 12 marks each drawn from all the units of the syllabus (minimum 2 questions per unit). There may be a maximum of three sub-divisions per question, carrying 3 or more marks per sub-division. Five (5) out of eight (8) questions are to be answered from Part B.

PRACTICALS EXAMINATION PATTERN

In the I semester 70 marks shall be awarded based on the experiment. But in the II and III semesters, out of 70 marks, 20 marks are for the viva-voce to be conducted during practical and 50 marks for the experiment and the scheme of evaluation can be decided by the examiners during examination.

Candidates of IV semester shall undergo a compulsory project work in an industry for four months and prepare a report on their work. The Project Report shall be evaluated by two examiners as in the case of theory papers. Internal Assessment marks shall be allotted by project supervisors at the Industry. The progress of the project work of a student will be evaluated time to time by internal guide from the department. Viva-Voce examination is to be conducted as per the University regulations.