GANPATUNIVERSITY

FACULTYOFENGINEERING&TECHNOLOGY

Programme	Bachelorof Technology	Branch/Spec.	Chemical Engineering
Semester	IV	Version	1.0.0.0
Effectivefrom AcademicYear	2025-26	EffectiveforthebatchAdmitted in	July2025
Subject code	2CH4102	Subject Name	Industrial Inorganic Processes

Teaching scheme						Examination scheme(Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:

1.Knowledge of basic chemistry

Course Outcomes

CO1: Understand the manufacturing, properties, and applications of industrial gases, acids, and inorganic Pigments.
CO2: Analyze the production of marine chemicals and nuclear materials, including uranium extraction And safety measures.
CO3: Evaluate Chloro-Alkali, Electrolytic, and Electrochemical processes for soda ash, caustic soda, Chlorine, and abrasives.
CO4: Apply knowledge of fertilizer manufacturing, including nitrogenous, phosphate, and complex Fertilizers, with sustainability considerations.

Theory syllabus

Unit	Content	Hrs
1	**Industrial gases:** Manufacture of CO, CO_2, H_2, N_2, O_2, and rare gases (including acetylene - C_2H_2), Separation and purification techniques.	6
2	**Industrialacids:** Manufacture and applications of Nitric Acid, Sulfuric Acid, and Phosphoric Acid, Environmental considerations and modern advancements in acid production.	5
3	**IndustrialCarbon&Inorganicpigments:**Manufacture, properties, and applications of Lamp Black, Carbon Black, Activated Carbon, Graphite, and Industrial Diamond. White pigments: White Lead, Zinc Oxide, Titanium Dioxide, and Lithopone – production methods, properties, and uses.	8
4	**Marine chemicals & Nuclear industries:** Extraction of common salt from seawater and recovery of by-products from bitterns. Production and industrial uses of Bromine. Overview of nuclear fission reactions and nuclear energy, Nuclear reactors, Radioactive safety measures and environmental impact.	10
5	**Chloro-Alkali & Electrolytic and Electrochemical industries:** Manufacture of Soda Ash, Caustic Soda, and Chlorine (Diaphragm cell, Mercury cell, and Membrane cell technologies). Production and applications of Potassium Chlorate and Perchlorate.Calcium Carbide, Silicon Carbide – synthesis and applications.	9
6	**Fertilizers:** Classification of fertilizers: Nitrogenous, Phosphatic, Potassic, Compound & Complex fertilizers.Manufacture and applications of Ammonia, Urea, Ammonium Nitrate, Ammonium Sulphate, Monoammonium & Diammonium Phosphate. Environmental aspects and advancements in fertilizer technology.	7

Practical content	
The Practical/term work shall be based on the topics mentioned above and will be defended by the candidates.	
Textbooks	
1	Industrial Chemistry byB.K.Sharma, GoelPub.House, Meerut.
2	Dryden,C.E. “Outlines ofChemical Technology”(EditedandRevisedbyM.GopalRaoandSittig .M) East WestPress.Pvt.Ltd,NewDelhi,3rdEdition (1997)
Reference Books	
1	AustinG.T,”Shreve’sChemicalProcessIndustries”, 5thed.McGraw-Hill.(1984).
2	G.N.Pandey,"TextbookofChemicalTechnology", Vol.I, 2ndrevised edition,(1994).
3	Textbook ofEngineeringChemistry,by S.S.Dara, Chand &Co. New Delhi
ICT/MOOCsreferences	
1	https://nptel.ac.in/courses/103106108/
2	https://www.youtube.com/watch?v=ZoUIfoGr-UM

MappingofCOwithPOandPSO:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	1	1	1	1	1	2	3	2	2
CO2	2	3	2	3	2	2	2	1	1	1	1	2	3	3	3
CO3	3	3	3	3	3	2	2	1	1	2	2	2	3	3	2
CO4	3	2	3	3	2	3	3	2	1	1	2	2	3	3	3