बिरसा मुंडा ट्रायबल युनिवर्सिटी
Birsa Munda Tribal University

राजपिपला, जि॰ नर्मदा Rajpipla, Dist. Narmda
Established by Tribal Development Department, Govt. of Gujarat

School of Science

M.Sc. (Chemistry) Programme

Subject Code & Name: - MS02ECHE02 & Industrial Chemistry

Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				Internal		External	
L	T	P	Total	TH	PWE	TH	PWE
2	-	2	4	25	25	25	25

Programme Name	M.Sc. Chemistry
Semester	II
Course Code	MS02ECHE02
Course Title	Industrial Chemistry
Course Content Type (Th./Pr.)	Theory
Course Credit	4
Sessions+ Lab. Per Week	4
Total Teaching/Lab. Hours	60 Hours
* 2 Laboratory = 1 Session	

Learning Objectives

1. An introduction to Industrial chemistry and a summary of significant Industrial techniques are provided in this course.
2. A review is given of significant Industrial techniques from the fields of separation, Liquid-Liquid Extraction , Distillation .
3. In this course, learners will gain an overview of the important use of selected classical and instrumental methods and a short introduction to their basic theory.
4. Mass transfer operations and its principles.

Prerequisites (if any)

Learning Outcomes

On the Completion of this course, students will able to:

1. Equip students with skills to select proper appropriate instruments, design control system, and optimize process.
2. Enable students to perform essential calculations in distillation .

School of Science

M.Sc. (Chemistry) Programme

Detailed Contents		
UNIT	**TOPIC/SUB-TOPIC**	**TEACHING HOURS**
I	**Chemicals from C_1 compounds and C_2** **Manufacture of following compounds:** Methane, Ethylene, Acetylene **Manufacture of following compounds from Methane:** Methanol, hydrogen cyanide, carbon disulphide **Manufacture of following compounds from Ethylene:** Ethyl chloride, ethanol, ethelene oxide, ethylene glycol, acetic acid, styrene, vinyl acetate. Manufacturing process, properties and uses of nitrobenzene, m-dinitrobenzene. Nitration process of chlorobenzene, acetanilide, toluene.	15
II	**Liquid-Liquid Extraction:** Introduction & classification of various separation methods. Difference between distillation and extraction,application,distribution coefficient and its terminology, triangular diagrams, solvent selection, introduction: extraction equipments. **Distillation:** Introduction, type of distillation, volatility and relative volatility, boiling point diagram, and equilibrium diagram, mass and enthalpy balance calculation ,calculation of theoretical plates, equipments of distillation.	15

Text Book(s)

1. B.K. Bhaskar Rao, (2002),Petrochemicals,Khanna Publishers,5th Edition,8174090444
2. Nelson, (1982), Petroleum Refinery Engineering, McGraw Hill, 4th Edition

sReference Books

1. A.L. Waddams, (1978), Chemicals from Petroleum, John Murray, 4th revised Edition,
2. Rao & M Gopala,1997, Dryden's Outlines Of Chemical Technology, East-West Press,

Web Resources

1. www.nptel.ac.in
2. www.swayam.gov.in
3. www.epgp.inflibnet.ac.in (e-PG pathshala)
4. www.ndl.iitkgp.ac.in (National Digital Library)

School of Science

M.Sc. (Chemistry) Programme

Required Software(s) (if any)
Practical(s) (if any)
Industrial Practicals: 1. Nitration process of chlorobenzene. 2.Nitration process of acetanilide 3.Nitration process of toluene 4.Separating an organic mixture containing an acid, a base, and a neutral compound (benzoic acid, aniline, and naphthalene) using Acid-Base (Chemically Active) Extraction 5. To separate a miscible liquid-liquid mixture (water and ethanol) or to separate a liquid from non-volatile solutes.

L:: Lecture, **T::** Tutorial , **P::**Practical

PWE:: Practical Work Exa mination

(PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)