

NATIONALLY HARMONISED B.Sc. CHEMICAL ENGINEERING PROGRAM				
Course Code	ChEg3142			
Course Name	Process Industries II			
Degree Program	B.Sc. in Chemical Engineering			
Module Name	Process industries			
Module Coordinator	N.N.			
Lecturer	N.N.			
Instructor's Contact Information	Office: Phone: Email: Office hour:			
ECTS Credits	5 CP			
Contact hours (per week)	Lecture	Tutorial	Industrial Visit	Home study
	4	0	1	3
Student workload (hrs per semester)	Lecture	Tutorial	Industrial Visit	Home study
	64	0	16	48
Mode of delivery	Parallel (per semester)			
Course Objectives & Competences to be Acquired	<p>The course will introduce the students with the basic principles and steps inorganic process industries. Upon the completion of the courses:</p> <ul style="list-style-type: none"> ➤ The students will be able to explain unit operation and processes in technologies. ➤ The students will be able to apply chemical engineering design sugar and leather processing factories. 			
Course Description/Course Contents	<p>Fermentation technology</p> <ul style="list-style-type: none"> ✓ Alcohol and beverage ✓ Penicillin production <p>Modern biotechnology industry</p> <ul style="list-style-type: none"> ✓ Environmental biotechnology ✓ Industrial Enzymes, Biocatalysts, and Chemicals Biotech drug products 			

Pharmaceutical Technology

- ✓ Drug formulation development
- ✓ Process Development
- ✓ Regulatory Affairs
- ✓ Quality Control
- ✓ Quality Assurance
- ✓ Package Engineering
- ✓ Analytical Development

Sugar processing

- Introduction of Sugarcane
- Process description
 - ✓ Cane preparation
 - ✓ Milling
 - ✓ Cane diffusion
 - ✓ Juice heating
 - ✓ Clarification
 - ✓ Filtration
 - ✓ Evaporation
 - ✓ Condensers and vacuum equipment
 - ✓ Syrup clarification
 - ✓ Crystallization
 - ✓ Cooling crystallizers
 - ✓ Centrifugal separation
 - ✓ Molasses exhaustion
 - ✓ Drying and storage of raw sugar
 - ✓ Raw sugar quality

Cement Technology

- ✓ Introduction
- ✓ Process description
- ✓ Energy utilization
- ✓ Environmental assessment

Leather Processing

- Introduction
 - ✓ Potential
 - ✓ Characteristics of hide and skins
 - ✓ Collagen
 - ✓ Curing
- Unit Operations in Leather Manufacturing
 - ✓ General process description
 - ✓ Pre-tanning
 - ✓ Tanning
 - ✓ Post-tanning and finishing
- Processes and techniques involved in the manufacture of different types of leathers

	<ul style="list-style-type: none"> ✓ Type and classification of leather products ✓ Type and nature of raw material required with respect to the end leather product ✓ Principles of different tanning and post tanning techniques adopted in heavy leather production ✓ Processes and techniques involved in the manufacture of different types of light leathers ✓ Marketing overview • Tanneries and the Environment <ul style="list-style-type: none"> ✓ General features of organic and inorganic pollutants of tannery ✓ Stabilization and disposal of organic and inorganic pollutants of tannery ✓ Treatment of tannery effluents ✓ Overview on cleaner leather processing ✓ Environmental legislation with respect to leather Manufacturing • Industrial visit (mandatory)
Pre-requisites	None
Semester	Year III, Semester II
Status of Course	Compulsory
Teaching & Learning Methods	Lectures, Industrial visit, Group discussion, Home study,
Assessment/Evaluation	<p>Continuous Assessment.....50%</p> <ul style="list-style-type: none"> ✓ Quizzes(at least 2).....10 ✓ Assignments (at least 2)10 ✓ Tests(at least 2).....15 ✓ Presentations (at least 3).....15 <p>Final exam.....50%</p>
Course Policy	<p>Attendance: As per harmonized academic policy 100% during industrial visits</p> <p>Assessments: students are supposed to handle all assessments on time.</p> <p>Cheating/plagiarism: it is strictly forbidden and any misconduct is accountable as per the students' code of conduct.</p> <p>Note: do not chew gum, eat, listen to recorders or CD players, wear sunglasses, or talk about personal problems.</p>

	Please be sure to turn off pagers and cell phones before class and exam sessions
Literature	<p>Reference Books</p> <ol style="list-style-type: none"> 1. Peter W. Rein, cane sugar engineering, 2006 2. Hugot for sugar technology 3. Flaherty, Willian Roddy, T Robert M Lollar, 'The Chemistry and Technology of Leather' Vol. I Preparation for Tannage, E Robert Krieger Publishing Co., New York, 1978. 4. R. Read, 'Science of Students of Leather Technology', Oxford Pergamon, 1966. 3. K.H. Gustavson, 'The Chemistry and Reactivity of Collagen' Academic Press, New York, 1956. 5. K.T. Sarkar, Theory and Practice of Leather Manufacture, Ajoy Sorcar, Madras, 1981. 6. C. Koteswara Rao and M.S. Olivannan, Lecture Notes on dyeing finishing of leathers, CLRI, Madras, 1983. 7. S. S. Dutta, Introduction to the Principles of Leather Manufacture, Indian Leather Technologists' Association, Professional Profile Calcutta, 1980. 8. T.C. Thorstenson, Practical Leather Technology, Robert E. Krigeger Publishing Co., Malabar, Florida, 1985. 9. B. kohlhaas, Cement engineers' hand book, 4 ed, 1983 10. Kurt E. Peray, Cement Manufacturer's hand book, 1979
Approval Section	Module team/ Course chair