

GUJARAT TECHNOLOGICAL UNIVERSITY

BRANCH NAME: Rubber Technology (26)
SUBJECT NAME: Rubber Plant & Process Engineering
SUBJECT CODE: 2172603
B.E. Semester-VII

Type of course: (B. E. Rubber Technology)

Prerequisite:

Rationale:

Teaching and Examination Scheme:

| Teaching Scheme | | | Credits C | Examination Marks | | | | | | Total Marks |
|-----------------|---|---|--------------|-------------------|-----|---------|-----------------|-----------|---|----------------|
| L | T | P | | Theory Marks | | | Practical Marks | | | |
| | | | ESE (E) | PA (M) | | ESE (V) | | PA (I) | | |
| | | | | PA | ALA | ESE | OEP | | | |
| 3 | 0 | 0 | 3 | 70 | 20 | 10 | 0 | 0 | 0 | 100 |

Content:

| Sr No. | Course Content | Total Hrs | % Weightage |
|-----------|--|--------------|----------------|
| 1. | Industrial Sanitation & Housekeeping: | 6 | 10 |
| 2. | Industrial Safety: General introduction, Safety science, Technology of hazard identification, Nature of fire & explosion & their Remedies, Safety in use of Rubber machineries & Equipments. Toxic hazards of Rubber Chemicals & their handling. | 6 | 15 |
| 3. | Industrial Pollution: Various types of Environmental pollution by Rubber Industries, Their impact & remedial measures. | 6 | 10 |
| 4. | Location & Layout: Factory location & layout, Plant location & layout, Equipment layout Guiding principles for layout of rubber industry. Calculation of storage area. | 6 | 10 |
| 5. | Motion & Time Study : establishing time value of time study, processing & use of time study date. Aims and benefits of time and motion study. | 6 | 10 |
| 6. | Cost Estimation & Profitability Analysis: Costing, Fixed, Variable & overhead costs, Job costing & Process costing, Product Cost, Cost analysis. Investment, Profitability analysis Projected cash flow statements and balance sheets. Introduction to project identification & Formulation for Rubber products. | 6 | 10 |
| 7. | Plant Maintenance: Types of Plant maintenance : Unplanned and planned maintenance, Preventive maintenance and its importance. | 6 | 15 |

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|-----------|--|----------|-----------|
| 8. | Just In Time Concept: Concept of JIT, Right first time and Total quality management. | 6 | 10 |
| 9. | Waste Management: Different ways of Waste disposal in rubber industry. | 6 | 10 |

Suggested Specification table with Marks (Theory):

| Distribution of Theory Marks | | | | |
|-------------------------------------|----------------------------------|--------------------------------|----------------------------|-----------------------------|
| Remembrance R Level | Understanding U Level | Application A Level | Analyze N Level | Evaluate E Level |
| 14 | 14 | 14 | 14 | 14 |

Reference Books:

- **Rubber Processing & Production Organisation. By: Philip K. Freakley**
- **Toxic Hazards of Rubber Chemicals By: A. R. Nutt.**
- **Rubber Products Manufacturing Technology By: Anil K. Bhowmick**

Course Outcome:

After learning the course the students should be able to:

- Understand the Industrial Sanitation & Housekeeping.
- Know about Safety science..
- Learn about Various types of Environmental pollution by Rubber Industries..
- Study about their impact & remedial measures.
- Know about Equipment layout Guiding principles for layout of rubber industry
- Learn about the Aims and benefits of time and motion study.
- Understand the Projected cash flow statements and balance sheets.
- Learn about the Concept of JIT.
- Understand the different ways of Waste disposal in rubber industry.

List of Experiments:

Tutorials/Presentation/ based on above topics.

Design based Problems (DP)/Open Ended Problem:

- Environmental Concern Of Pollution In Rubber Industry.
- Environmental Pollution, Its Sources and Effects
- Plants with High Safety Requirement

Major Equipments:

Industrial Visit for different Rubber Industries, Different Case Study etc.

List of Open Source Software/learning website:

- <http://esatjournals.net/>
- <http://www.tropical-rainforest-animals.com/Environmental-Pollution.html>
- <http://www.chemionics.com/natlatex.html>
- <http://safety-work.org/>

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.