



# GUJARAT TECHNOLOGICAL UNIVERSITY

**Bachelor of Engineering**

**Subject Code: 3152310**

**Semester – V**

**Subject Name: Auxiliary equipments in Plastic Industries**

**Type of course: Professional Elective Course**

**Prerequisite: NA**

**Rationale:** There is an inevitable need of Auxiliary equipments in today's modern plastic processing industries. The auxiliary equipments help in running the plastic processes with automation and preciseness. At the end of this course the student will be able to have the knowledge of various auxiliary equipments used in plastic industries. This knowledge will help the students to operate the auxiliary equipments in line with the processing machines.

**Teaching and Examination Scheme:**

| Teaching Scheme |   |   | Credits<br>C | Examination Marks |        |                 |        | Total<br>Marks |
|-----------------|---|---|--------------|-------------------|--------|-----------------|--------|----------------|
| L               | T | P |              | Theory Marks      |        | Practical Marks |        |                |
|                 |   |   |              | ESE (E)           | PA (M) | ESE (V)         | PA (I) |                |
| 3               | 0 | 2 | 4            | 70                | 30     | 30              | 20     | 150            |

**Content:**

| Sr. No. | Content  | Total<br>Hrs |
|---------|--|--------------|
| 1       | Pre & Post part handling for Injection Molding machines<br>-Robotic & Conveyor Belt techniques<br>-Insert molding<br>In mold Labeling with Robotics<br>-Post Molding-Conveyor belts<br>-Counting of parts<br>-Segregation of runner and parts<br>-Conveyor systems for taking runner and feeding it into the grinder | 8            |
| 2       | Heating & Cooling equipments for plastic processing machines like Injection, Extrusion & Blow Molding<br>Raw Material Drying<br>- Oven Drying<br>- Hopper Drying<br>- De-humidifying air dryer<br>- Mold Temperature Controller<br>- Chiller for Cooling<br>- Cooling Tower  | 15           |
| 3       | Centralized conveying system for plastic powders & granules<br>-Hopper loaders<br>-Volumetric & Gravimetric blenders   | 5            |



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|   |  |   |
|---|--|---|
| 4 | Recycling using Auxiliary Equipments<br>- Granulators ( Low, Medium & High Speed Granulators)<br>- Shredders   | 6 |
| 5 | Auxiliary Equipments for Extrusion Machinery<br>- Crammer Feeders<br>- Hopper loaders<br>- Mixing Sections<br>- Post Extrusion Mixing<br>- Screen Changers<br>- Breaker Plate and Die cleaning<br>- Take Off & Cutting Equipment for Pipe & tubing | 8 |

### Suggested Specification table with Marks (Theory): (For BE only)

| Distribution of Theory Marks |         |         |         |         |         |
|------------------------------|---------|---------|---------|---------|---------|
| R Level                      | U Level | A Level | N Level | E Level | C Level |
| 20                           | 20      | 15      | 5       | 5       | 5       |

**Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

### Reference Books:

1. **Plastic Materials & Processes** by Seymour S. Schwartz And Sidney H. Goodman
2. **Extrusion of Plastics** by Hensen
3. **Polymer Extrusion** by Rauwendaal

1. The theory should be taught and practical should be carried out in such a manner that students are able to acquire required learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

| Sr. No. | CO statement                                | Marks % weightage |
|---------|---|-------------------|
| CO-1    | Understand Pre & Post Part handling systems | 15                |



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|      |   |    |
|------|---|----|
| CO-2 | Explain the working Heating & Cooling through equipments for plastic processing machines      | 30 |
| CO-3 | Understand the centralized conveying system and recycling plastics using auxiliary equipments | 20 |
| CO-4 | Explain the working and importance of Auxiliary Equipments used in Extrusion Process.         | 15 |
| CO-5 | Operate various Auxiliary equipments used in plastic processing industries.                   | 20 |

**List of Experiments: - As per the syllabus topics**

**Major Equipment:**

**List of Open Source Software/learning website:**

- i. [www.sciencedirect.com](http://www.sciencedirect.com)