

# GUJARAT TECHNOLOGICAL UNIVERSITY

## Plastic Technology

### B. E. SEMESTER: VI

Subject Name: **Additives & Compounding**

Subject Code: **162305**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Practical (I)
2	0	2	4	70	30	50

Sr. No.	Course Contents	Total Hrs
1.	<b>Introduction –</b> Technological Requirements – Classification – Chemistry and Mechanism – Selection Criteria – General effect on Properties – Evaluation and functions of additives.	6
2.	<b>Fillers – Reinforcements –</b> Thermal Stabilizers- Antioxidants (Heat & UV) – Plasticizers - Impact Modifiers – Lubricants - Processing aids – Blowing agents – Flame Retardants – Anti-static agents – Anti blocking agent- Slip and anti slip agent- processing aids- Mould releasing agents. Conductive additives- Toughening agents – Nucleating agents – Colorants – Additives for Recycling – aids – mould releasing agents, coupling agents.	8
3.	<b>Selection of Polymers and Compounding ingredients –</b> General objectives – possibilities and limitations of mixing and compounding – Methods of incorporation of additives into polymer materials, Mixing and mixing equipments.	8
4.	<b>Mixing and Mixing Equipments. Principles –</b> Operating characteristics – Machine construction – Specifications – Process control systems and working details of Batch mixers and continuous mixers – High speed mixer – Two roll mill – Banbury Mixer – Ribbon blender – Planetary mixers –	8

5.	<b>End Use Market for Plastics</b>  Principles of Material selection including consideration of conventional materials competitive with plastics – Case studies on material suitability (e.g., Plastic Gears, Feeding Bottle, Bowels for micro wave ovens). Survey and uses of plastics additives with reasons for their importance in major industries like, Agriculture, Packaging, Building, Transport, Electrical, Electronics and Telecommunications, Medical and Furniture.	6
----	---	---

### **Text Books:**

1. J. A. Brydson, *Plastics Materials*, Butterworth Heinemann, Oxford, 1999.
2. John Murphy, *The Additives for Plastics Hand Book*, Elsevier Advanced Technology, Oxford, 1996.

### **Reference Books:**

1. R. Gachter and H. Muller, *Plastics Additives Hand Book*, Hanser Publishers, Munich, 1993.
2. Jesse Edenbaum, *Plastics Additives and Modifiers Hand Book*, Chapman & Hall, London, 1996.
3. Ica Manas – Zloczower and Zehev Tadmor, *Mixing and Compounding of Polymers*, Hanser Publications, Munich, 1995.
4. Nicholas P. Cheremisionoff, *Polymer Mixing and Extrusion Technology*, Marcel Dekker Inc., New York, 1995.