

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: II

Plastic Engineering

Subject Name: **SECONDARY PLASTICS PROCESSING TECHNIQUES**
(Minor Elective-II)

Sr.No	Course content
1.	<p>Calendering, Thermoforming and Rotomoulding Calendering: Introduction – type of calenders – roll configuration – Definition of terms such as calender bank – calendering process – process variable and application.</p> <p>Thermoforming: I</p> <p>ntroduction – pressure forming – vacuum forming – Techniques of vacuum forming – simple vacuum forming, drape forming, plug assisted forming, snap-back vacuum forming – pressure snap-back forming-blow back forming – merits & demerits of vacuum forming – vacuum forming moulds. Pressure forming – Advantages over vacuum forming – material for thermo forming – heating systems. Matched die forming – continuous forming methods – application.</p>
2.	<p>FRP Laminates:</p> <p>Introduction, FRP processing methods – contact moulding – hand lay up, spray up method – vacuum bag & pressure bag moulding, filament winding, centrifugal casting, pultrusion, matched die moulding – Laminates, definition of terms – high, pressure laminating process, types of machinery, impregnation systems – decorative and industrial laminates, continuous high pressure laminating process, application.</p>
3.	<p>Cellular Plastics:</p> <p>Introduction – process to create foam in resins – mechanical foaming, chemical foaming, physical foaming – processes to shape and solidify foams – low pressure foam moulding, high pressure foam moulding, RIM extrusion foaming, casting foams, steam chest moulding structural foam moulding – applications.</p>
4.	<p>Machinery & Joining of Plastics:</p> <p>Introduction – Importance of machining – methods viz. cutting, drilling, blending, filling, etc. Joining – principles – cohesion principle, adhesion principle – solvent cementing, Dop cementing, welding of plastics – viz. high frequency welding thermal sealing, spin welding, vibration welding, hot plate welding, ultrasonic welding, Adhesive bonding – examples: Mechanical fasteners.</p> <p>Other Secondary Processes:</p> <p>Printing, painting, Hot stamping, In mould decoration, Electro plating and vacuum metallising</p>

5.	<p>Casting Processes:</p> <p>Dipcasting, slush casting, continuous casting, cell casting, processes and applications.</p> <p>Rotational Moulding:</p> <p>Introduction – principle – process – machinery used – materials – moulds, process parameters – merits & demerits of roto moulding.</p> <p>Coating Processes:</p> <p>Roller coating, powder coating, fluidised bed coating, electrostatic spray coating, processes and applications.</p>
----	---

Reference Books:

1. Donal V. Rosato & Dominick V. Rosato, *Plastics Processing Data Book*, Van Nostrand Reinhold, New York, 1990.
2. A. Brent Strong, *Plastics: Materials and Processing Practice* – Hall, New Jersey, 1996.
3. M.N. Watson, *Joining Plastics in Production*, The Welding Institute, Cambridge, 1988.