

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B.E. SEMESTER : VI**  
**CHEMICAL TECHNOLOGY**

**Subject Name: Compounding & Processing of Plastics & Rubbers- II**  
**Subject Code: 163606**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam(E)	University Exam(P)	Mid Sem Exam(Theory) (M)	Practical (Internal)
4	0	3	7	70	0	30	50

Sr. No	Course contents
1.	Blends & alloys of polymers & rubbers. Nano composites. Injection molding, compression molding, RTM, RIM, Blow molding & stretch blow molding, DMC, SMC, FRP etc.
2.	Pultrusion, Pull winding ,gas / water assisted injection molding & similar processes. Caps & enclosure .Making of tires, hoses, mats & other rubber products. Foamed plastics & rubbers.
3.	Post extrusion techniques such as -Metallization, electroplating, Stamping, Welding & bonding, Printing & painting on plastics & rubbers etc. Simple flow models for extrusion
4.	Compounding & Processing of rubbers. Making of compounds for products such as tires, hoses, mats & other products. Making of some common products.
5.	Depolymerization for recovery of monomers / oligomers from waste polymers. Basics of recycling of polymers & rubbers.
6.	Characteristics of packaging films such as — Permeability, Heat seal, Printing, Drop impact etc.

**Reference Books:**

1. Transport Phenomena, Bird & Steuart, John Wiley & Sons, Inc1960.
2. Understanding Injection Molding Technology, Herbert Rees, Hanser Publishers, 1994.
3. Understanding Extrusion , Chris rauwendaal, Hanser Publishers, 1998
4. Rotational Molding , Glenn L. Beau, Hanser Publishers, 1998
5. Introduction to Polymer Science & Technology H. S. Kaufman & J. J. Falcetta,, Wiley –  
 a. Interscience Publication, 1977
6. Understanding Compounding, R. H. Wildi & Maier,Hanser Publisher mc, 1998.
7. Fundamentals of Polymer Processing, S. Middleman,Houghton Mifflin Compony, 1997.
8. Injection Molding of Plastics a User Guide ,Klockner Windosor India Ltd. 1994.
9. Fillers & Filled Polymers, J. F. Gerard, Wiley-VCH verlag GmbH, 2001.
10. Handbook of Fillers, C. Wypych, Chem Tech Publishing 2000.
11. Handbook of Fillers & Reinforcements for Plastics, H. S. Katz & J. V. Milewski, Van
12. Nostr& Zeinhold Co, 1978.

13. Composite Polymeric Material, Applied Science Publishers, R. P. Sheldon ,1982.
14. Composites: Design Guide, Industrial Press mc, 1987.
15. Composite Material Handbook, M. M. Schwartz, McGraw-Hill company, 1984.
16. Polymer Processing Fundamentals, Ossawald, A. Tim, Hanser Publishers, 1998.
17. Fundamentals of Reaction Injection Molding, C. W. Macosko, Hanser Publishers, 18. 1989.
19. Flow of High Polymers, S. Middleman, Interscience Publishers, 1968.
20. Metalizing of Plastics, H. Narcus, Reinhold Publishing Corp. 1960.
21. Decorating Plastics, I M Margolis, Hanser Publishers, 1986.
22. Handbook of Plastics Joining, a Practical Guide, Plastics Design Library, 1997.
23. Plastics Finishing & Decoration, D. Sastas, Van Nostrand Reinhold Co, 1986.
24. Cross linking & Network Formation in Polymers, F. R. Jones,The Plastic & Rubber Institute, 1982
25. Plastics Films, J. H. Briston, The Plastics Institute, 1974.
26. Plastics process Engineering, Thorne, Marcel Dekker, 1979.
27. Thermoforming ,J. L. Thorne, Hanser Publishers, 1988.
28. Understanding Blow Molding, N. C. lee, Hanser Publishers, 2001.
29. Raw Materials for Industrial Polymers , H Ulrich, Hanser Publication ,1989
30. Principles of Polymer Science, Bahadur & Sastry, Narosa Publishing Houses, 2002
31. Polymer Science , Gowarikar,John Wiley & Sons ,1986
32. Encyclopedia of Polymer Science & Technology, John Wiley & Sons, Inc ,1965
33. Encyclopedia of Polymer Science & Engineering, John Wiley & Sons, Inc, 1988
34. Petrochemicals the Rise of an Industry, Peter H.Spitz,John Wiley & sons,1988.
35. Polymer Chemistry , Malcolm P. Stevens, Oxford University Press Inc ., 1990
36. Textbook of Polymer Science, Billmeyer,John Wiley & Sons, 1984.
37. Polymer Science and Technology: Plastics, Rubbers, Blends and Composites, P Ghosh, Mc Graw Hill, 2<sup>nd</sup> ed.,1990
38. Principles of Polymer Systems, Rodriguez, Hemisphere Publishing Corpn, 5<sup>th</sup> Ed., 2007
39. Textbook of Polymer Science, P Nayak and S Lenka, Kalyani Publishers, 1986
40. Polymer Chemistry, Seymour and Carraher, Marcel Dekker, 2003
41. Handbook of Rubber Technology, S Blow, Galgotia Publications Pvt. Ltd, 1998
42. Rubber Technology, Morell S H, Applied Science Publication, 1981
43. Plastics and Rubber, E W Duck, Butterworth, 1971
44. Tyre and Vehical Dynamics, Hans B Pacejka, SAE International, 2<sup>nd</sup> Ed, 2005
45. Introduction to Rubber Technology, Andrew Ciesielski,RAPRA Publications, 2000
46. Rubber Technology, Maurice Morton, Springer, 1<sup>st</sup> Ed, 1987
47. The Science and Technology of Rubber, Mark and Erman, Academic Press,3<sup>rd</sup> Ed,2005
48. Rubber Processing, Robert Johnson, Hanser Publications, 2001
49. Rubber Compounding, Barlow, CRC Press, 2<sup>nd</sup> Ed, 1993
50. Rubber Compounding : Chemistry and Applications , Brendan Rodgers, CRC, 1<sup>st</sup> Ed, 2004
51. Rubber Compounding 2E: Compounding and Testing for Performance, John Dick, Hanser Publications, 1<sup>st</sup> Ed.,2009
52. The Mixing of Rubber, R F Grossman, Springer, 1<sup>st</sup> Ed.,1997