GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : V

CHEMICAL TECHNOLOGY

Subject Name: Basics of Glass Technology
Subject Code: 153607

Teaching Scheme				Evaluation Scheme			
Theory	**Tutorial**	**Practical**	**Total**	**University Exam(E)**	**University Exam(P)**	**Mid Sem Exam(Theory) (M)**	**Practical (Internal)**
3	0	2	5	70	0	30	50

Sr. No.	Course contents
01.	Non crystalline solids & glasses: Formation & different vitreous phase transition, relaxation behavior, conditions of vitrification, kinetic & structural theory.
02.	Structure of glasses: XRD, SAXS, SANS & similar techniques, crystalline glasses, Electrical & mechanical properties
03.	Optical properties such as refractive index, molar volume & ionic refractivity, birefringence, IR, uv & visible absorption, colloidal colors, solaraization, photosensitive & photo chromatic glasses
04.	Optical applications of glasses, formation of artificial layer. Thermal properties. Rheological properties
05.	Manufacturing Processes: Raw material selection, manufacturing, annealing, chemical treatment & other relevant modifications & processes
06.	Optical glass fibers & fibers for reinforcements

Reference Books:

1. Chemistry of Glasses, Paul A., Chapman and Hall, 2nd Ed.,1990
2. Glasses & the Vitreous state, Zarzycki J., University of Cambridge, 1991
3. Handbook of Glass Properties,N P Bansal and R.H. Doremus, Academic Presss, 1986
4. Glass : Nature, structure and properties, Horst Scholze, Springer-Verlag, 1991
5. Glass Engineering Handbook, G W Mcleelan and E B Shand, Mc Graw Hill, 1984
6. Fundamentals of Inorganic Glasses, A K Varshneya, Gulf Professional Publishing, 1994
7. Glasses for Phonotics, M Yamane and Y Asahara, Cambridge University Press, 2000
8. Introduction to the principles of ceramic processing, Reed J.S., John Wiley & Sons, 1998
9. Rheology of Ceramic Systems, Moore F.,Elseiver, 1979
10. Rheology and rheometry of clay-water systems, G W Phelps, S W Maguire, W J Kelly and R K Wood, Cyprus Industrial Minerals Co,2008
11. Ceramic Processing before Firing, Onoda & Hench,Wiley, 1978
12. Elements of Fuels, Furnaces & Refractories, Gupta O.P, Khanna Publishers, 1996
13. The Science of Flames & Furnaces ,Thring M.W ,Taylor and Francis, 1962
14. Principles of Blast Furnaces for Iron Making ,Biswas A.K., SBA Publications, 1984
15. Elements of ceramics ,Norton F.H, Longman higher education, 2nd Ed, 2001

16. Introduction to ceramics, Barsoum, Institute Of Physics Publishing (gb) 2002
17. Introduction to Ceramics ,Kingery W.D,. Wiley New York :, 2nd Ed, 1976.
18. Material Science ,Smith, Mcgraw Hill Higher Education, 4th Ed,2005
19. Industrial ceramics ,Singer & Singer, , Oxford & Ibh (From Technip), 1st Ed.,2008
20. Textbook of physical Geology ,Mukherjee, , CBS Publishers & Distributors-New Delhi 1st Ed.,2011
21. Textbook of Mineralogy, Tyrrel,W, , CBS Publishers & Distributors, 4th Ed.,2006
22. Textbook of Geology, J B Mahapatra, CBS Publishers & Distributors, 2nd Ed. ,2008