

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Ceramic Technology

Semester: 3

Subject Code

Subject Name GLASS – I

Sr. No.	Course content
1.	INTRODUCTION : 1.1 Definition of glasses 1.2 General properties and uses of glass 1.3 Chemical composition of glass 1.4 Description in brief about different types of glass
2.	RAW MATERIALS : 2.1 Details regarding various materials used in glass making 2.2 Classification of raw materials with their functions in glass making 2.3 Essential glass forming substances 2.4 Fluxes 2.5 Oxidizing agents 2.6 Reducing agents 2.7 Finishing agents 2.8 Coloring agents and cullets 2.9 Occurrences of various glass making raw materials in India 2.10 Properties of glass sands and other raw materials used in glass making 2.11 Grading and washing of sands used in glass making
3.	BATCH MIXING AND CALCULATIONS : 3.1 Methods of batch preparation 3.2 Methods of batch mixing 3.3 Description of machines used for batch preparation and mixing 3.4 Processing of raw materials before batch making 3.5 Theory of glass making 3.6 Process of handling and mixing of raw materials 3.7 Methods of batch calculation detailed description of calculating batch recipe, chemical composition and molecular formula of glass
4.	GLASS MELTING : 4.1 Introduction 4.2 Various types of furnaces used for glass melting 4.3 Construction and function of pot furnace 4.4 Construction and function of Tank furnace 4.5 Construction and function regenerative and recuperative type furnaces 4.6 Description regarding various parts of glass melting furnaces. 4.7 Details description regarding melting process of glass batches
5.	MANUFACTURING OF GLASS ARTICLES : 5.1 Introduction 5.2 Description regarding manufacturing process of hollow wares by mouth blowing 5.3 Manufacturing of hollow ware articles by semi-automatic and automatic machines

	5.4 Manufacturing process of articles by pressing process 5.5 Manual and automatic machines pressing process 5.6 Manufacturing process of flat glass by manual pressing process & auto-machine process 5.7 Manufacturing process of sheet glass
6.	GLASS COMPOSITION AND DEVITRIFICATION : 6.1 Detail of melting phenomenon of glass 6.2 The composition of molten glass 6.3 Method of solidification of molten glass 6.4 Devitrification in glass 6.5 Danger period in glass melting 6.6 Working temperature and working zone of glass
7.	VISCOSITY OF GLASS AND ANNEALING : 7.1 Introduction 7.2 Importance of Viscosity in glass manufacturing 7.3 Effect of heat on glass viscosity 7.4 Reasons of annealing of glass 7.5 Methods of annealing of glass 7.6 Precaution required during annealing of glass 7.7 Relation between annealing and viscosity of glass

LABORATORY EXPERIMENTS:

1. Dry sieve analysis of sand
2. Wet sieve analysis of sand
3. Preparation of soda-lime glass batch recipe
4. Preparation of opal glass batch recipe
5. Preparation of glass batch of blue colour glass
6. Preparation of glass batch of green colour glass
7. Preparation of glass batch transparent glass
8. Preparation of glass batch of black colour glass
9. Industrial visit of glass industries

Reference Books:

1. A hand book of glass Manufacture R.Charan
2. Modern glass practice S.R.Scholes
3. A hand book of glass engineering E.B.Shand
4. Elements of ceramics F.H.Norton
5. Glass manufacture Vol. I & Vol. II F.V.Tooley
6. History of glass making W.Douglass