

**OBJECTIVE**

To enable the students to have a thorough knowledge about the different ceramic fabrication process and the other final operations involved after the fabrication of the product.

**OUTCOME**

On completion of the course the students are expected to

- Have complete knowledge about the slip casting process.
- Have a complete knowledge about the various plastic forming process.
- Have a complete knowledge about the various dry forming process.
- Have a sound understanding on the mechanism of drying and the construction and working of the various drying equipments.
- Understand effectively the importance of firing and the mechanism and types of firing equipments.

**UNIT I SLIP FORMING PROCESS**

Introduction. Slip- selection of materials, particle size measurement, viscosity, surfactant concentration, binders, pH, zeta potential, settling, solid recovery, slip recovery, slip conditioning and storage. Plaster mould – process, preparation. Slip casting – methods, mechanisms.

**UNIT II PLASTIC FORMING PROCESS**

Plastic mass preparation – pug mill, pugging defects. Shaping methods – extrusion, jiggering, injection molding, roller machine, compression molding.

**UNIT III DRY FORMING PROCESS**

Theory of packing. Pressing- Uniaxial pressing – stress distribution on green body – defects and remedies, vibration compaction, isostatic pressing, reactive hot pressing – advantages – defects and remedies.

**UNIT IV DRYING AND FINISHING**

Mechanism of drying – transfer of heat – factors that control drying – types of dryers – intermittent and continuous dryers – process of drying – drying defects – finishing – cutting and trimming – sponging, fettling and towing – scumming.

**UNIT V FIRING**

Action of heat on ceramic bodies – physical changes, chemical changes. Firing equipments, firing schedules – fast firing, firing range. Problems, defects. Liquid phase sintering, vitrification, microstructure control.

**TEXT BOOKS**

1. Alan G. King, Ceramic Technology and Processing, Noyes Publication, USA, 2002.

2. James S. Reed, Principles of Ceramic Processing, John Wiley and Sons, NY, 1988.

## **REFERENCES**

1. Norton F. H, Fine Ceramics Technology and Applications, McGraw-Hill Co., 1978.
2. Terpstra, Ceramic Processing, Chapman and Hall, 1995.
3. I.J. McColm, N.J.Clark, Forming, Shaping and Working of High Performance Ceramics, Chapman and Hall, 1998.
4. Sudhir Sen, Ceramic Whiteware, Oxford & IBH Publishing Co., New Delhi, 1992.