AMCT13 CERAMIC FABRICATION PROCESSES

UNIT-1 SLIP FORMING PROCESS

1.1 Introduction. Slip- selection of materials,
1.2 Particle size measurement, viscosity,
1.3 Surfactant concentration, binders,
1.4 pH, zeta potential, settling, solid recovery,
1.5 Slip recovery, slip conditioning and storage.
1.6 Plaster mould- process, preparation.
1.7 Slip casting- methods, mechanisms.

UNIT-2 PLASTIC FORMING PROCESS

2.1 Plastic mass preparation- pug mill, pugging defects.
2.2 Shaping methods- extrusion,
2.3 Jiggering, injection molding, roller machine,
2.4 Compression molding.

UNIT-3 DRY FORMING PROCESS

3.1 Theory of packing. Pressing
3.2 Uniaxial pressing- stress distribution on green body
3.3 Defects and remedies, vibration compaction,
3.4 Isostatic pressing, reactive hot pressing
3.5 Advantages- defects and remedies.

UNIT-4 DRYING AND FINISHING

4.1 Mechanism of drying- transfer of heat
4.2 Factors that control drying- types of dryers
4.3 Intermittent and continuous dryers
4.4 Process of drying- drying defects- finishing-
4.5 Cutting and trimming- sponging, fettling and towing – scumming.

UNIT-5 FIRING

5.1 Action of heat on ceramic bodies- physical changes, chemical changes.
5.2 Firing equipment's, firing schedules- fast firing, firing range.
5.3 Problems, defects. Liquid phase sintering, vitrification, microstructure control.

References Books:

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.