**MINERAL PREPARATION ENGINEERING (MPR)**

**MPR F601  Froth Flotation**  
3 Credits  
Offered As Demand Warrants  
Theory and application of bulk and differential froth flotation to metallic minerals, nonmetallic minerals and coal.  
**Prerequisites:** Admission by arrangement.  
Lecture + Lab + Other: 2 + 3 + 0

**MPR F606  Plant Design**  
3 Credits  
Offered As Demand Warrants  
Selection and design of equipment for the operation of mineral and coal beneficiation plants for specific custom and milling problems.  
**Prerequisites:** Admission by arrangement.  
Lecture + Lab + Other: 1 + 6 + 0

**MPR F611  Hydrometallurgy**  
3 Credits  
Offered As Demand Warrants  
Study of the theoretical and engineering aspects of the processes to recover metals from different types of ores and/or scraps, in which aqueous solutions play the predominate role.  
**Prerequisites:** MATH F253X; CHEM F331.  
Lecture + Lab + Other: 3 + 0 + 0

**MPR F612  Solution Concentration and Purification**  
3 Credits  
Offered As Demand Warrants  
The physical chemistry of reaction encountered in solution concentration and purification processes. The types of reaction discussed are cementation, solvent extraction, ion exchange and carbon absorption which are studied in terms of solution chemistry, reaction kinetics and mass transfer effects.  
**Prerequisites:** MATH F253X; CHEM F331.  
Lecture + Lab + Other: 3 + 0 + 0

**MPR F613  Waste Problems and Treatments**  
3 Credits  
Offered As Demand Warrants  
Waste problems and treatments encountered in mineral processing and metallurgical industries. Includes waste problems and treatments in gold, copper, zinc, iron and steelmaking, aluminum and non-metal industries as well as in electronic and electroplating industries.  
**Prerequisites:** Graduate standing.  
Lecture + Lab + Other: 3 + 0 + 0

**MPR F688  Graduate Seminar I**  
1 Credit  
Preparation and presentation of research outlines by graduate students and participation in regularly organized mineral engineering department seminars.  
**Prerequisites:** Admission to graduate program.  
Cross-listed with MIN F688.  
Lecture + Lab + Other: 1 + 0 + 0

**MPR F698  Non-thesis Research/Project**  
1-9 Credits  
Lecture + Lab + Other: 1-9 + 0 + 0

**MPR F699  Thesis**  
1-9 Credits  
Lecture + Lab + Other: 0 + 0 + 0