

CH487: FERTILIZER TECHNOLOGY

CREDITS = 4 (L = 4, T=0, P = 0)

1. **DEFINITION** of fertilizer, nutrient requirement of different plants e.g., paddy, wheat, cane etc. Natural way of fixing nitrogen; nitrogen cycle, carbon cycle, different nitrogen fixing plants, bacteria and algae. Role of C/N ratio in the growth of different plants. Organic manure. 8 Hours
2. **PRODUCTION OF AMMONIA:** feed preparation. Limitations of using different feed material for hydrogen generation. Reforming process and reformer design. Partial oxidation process and partial oxidation reactor design. 10 Hours
3. **HYDROGEN GENERATION:** from high ash containing coals, design of different hydrogen generation units using high ash coals, Kopper-Totzek suspended bed gasifier design. Removal of impurities from synthesis gas. CO removal and Shift reactor design. 8 Hours
4. **CO₂ REMOVAL METHODS:** Design of CO₂ absorbers, NH₃ synthesis loop design Design considerations for different types of NH₃ reactors. Urea production: special features of urea reactor, prilling tower design. Phosphatic fertilizers: different methods of production: NPK reactors, production and drying of NPK fertilizers. Coating of fertilizers for slow release of nutrients. Cost consideration in fertilizer production. 14 Hours

REFERENCE BOOKS

Title: Shreve's Chemical Process Industries
Author: Austin T G
Publisher: Tata McGraw Hill.

Title: Out lines of Chemical Technology
Author: E E Dryden
Publisher: East west Publication