[A-3]COURSE SYLLABUS

1. Course Description (Approximately 100 words)

This course introduces students to how projects are executed in the process industries, including an understanding of what constitutes preliminary process design, preliminary cost estimation, the fundamentals of macroeconomics as applied to process economic assessment, and the typical drawings and other deliverables produced during the scoping phase of process plant design. There is a particular emphasis on safety considerations in design. Proficiency is gained in the development of the preliminary design for a major chemical process. In addition, this course provides an introduction to the second stage of process design–the conceptual design process including an introduction to Piping and Instrument–level design development, process control design and facility layout.

2. Course Goals and Objectives (Approximately 100 words)

By the end of the course, students are expected to:
-have understanding of the principles of reaction engineering and reactor design.
-apply stoichiometry in combination with a rate law to design a chemical reactor that produces the desired conversion of reactants.
-design various types of chemical reactors which will be discussed at length, including continuous stirred-tank (CSTR), plug-flow (PFR), continuous-operation and batch-operation reactors.
-Additional topics include heterogeneous reactors, catalytic systems and fluidized beds, the design and optimization of reactor networks, and safety. The course integrates fluid mechanics and heat transfer to the design and analysis of isothermal and non-isothermal reactors. it leads to the capstone design course in which chemical reactors are integrated into a chemical plant.

3. Textbook (Title, Author, Publisher, Year of Publication, etc.)

Chemical Plant Utilities, 2016 by Sathiyamoorthy Manickkam (Author)

Plant Utilities Engineer(Passbooks) by Jack Rudman (Author)

4. Reference

Process Utility Systems: Introduction to Design, Operation and Maintenance - IChemE
by Jack Broughton (Author, Editor)

5. Course Requirements and Grades

EXAMINATION = 70%
ASSIGNMENT = 10%
C.A.T. = 20%

TOTAL = 100%

6. Course Calendar

Week	Main Content
1	Water Resources
2	Water Resources 2
3	Policy and regulation
4	COMPRESSORS
5	COMPRESSOR TYPES
6	VACUUM PUMPS
7	C.A.T.
8	REFRIGERATION
9	REFRIGERATION continued
10	AIR CONDITIONING AND VENTILATION
11	Atmospheric Towers
12	STEAM
13	Types of turbines (steam)
14	EXAMINATION