[A-3]COURSE SYLLABUS

1. Course Description (Approximately 100 words)

The Process Modeling, Simulation and Optimization of chemical engineering processes is a subject of major importance for the knowledge of transport processes; improved design process and its kinetics. Basically this subject comprises of three parts; modeling, simulation and optimization. Modeling and simulation emphasize on the concept of modeling of chemical engineering processes, parameter estimations, decomposition of networks, application of numerical methods, data regression, convergence promotion, specific-purpose simulation, dynamic simulation, etc. Optimization includes the concept; i.e., how one develops mathematical statements for the objective function (usually economic model) to be minimized or maximized and the equality and inequality constraints (the process model) and selection of optimization technique which is best suited to the problem characteristics.

2. Course Goals and Objectives (Approximately 100 words)

The objectives include, To familiarise students with the techniques of prediction and estimation and data optimization techniques .
· To develop the student's ability to apply these techniques wisely .
· To introduce students to the techniques of control chemical processes themselves .
· To introduce students to different commercial softwares to simulate the chemical processes from the design stage to thecontrol and optimization.
· To develop specific skills associated with academic and transverse detailed below.
Specific skills :
· Ability to design, manage and operate procedures for simulation, control and instrumentation for chemical processes .
· Ability to implement process optimization and chemicals.
· Knowledge and application of the terminology used to describe the concepts relevant to this

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

Business Process Modeling, Simulation and Design by Manuel Laguna (Author), John Peter Marklund (Author)

Refinery Process Modeling: 1st edition (29 August 2008) by Gerald L. Kaes (Author, Editor, Illustrator) Athens Printing

4. Reference

Data Analysis, Optimization, and Simulation Modeling, 2010 by Wayne L. Winston (Author), S. Albright (Author), Christopher J. Zappe (Author)

5. Course Requirements and Grades

examination = 70
assignment = 10
C.A.T. = 20

Total = 100

6. Course Calendar

Week	Main Content
1	BASICS OF MODELING
2	PRINCIPLES OF FORMULATION
3	NUMERICAL METHODS
4	LINEAR ALGEBRA
5	GAUSS-SEIDEL METHOD
6	LINEAR TRANSFORMATIONS
7	C.A.T.
8	MODELING OF REACTORS
9	NON-ISOTHERMAL CSTR
10	HEAT EXCHANGER
11	LIQUID FLOW IN A PIPE
12	INTRODUCTION TO PROCESS OPTIMIZATION
13	SUMMARY, REVISION AND ASSIGNMENTS
14	EXAMINATION