22PCM405P					Software lab for Petrochemical Engineers					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hours/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
0	0	2	1	2	--	--	--	50	50	100

COURSE OBJECTIVES

- To introduce basic knowledge of flow sheeting and application of commercial simulators.
- To introduce various programs and simulator usage.
- To demonstrate usage of process equipment in simulators.
- To introduce spread sheet drawing in simulators to solve material and energy balance calculations.
- Introduction to basic modelling and simulation and related technologies.

The following experiments will be conducted using
/C++/Simulink/MATLAB/UNISIM/Simulink/CAD/ASPEN HYSIS

- Estimation of physical property, critical temperature, enthalpy and Gibb's free energy in aspen plus/UNISIM.
- Drawing of T-x, y and P-x, y diagram using python program.
- Regression, Vapor-Liquid equilibrium data, Flash separation, dew point, bubble point in java program.
- Performing mass and energy balance calculation in a flow sheet using UNISIM/Aspen Hysis
- Heat exchanger design, thermal analysis and simulation of heat exchanger in UNISIM/Aspen Plus
- Process Simulation of batch, CSTR and PFR in UNISIM/Aspen plus
- Design and simulation for distillation and absorption unit etc. in UNISIM/Aspen plus
- Process simulators in real industrial scale processes. (Examples: Simulation of cumene production process, Ammonia synthesis, manufacture of vinyl chloride monomer, hydro-dealkylation, etc.) in UNISIM/Aspen plus

COURSE OUTCOMES

On completion of the course, student will be able to

CO1: Create input file for given raw data by appropriate pseudo-cut, thermodynamic model selection for hydrocarbon & sour applications.
CO2: Simulate a process plant using a basic process flow diagram/ scheme by building a simulation flow chat/ environment and converging model.
CO3: Use appropriate information in distillation applications a given product specification.
CO4: Write programs and execute to estimate physical properties of petrochemical systems.
CO5: Carry out detailed thermal sizing or rating of shell & tube heat exchangers specifications and guidelines from converged simulation.
CO6: Generate heat & material balance of the streams with required physical & chemical properties from converged simulation.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100 **Exam Duration: 3 Hrs.**

Part A: Evaluation based on the lab class performance and laboratory book 50 Marks
Part B: Viva Examination based conducted experiments 50 Marks