

Department of Chemical Engineering			
Design and Analysis of Experiments (64554)			
Total Credits	3		
major elective			
Prerequisites	-		
Course Contents			
<p>In this course the student learn the most effective approach to design, conduct, and analyze experiments that optimize performance in products and processes. They learn also how to use statistically designed experiments to obtain information for characterization and optimization of systems, improve manufacturing processes, and design and develop new processes and products. Evaluate material alternatives in product design, improve the field performance, reliability, and manufacturing aspects of products, and conduct experiments effectively and efficiently.</p>			
Intended Learning Outcomes (ILO's)		Student Outcomes (SO's)	Contribution
1	An ability to understand and apply knowledge of the mathematical theory of experiments design	A	20 %
2	An ability to design experiments by factorial designs	B	45 %
3	An ability to utilize design and analysis of experiments in optimizing processes and products and solve real scientific problems	C E	30 %
4	An ability to analyze to experiment through some modern useful techniques	K	5 %
Textbook and/ or References			
Jiju Antony, Design of Experiments for Engineers and Scientists, Elsevier, 2003			
Assessment Criteria		Percent (%)	
First Exam		20 %	
Second Exam		20 %	
Homeworks		10 %	
Final Exam		50 %	
Course Plan			
Week	Topic		
1	Introduction to industrial experimentation		
1_2	Fundamentals of Design of Experiments		
3	Understanding key interactions in processes		
4	A systematic methodology for Design of Experiments		
5_6	Screening design First Exam		
7_9	Full factorial designs		
10_12	Fractional factorial designs		
13	Some useful and practical tips for making your industrial experiments successful		
14_15	Case studies		
16	Final Exam		