SCHEME OFCOURSEWORK

CourseDetails:

CourseTitle	:**DESIGN AND ANALYSISOFEXPERIMENTS**			
CourseCode	:15CH1149		**LTPC**	**:3 0 0 3**
Program:	:B.Tech			
Specialization:	Information Technology			
Semester	:VIII			
Prerequisites	:Probabilityand Statistics			

CO1	Understand the importanceof DesignofExperiments
CO2	Given anumberoffactorswhichaffects theexperiment, thestudent should be able todetermine the most importantfactor
CO3	Learn the factorial design of experiments
CO4	Designalearn regression model for an experiment and construct confidence intervalsforeach parameter
CO5	Asses the importance of curvature in regression and construct response surface

ProgramOutcomes(POs):

1. Ableto applythe knowledgeof mathematics,science,engineeringfundamentalstosolvecomplexchemicalengineeringproblems.
2. Attainthecapabilitytoidentify,formulateandanalyseproblemsrelatedtochemicalengineeringandsubstantiatetheconclusions
3. Inapositiontodesignsolutionsforchemicalengineeringproblemsanddesignsystemcomponentsandprocessesthatmeetthe specifiedneedswithappropriateconsideration to publichealthandsafety.
4. Abletoperformanalysisandinterpretationofdatabyusingresearchmethodssuchasdesignofexperimentstosynthesize theinformationand toprovidevalidconclusions.
5. Abletoselectandapplyappropriatetechniquesfromtheavailableresourcesandmodernchemicalengineeringandsoftwaretools, andwillbeabletopredictandmodelcomplexengineeringactivitieswithanunderstandingofthepracticallimitations.
6. Abletocarryouttheirprofessionalpracticeinchemicalengineeringbyappropriatelyconsideringandweighingtheissuesrelated tosocietyandculture andtheconsequentresponsibilities.
7. Abletounderstandtheimpactoftheprofessionalengineeringsolutions onenvironmentalsafety.
8. Transformintoresponsiblecitizens byresortingtoprofessionalethicsandnorms oftheengineeringpractice.
9. Abletofunctioneffectivelyinindividualcapacityaswellasamemberindiverseteamsandinmultidisciplinarystreams.
10. Abletocommunicatefluentlyon complexengineeringactivitieswiththeengineeringcommunityand society,and willbe abletoprepare reportsandmakepresentationseffectively.
11. Abletoapplyknowledgeofengineeringandmanagementprinciples whilemanagingprojectsinmultidisciplinaryenvironments .
12. Engage in independentandlife-longlearningin theirspecializedareasof chemicalengineering.

CourseOutcomeVersus**ProgramOutcomes:**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1												
CO-2												
CO-3												
CO-4												
CO-5												

S -Stronglycorrelated,*M-Moderately*correlated,*Blank-No correlation*

Assessment Methods:	Assignment/Quiz /Seminar /CaseStudy/ Mid-Test/End Exam

Teaching-Learning andEvaluation

Week	TOPIC/CONTENTS	Course Outcomes	Samplequestions	Teaching-learning strategy	Assessment Method& Schedule
1	StrategyofExperimentation,Some Typical Applications ofExperimentalDesign, Basic Principles, GuidelinesforDesigningExperiments,	CO1	▫ Writeabouttheimportanceofdesignofexperiments?	▫ Lecture ▫ PPpresentation	Assignment(Week2-4)
2	A Brief Historyof StatisticalDesignSummary: UsingStatisticalTechniques inExperimentation.	CO1	▫ Whatarethevariousprobabilitydistributionsandgivetheirsignificance?	▫ Lecture/Discussion/Problemsolving	Assignment(Week2-4)
3	SamplingandSamplingDistributions,Inferencesabout the Differences inMeans-Randomized Designs,Inferences about theDifferences in Means-PairedComparisonDesigns,	CO1	▫ Calculatethe95%confidenceintervalofthedata?	▫ Lecture/Discussion/Problemsolving	
4	Inferencesabout theVariances of NormalDistributions	CO1	▫ Whatistheimportanceof ▫ hypothesistesting.	▫ Lecture ▫ PPpresentation	Quiz (Week2-4)
5	TheAnalysis of Variance,	CO2	▫ ExplainthefixedeffectsmodelofANOVA,	▫ Lecture/Discussion/Problemsolving	
6	Analysis of the FixedEffectsModel	CO2	▫ Derivethestatisticalsignificanceforthefixedeffects model	▫ Lecture ▫ PPpresentation	
7	StatisticalAnalysis of theRCBD	CO2	GivetheimportanceofRCBD	▫ Lecture ▫ PPpresentation	

8	Introduction to FactorialDesigns,BasicDefinitionsandPrinciples, TheAdvantage	CO3	▫ Definethetermsfactorsandfactorlevels?	▫ Lecture ▫ Presentation	
9	**Mid-Test1**				Mid-Test1 (Week9)
10	TheTwo-FactorFactorialDesign, The General FactorialDesign The2k FactorialDesign,	CO3	Givethedesignmatrixforatwofactorandtwoleveldesign?	▫ Lecture/Discussion/Problemsolving	
11	Introduction, The22 Design,The23 Design, The General2k Design,A singlereplicateofthe 2k design, Theadditionof center pointsto the2kdesign.	CO3	▫ Whatarefactorialdesigns?Howaretheyimportant?	▫ Lecture ▫ Problemsolving	
12	FittingRegression Models,Introduction,LinearRegression Models,	CO4	▫ Explainimportanceofregressionanalysis?	▫ Lecture/Discussion/Problemsolving	Assignment(Week10-14)
13	Estimation of the Parameters inLinearRegression	CO4	▫ Calculatethelinearregressioncoefficientsofthegivendata?	▫ Lecture/Discussion/Problemsolving	
14	Hypothesis testingin multipleregression, Confidenceintervals in multipleregression	CO4	▫ Constructthe90%confidenceintervalforthedatagiven.	▫ Lecture/Discussion/Problemsolving ▫	Quiz (Week12-14)
15	Introduction to ResponseSurface Methodology, theMethod	CO5	▫ Whatisresponse surfacemethodologyandexplainitsimportance?	▫ Lecture ▫ Problemsolving	
16	ExperimentalDesigns forFittingResponse Surfaces-DesignsforFittingthe First-Order Model,	CO5	▫ Whatfactorlevelsdoyourecommendtomaximizetheresponse	▫ Lecture	
17	DesignsforFittingtheSecond-OrderModel,Evolutiona	CO5	▫ Explainthevariousse condordermodelsavailableinRSM	▫ Lecture ▫ Problemsolving	
18	**Mid-Test2**				Mid-Test2 (Week18)
19			▫		
20	**ENDEXAM**		▫	▫	