NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF CHEMICAL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech, Chemical Engineering		
Course Title	DESIGN AND ANALYSIS OF EXPERIMENTS		
Course Code	CLOE17	No. of Credits	3
Course Code of Pre-requisite subject(s)			
Session	July 2019	Section (if, applicable)	
Name of Faculty	Dr.Nagajyothi Virivinti	Department	Chemical Engineering
Official Email	jyothi@nitt.edu	Telephone No.	
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		Telephone No.	
Course Type (please tick appropriately)	☐ Core course	☑ Elective course	

Syllabus (approved in BoS)

Statistics, Simple Comparative Experiments, Experiments of a single factor, analysis of variance

Randomized blocks, Latin squares, The 2^k factor design, Blocking and confounding

Two level fractional Factorial design, Three level and mixed level factorial and fractional factorial design.

Fitting regression methods, LS method, Robust parameter design, Experiment with random factors, Nested design

Response surfaces, EVOP, Multivariate data analysis

COURSE OBJECTIVES

1. Describe how to design experiments, carry them out, and analyze the data they yield.
2. Understand the process of designing an experiment including factorial and fractional factorial designs.
3. Investigate the logic of hypothesis testing, including analysis of variance and the detailed analysis of experimental data.
4. Formulate understanding of the subject using real examples, including experimentation

in the social and economic sciences. 5. Learn the technique of regression analysis, and how it compares and contrasts with other techniques studied in the course. 6. Understand the role of response surface methodology and its basic underpinnings. 7. Gain an understanding of how the analysis of experimental design data is carried out using the most common software packages.

MAPPING OF COs with POs

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1.plan experiments according to a proper and correct design plan.	**1,2,3,4,5,9,11,12**
2.analyze and evaluate experimental results (statistically), according to chosen experimental design (ANOVA, regression models).	**1,2,3,4,5,9,11,12**
3.use fundamentals such as hypothesis testing, degrees of freedom, ANOVA, fractional design and other design methods/techniques and so on.	**1,2,3,4,5,8,9,11,12**
4.know the fundamentals of multivariate analysis and chemo metric methods (PCA and PLS) with simple applications.	**1,2,3,4,5,8,9,11,12**

COURSE PLAN – PART II

COURSE OVERVIEW

This course deals with the concepts and techniques used in the design and analysis of experiments. The concepts and different models of an experimental design will be studied, leading to their statistical analysis based on linear models and appropriate graphical methods.

COURSE TEACHING AND LEARNING ACTIVITIES (Add more rows)

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1	Introduction	chalk and talk
2	9	Statistics, Simple Comparative Experiments, Experiments of a single factor, analysis of variance	PPT,chalk and talk
3	5	Randomized blocks, Latin squares, The 2^k factor design, Blocking and confounding	PPT,chalk and talk

4	7	Two level fractional Factorial design, Three level and mixed level factorial and fractional factorial design.	PPT,chalk and talk
5	8	Fitting regression methods, LS method, Robust parameter design, Experiment with random factors, Nested design	PPT,chalk and talk
6	5	Response surfaces, EVOP, Multivariate data analysis	PPT,chalk and talk

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment-I	After 13th contact hour	One hour	20
2	Assessment-II	After 30th contact hour	One hour	20
3	Assignment	After 15th contact hour		10
CPA	Compensation Assessment*	After 35th contact hour	One hour	
4	Final Assessment *		3 hours	50

***mandatory; refer to guidelines on page 4**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

Feedback will be taken two times, one after the Assessment-I, the other at the end of the semester.

COURSE POLICY (including compensation assessment to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

Students may contact the faculty over mail (jyothi@nitt.edu) or over whatsapp 9985329988

COMPENSATION ASSESSMENT POLICY

Students fail to appear the Assessment-I or Assessment-II will be allowed to write the reassessment with prior information and with a valid reason.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

FOR APPROVAL

Course Faculty V.Nagajyothi **CC- Chairperson** M.A **HOD**