



Code	INI394	Prerequisites	INI310
Name	Design of Experiments	Co-requisites	INI394L

Credits	Contact Hours
4	44
Categorization of credits	
Math and basic science	
Engineering topic	X
Other	

Coordinator's name	Demetrio Mota
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Text book
Gutiérrez Pulido, H. (2013). Analysis and design of experiments (Third edition). McGraw Hill.
Gonzalez, R. (2018). Design of Experiments: Elements (Second edition). Amazon.
Montgomery, D.C. (2015). Design and Analysis of Experiments (Second Edition). Limusa Wiley
Peña, D. (2010). Regression and Design of Experiments (Second Edition). Publishing Alliance
Walpole, R. (2007). Probability and statistics for engineering and science (8th edition). Pearson.
Other supplemental materials

Description	
This subject provides the student with the techniques and tools of Statistics that allow them to establish a relationship between the elements of inputs of a process (critical parameters of materials and critical parameters) and the elements of output of the same (The Attributes of quality). The information generated by the use of this instrument will allow you to make decisions on fundamental topics of Industrial engineering such as product design, selection of options, design of effective processes, the search for solutions to quality problems (CAPA), quality by design (Quality by Design), through the methods of Taguchi, process validation and process efficiency through Response surface.	
Type of course	Required ☒ Elective ☐

Specific goals for the course	
Outcomes of instruction	1. Know the techniques that make up the Design of Experiments. 2. Recognizes the situations in which you can apply the different tools of Experimental Design. 3. Generate sufficient alternatives to solve the problem 4. Sets the parameters that determine the responses of processes.

	5. Objectively select the best solution from the solutions generated by the model. 6. Adequately communicates the appropriate arguments justifying your choice. 7. Design control systems that ensure your solution works properly over time
Student outcomes	CG1. Identifies, formulates and solves complex Engineering problems by applying the principles of Engineering, Science and Mathematics. SO2. Apply and use the engineering design process to produce solutions that meet specific needs, taking into consideration public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. SO6. Develops and conducts appropriate experimentation, in which they analyze and interpret data, as well as use engineering criteria to draw conclusions. SO7. Acquire and apply new knowledge using appropriate learning strategies.

Topics
Unit I. Single Factor Experiments Unit II. Factorial Experiments Unit III. Regression and Experimental Design of Taguchi Unit IV. Process Optimization with Response Surface Unit V. Special Experiment Design Cases