

Course Syllabi

1. MAES-00096 EXPERIMENTAL DESIGN

2. Instructor:

- Diana Lucia Moscoso Vanegas

3. Bibliography

- Análisis y Diseño de Experimentos., Gutiérrez, H., De la Vara, R, 2008
- Diseño de Experimentos., Kuehl, R., 2000
- A first course in design and analyzis of experiments., G. Oehlert., 2010

4. Specific Course Information

- a. The subject of experimental design, will contribute to the training of the student by addressing knowledge on the planning and analysis of experimentation through statistical criteria, being a useful tool in the hands of the engineer since it allows rationalizing the experimental effort to be made to know the effect that on one or more objectives have a series of experimental or process variables. Its meaning is to minimize the experimental effort by reducing time and costs, deducting the maximum. This course will enable the student to develop the skills necessary for the identification and solution of chemical engineering problems and will promote the development of skills that stimulate the capacity for analysis, synthesis and critical thinking, and this in turn will form the basis for the development of projects and projects. Ingenierile designs. The contents and learning results of this subject are in accordance with the discharge profiles of chemical engineer No. 1, 2, 5 and 6.

b. Prerequisites:

- INGE-00021 Material and energy balances
- INGE-00023 Computer drawing
- MAES-00098 Statistics

5. Learning Objectives of the Course

- a. Design, execute and analyze procedures of different complexity depending on experimentation, applied in the field of engineering, through appropriate computing, as a scientific and technological basis for the design of new products, processes, systems and services as well as for the optimization of others already developed. - Understand the fundamental role and practical utility of experimental design in the field of industrial processes and research. - Detect and quantity - Applying computer tools for experimental design. - Applying the design of experiments to obtain information that allows you to solve a particular problem and demonstrating that efficient design allows you to reduce costs, increase the effectiveness of experimentation and reveal the essential nature of a process.

b. Learning Outcomes

1. Apply knowledge and skills in mathematics, physics and chemistry effectively, as basic tools for solving problems in the field of chemical engineering.
2. Communicate effectively in oral and written form using the appropriate technical language, whether working individually or in interdisciplinary and/or multi-ethnic teams.
3. Simulate chemical industrial processes and operations, using computational tools to establish relationships between variables that allow for appropriate decision-making.
4. It controls experiments and processes in the field of chemical engineering, to obtain relevant information and meet previously defined objectives.

6. Course Topics

1. Scientific method and fundamental concepts of the design of experiences
2. Statistical inflation elements: experiences with one and two treatments
3. Experiments with only a factor (variance analysis)
4. Designs in blocks
5. General and factory factory designs 2^k
6. 2^k -p factorial designs
7. Optimisation and design of mixings