Code	INI391L	Prerequisites	INI382 INI382L ING302
Name	Operations Research Laboratory I	Co- requisites	INI-391

Credits	Contact hours
01	22
Categorization of credits	
Math and basic science	
Engineering topic	X
Other	

Coordinator's Name	Fernando Albaine

Textbook
Frye, C (2016). Microsoft Excel 2016 Step by Step: Practice Files Ojeda, FC (2016). Microsoft Office Excel 2016 Advanced Manual. Madrid, Spain: Anaya Multimedia Winston, Wayne (2016). Microsoft Excel Data Analysis and Business Modeling 5th Ed: Microsoft.
Other supplementary materials
Edwin O. (Producer). (2016). Excel 2016. https://www.youtube.com/playlist?list=PLNXKSKL0wyTL1WgcYIoZ8tYBCQblXsvJZ Indigo Tutorial. (Producer). (2016). Excel Tutorials. https://www.youtube.com/playlist?list=PLxgQzwsFLGL2FJhmBNZ8EW7Zn7-OqBlHI

Description
In today's world, the Industrial Engineering professional must be able to use spreadsheet tools and optimization techniques to develop efficient and effective solutions. The course is divided into an introduction to advanced spreadsheet functions and their application in Industrial Engineering, and the use of " Solver " to solve Linear Programming problems. Learning will take place mainly through the execution of practices guided by the teacher and practices executed individually by the student. The development of competencies will be evaluated with the use of checklists, rubrics, and objective tests.

Type of course	☒ Required ☐Elective _

Specific goals for the course	
Outcomes of instructions	1. Integrate the knowledge of the different areas of knowledge of industrial engineering in the development of proposals for the solution of problems. 2. Criticize and propose improvements to the proposals for solutions to optimization problems made by their peers
Student outcomes	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.

topics
Unit I. Pivot Tables
Unit II. Create and run macros
Unit III. Creation of Forms
Unit IV. Manipulation Modules with Variables
Unit V. Introduction to Solver
Unit VI. Solver Reports and Sensitivity Analysis
Unit VII. Transportation Model
Unit VIII. Allocation Model
Unit IX. Integer Programming Models