

Course Syllabi

1. TICS-00023 PROGRAMMING LANGUAGES

2. 192 credits hours.

3. Bibliography

- Cálculo matemático con matlab: problemas resueltos, Vera Lázaro, Alejandro Segundo., 2013
- Investigación de operaciones aplicaciones y algoritmos, Winston, Wayne L, 2011
- Programación con microsoftexcel 2000: macros y visual basic para aplicaciones, Jacobson, Reed, 1999
- Cálculo matemático con MATLAB: problemas resueltos, Vera Lázaro, Alejandro Segundo, 2013
- Matlab para ingenieros Matlab for engineers, Moore, Holly, 2007
- Métodos numéricos con matlab., Mathews, John H.. and Fink, Kurtis D, 2000
- Python para todos, González Duque, R, 2014
- <https://research.ebsco.com/c/thsxni/search/details/7c54vpwrtz?q=8.%20Programming%20in%20Visual%20Basic%202010%20%3A%20The%20Very%20Beginner%27s%20Guide%2C%20McKeown%20J%2C%202010%20%2CeBook%20Collection%20%28EBSCOhost%29>, McKeown, Jim, 2010

4. Specific Course Information

- a. The Programming Language subject is theoretical-practical in nature that will allow students to know the main programming languages and create basic knowledge to design algorithms, flow diagrams and the basics for programming in Visual Basic, Matlab and Python. This subject will allow the student to have a thinking logic in programming paradigms and thus allow a more appropriate language to be selected to solve a specific problem. o. The use of a programming language and data analysis is not only complementary but indispensable in the professional development of the career of the Industrial Engineer The subject contributes to achieving the following learning results: RA1. Problem solving: Identifying, formulating and solving complex engineering problems by applying RA2 engineering, science and mathematics principles. Design: Applying engineering design to produce solutions that meet specific needs have taking into account public health, safety and well-being, as well as global, cultural, social, environmental and economic factors
- b. Corequisites:
 - MAES-00085 INTEGRAL CALCULUS
- c. Prerequisites:
 - MAES-00084 DIFFERENTIAL CALCULUS
 - MAES-00089 LINEAR ALGEBRA

5. Learning Objectives of the Course

- a. Develop in students the ability to identify, formulate and solve engineering problems by using programming languages, applying engineering, science and mathematics principles.
 - Develop the ability to analyze and solve engineering problems using programming languages
 - Implement practical programming skills to model and simulate industrial processes, facilitating decision
 - making within an industrial context.
 - Develop the layer the ability to manage and analyze data through programming languages and databases.
- b. Learning Outcomes
 - Applies excel functions, generates macros, uses numeric calculation platforms and python code for

automated engineering troubleshooting. ra1

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- Manages databases through programming in matlab and python. ra1
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- Identify problems and design algorithms for your resolution. ra1, ra2
- Applies excel functions, generates macros, uses numeric calculation platforms and python code for automated engineering troubleshooting. ra1
- Identify problems and design algorithms for your resolution. ra1, ra2

6. Course Topics

- Introduction and general
- Algorithms
- Excel and visual basic
- Matlab
- Programming in python