Course Syllabi

1. MAES-00128 NUMERICAL METHODS
2. 96 credits hours.
3. Bibliography
   - Numerical Methods using Python (For scientists and Engineers). , Dumka, P., Dumka, R., & Mishra, D. R. , 2022
   - Applied Numerical Methods with Matlab for Engineers and Scientists., Chapra S. , 2023
   - Numerical Methods for Engineers, Chapra S., Canale R., 2021
4. Specific Course Information
   a. This subject is a gateway to the fundamental numerical methods used in solving engineering problems. It not only offers students a repertoire of techniques applicable in various situations, but also establishes the necessary foundations for the expert management of modelling, data processing tools, as well as for the analysis and interpretation of results.
   b. Prerequisites:
      - TICS-00056 PROGRAMMING I: ALGORITHMS, DATA, AND STRUCTURES
      - MAES-00120 MULTIVARIABLE CALCULUS
      - MAES-00122 DIFFERENTIAL EQUATIONS
5. Learning Objectives of the Course
   a. Formulate problems mathematically and solve them by implementing numerical methods in the form of computational algorithms.
      - Understand the general basic structure of a numerical method.
      - Understand the influence that different types of error have on the results that can occur at the time of performing numerical algorithms and manage these errors in an appropriate way.
      - Analyze, interpret, and make decisions based on the results obtained from the application of u n numerical method for solving an engineering problem.
      - Assimilating the theoretical foundations and understanding the functioning of the most important numerical methods in the area of engineering.
      - Being able to implement, using a specialized computational tool, the most important numerical methods in the area of engineering.
   b. Learning Outcomes
      - It implements and applies numerical methods for the resolution of different mathematical problems relevant in the field of science and engineering.
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      - It identifies the main characteristics of the most important numerical methods.
      - It interprets the results obtained after executing a numerical method.
6. Course Topics
   - Introduction
   - Race of equations
   - Linear systems
   - Adjustment of a curve
   - Numeric integration and referral

- Differential equipment