

Course Syllabi

1. MAES-00097 DIFFERENTIAL ECUATIONS

2. Instructor:

- Tsai Garcia Perez

3. Bibliography

- Matemáticas Avanzadas para Ingeniería, Erwin Kreyszig, 2013
- Ecuaciones diferenciales con aplicaciones de modelado, DENNIS G. ZILL y MICHAEL R. CULLEN, 2007
- Ecuaciones diferenciales para ingeniería y ciencias, Cengel, Yunus A., 2014

4. Specific Course Information

- a. This subject will apply basic knowledge in the formulation and solution of engineering and information processing problems. It comprises three themes: (a) Ordinary differential equations through which methods are tested to solve equations of first order and of higher order with initial and frontier value; (b) Systems of ordinary differential equations with constant coefficients, the solutions of which are determined by the systematic method of elimination and using c 11pts of matrix algebra and c) Partial differential equations that will be solved or the classical method of separation of variables. When developing the contents of this subject, it is provided with the following learning results of the discharge profile: 1. Apply knowledge and skills in mathematics effectively, as basic tools for solving problems in the field of Chemical Engineering 2. Communicate effectively in oral and written form used or appropriate technical language, whether working individually or in interdisciplinary and/or multi-ethnic teams.

b. Prerequisites:

- MAES-00094 Comprehensive calculation
- TICS-00024 Programming languages
- INGE-00023 Computer drawing

5. Learning Objectives of the Course

- a. To develop in the student the ability to understand and solve exercises and problems in which differential equations appear. Models are incorporated that predict the behavior of systems of the real world. - To apply the different methods of solving ordinary differential equations of first order and of higher order to determine solutions to different engineering problems. - To solve systems of differential equations with constant coefficients through the method of elimination of variable and other algebraic methods. - Study the approach and solution of mathematical models in which differential equations are applied - Solve partial differential equations through the method of separation of variables to treat problems involving oscillatory displacements and temperature changes among others.

b. Learning Outcomes

1. Establish some processes of solving systems of linear differential equations or of superior order concoeficient constants and variable coefficients.
2. To argue the basic theory necessary for the resolution of first order differentiaallineal equations through qualitative and analytical processes and second order linear differential equations and higher order.
3. Apply the devariable separation method in resolution of partial differential equations

4. Solve problems of differential equations of initial value, especially those in which external agents are discontinuous or periodic functions, through the laplace transform.

6. Course Topics

1. Linear differential equations of first order
2. Differential linear equivalencies of second order and higher order
3. The transformation of lapance
4. Linear differential equation systems
5. Introduction to particular differential equations