



Sistema de Administración de Calidad

Clave	Nombre	Revisión	Hoja
R-03-SAP	Programa Sintético	00-06/17	1de1

Área Curricular	Optional		
Campo Disciplinar	Mathematics		
Unidad de Aprendizaje	Study of change	Semestre	4th
Periodo Académico	January – June 2020		
Coordinador de Cuerpo colegiado:	Hugo Contreras Heredia		

PROPOSITO:

Study of change is an important learning unit since it will allow the student to understand changing elements and variables and the theories or equations that describe them. In this unit the student will learn how apply elements of differential calculus to model and solve situations in the world around us, developing a variacional and analytical thinking developing the competences of mathematics.

COMPETENCIAS GENERALES:

3. Uses Information and communication technologies as a tool to access information and its transformation to knowledge, as well as for the learning and collaborative work with innovative technics that will allow the constructive participation of the student in the society.
- Uses linguistic, mathematical or graphical representations as a communication strategy.

14. Solves personal and social conflicts according to specific technics in the academic and professional environment for the correct decision taking.
- Constructs the learning processes taking into account self-organization and freedom.

COMPETENCIAS DISCIPLINARES:

Models, solves and interprets problems related to limits, rate of change and derivatives in exact, economic and social sciences through the analysis of tables, graphs, properties of limits and the criteria for derivatives.

CONTENIDO:

Stage 1. Limits and continuity

- 1.1 Concept of a limit.
- 1.2 Methods to evaluate limits.
- 1.3 Theorems of limits.
- 1.4 Side limits.
- 1.5 Limits to the infinity.
- 1.6 Continuity

Stage 2. Derivatives

- 2.1 Increase and average rate of change.

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2.2 The derivative.

2.3 High order derivatives.

Stage 3. High order polynomials

3.1 Procedure to divide polynomials in one variable.

3.2 Synthetic division or Ruffini's rule.

3.3 Ruffini's rule to evaluate polynomials.

3.4 Ruffini's rule to factor polynomials.

3.5 Zeros of a polynomial function.

3.6 Remainder's theorem.

3.7 Factor's theorem.

3.8 Rational root's theorem.

3.9 Fundamental theorem of algebra.

Stage 4. Applications of derivatives.

4.1 The tangent line of a function's graph.

4.2 The derivative and the sketch of graphs.

4.3 The derivative as rate of change.

CRITERIOS DE EVALUACIÓN:

Portfolio 1 ----- 8pts

Portfolio 2 ----- 8pts

Portfolio 3 ----- 8pts

Portfolio 4 ----- 8pts

PIA ----- 8pts

First partial exam ----- 10 pts

Mid term exam ----- 15 pts

Internal global exam ----- 10 pts

External global exam ----- 25 pts

TOTAL	100 pts
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BIBLIOGRAFÍA:

- Brown, R., Carrell, R. and Wees, D. (2013). Pearson Baccalaureate Mathematical studies. Essex, U.K.: Pearson Education.
- Charles, C., et. al. (2019). Estudio del Cambio. N.L., Mexico: LA&GO ediciones.

Electronic sources

Stage 1

www.mathxl.com

<https://www.mathsisfun.com/calculus/limits.html>

<https://www.youtube.com/watch?v=poBobcFn1Co>



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Stage 2

www.mathxl.com

https://www.youtube.com/watch?v=-ktrtzYVk_I

<https://www.mathsisfun.com/calculus/derivatives-introduction.html>

Stage 3

www.mathxl.com

https://www.ditutor.com/polynomials/polynomials_higher.html

<https://www.youtube.com/watch?v=AWCQBLthbNI>

Stage 4

www.mathxl.com

https://www.whitman.edu/mathematics/calculus_online/chapter06.html

<https://www.youtube.com/watch?v=meONGezEXII>

Notes:

- The portfolios 1 and 3 will be conditioned according to the rules of the institution with the First partial exam and the Internal global exam respectively.
- The students that fail to upload the corresponding activity to the Nexus platform will be penalized with 1 point of the final score of the portfolio.