Mathematics V - Differential calculus	
Department: Mathematics	**Key of the matter:** 813/820
Requirements: Have passed mathematics IV of High School Mathematics	**Year:** Third
Weekly load: 5	**Date of elaboration** April 2017

Topics

Unit I

1.1. Intuitive idea of limit.
- 1.1.1. Numerical and graphic estimation.
- 1.1.2. Find the limit from a table.
- 1.1.3. Limits that do not exist.

1.2. Limits laws and their application.
- 1.2.1. Special limits.
- 1.2.2. Limits by direct substitution.
- 1.2.3. Limits of a polynomial function.
- 1.2.4. Limits of a rational function.

1.3. Limits on the right and on the left.

1.4. Bilateral limits (Not directed).

1.5. Some important trigonometric limits.

1.6. Indeterminate forms.
- 1.6.1. Limit of form .
- 1.6.2. Limits when .

1.7. Continuity.
- 1.7.1. Continuity at one point.

1.8. Increments and derivatives as a reason for change.

1.9. Formal definition of derivative.

Unit II

2.1 Obtaining derivative.
- 2.1.1. Derived from algebraic functions.

2.1.2. Derived from exponential and logarithmic functions.
2.1.3. Derived from trigonometric functions.
2.1.4. Derived from inverse trigonometric functions.

2.2. Chain rule.
2.3. Derived from implicit functions.
2.4. Physical and geometric interpretation.
2.5. Relative maximums and minima of a function.
2.5.1. Criterion of the first derivative.
2.5.2. Criterion of the second derivative.
2.6. Optimization problems.