



Teaching plan

Functions of one variable Q3/2019 *Majid Forghani*

Course code: DI1BCN0402-15SA

Section: Day class

1. Ementa

Derivatives. Geometric Interpretation and Rate of Change. Differentiation Rules. Derivatives of elementary functions. Higher order Derivatives. Differential of one-variable functions. Applications of Differentiation. Taylor's Formula. Absolute and relative maximum and minimum. Analysis of the behavior of functions through the derivatives. L'Hospital's Rule. Growth, Decrease and Concavity. Graphing. Definite Integral. Geometric Interpretation. Properties. Antiderivative and Indefinite Integral. The Fundamental Theorem of Calculus. Applications of the Definite Integral. Antiderivative's Techniques: Elementary Techniques, Substitution Technique, Integration by Parts, Integration of Rational Functions by Partial Fractions, and Trigonometric Integrals. Applications to Calculation of Area and Volume.

2. Approximate Schedule

Here, you can find lesson-by-lesson content planning. Note that this is only a forecast, and so (except exams' dates) it may be changed and updated without previous notice.

Date	Topics
23/09	Derivatives. Geometric Interpretation and Rate of Change. Differentiation Rules (products and quotients).
30/09	Derivatives of elementary functions (polynomials, exponential, trigonometric and hyperbolic functions).
3/10	The chain rule. Implicit differentiation.
7/10	Derivative of inverse functions (logarithmic, inverse trigonometric).
10/10	Higher order Derivatives. Applications. Taylor's Formula.
14/10	Analysis of the behavior of functions through the derivatives. Absolute and relative maximum and minimum.
17/10	Indeterminate forms and L'Hospital's Rule. Curve sketching.
21/10	Optimization problems.
24/10	Definite integrals, geometric interpretation and some applications.
31/10	Exercises
4/11	Test I
7/11	Antiderivative and indefinite integral. The fundamental theorem of calculus. Calculation of the area between two functions.
11/11	Techniques of integration: Substitution. Integration by parts.
14/11	Trigonometric integrals, Trigonometric substitution.
18/11	Integration of rational functions by partial fractions.
21/11	Strategy for integration.
25/11	Reviewing the techniques.
28/11	Further application: Arc length
2/12	Area of a surface of revolution
5/12	Exercises
9/12	Test II
12/12	Substitute Test (ST)
17/12	REC (at 10:00 in S-302-2)

3. Evaluation

We have two written tests on the dates:

Test I: 04/11

Test II: 09/12

- **Substitute Test (ST)** will be held on **12/12** and **REC** on **17/12**.
- 1. ST will be only offered to the students who cannot attend on the day of the tests (I or/and II) and justify their absence according to RESOLUÇÃO CONSEPE N° 227, DE 23.
- 2. REC will be considered only for the students whose primary average is less than **C**.
- The tests T1 and T2 are marked from 0 to 10 and the final average (FA) will be calculated as follows.

$$FA = \frac{T1+T2}{2}$$

And “**conceito**” will be determined according to the following table.

Final Average	Conceito
$8.5 \leq FA \leq 10$	A
$7.0 \leq FA < 8.5$	B
$5.0 \leq FA < 7.0$	C
$4.5 \leq FA < 5.0$	D
$0.0 \leq FA < 4.5$	F

- The “conceito” of REC will be also determined similarly, and then the new average is obtained following the table below.

REC	FA	New Average
A	D ou F	C
B	D	C
B	F	D
C	D ou F	D

- Please notice that the “conceito” **D** or **F** in REC does not effect on FA.

4. Office hours

Time and Place: Mondays, 15:00 – 18:00, Office 534-2
E-mail: forghaniufabc@gmail.com
General page of Discipline: <http://gradmat.ufabc.edu.br/disciplinas/fuv/>
Lists of Exercises: <http://gradmat.ufabc.edu.br/disciplinas/fuv/listas/>

5. Bibliography

Basic Bibliography

1. STEWART, J. – Cálculo, vol I, Editora Thomson 2009.
2. GUIDORIZZI, H. L – Um curso de cálculo, vol I, Editora LTC 2001.
3. ANTON, H – Cálculo: um novo horizonte, vol I, Editora Bookman 2007.
4. THOMAS, G. B.; FINNEY, R. L. – Cálculo diferencial e integral, Editora LTC 2002.

Complementary Bibliography

1. APOSTOL T. M – Cálculo, vol I, Editora Reverté Ltda, 1981.
2. BOULOS, P.. Cálculo diferencial e integral. São Paulo: Pearson Makron Books, c1999.
3. LARSON, R.; HOSTETLER, R., P.; EDWARDS, B. Cálculo. 8 ed. São Paulo: McGraw-Hill, 2000.
4. MALTA, I.; PESCO, S.; LOPES, H.. Cálculo a uma variável vol I. São Paulo: Loyola, 2002.