
PROGRAMA DE VERÃO 2021 - 709

ESCOLA DE MATEMÁTICA APLICADA FGV EMap

DISCIPLINA: Iterative Methods for Solving Structured Optimization Problems

PROFESSOR: Jose Yunier Bello Cruz (NIU)

CARGA HORÁRIA: 24h

PRÉ-REQUISITO: Linear Algebra, Basis of Calculus and Analysis

PERÍODO: 10 a 24 de janeiro (Segunda a Sexta-feira - 10 a 14/01. Segunda e Quarta-feira. - 17, 19 e 24/01)

HORÁRIO: 13h às 16h

PLANO DE ENSINO

1. Ementa

Convex Sets, Best Approximation Properties, Topological Properties, Separation, Nonexpansive Operators, Fixed Points of Nonexpansive Operators, Averaged Nonexpansive Operators, Convex Functions, Subdifferentiability, Lower Semicontinuous Convex Functions, Subdifferential Calculus, Differentiability of Convex Functions, Directional Derivatives and Subgradients, Conjugation, The Fenchel–Moreau Theorem, Maximally Monotone Operators, Minty’s Theorem, Resolvents of Monotone Operators, Zeros of Sums of Monotone Operators, The Subgradient Algorithm, Proximal-Point Algorithm, Douglas–Rachford Splitting, Forward-Backward Splitting, Tseng’s Splitting Algorithm, Variational Inequalities, The Extragradient Algorithm, The Subgradient Extragradient Algorithm.

2. Procedimentos de avaliação

Não será aplicado avaliação durante o curso.

3. Bibliografia Obrigatória

Convex Analysis and Monotone Operator Theory in Hilbert Spaces (Heinz Bauschke)

4. Mini Currículo

I am an Associate Professor: Numerical Analysis and Optimization in the Department of Mathematical Sciences at Northern Illinois University (NIU), IL, USA. Prior to NIU, I was an Assistant Professor (with tenure) in the Institute of Mathematics and Statistics at the Federal University of Goias, Brazil. I worked for almost two years with Prof. Heinz H. Bauschke as a CNPq Postdoctoral Research Fellow in the Irving K. Barber School of Arts and Sciences, Mathematics at the University of British Columbia, Canada. My Ph.D. in Mathematics was supervised by Prof. Alfredo N. Iusem at the Institute of Pure and Applied Mathematics (IMPA), Rio de Janeiro, Brazil. All my basic education, the five years Bachelor of Mathematics and the two years M.Sc. in Analysis, were coursed in the Faculty of Mathematics and Computer Science, University of Havana, Cuba.

My main research interest is in the area of Continuous Optimization, focusing on Nonsmooth and Convex Optimization, Variational Inequalities, Inclusion Problems, Algorithms, and Applications. I am interested in the design, complexity, and analysis of efficient algorithms for solving structured optimization problems arising in applications. My research is currently supported by the National Science Foundation (NSF) on the research Grant # DMS - 1816449 and by the Research & Artistry Grant (R&A) from NIU. For further details, please visit my homepage <https://sites.google.com/site/joseyunierbellocruz/>