UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE CIÊNCIAS FÍSICAS E MATEMÁTICAS
PÓS-GRADUAÇÃO EM MATEMÁTICA PURA E APLICADA

MTM510019 Computational Methods in Optimization

Pre-requisite: x-x

Weekly lesson hours: 06h

Discipline syllabus: Optimality conditions for nonlinear programming problems. Convexity and duality. Minimization of quadratics. System of nonlinear equations and main methods for their resolution (Newton, Quase-Newton and Newton Inexato). Results of local convergence of the main methods for nonlinear systems. Unrestricted minimization, linear search and main methods for unrestricted minimization (Newton, Quase-Newton and Truncated Newton methods). Region of trust. Barrier method, external and lagrangean penalty increased for restricted minimization. Sequential quadratic programming (SQP).

 BIBLIOGRAPHIC REFERENCES

Text book:

1. SANTOS, S. A, MARTÍNEZ, J. M. Métodos Computacionais de Otimização. 20º Colóquio de Matemática. IMPA, 1995.
2. NOCEDAL, J.; WRIGHT, S. J. Numerical Optimization. Springer Series in Operations Research. Springer Verlag. New York, 1990.

COMPLEMENTARY BIBLIOGRAPHY

1. BERTSEKAS, D.P. - Nonlinear Programming. Athena Scientific, 1995.
2. BONNANS, J.F., GILBERT J-CH., LEMARÉCHAL, C., SAGASTIZÁBAL, C. -Numerical optimization : theoretical and practical aspects. 2nd ed, Berlin; New York. Springer, 2006.
3. DENNIS JR, J. E., SCHNABEL, R. B. - Numerical methods for unconstrained optimization and nonlinear equations. Corrected reprint of the 1983 original. Classics in Applied Mathematics, 16. Society for Industrial and Applied Mathematics (SIAM), Philadelphia, PA, 1996.
4. A. IZMAILOV; M. SOLODOV – Otimização-Volume 1: Condições de otimalidade, Primeira Edição, Projeto Euclides, IMPA, 2007.
1. A. IZMAILOV; M. SOLODOV – Otimização-Volume 2: Métodos Computacionais, Primeira Edição, Projeto Euclides, IMPA, 2007