A basic approach in recent research developments in bioinformatics and applications in proteomics. The course is organized in four broad topics:

A. Linear Programming

(Formulating linear programs; The simplex algorithm; Certificates of optimality, infeasibility and unboundedness; Duality and sensitivity analysis).

B. Unconstrained Nonlinear Programming

(Optimality condition; Newton's method and other basic algorithms; Conjugate direction algorithms for convex quadratic problems; Line search algorithms on Rn).

C. Constrained Nonlinear Programming

(KKT Optimality conditions for nonlinear programming; Basic nonlinear programming algorithms; Optimality conditions for convex optimization; Interior point methods).

D. Applications in Mathematical Biology and especially in Proteomics.