COURSE DETAIL

NUMERICAL ALGORITHMS
Country Ireland
Host Institution University College Dublin
Program(s) University College Dublin
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Statistics Mathematics
UCEAP Course Number 118
UCEAP Course Suffix
UCEAP Official Title NUMERICAL ALGORITHMS
UCEAP Transcript Title NUMRICAL ALGORITHMS
UCEAP Quarter Units 4.00
UCEAP Semester Units 2.70

Course Description
This course covers MATLAB programming (data types and structures, arithmetic operations, functions, input and output, interface programming, graphics and implementation of numerical methods); finite floating point arithmetic, catastrophic cancellation, and chopping and rounding errors); solution of nonlinear equations (bisection method, secant method, Newton's method, fixed point iteration, and Muller's method); numerical optimization (method of golden section search and Newton's optimization method); solutions of linear algebraic equations (forwarding Gaussian elimination, pivoting, scaling, back substitution, LU-decomposition, norms and errors, condition numbers, iterations, Newton's method for systems, and computer implementation); interpolation (Lagrange interpolation, Newton interpolation, and inverse interpolation); numerical integration (finite differences, Newton cotes rules, trapezoidal rule, Simpson's rule, extrapolation, Gaussian quadrature); and numerical solution of ordinary differential equations (Euler's method, Runge-Kutta method, multi-step methods, predictor-corrector methods, rates of convergence, global errors, algebraic and shooting methods for boundary value problems, and computer implementation).

Language(s) of Instruction
English

Host Institution Course Number
ACM40290

Host Institution Course Title
NUMERICAL ALGORITHMS

Host Institution Campus
UC Dublin

Host Institution Faculty

Host Institution Degree

Host Institution Department
Applied & Computational Maths

Print