



Course Syllabus: CMGP 09 Finite Element Method II

Instructors: Dr. N. Ben Salah, Dr. S. Adjerid

Course Outline:

1. Discontinuous Galerkin Method for ordinary differential equations
2. Discontinuous Galerkin Method for first-order hyperbolic problems
3. A space time Discontinuous Galerkin Method
4. Discontinuous Galerkin Method for convection-diffusion problems
5. Time dependent problems
6. Convection-Diffusion problem
7. Stokes problem
8. Nonlinear problems in fluids
9. Eigenvalue problems

Course Offering:

Quarter 2 of each academic year (Required Course; 45 hours total; 4.5 Credit hours)

Course Grade: Homework and projects (40%); Exam (60%)

References:

- Reddy, J.N., “Applied Functional Analysis and Variational Methods in Engineering”, McGraw Hill, 1986.
- Johnson, C., “Numerical Solution of Partial Differential Equations by the Finite Element Method”, Cambridge University Press, 1990.
- Girault, V. Ans Raviart P.A., “Finite Element Methods for Navier-Stokes Equations” Springer Series in Computational Mathematics, Vol. 5, Springer-Verlag, 1986.
- Stroud A.H., “Approximate Calculation of Multiple Integrals”, Prentice-Hall, Englewood Cliffs, 1971.
- Saad, Y. “Iterative Methods for Sparse Linear Systems”, PWS Publishing Company, 1996.
- Zienkiewicz, O.C., Taylor, R.L., “The Finite Element Method, Volume 3, Fluid Mechanics, 5th Edition”, Butterworth-Heinman, 2000.