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Determine the effect of roundoff error or loss of significance
Learn methods for solving ODE and PDE

## **TEXTS AND REFERENCES**

- 1. Numerical Methods in Engineering and Science with Programs in C & C++ by B.S. Grewal, Khanna Publisher (2010)
- 2. Introductory Methods for Numerical Analysis by S.S. Sastry, Fourth edition, Prentice Hall of India (2009)
- 3. Numerical Methods for Scientific and Engineering Computation by M.K. Jain, S.R.K. Iyenger and R.K. Jain, 5<sup>th</sup> edition, New Age International (2007)
- 4. Numerical Recipes by WH Press, SA Teukolsky, WT Vetterling and BP Flannery, 3<sup>rd</sup> edition, Cambridge University Press.
- 5. Elementary Numerical Analysis An Algorithmic Approach by S.D. Conte, Carl, de Boor, Third Edition, McGraw Hill Book Company.