

Queens College, CUNY, Department of Computer Science  
**Numerical Methods**  
**CSCI 361 / 761**  
**Spring 2019**  
Instructor: Dr. Sateesh Mane

**Course Website:** <http://venus.cs.qc.cuny.edu/~smane/cs361/>

**Classes:** Tu/Th 6:30 – 7:45 pm, SB D133; 3 hr., 3 cr.

**Office & Hours:** SB A201; Tu/Th 3.30 – 4.30 pm (approx)

**Prerequisites:** CSCI 220 and 313; Math 152 and 231.

**Textbook:** no required text.

**Reference texts (optional):**

- Richard Burden, Douglas Faires, Annette Burden, *Numerical Analysis*, 10<sup>th</sup> ed.
- Richard W. Hamming, *Numerical Methods for Scientists and Engineers*, 2<sup>nd</sup> ed.
- W. H. Press, S. A. Teukolsky, W. T. Vetterling, B. P. Flannery, *Numerical Recipes*, 3<sup>rd</sup> ed.
- Timothy Sauer, *Numerical Analysis*, 2<sup>nd</sup> ed.

**Learning Goals:** The emphasis will be not only on computation but also *analysis*.

**Students will be expected to display independent thought**, not simply memorization of formulas.

**Course Description:** Topics which will be covered are:

- Useful ‘basic’ techniques (Horner’s rule, gcd calculator, Taylor series, etc.).
- Solution of non-linear equations (bisection, Newton-Raphson, secant, fixed point iteration).
- Numerical integration (trapezoid, Simpson, etc.), multi-dimensional integrals.
- Applied Linear Algebra (matrix operations).
- Numerical solutions of ordinary differential equations.
- Additional topics if time permits.
- **Students will be required to write working programs to implement the above algorithms.**
- **Students will be required to carry out mathematical computations in class, using a calculator and/or spreadsheet, including questions for in-class exams.**

**Grade Policy:** The grading policy is as follows.

- The exams will consist of a set of in-class quizzes. Some questions may be take-home. Some exam questions will be mandatory for graduate students and optional for undergraduates. All graded exams have equal weight.
- The dates of the quizzes may not necessarily be announced in advance.
- The number of graded exams will be subject to the constraints of the lecture schedule.
- There may be one or more projects, totally worth approximately 10% of the total grade.
- Homework is not officially graded but good quality homework solutions may be counted for a grade boost.
- **Submission of plagiarized homework will result in a loss of grade.**
- **Any question for which a student submits two or more different answers automatically receives a score of zero for that question.**

**Academic Policy:** Academic dishonesty such as plagiarism or cheating will be dealt with seriously in accord with the University’s policy on academic integrity.

**A student caught cheating on any question in an exam will fail the entire course.**