

**Unit I** Programming with C++: Fundamentals, arrays, Functions, pointers and strings. [1]

**Unit II** Object oriented programming : Class, inheritance, structures. [2]

**Unit III** Introduction to algorithm with programming: Introduction, Sorting: Heap sort, Quick sort, Sorting in linear time. [3]

**Unit IV** Numerical method with programming: Root finding, Interpolation (polynomial interpolation, divided differences), Numerical integration, Solution of system of linear equation (Gauss elimination, LU factorization), Eigenvalue problem, Solution of differential equation (Taylor's method, Euler method, R-K Methods, predator-corrector methods, Boundary value problem and finite difference methods). [4]

**Unit V** Report I

## Textbook

1. D. Ravichandran. *Programming with C++*. McGraw-Hill Education (India) Pvt Limited, 2 edition, 2002.
2. E. Balagurusamy. *Object-oriented programming with C++*. Tata McGraw-Hill Pub. Co., 2 edition, 2001.
3. Thomas H. Cormen. *Introduction to algorithms*. The MIT Press, Cambridge, Massachusetts, 3 edition, 2009.
4. Kendall E. Atkinson. *Elementary numerical analysis*. Wiley, New York, 2 edition, 1985.

## References

- [1] Samuel Daniel Conte and Carl Boor. *Elementary numerical analysis; an algorithmic approach*. McGraw-Hill, New York, 2 edition, 1972.
- [2] B.S. Grewal. *Numerical Methods in Engineering & Science with Programs in C & C++*. Khanna Publishers, 9 edition, 2013.
- [3] Gregory L. Heileman. *Data structures, algorithms, and object-oriented programming*. McGraw-Hill, New York, 1996.
- [4] J. R. Hubbard and Anthony Q. Baxter. *Programming with C++*. McGraw-Hill, 2000.
- [5] Yedidyah Langsam, Moshe Augenstein, and Aaron M. Tenenbaum. *Data structures using C and C++*. Prentice Hall, Upper Saddle River, N.J., 2 edition, 1996.