UTFPR
UNIVERSIDADE TECNOLÓGICA FEDERAL DO PARANÁ

Unit of Study Information

Code	Unit	Evaluation Method	Mode	Session options
CSF20	Data Structure 1	Grade and Attendance	Presencial	Semestral

Workload

TC	PC	OA	SPA	PACC	Total
2	1	3	6	0	45

- TC: Theorethic Classes (per week);
- PC: Practical Classes (per week);
- OA: Out-of-class Activities (hours per session);
- SPA: Supervised Practical Activities (classes per session);
- PACC: Practical Activities as Curricular Components (classes per session, included in OA and SPA);
- Total: total workload in hours.

Learning Outcomes

Present to the student the main data structures used in programming, their characteristics, representations, applications and implementation in a programming language, as well as the associated algorithms for manipulation and retrieval of stored information.

Syllabus

List, queue and stack. Sequential search and binary search. Sort Algorithms (Bubble-Sort, Selection-Sort, Insertion-Sort, Quick-Sort, Merge-Sort, Linear Sort).

Content

Order	Syllabus	Content
1	Linear Data Structures and their Generalizations Ordered Lists, Chained Lists, Stacks, and Queues.	Linked lists (single, double, circular). Stacks and rows.
2	Sequential search and binary search.	Search in arrangements.
3	Search and Sort Algorithms.	Search in primary memory. Sequential and binary search. Research Trees. Internal sorting (selection, insertion, shellsort, quicksort, heapsort). External ordering.

Basic Resources

DROZDEK, Adam. Estrutura de dados e algoritmos em C++. São Paulo, SP: Cengage Learning, c2002. xviii, 579 p. ISBN 8522102593.

ZIVIANI, Nivio. Projeto de algoritmos: com implementações em Java e C++. São Paulo: Thomson, c2007. xx, 621 p. ISBN 8522105251.

CORMEN, Thomas H. et al. Algoritmos: teoria e prática. Rio de Janeiro, RJ: Elsevier, 2012. xvi, 926 p. ISBN 9788535236996.

Aditional Resources

KNUTH, DONALD E. The Art of Computer Programming, Volume 3: Sorting and Searching, Addison-Wesley, 1998.

SEDGEWICK, Robert. Algorithms in C++. 3rd ed. Boston: Addison-Wesley, c1998-c2002. 3 v. ISBN 0-201-35088-2 (Parts 1a4

SCHILDT, Herbert. Borland C++: completo e total. São Paulo: Makron Books, 1997 1114 p. ISBN 85-346-0813-X

TENENBAUM, Aaron M.; LANGSAM, Yedidyah; AUGENSTEIN, Moshe. Estruturas de dados usando C. São Paulo, SP: Pearson Makron Books, c1995. xx, 884 p. ISBN 8534603480.

LOUDEN, Kenneth C. Compiladores: princípios e práticas. São Paulo, SP: Thomson, c2004. xiv, 569 p. ISBN 8522104220.

PREISS, BRUNO R. Estrutura de Dados e Algoritmos, Rio de Janeiro: Campus, 2001.

KNUTH, Donald E. The art of computer programming. 3rd ed. Reading: Addison-Wesley, c1997, c1998. 3 v. ISBN 0201896834 (v. 1).