

Advanced Programming

SYLLABUS

I. IDENTIFICATION

Program: Computer Science		
Course: Advanced Programming		
Class hours: 60 hours (4 local credits)	Academic year: 2022/2	Phase: Optative class
Professor: Yuri Kaszubowski Lopes		
Contact: yuri.lopez@udesc.br		

II. SUMMARY

Programming and languages; Data structures; Recursion; Sorting; Graph; Algorithm design and analysis.

III. DIDACTIC PROGRAM

The class will cover but is not restricted to the following topics:

- Fundamentals of mathematics
- Programming and languages
- Data structures
- String-searching algorithms
- Recursion
- Sorting algorithms
- Graph algorithms
- Algorithm design and analysis: brute force, greedy, divide and conquer, dynamic programming, backtracking, amortized analysis, approximation, randomized
- Selected topics

IV. LEARNING METHODOLOGY

The learning methodology will consist of lectures, seminars, activities at both computer laboratories, and homeworks.

V. ASSESSMENT SYSTEM

The assessment will consist on quizzes and seminars with group presentation throughout the semester.

IV. BIBLIOGRAPHY

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HOROWITZ, Sahni. Fundamentals of Computer Algorithms. Computer Science Press, 1978.

SEDGEWICK, Robert. Algorithms in C, 3 rd. edition. Addison-Wesley/Longman, 2002.

AHO, Hopcroft, Ulman. The Design and Analysis of Computer Algorithms. Addison-Wesley, 1974.

SKIENA, Steven S., e REVILLA, Miguel A., Programming Challenges – The Programming Contest Training, Manual. Springer, 2003.

MANBER, UDI. Introduction to Algorithms. A Creative Approach. Addison-Wesley, 1989.

NORVIG, Peter. Techniques for Automatic Memoization with Applications to Context-Free Parsing, Computational Linguistics. Vol. 17 No. 1, pp. 91-98, March 1991.

TOSCANI, Laira. Métodos de Desenvolvimento de Algoritmos: Especificação Formal. Análise Comparativa e de Complexidade. Tese de Doutorado. Dep. De50 Informática. PUC-RJ, 1988.

RESENDE, M., Greedy Randomized Adaptive Search Procedures. Technical Report, AT&T Bell Laboratories, Murray Hill, 1998.

PRAIS, M., RIBEIRO, C. C., Reactive GRASP: Na Application to a Matrix Decomposition Problem in TDMA Traffic Assignment. Informs Journal on Computing, 1998.

BLACK, Paul E., Divide and marriage before conquest at the NIST Dictionary of Algorithms and Data Structures.