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CSTP 1305: Algorithm Analysis and Data Structure

EFFECTIVE DATE

September 2019

DEPARTMENT

Computer Systems Tech Diploma

DESCRIPTION

Students learn the fundamentals of algorithm design and analysis through hands-on practice with various popular algorithms and data structures used in software development. Students learn how to analyze the time and space complexity of an algorithm and learn how to test and choose the right solution for a non-trivial programming problem. The emphasis is on developing practical skills as well as the conceptual mastery of efficient algorithm selection. Important data structures covered in this course include: Arrays and Vectors, Trees and Graphs. Popular algorithms and design strategies covered include: Recursion vs Iteration, Divide and Conquer, Greedy Techniques and basic sorting algorithms.

CREDITS

3.0

YEAR OF STUDY

1st Year Post-secondary

PREREQUISITES

CSTP 1205 Programming in C++

COREQUISITES

None

COURSE LEARNING OUTCOMES

Upon successful completion of this course, students will be able to:

- Examine fundamentals of Algorithm Analysis
- Efficiently analyse an algorithm's requirements and performance
- Apply proper algorithms and choose the right data structure to solve practical problems
- Identify algorithmic bottlenecks in an application code and suggest solutions
- Deduce time and space complexity of common algorithms

PRIOR LEARNING ASSESSMENT & RECOGNITION (PLAR)

None

HOURS

Lecture: 30

Lab: 30

INSTRUCTIONAL STRATEGIES

Instructional strategies include classroom lectures, demonstrations, group discussions, computer lab and hands-on practical work.

GRADING SYSTEM

Letter Grade (A-F)

PASSING GRADE

C

EVALUATION PLAN

Type	Percentage	Assessment activity
Assignments	60	6 assignments, each 10%
Midterm Exam	20	
Final Exam	20	

COURSE TOPICS

- The fundamentals of algorithm analysis
- Vectors and Arrays
- Iteration vs Recursion
- Time and space lower bound complexity
- Pseudo-code
- Divide and Conquer
- Greedy Algorithms
- Binary Trees

LEARNING RESOURCES

None

Notes:

- Course contents and descriptions, offerings and schedules are subject to change without notice.
- Students are required to follow all College policies including ones that govern their educational experience at VCC. Policies are available on the VCC website at:
<https://www.vcc.ca/about/governance--policies/policies/>.
- To find out how this course transfers, visit the BC Transfer Guide at <https://www.bctransferguide.ca>.

Broadway campus

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Downtown campus

250 West Pender Street
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