



Data Structures and Algorithms Introduction

Văn Chí Nam

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Pre-course survey

- Link: <https://link.hcmus.edu.vn/precourseDSA23CQ>



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Course Information

- Place: room F301
- Time: Friday morning (from **7:30** - 11:00)
- Instructor: Mr. **Văn Chí Nam** (vcnam@fit.hcmus.edu.vn)
- Teaching assistant: Mr. **Trần Hoàng Quân** (thquan@fit.hcmus.edu.vn)
- Lab teacher: Ms. **Phan Thị Phương Uyên** (ptpuyen@fit.hcmus.edu.vn)



Course Website

- Moodle: <https://courses.fit.hcmus.edu.vn>
 - Mobile app
- This course website is used for:
 - Questions and Answers
 - Announcement
 - Course materials
 - Work submission



Grading

- Lab (practice, mid-term, final): 40%
- Theory:
 - Class-work (exercises on theory sessions, quiz, etc): 10%
 - Mid-term test: 10%
 - Final test: 40%
- (Bonus) Challenges: 10%
- The lab exams (mid-term and final) will be taken on computer (programming tasks).
- **Cheating** (copies during the course): getting 0 for the final result.



Participation

- Students are required to attend the class more than **70%** number of sessions (**≥ 8 sessions**).
- If your attendance is less than the requirement, you will FAIL the course.
- SPECIAL CASE?



Class Requirements | Theory Sessions

- To be on time and actively participate in class activities.
- There are some quizzes during the course.
- Prepare and use your own notebook for the course.
- Use your laptop/phone only for the course-related purposes.
- Keep your phone in silent mode.



Class Requirements | Lab Sessions

- Follow the guidance of the teachers.
- Are not hesitate to ask questions.
- Try your best to get as much experience as you can.
- Language: C++.
- IDE: optional. (Dev C++, g++, Visual Studio are OK)



Other Notes

- Use official email always (subject starting with **[23CQ-DSA]**).
- Read text-books more than the requirements.
- Get the knowledge from the videos suggested by the instructors.

Textbooks

- Frank M. Carrano, Timothy Henry (2017), **Data Abstraction and Problem Solving with C++: Walls and Mirrors** (Seventh Edition)
- Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein (2001), **Introduction to Algorithms** (Second Edition)
- Steven S. Skiena (2008), **The Algorithm Design Manual** (Second Edition)

Course Topics

- **Algorithm Efficiency**
 - Big-O notation
- **Sorting Algorithms**
 - Selection Sort,
 - Heap Sort, Quick Sort, Merge Sort,
 - Radix Sort
- **Tree structures**
 - General tree
 - Binary tree, Binary search tree
 - Balanced tree(s)
- **Hash table**
 - Hashing
 - Collision resolving techniques
- **Graph structure**
 - Traversal
 - Spanning tree, Minimum spanning tree
 - Shortest path



Questions and Answers