CÁC CHỦ ĐỀ CHO BÀI TẬP LỚN

(2 sinh viên/nhóm, viết báo cáo và slide trình bày)

I. Time Complexity
1. MEASURING COMPLEXITY

Big-O and small-o notation - Analyzing algorithms - Complexity relationships among models

2. THE CLASS P

Polynomial time - Examples of problems in P

3. THE CLASS NP

Examples of problems in NP - The P versus NP question

4. NP-COMPLETENESS

Polynomial time reducibility - Definition of NP-completeness - The Cook-Levin Theorem

5. EXAMPLES OF NP-COMPLETE PROBLEMS

The vertex cover problem - The Hamiltonian path problem - The subset sum problem

II. Space Complexity
1. SAVITCH'S THEOREM
2. THE CLASS PSPACE
3. PSPACE-COMPLETENESS

The TQBF problem - Winning strategies for games - Generalized geography

4. THE CLASSES L AND NL
5. NL-COMPLETENESS

Searching in graphs

6. NL EQUALS CONL

III. Intractability
1. HIERARCHY THEOREMS

Exponential space completeness

2. RELATIVIZATION

Limits of the diagonalization method

3. CIRCUIT COMPLEXITY

IV. Advanced Topics in Complexity Theory
1. APPROXIMATION ALGORITHMS
2. PROBABILISTIC ALGORITHMS

The class BPP - Primality - Read-once branching programs

3. ALTERNATION

Alternating time and space - The Polynomial time hierarchy

4. INTERACTIVE PROOF SYSTEMS

Graph nonisomorphism - Definition of the model - IP = PSPACE

5. PARALLEL COMPUTATION

Uniform Boolean circuits - The class NC - P-completeness

6. CRYPTOGRAPHY

Secret keys - Public-key cryptosystems - One-way functions - Trapdoor functions