**COMP 5900D/4900E for Term Fall 2024 (Preliminary Version)**

**Approximation Algorithms**

**Course Information**

Instructor: Svetlana Obraztsova

Contact: svetlana.obraztsova@carleton.ca.

Classroom: Check Brightspace

Lectures: Mondays & Wednesdays, 11:35 - 12:55 (in class)

Tutorials: no separate tutorials

Course Website: https://brightspace.carleton.ca/d2l/home/292798

* Brightspace access for University of Ottawa Students; please see information here: <https://gradstudents.carleton.ca/faculty-of-graduate-and-postdoctoral-affairs-access-to-brightspace/>

For information about Carleton's academic year, including registration and withdrawal dates, see [Carleton's Academic Calendar](https://calendar.carleton.ca/academicyear/).

**Course prerequisites:**

COMP 2804, COMP 3804

**Required Textbook(s) and Other Resources**

Vijay V. Vazirani “Approximation Algorithms”

**Topics Covered**

Week 1. Introduction

Week 2. Basic combinatorial optimization problems and definitions. Basics of computational complexity.

Week 3. Set cover problem.

 Homework 1 becomes available on 16 September.

Week 4. Travelling salesman problem, minimum spanning tree problem.

 Deadline for submitting Homework 1 is 23 September 23:59.

 Short in class quiz 1 is on 25 September.

Week 5. Knapsack problem. Homework 1 solutions.

 Test 1 (in class) is on 2 October.

Week 6. Bin packing problem. Solutions of test 1.

 Homework 2 becomes available on 7 October.

Week 7. Test 2 (in class) is on 16 October.

 Deadline for submitting Homework 2 is 15 (Tuesday!) October 23:59 .

Week 8. Recess week.

Week 9. Introduction to LP Duality. Solutions of test 2 and homework 2.

Week 10. Dual fitting.

 Short in class quiz 2 is on 6 November.

 Homework 3 becomes available on 4 November.

Week 11. Rounding.

 Test 3 in class is on 13 November.

 Deadline for submitting Homework 3 is 11 November 23:59.

Week 12. Scheduling on unrelated parallel machines. Solutions of test 3 and homework 3.

 Short in class quiz 3 is on 20 November.

 Homework 4 becomes available on 18 November.

Week 13. Reserve.

 Deadline for submitting Homework 4 is 25 November 23:59.

Week 14. Test 4 in class on 2 December.

**Assessment Scheme**

Homework assignments contribute 30% to the final grade. Tests contributes 60%. Quizzes contribute 10% to the final grade.

Homework component will be calculated based on 3 best homework assignments out of 4. Tests component will be calculated based on 4 best tests out of 4.

No make up tests and quizzes will be available.

Homeworksshould be submitted via Brightspace as **pdf**.

**Undergraduate Academic Advisors**

The Undergraduate Advisors for the School of Computer Science are available in Room 5302HP; or by email at scs.ug.advisor@cunet.carleton.ca. The undergraduate advisors can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisors will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and Writing Tutorial Services.

**Graduate Academic Advisors**

The Graduate Advisors for the School of Computer Science are available in Room 5302 HP; or by email at grad.scs@carleton.ca. The graduate advisors can assist with understanding your academic audit and the remaining courses required to meet graduation requirements.

**University Policies:**

* **Academic Accommodations**

Carleton is committed to providing academic accessibility for all individuals. Please review the academic accommodation available to students here: <https://students.carleton.ca/course-outline/>.

* **Academic Integrity**

**Student Academic Integrity Policy.** Every student should be familiar with the Carleton University Student Academic Integrity policy. A student found in violation of academic integrity standards may be sanctioned with penalties which range from a reprimand to receiving a grade of F in the course, or even being suspended or expelled from the University. Examples of punishable offences include plagiarism and unauthorized collaboration. Any such reported offences will be reviewed by the office of the Dean of Science. More information on this policy may be found on the ODS Academic Integrity page: [Academic Integrity | Faculty of Science (carleton.ca)](https://science.carleton.ca/students/academic-integrity/).

**Plagiarism.** As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offences will be reviewed by the office of the Dean of Science. More information and standard sanction guidelines can be found here: <https://science.carleton.ca/students/academic-integrity/>. Please note that content generated by an unauthorized A.I.-based tool \*is\* considered plagiarized material.

**Unauthorized Collaboration.** Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis".