CSCE 2211: Applied Data Structures
Term Paper Guidelines

The term paper is **NOT OPTIONAL**. The paper grade represents **10%** of the total course grade.

A group of **3–5 members** should submit a paper on a subject of their own choice but related to the course. The paper aims at presenting a **literature survey of methods, data structures, and/or algorithms** in the chosen topic with exposure of applications as well as **analysis and critique of the methods and some experimental evaluation**. The paper should present a survey of some published works on the paper topic and its applications with analysis and critique of the method(s). *You are required to run an experiment of your own following what you find in the survey and report on it.*

Guidelines

- The paper is intended to be a teamwork.
- A group of **3–5 members** is to write a paper of **6 pages in IEEE double column format** on a subject of their own choice and to submit the paper by the deadline. The paper should be written using **LaTeX** (you can use **Overleaf**, a local installation of LaTeXcoupled with Git or any other tool you prefer).
- Group members can be from different sections.
- The paper group can be the same as that presenting the term project.
- Names of group members should be **registered** in the Google sheet on **Canvas** by **Thursday the 2nd of October, 2025**. The groups cannot be changed past that date.
- Names of group members must be included in the final report with no allowance to change the names from those sent before.
- The final paper manuscript should be submitted on Canvas.
- Final date of submission of the complete paper is **Thursday the 11th of December, 2025**. There will be **NO late policy** for the submission of the paper. No submissions will be accepted after the due date.
- To check the similarity of your paper, you should use Turnitin. The class ID is *50166616*. The enrollment key is *F25CSCE2211*.

Grading Rubric

- Formatting (20%): This includes following the IEEE double column conference format, using proper in-text citations and writing the references correctly following the IEEE referencing style. It also includes the organization of the paper (section names and topics, flow of ideas,...). The paper should be well written and cohesive (sections written by different people should still fit well together and follow the same formatting).

- Abstract (20%): The abstract needs to be well written and to be representative of the content of the paper. The abstract will be graded in the first and last milestones.
- Conclusion and future work (10%): Your paper should include a meaningful conclusion of what was found from the literature survey and your experiment, and suggested future work.
- Experiment (30%): Your paper should include the description and the results of a meaningful well-designed experiment that relates to its topic (e.g., if there are different implementations for a data structure that result in different performance and memory usage, you can have an implementation of each evaluated version and present the results when using them). The experiment can also be used in the project if the topics are the same.
- Literature survey (20%): Your literature survey should present a **minimum of four published papers** on the topic that you are covering, and present a discussion of what they do and their findings. *At least two of the presented papers should be published within the last ten years.* Your literature survey should also guide your analysis in the rest of the paper including the experiment part.
- Plagiarism: You will need to check your paper for similarity on Turnitin. Your plagiarism should not be more than 20%. If it is, then it is your responsibility to fix this before the submission deadline. Please also note that it is **NOT** allowed for you to use AI tools to write the paper for you. You can use the tools to help you before writing, with LaTeX issues, or with grammar issues. If you do so, you must acknowledge the use. You **cannot** cite an AI tool as a reference.

Milestones

- Milestone 1 (Abstract) **Monday 27th of October**: You should present the chosen topic and the abstract in this milestone as well as an initial plan for the paper.
- Milestone 2 (Experiment) **Monday 17th of November**: A presentation of the experiment carried out along with the corresponding parts in the paper for the experiment. At this point, the literature survey should also be well developed to align with the choice of the experiment.
- Milestone 3 (Final submission) **Thursday 11th of December**: Final submission of the pdf of the completed paper.

Academic Integrity

Students are expected to commit to the principles of academic integrity. Any plagiarism detected will result in zero grade.

Check AUC Academic Integrity

Suggested Topics for the Paper

- String matching algorithms

- Real-world applications of self-balancing trees (including types not covered in the course).
- Minimum-cost spanning trees for graphs and their applications
- Shortest path problems in graphs
- Social networking and Graph algorithms
- Mesh data structures
- Google Maps
- The new shortest path algorithm (Breaking the Sorting Barrier for Directed Single-Source Shortest Paths)
- Doubly connected edge lists
- Cluster analysis
- Sudoku by backtracking and variations of Sudoku (16 * 16, mini Sudoku)
- Knight's tour problem
- N-Queens problem
- The traveling salesman problem
- Quantum computing
- Rubik's cube algorithms
- Minimax algorithms
- Sparse matrices storage formats
- Tries
- Bounding volume hierarchies
- Data structures in computational geometry