Data Structures and Algorithmic Problem Solving

This course is cross-listed in three graduate programs at Rutgers-Camden: Data Science, CCIB and Computer Science. The course is aimed at developing expertise in understanding and implementing many commonly used data structures like arrays, linked lists, tree structures and hash tables. Side by side, the course also serves as an introduction to fundamental techniques and tools for algorithm design and analysis. To implement algorithms and data structures, we will use the **Python** programming language along with specific frameworks and libraries from the Python ecosystem.

> **!** Important
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> This is a hands-on course! It will be taught in a manner that facilitates in-class coding and analysis assessments. Please be prepared to come to every class with a laptop. Students who are unfamiliar or new to Python coding must be prepared to quickly get up to speed with the language constructs, object-oriented programming and builtin modules by the end of the first three weeks.

> **i** Software Requirements
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> Please make sure that you have the following software installed:
> - a suitable command-line Unix shell (`gitbash` or `wsl2` on Windows machines; any flavor of Unix on Linux/Mac)
> - Python 3.10+
> - Project Jupyter (for working with IPython/Jupyter notebooks)
> - A suitable code editor (`Pycharm`, `VS Code` etc.) for creating/editing Python modules.
> - The Python package pythonds3: you can install it via `pip`.
> - The Python testing framework pytest: also use `pip` to install.
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> Additional Python packages will be recommended for installation as needed.

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