Quantum Computing Project
Weight: 7%

Learn the basics of Qiskit from these videos. Note that in the final exam, there will be some basic questions based on these videos. Additionally, you may watch any other videos or look at Qiskit documentation.

The project consists of three different tasks and can be completed by a group of three individuals.

1. Task One (Deadline: April 29th, 11:59 PM): Write a one-page project proposal document. Your proposal should include the following:

    - Choose a quantum circuit that may or may not perform a useful function, but ensure it is not copied from the internet and does not already exist. Create a hand-drawn diagram and include it in your proposal.
    - The quantum circuit should have at least a 4-qubit register and contain at least 5 gates, including some control gates.
    - Incorporate at least one noise model into the quantum circuit to simulate noise. Explain your noise model.
    - Produce results using two different backends and explain each of them.
    - Utilize two different methods to visualize the final output of your results and explain these methods in your proposal.
    - One or two bonus marks if your project is difficult, novel, and have something dazzling.

2. Task Two (Deadline: May 13th, 11:59 PM):

    - Submit the complete code of your project, which can be executed in a Jupyter notebook. Ensure that the code has ample comments. The instructor should be able to run it on his computer without any errors.
    - Write a document from on to three pages long explaining your code and project in detail.

3. Task Three (Deadline: May 14th-17th):

    - Attend a viva with your team members.
    - Expect questions about your contributions, your project, and your understanding of Qiskit.
    - Marks may vary based on your performance during the viva.