# Exam 3: Study guide

The exam is open internet. However, I strongly recommend you to prepare for the exam and not bank on the fact you can search online. I recommend preparing a summary sheet of 8.5 x 11 inch of your own handwritten notes - this is a good learning exercise. The exam questions will be determined such that they satisfy a subset of the objectives listed here.

Exam 3 will cover:

- Functions, data structures, Taylor series and Newton Raphson

- Lecture handouts # 3 and #5

- Assignments 03 and 04 (functions, Taylor series and Newton Raphson)

- Labs 03 to 05 (Functions, Taylor series and Newton Raphson)

To perform successfully on Exam I, you should be able to:

1. Define function with arguments (including default) and multiple return types for a given problem and call (use) the functions in a Python code.

2. Rewrite a given program using functions to make re-use of code as much as possible.

3. Identify and fix errors in passing function arguments and return types.

4. Evaluate the output of a given function(s).

5. Evaluate the value of different variables within and outside the function (scoping)

6. Develop Python code that use, index, manipulate and search (`in` and `not in`) lists.

7. Iterating through a list using indexing and `in` operations.

8. Deduce the value of a variable after trying to modify a list item and a tuple using an index or a key.

9. Use of dictionary is **not** part of the exam.

10. Develop Taylor series approximation for non-polynomial functions for single variable functions. Write a Python code to solve for the Taylor approximation with relative errors.

11. Develop Newton-Raphson code to find the root of a function. Compute the tolerance error at each iteration.

You won't be required to write lengthy code (more than 30 lines). I will not penalise for obvious typos and syntax errors in your code (for e.g., missing : at the end of function definitions), unless that is what is tested.