

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:

- Data structures, Taylor series and Newton Raphson, Vectors and Matrices
- Assignments 04 and 05 (Taylor series and Newton Raphson, Vectors and Matrices)
- Labs 04 - 06 (Data Structures, Taylor series and Newton Raphson, Vectors and Matrices)

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

1. Develop Python code that use, index, manipulate and search (**in** and **not in**) lists.
2. Iterating through a list using indexing and **in** operations.
3. Deduce the value of a variable after trying to modify a list item and a tuple using an index or a key.
4. Use of dictionary is **not** part of the exam.
5. 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.
6. Develop Newton-Raphson code to find the root of a function. Compute the tolerance error at each iteration.
7. Determine if a given Matrix-Vector operation is valid or not (for e.g., $A \cdot b$, where A is a 3x3 matrix and b is a 3x1 vector) and estimate the shape of the output.
8. Use array slicing in vectors and matrices to get selected sub-set of elements, rows or columns.

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.