

Course: Programming, Data Structures and Algorithms using Python

Course Code: noc18-cs34

Session: 2018-19

Duration: 8 Weeks

Assessment procedures: Weekly Assignment (25%) + proctored certification Exam (75%)

Curriculum of the Course:

Week 1:

- Informal introduction to programming, algorithms and data structures via gcd, Downloading and installing Python, gcd in Python: variables, operations, control flow - assignments, conditionals, loops, functions.

Week 2:

- Python: types, expressions, strings, lists, tuples, Python memory model: names, mutable and immutable values, List operations: slices etc., Binary search, Inductive function definitions: numerical and structural induction, Elementary inductive sorting: selection and insertion sort, In-place sorting

Week 3:

- Input-Output Handling in Java
- Basic algorithmic analysis: input size, asymptotic, complexity, $O()$ notation, Arrays vs lists, Merge sort, Quicksort, Stable sorting

Week 4:

- Dictionaries, More on Python functions: optional arguments, default values, Passing functions as arguments, Higher order functions on lists: map, iter, list comprehension

Week 5:

- Exception handling, Basic input/output, Handling files, String processing.

Week 6:

- Backtracking: N Queens, recording all solutions, Scope in Python: local, global, nonlocal names, Nested functions, Data structures: stack, queue, Heaps

Week 7:

- Abstract datatypes, Classes and objects in Python, "Linked" lists: find, insert, delete, Binary search trees: find, insert, delete, Height-balanced binary search trees.

Week 8:

- Efficient evaluation of recursive definitions: memorization, Dynamic programming: examples, Other programming languages: C and manual memory management, Other programming paradigms: functional programming.

List of students enrolled

S. No	Name of Student
1	Sahil Agarwal
2	Shruti Agarwal
3	Anjali Poddar
4	Anshul Kumar Garg
5	Apurv Agarwal

6	Arpit Gupta
7	Ashita Gupta
8	Ayush Agrawal
9	Bharat Jain
10	Himanshu Koley
11	Dilkhush Sharma

12	Jigyasa Gupta
13	Harshit Tiwari
14	Isha Gupta
15	Ankit Saini
16	Jitisha S. Gupta
17	Keyur
18	Khushboo
19	Madhav Dwivedi
20	Hitakshi Malhotra
21	Mohit Sharma
22	Namit Patni
23	Sharad Kumar Pareek
24	Rajat Saini
25	Ritik Agarwal
26	Samridh
27	Manan Saxena

28	Shashank Mathur
29	Shivani Kharra
30	Siddhartha Kumar
31	Sachin Kumar
32	Soumya Kharwas
33	Tamanna
34	Tarun Gupta
35	Urvi Sharma
36	Utkarsh Singh
37	Umang Vanawat
38	Vishavadeep Singh Shekhawat
39	Vishal Tulsani
40	Yashita Jain
41	Yash Vardhan Sharma
42	Yoshit Mathur