

DSE(Hons) – Preparatory Material

horizontal line

The learning resources to help you prepare for the screening test. The resources that we list here are references that we have collected over the internet. While we do recommend these resources based on the inputs of our user community, we do not claim that these are the most authoritative Learning Resources about any topic. Please feel free to find out what suits best to you.

You can expect problems from the following topics to come in the screening test.

## Syllabus:

The syllabus for each level is mentioned below:

- Basic Programming (Conditionals, if-else, etc.)

- Basic Data Structures & Algo (Linear data structures - arrays, stacks etc.)

- Maths & Algebra

- Probability

- Set theory

- Basic Statistics

- Logical thinking

- Guesstimates

## Learning Resources:

1. **Basic Programming: -**
2. Python (Conditionals statements)

YouTube - <https://www.youtube.com/watch?v=PqFKRqpHrjw>

1. Python (Functions)

YouTube - <https://www.youtube.com/watch?v=NSbOtYzIQI0> – Define Functions

YouTube - <https://www.youtube.com/watch?v=cKlnR-CB3tk> – Lambda Functions

1. Python (Loops)

YouTube - <https://www.youtube.com/watch?v=HZARImviDxg> - While Loops

YouTube - <https://www.youtube.com/watch?v=0ZvaDa8eT5s> – For Loops

1. Theory/Concepts – Basic Programming – Python

Techbeamers.com - <https://www.techbeamers.com/python-if-else/>

[Techbeamers.com - https://www.techbeamers.com/python-for-loop/](file:///C:\Users\DILIP\Desktop\Techbeamers.com%20-%20%20https:\www.techbeamers.com\python-for-loop\)

Techbeamers.com - <https://www.techbeamers.com/python-while-loop/>

Techbeamers.com - <https://www.techbeamers.com/python-function/>

1. Practice – Basic Programming – Python

W3resource.com - <https://www.w3resource.com/python-exercises/python-conditional-statements-and-loop-exercises.php>

W3resource.com - <https://www.w3resource.com/python-exercises/python-functions-exercises.php>

1. **Basic Data Structures & Algo (Linear data structures)**

* **Arrays**
  + - Resources
      * codechef.com - [Data Structure Tutorial: Array](https://discuss.codechef.com/questions/87915/data-structure-tutorial-array)
      * geeksforgeeks.org - [Arrays Data Structure](http://www.geeksforgeeks.org/array-data-structure/)
    - Practice Problems
      * codechef.com - [COPS](https://www.codechef.com/problems/COPS), [editorial](https://discuss.codechef.com/questions/72499/cops-editorial)
* **Strings**
* Resources
  + - * docs.python.org - [Python strings](https://docs.python.org/2/library/string.html)
      * tutorialspoint.com - [Python strings](https://www.tutorialspoint.com/python/python_strings.htm)
      * geeksforgeeks.org - [Many string questions](http://www.geeksforgeeks.org/string-data-structure/)
    - Practice Problems
      * codechef.com - [CSUB](https://www.codechef.com/problems/CSUB), [editorial](https://discuss.codechef.com/questions/47237/csub-editorial)
* **Stack and Queue**
* Resources
  + - * geeksforgeeks.org - [Stack Data Structure](http://www.geeksforgeeks.org/stack-data-structure/)
      * geeksforgeeks.org - [Introduction and Array Implementation](http://www.geeksforgeeks.org/queue-set-1introduction-and-array-implementation/)
      * tutorialspoint.com - [Data Structures Algorithms](https://www.tutorialspoint.com/data_structures_algorithms/stack_algorithm.htm)
      * cs.cmu.edu - [Stacks](https://www.cs.cmu.edu/~wlovas/15122-r11/lectures/10-stacks.pdf)
      * cs.cmu.edu - [Stacks and Queues](https://www.cs.cmu.edu/~adamchik/15-121/lectures/Stacks%20and%20Queues/Stacks%20and%20Queues.html)
      * cs.cmu.edu - [Stacks and Queues](https://www.cs.cmu.edu/~rjsimmon/15122-s13/09-queuestack.pdf)
    - Practice Problems
      * codeforces.com - [D. Maximum Xor Secondary](http://codeforces.com/problemset/problem/281/D)
* **Basic math operations (addition, subtraction, multiplication, division, exponentiation)**
  + - * codechef.com - [A tutorial on Fast Modulo Multiplication](https://discuss.codechef.com/questions/20451/a-tutorial-on-fast-modulo-multiplication-exponential-squaring)
* **Basic Recursion**
* Resources
  + topcoder.com - [An Introduction to Recursion, Part 1](https://www.topcoder.com/community/data-science/data-science-tutorials/an-introduction-to-recursion-part-1/)
  + topcoder.com - [An Introduction to Recursion: Part 2](https://www.topcoder.com/community/data-science/data-science-tutorials/an-introduction-to-recursion-part-2/)
  + byte-by-byte - [Recursion for Coding Interviews](https://www.byte-by-byte.com/recursion/)
    - Practice Problems
      * codechef.com - [TRISQ](https://www.codechef.com/problems/TRISQ), [editorial](https://discuss.codechef.com/questions/64151/trisq-editorial)

**Sorting**

* **Resource**
  + [khanacademy.org](https://www.khanacademy.org/computing/computer-science/algorithms/sorting-algorithms/a/sorting)
  + [visualgo.net](https://visualgo.net/en/sorting?slide=1)
  + [iarcs.org.in](https://www.iarcs.org.in/inoi/online-study-material/topics/sorting.php)

**Merge sort**

* youtube.com - [Merge sort algorithm](https://www.youtube.com/watch?v=TzeBrDU-JaY)

1. Practice Problems

* codechef.com -[MRGSRT](https://www.codechef.com/problems/MRGSRT)

**Quick sort**

* youtube.com - [Quicksort algorithm](https://www.youtube.com/watch?v=COk73cpQbFQ)

1. Practice Problems

* codechef.com -[TSORT](https://www.codechef.com/problems/TSORT)

**Counting sort**

* geeksforgeeks.org - [Counting Sort](http://www.geeksforgeeks.org/counting-sort/)

1. Practice Problems

* codechef.com - [STICKS](https://www.codechef.com/problems/STICKS), [editorial](https://discuss.codechef.com/questions/82568/sticks-editorial)

**Python (Data Structure’s): -**

* **Resource: -**
  + Geekforgeeks - <https://www.geeksforgeeks.org/inbuilt-data-structures-python/>
  + YouTube – <https://www.youtube.com/watch?v=R-HLU9Fl5ug&list=PLj8W7XIvO93qsmdxbaDpIvM1KCyNO1K_c>

1. Practice Problems

* W3resource - <https://www.w3resource.com/python-exercises/data-structures-and-algorithms/python-data-structure.php>

**Math & Algebra: -**

* **Resource: -**
  + Toppr.com - <https://www.toppr.com/guides/maths/algebra/mathematical-equation/>
  + Khanacademy.org - <https://www.khanacademy.org/math/algebra-home/alg-intro-to-algebra>

**Probability: -**

* **Resource: -**
  + Khanacademy - <https://www.khanacademy.org/math/statistics-probability>
  + Hitbullseye :-

<https://www.hitbullseye.com/Probability-Problems.php> - Optional

* + Hitbullseye :-

<https://www.hitbullseye.com/Probability-Examples.php>- Optional

**Set theory: -**

* **Resource: -** 
  + Khan Academy – <https://www.khanacademy.org/math/statistics-probability/probability-library/basic-set-ops/v/intersection-and-union-of-sets>

**Basic statistics: -**

* **Resource: -**
  + makemeanalyst.com - <http://makemeanalyst.com/basic-statistics-explore-your-data-cases-variables-types-of-variables/>
  + makemeanalyst.com - <http://makemeanalyst.com/explore-your-data-matrix-and-frequency-table/>
  + makemeanalyst.com - <http://makemeanalyst.com/explore-your-data-graphs-and-shapes-of-distributions/>
  + makemeanalyst.com - <http://makemeanalyst.com/explore-your-data-mode-median-and-mean/>
  + makemeanalyst.com - <http://makemeanalyst.com/explore-your-data-range-interquartile-range-and-box-plot/>
  + makemeanalyst.com - <http://makemeanalyst.com/explore-your-data-variance-and-standard-deviation/>
  + makemeanalyst.com - <http://makemeanalyst.com/explore-your-data-z-scores/>
  + makemeanalyst.com - <http://makemeanalyst.com/contingency-table-scatterplot-pearsons-r/>
  + makemeanalyst.com - <http://makemeanalyst.com/basics-of-regression/>
  + makemeanalyst.com - <http://makemeanalyst.com/elementary-probability/>
  + makemeanalyst.com - <http://makemeanalyst.com/basic-statistics-for-data-analysis/random-variables-and-probability-distributions/>
  + makemeanalyst.com - <http://makemeanalyst.com/normal-distribution-binomial-distribution-poisson-distribution/>

**Logical Thinking: -**

* **Resource: -**
* indiabix.com - <http://indiabix.com/logical-reasoning/questions-and-answers/>

**Guess estimate: -**

* **Resource: -**
  + analyticsvidhya.com - <https://www.analyticsvidhya.com/blog/2014/01/tips-crack-guess-estimate-case-study/>
  + <https://soumyagupta.in/how-to-approach-guesstimates-76344ad1fafe>
  + <https://soumyagupta.in/guesstimate-cost-of-painting-the-pillars-of-the-metro-lines-in-delhi-4efaabd642ce?#.rzr2pbnwn>
  + <https://soumyagupta.in/guesstimate-total-revenue-earned-by-the-australian-tourism-industry-de08486cbc50?#.9dwhursj0>
  + <https://soumyagupta.in/guesstimate-number-of-whatsapp-messages-sent-in-ncr-each-day-dc4efe8fa900?#.h1uq4ekkk>