**Discrete Mathematics**

1.Chapter-01:The Foundation: Logic and Proofs: [Neso Academy](https://youtube.com/playlist?list=PLBlnK6fEyqRhqJPDXcvYlLfXPh37L89g3&si=2BVwDZR9WAVVD50-)

2.Chapter-02:Sets, Functions, Sequence, Sums and Matrices: [Kimberly Brehm](https://youtube.com/playlist?list=PLl-gb0E4MII28GykmtuBXNUNoej-vY5Rz&si=ABkUVLIzhQ7NGyRk)

[Computer representation of sets](https://youtu.be/zMi9dWueRR8?si=cJ6BMN8b2JuHfZ11)

[Multisets](https://youtu.be/JiT0vQvdB44?si=Y3ROUGhP8egZuASm)

3.Chapter-03: Algorithms:(Out of Syllabus)

i.[Linear, Binary, Sorting, Big-O, Big-Omega, Big-Theta, Time complexity](https://youtube.com/playlist?list=PLu0W_9lII9ahIappRPN0MCAgtOu3lQjQi&si=1MxRJa635a7Htzur)

ii. [string matching](https://youtube.com/playlist?list=PLDuVD9cAe6J33FP575soourCCRkMhIiqv&si=n3pP8RUmm0oGO7yQ)

iii. [Algorithms](https://youtube.com/playlist?list=PLDN4rrl48XKpZkf03iYFl-O29szjTrs_O&si=4c95YnmGZv_PdRZk)

4. Number Theory:

I. [Divisibility](https://youtube.com/playlist?list=PL22w63XsKjqwAgBzVFVqZNMcVKpOOAA7c&si=YfKx9DdfXRpJPE-O)

ii. [Modular Arithmetic](https://youtube.com/playlist?list=PLBlnK6fEyqRjjeHdm0cwu6E-nhhEluuVA&si=I7QrQP67Ix50HtzM)

iii. [Integer representations and Algorithms](https://youtu.be/7x0G-kl7_14?si=Ijw4oyGuxpTEtxj1)

iv. [Modular Exp, GCD, Euclidean Algorithm](https://youtube.com/playlist?list=PLBlnK6fEyqRjjeHdm0cwu6E-nhhEluuVA&si=5GsgF-3QZOHDhpEa)

V. [Bezout's Theorem](https://youtu.be/7I92alYuF2M?si=Jktamv4kX-D1aw9g)

Vi. [Congruence](https://www.youtube.com/watch?v=QjTMbspAjsw&list=PL22w63XsKjqwAgBzVFVqZNMcVKpOOAA7c&index=10)

Vii. [Chinese Remainder Theorem](https://www.youtube.com/watch?v=5O08mG_6OEo&list=PL22w63XsKjqwAgBzVFVqZNMcVKpOOAA7c&index=22)

Viii.[Fermat's Little Theorem](https://www.youtube.com/watch?v=OkQJGql8os8&list=PL22w63XsKjqwAgBzVFVqZNMcVKpOOAA7c&index=34)

5. Mathematical Induction:

i.[Basic Of Mathematical Induction](https://youtu.be/1lDfp1j9yzA?si=PodOXopkxdS_mGNS)

ii.[Strong Induction](https://youtu.be/VB1b-FtUg3A?si=91YqXMs1B9NXP-Jz)

iii.[Postage](https://youtu.be/4hJNeRXavpE?si=gewL4IHxaBx_rxzJ)

6.Counting:

i.[Sum and Product Rule](https://youtu.be/xaxt-zNlRRg?si=2L3YuyhfgPyezzYg)

ii.[Subtract Rule](https://youtu.be/GDur7-XiTlE?si=IUWM7K8CfxDVnTMj)

iii.[Pigeonhole Principle](https://youtu.be/a-O-ioYy1rI?si=P47G6XkaKgnyrO24)

8.Advanced Counting Techniques:

i.[Tower of Hanoi](https://youtu.be/q6RicK1FCUs?si=P72Ici-VDIoJQ9QB)

ii. [not two consecutive 0s](https://youtu.be/qoUSbM_wSiw?si=wasmFtSF9vlTDaYS)

iii.[Permutation of n elements](https://youtu.be/NleYGeoWYGI?si=ZpV0ob24TpgQx-_3)

iv. [pair of 0s](https://youtu.be/YEO7uWAkBmA?si=yC4hubf7H62XxrLh)

ii.[Solving Recurrence Relation](https://youtu.be/1sZxmHICwUU?si=LdLvJZt84zIaWrKq)(Out of syllabus)

9.Relations:

i.[Relations](https://youtu.be/4Caxyh0zt_o?si=4lJNgMo_Kcd8B54v)

10.Graphs:

I. [Graphs](https://youtube.com/playlist?list=PLU6SqdYcYsfLV24T0XVb3z3mjl8QG0EBN&si=_fvRTeVP3lU2Yg2H)

II.[Welsh Powell Algorithm for Colouring](https://youtu.be/u2Mgs66ii8c?si=eiw3ohwqsRhsOwQR)

11.Tree:

i. [Tree Traversal](https://youtu.be/-b2lciNd2L4?si=ntwZKEa3Ac3Ued8y)

Exercise Solution website:

1.[Stack Exchange](https://stackexchange.com/)

2.[Gate Overflow](https://gateoverflow.in/)