Syllabus (Senior)

1 Number theory

1.1 Primes, Divisibility and Congruence.
1.2 Theorems of Euler, Fermat and Wilson.
1.3 Chinese Remainder Theorem.
1.4 Sophie Germain identity.
1.5 Diophantine Equations.

2 Algebra

2.1 Sets, Relations and Functions.
2.2 Polynomials.
2.3 Sequences and Series.
2.4 Complex Numbers.
2.5 Identities and Inequalities.
2.6 Matrices and Determinants.

3 Combinatorics

3.1 Basic Counting Problems.
3.2 Pigeon Hole Principle.
3.3 Recurrence Relations.
3.4 Invariants and Monovariants.

4 Calculus

4.1 Limits, Continuity, Differentiability.
4.2 Differentiation.
4.3 Integration.
4.4 Solving Simple Functional and Differential Equations.

5 Geometry

5.1 Euclidean Geometry.
5.2 Coordinate Geometry.
5.3 Complex Geometry.

6 Puzzles and Logical Reasoning.