

The Course Syllabus for Overseas Pre-university Students

Pre-U Mathematics

I . scheduled total credits: 96 (experiments: 96 credits) credits: 96 term: I

Teaching method: Blackboard-writing/PPT

Assessment method : Assignment, Quiz, Exam(Close)

II .Compatible Major:

III .prerequisite course:

IV .OBJECTIVE:

Pre-U Mathematics course is built on a core set of educational aims to prepare basic-level learners for university admission. Throughout this course, learners are expected to develop two parallel strands of mathematics: pure mathematics and a positive attitude towards an understanding of mathematics and mathematical processes. It also encourages learners to think laterally, critically and creatively, and to acquire good problem-solving skills and supports learners to promote comprehensive understanding of the subject through depth and rigor.

V .Content of the Syllabus and the Scheduled Study Hours:

Chapter 1 Fundamental concepts of algebra (12 credits hours)

1. Real numbers and their properties
2. Exponents and radicals
3. Factorization
4. Sets and operations on sets
5. Absolute value
6. Ratio, proportion, and direct, inverse, joint and partial variations

Chapter 2 Functions and their graphs (20 credits hours)

1. Order pairs and Cartesian products
2. Various types of relations
3. Definition of a function
4. Operations on functions
5. Quadratic and polynomial functions
6. Factor and remainder theorem
7. Exponential and logarithmic functions
8. Composite functions and inverse functions
9. Intercepts and writing the equation of a straight line
10. Graphs of functions, The equation of a circle, Rational functions

Chapter 3 Trigonometry (16 credits hours)

1. Angles and their measure
2. Right-triangle trigonometry
3. The Pythagorean theorem

4. Trigonometric functions, laws of sines and cosines
5. Graphs of Trigonometric functions
6. Using and verifying trigonometric identities
7. Solving Trigonometric equations
8. Laws of trigonometric functions
9. Verifying trigonometric identities
10. Solving trigonometric equations
11. Sum and difference Formulas
12. Some applications

Chapter 4 Systems of equations and inequalities (18 credits hours)

1. Solution sets for linear equations
2. Solving linear inequalities and illustrating the result on the number line
3. Solving quadratic equations by factorization
4. Identifying the axis of symmetry and writing its equation
5. Finding the maximum and (or) minimum values and points from graphs
6. Partial fractions
7. Systems of inequalities

Chapter 5 Ration, rates and percentages (8 credits hours)

1. Dividing a quantity in a given ratio
2. Common rates
3. Distance-time graphs
4. Some applications

Chapter 6 Geometry (12 credits hours)

1. Properties of lines, angles, triangles, polygons, and circles
2. Perimeter and area
3. Vectors in the plane
4. Volume

Chapter 7 Sequences, Probability and Counting theory (10 credits hours)

1. Sequences and their notation
2. Series and their notation
3. Counting principles
4. Binomial theorem
5. Probability

VI. Teaching Materials and Reference Books:

1. Zhang Hong, Paul Georgescu, Pre-U pure Mathematics, Jiangsu University Press. 2018.
2. Jay Abramson, Precalculus, Arizona State University, Openstax

VII. Teaching team:

Qian Lijuan, Fang Houqing, Du Ruijin, Cheng Yueling

VIII.the Author who write the Syllabus: Qian Lijuan,

Notice to fill out the form:

1. Fill out the term in which to open the course with I or II
2. Teaching Method: Class teaching、Class teaching and Seminar、Seminar、Others, Please make it clear which kind of method it belongs to ***Others***
3. Assessment Method: Exam(Open、Close), Essay Report, Others, Please make it clear which kind of method it belongs to ***Others***