



Pre-University Remedial Program for the 2014 EC ESSLCE Examinees

Mathematics Module for Social Science stream

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February, 2023
Addis Ababa,
Ethiopia

Ministry Of Education

Mathematics Course outline for Social Sciences

This course outline is designed taking into account the following points:

1. The time limit.
2. Avoiding repetition of topics
3. Avoiding some topics that are part of the Freshman Mathematics modules.

Course outline

Chapter 1: Solving Equations and Inequalities (12 hrs)

- 1.1. Equations involving exponents and radicals
- 1.2. System of linear equations in two variables
- 1.3. Equations involving absolute values
- 1.4. Inequalities involving absolute values
- 1.5. System of linear inequalities in two variables
- 1.6. Quadratic equations and inequalities
- 1.7. Simplification of rational expressions and solving rational equations

Unit Summary

Review Exercises

Chapter 2: Relations and Functions (10 hrs)

- 2.1. Definition and examples of relations
- 2.2. Definition and examples of functions
- 2.3. Classification of functions (one to one, onto, even and odd) and inverse of functions
- 2.4. Operations on functions and composition of functions
- 2.5. Types of functions
 - 2.5.1. Polynomial functions
 - 2.5.1.1. Theorems on polynomial functions (Division, remainder, factor and location theorems)
 - 2.5.1.2. Graphs of polynomial functions
 - 2.5.2. Rational functions and their graphs
 - 2.5.3. Exponential functions and their graphs
 - 2.5.4. Logarithmic functions, graphs of logarithmic functions and equations involving logarithms
 - 2.5.5. Power function, Absolute value function, Signum function and greatest integer function
 - 2.5.6. Trigonometric (Sine, Cosine and Tangent) functions and their graphs.

Unit Summary

Review Exercises

Chapter 3: Geometry and Measurement (10 hrs)

- 3.1. Theorems on triangles
- 3.2. Special quadrilaterals
- 3.3. Circles
- 3.4. Regular Polygons
- 3.5. Congruency and Similarity
- 3.6. Areas of Triangle and parallelogram
- 3.7. Surface area and volume of solid figures (Prism, Cylinder, Cone and Sphere)
- 3.8. Frustum of pyramids and cones

Unit Summary

Review Exercises

Chapter 4: Coordinate Geometry (8 hrs)

- 4.1. Distance between two points
- 4.2. Division of a line segment
- 4.3. Equation of a straight line
- 4.4. Distance between a point and a line and between two lines.
- 4.5. Conic Sections

Unit Summary

Review Exercises

Chapter 5: Statistics and Probability (12 hrs)

- 5.1. Statistics
 - 5.1.1. Types of data
 - 5.1.2. Measures of location for ungrouped and group data
 - 5.1.3. Measures of Dispersion for ungrouped and grouped data
- 5.2. Probability
 - 5.2.1. Permutation and combination
 - 5.2.2. Binomial theorem
 - 5.2.3. Random experiment and their outcomes
 - 5.2.4. Events
 - 5.2.5. Probability of an event

Unit Summary

Review Exercises

Chapter 6: Limit and Continuity (8 hrs)

- 6.1. Limit of functions
- 6.2. Continuity of functions
- 6.3. Intermediate value theorem

Unit Summary

Review Exercises

Chapter 7: Derivative and its Application (11 hrs)

- 7.1. Definition of derivative and its geometric interpretation
- 7.2. Rules of differentiation
- 7.3. Derivatives of special functions (exponential, logarithmic and trigonometric)
- 7.4. Extreme values of functions
- 7.5. Minimization and Maximization problems

Unit Summary

Review Exercises

Chapter 8: Integration and its Application (11 hrs)

- 8.1. Integration as a reverse process of derivative
- 8.2. Techniques of integration (Substitution, by partial fractions and by parts)
- 8.3. Definite integral and Fundamental theorem of calculus
- 8.4. Area of a region under a curve and between two curves

Unit Summary

Review Exercises

Chapter 9: Introduction to Linear Programming (6 hrs)

- 9.1. Graphical solutions of systems of linear inequalities
- 9.2. Maximum and minimum values
- 9.3. Real life linear programming problems

Unit Summary

Review Exercises

Chapter 10: Mathematical Applications in Business (8 hrs)

- 10.1. Basic mathematical concepts in business
- 10.2. Interest (simple and compound) and depreciation
- 10.3. Saving, investing and borrowing money
- 10.4. Taxation
- 10.5. Purchasing
- 10.6. Percent increase and percent decrease
- 10.7. Real state expenses
- 10.8 Wages

Unit Summary

Review Exercises

Text Books:

The text books for the course are the Mathematics text books from grade 9 -12 that are currently under use. The table below indicates the chapters one can refer or cover from the existing Mathematics text books for each chapters of the remedial course for Social Sciences.

Chapter	Reference Material(s)
1	Grade 9 (Unit 2), Grade 10 (Unit 3) , Grade 11(Chapter 2)
2	Grade 9 (Unit 4), Grade 10 (Unit 1, Unit 2 and Unit 5), Grade 11(Unit 1)
3	Grade 9 (Unit 5), Grade 10 (Unit 6, Unit 7)
4	Grade 10 (Unit 4), Grade 11 (Unit 3)
5	Grade 9 (Unit 6), Grade 11 (Unit 5)
6	Grade 12 (Unit 2)
7	Grade 12 (Unit 3, Unit 4)
8	Grade 12 (Unit 5)
9	Grade 11 (Unit 10)
10	Grade 11 (Unit11), Grade 12 (Unit 9)

The outcomes (or objectives) of each Chapter are the same as the objectives (with few exceptions) that are stated under each unit in the text books.

Recommendations:

1. The course has to be offered for 96 hours (5 hrs/week for 20 weeks).
2. Better to have at least one model examination in cluster.
3. Soft copies of the text books must be available for students online and hard copy at the library.
4. To check their understanding of the subject matters, we encourage students to solve problems of previous years national examination questions related to the topics they covered.

Mode of Delivery:

- Gap Lecture
- Tutorials/ Exercise sessions
- Individual Presentations
- Group work