Logic

SEMESTER I
(AS PER CBCS AND NEP 2020)

PHILOSOPHY

SURYA KUMAR BHUYAN SCHOOL OF SOCIAL SCIENCES

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

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August, 2024

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Printed and published by Registrar on behalf of the Krishna Kanta Handiqui State Open University.

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The University acknowledges with thanks the financial support provided by the **Distance Education Bureau**, **UGC** for the preparation of this study material.

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COURSE INTRODUCTION

This course deals with Logic. Logic is an important branch of philosophy. The word 'logic' is derived from the Greek word 'logos'. It means thought or reason or law. Logic is defined as the science of reasoning. This definition is not accepted as the real definition of logic because reasoning implies a special kind of inferring or inference. Again, we can define logic as the study of the methods and principles used in distinguishing correct from incorrect arguments. This helps us to make a distinction between correct and incorrect argument. That is why; it is clear that logic is a tool or strategy by which we can find out the distinction between good reasoning and bad reasoning. The study of logic, therefore, enhances our reasoning power to testify the arguments, whether they are valid or invalid. It also helps us in our domestic discourse to argue systematically with others.

This course consists of fifteen units. The first unit starts with **"Fundamental Ideas of Logic".** The issues covered in this unit are- Logic: what it is, Nature of argument, Kinds of argument: Inductive and Deductive, Logic and Deductive argument, Argument and argument form, and Truth and Validity.

The second unit is **'Symbolic Logic and Traditional Logic'.** The concepts included in this unit are- Nature of Symbolic Logic, Classical Logic and Symbolic Logic, Development of Symbolic Logic, Characteristics of Symbolic Logic, and functions and the Importance of the Use of Symbols in Symbolic Logic

The third unit is **'Truth Functions, Inter-Definitions of Logical Constants'.** The issues covered in this are- Definition of Truth Function, Basic Truth Functions, Negative or Contradictory function, Conjunctive function, Disjunctive function, Implicative or Conditional function, Equivalence or Biconditional function, Alternative function, Stroke Function, and Inter- definitions of logical constants

The fourth unit is **'Definitions of Connectives and Symbolization of Everyday Language'.** It discusses the concepts, which are- Meaning of connective, Definition of connectives, Not/ It is not the case that (Negation), And (Conjunction), Either-or (Disjunction), If-then (Material Implication), If and only if (Equivalence of Biconditional), Symbolization of everyday language, Two kinds of statements, Symbolization of Simple statements, Symbolization of Simple statements, and Complex Symbolizations

The fifth unit is **'Construction of Truth Table'.** The concepts covered in this unit are: Construction of Truth Tables, Truth Table for Statement, Characterization of Statement forms as Tautologies, Contradictory and Contingent, Truth Table for Arguments, and To Decide Logical Equivalences

The Sixth unit is **'Determination of Validity and Invalidity of Arguments'.** The issues included in this unit are: Validity of arguments, Invalidity of arguments, Determination of validity and invalidity of arguments-direct truth table method, Indirect truth table method, Formal proof of validity, Conditional proof, and Indirect proof

The seventh unit is **"Formal Proof of Validity and Conditional Proof".** After going through this unit, you will be able to get knowledge of the Method of Formal Proof of Validity, The Rules of Inference, The Rules of Replacement, and The Rule of Conditional Proof.

The name of the eighth unit is **'Indirect Proof and Strengthened Rule of Conditional Proof'.** The issues included in this unit are: Indirect Proof, What is a logical method?, The use of Indirect Proof in proposition, The use of indirect proof in validity of argument, The Strengthened Rule of Conditional Proof, Types of Conditional Proof, Ordinary Conditional Proof (OCP), Strengthened Conditional Proof (SCP), and The concept of the scope of the assumption

The name of the ninth unit is **'Singular Proposition and General Proposition'.** After going through this unit you will be able to get knowledge of Singular proposition, General proposition, and the concept of Traditional subject-predicate propositions

The tenth unit is **"Quantification and Rules of Quantification".** The concepts included in this unit are: Universal and existential quantifiers, Modern square of opposition, Symbolization of four categorical statements with quantifiers, Symbolization of universal and existential propositions, Symbolization of propositions by the process of instantiation, Rules of quantification, and Proving validity.

The elevenths unit is **"Set Theory".** The issues included in this unit are- Definition of set, Set membership, Set inclusion, Empty set, Operations on sets, Union of sets, Intersection of sets, Difference of sets, Complement of set, Laws of operations on set, Domain of individuals, and Using set notation for logical propositions (categorical propositions)

The twelfth unit is **"Membership, Inclusion, the Empty Set".** The concepts covered in this unit are- The concept of membership, the concept of inclusion, and the concept of empty set.

The thirteenth unit is **"Operation on Sets, Domains of Individuals".** This unit provides us the knowledge of Operation on sets, Union of sets, Intersection of sets, Difference of sets, and Domain of individuals

The fourteenth unit is **"Translating everyday language".** The concepts covered in this unit are- Symbolization of ordinary language, Symbolizing Propositions of Predicate Logic, and

Symbolization of Categorical Propositions by Using Set Notation:

The fifteenth unit is **"Venn Diagram".** The concepts included in this unit are:

Categorical proposition and standard form categorical proposition, Classes and relation,

The four standard form categorical propositions and their class relations, Distribution of terms,

Venn diagram, Use of Venn diagram, History, Aristotelian and Boolean standpoint, and

Symbolism and diagrams for standard form categorical propositions

While going through this course you will come across some boxes which are put on the left side or right side of the text. These boxes will give us the meanings of some words and concepts within the text. Apart from this, there will be some broad and short questions included under Activity and Check

Your Progress in every unit. Activities will increase our thinking capacity because questions put in Activity are not directly derived from the text. But answers to the short questions are put in the section Answers to Check Your Progress. Besides, there are some text-related questions which are put in Model Questions. These questions will help you in selecting and mastering probable topics for the examination so that you can prepare for the examination with confidence.