PGPH S4 04 (DSE)

TWO YEAR MASTER'S DEGREE COURSE

(CBCS in Accordance with NEP 2020)

SEMESTER IV

LOGIC-II

Surya Kumar Bhuyan School of Social Sciences

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

Subject Experts

1. **Prof. Sauravpran Goswami,** Dept. of Philosophy, G.U.
2. **Dr. Sabitri Devi,** Associate Professor (Rtd), Dept. of Philosophy, Cotton College.
3. **Dr. Naba Prasad Nath,** Associate Professor, Dept. of Philosophy, Nowgong University

Course Coordinator: Dr. Bhaskar Bhattacharyya, Assistant Professor, KKHSOU

SLM Preparation Team

UNITS	CONTRIBUTORS
1,7	Dr. Pranati Devi (Rtd.) B.Borooah College, Dr. Bhaskar Bhattacharyya, KKHSOU
2,3,6	Dr. Hasen Ali Ahmed, Indira Gandhi College Dr. Tejasha Kalita, KKHSOU
4,11,12	Dr. Hasen Ali Ahmed, Indira Gandhi College Mr. Utpal Gogoi, KKHSOU
5,15	Dr. Hridoy Ranjan Borah, KKHSOU
9	Dr. Hasen Ali Ahmed, Indira Gandhi College Dr. Hridoy Ranjan Borah, KKHSOU
8	Dr. Hasen Ali Ahmed, Indira Gandhi College Dr. Bhaskar Bhattacharyya, KKHSOU
10,14	Dr. Dipu Basumatary, KKHSOU
13	Dr. Hasen Ali Ahmed, Indira Gandhi College Dr. Dipu Basumatary, KKHSOU

Editorial Team

Content : Dr. Tejasha Kalita, KKHSOU
Dr. Bhaskar Bhattacharyya, KKHSOU

Language : Dr. Tejasha Kalita, KKHSOU, Dr. Bhaskar Bhattacharyya, KKHSOU

Structure, Format & Graphics : Dr. Tejasha Kalita, KKHSOU, Dr. Bhaskar Bhattacharyya, KKHSOU

April, 2026

This Self Learning Material (SLM) of the Krishna Kanta Handiqui State Open University is made available under a Creative Commons Attribution-Non-Commercial-Share Alike 4.0 License (international): http://creativecommons.org/licenses/by-nc-sa/4.0/

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

Headquarter: Patgaon, Rani Gate, Guwahati - 781017

City Office: Housefed Complex, Dispur, Guwahati-781006; Web: www.kkhsou.in

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

CONTENTS

Unit 1: Probability and Induction- The Traditional Problem of Induction **9-25**

Theories of Probability, The Probability Calculus, Induction, Inductive leap

Unit 2: The A Priori Theory of Probability **26-42**

What is a priori probability, A priori probability in

statistical mechanics, Deductive reasoning

Unit 3: The Frequency Theory of Probability **43-60**

The Frequency Sequence, The Theory of Bernoulli, The frequency dispersion

Unit 4: The Probability of Calculus, Joint Occurrence and **61-75**

Alternative Occurrences

Elementary calculus of probability, Various occurrences

Unit 5: Primary Inductions **76-88**

What is primary induction, its difference with other induction, inductive leap

Unit 6: Secondary Inductions **89-106**

What is secondary Induction, Higher theory and secondary induction,

Non-instantial hypothesis

Unit 7: The Nature of Induction **107-128**

Definition of Induction, Nature of induction, Characteristics of Induction,

Types of induction

Unit 8: Enumerative induction **129-142**

Meaning of Enumerative induction, Antiquity, Bacon, Hume,

Kant, Comte, Whewell, Peirce, Russell, Harman, Popper

Unit 9: Eliminative induction **143-160**

Meaning of Eliminative induction, definitions of Enumerative induction,
Different views of Eliminative induction

Unit 10: The Method of Hypothesis **161-176**

Meaning and definition of Hypothesis, Methods of hypothesis, Criticism

Unit 11: The Hypothetical Reasoning **177-193**

What is Hypothetical Reasoning, Radium, Neptune,
Atmospheric Pressure, Spontaneous Generation,

Unit 12: The Proof of Hypothesis **194-210**

Empirical Hypothesis, Theoretical Hypothesis, Distinction between
Empirical and Theoretical Hypothesis

Unit 13: The Tentative Acceptance of Hypothesis **211-229**

Adequacy, Internal Coherence, Internal Coherence, External Consistency,
Fruitfulness

Unit 14: When Hypothesis Compete **230-248**

Analysis of Competing Hypotheses, Analysis of Competing Hypotheses,
Different Steps of Analysing of Competing hypothesis

Unit 15: Classification of Hypothesis **249-260**

Simple Hypothesis, Complex Hypothesis, Empirical Hypothesis,
Null Hypothesis, Alternative Hypothesis, Logical Hypothesis, Statistical Hypothesis

Course Introduction

The course entitled ‘Logic II’ consists of all total fifteen units. This course provides a structured understanding of probability and induction, which are important areas in logic and philosophy. It begins with the basic concepts of probability and the traditional problem of induction and gradually explains different theories of probability such as a priori and frequency theory. The course also deals with probability calculus, types of induction, and the role of hypothesis in reasoning. Ultimately, students will develop the ability to analyse logical arguments and understand scientific reasoning.

The first unit of this block is ‘Probability and Induction – The Traditional Problem of Induction’. In this unit, you will learn the basic ideas of probability and induction, along with the problems related to induction. It helps you understand why induction is important in everyday thinking. It also shows some of the difficulties that arise when we rely on past experience.

The second unit is ‘The A Priori Theory of Probability’. This unit explains probability based on reasoning rather than experience. You will learn how logic plays an important role in forming conclusions. It also introduces deductive thinking in a simple way.

The third unit is ‘The Frequency Theory of Probability’. This unit focuses on probability based on repeated experience and observations. It explains how recurring events shape our expectations. It also introduces concepts such as frequency sequences and Bernoulli’s theory.

The fourth unit is ‘The Probability Calculus’. In this unit, you will learn the basic rules used in probability calculations. It explains how different events are related to each other. It also helps you understand simple ways of solving probability problems.

The fifth unit is ‘Primary Inductions’. This unit introduces the basic form of inductive reasoning. It explains how we move from particular cases to general conclusions. It also helps you understand the simple structure of induction.

The sixth unit is ‘Secondary Inductions’. This unit explains advanced forms of induction in a simple way. It shows how we can make conclusions even without direct observation. It also introduces the idea of a theoretical hypothesis, where conclusions are made without direct examples and are based on reasoning or indirect evidence.

The seventh unit is ‘The Nature of Induction’. This unit explains what induction really is and how it works. It describes its main features and types. It also shows why induction is important in science and daily life.

The eighth unit is ‘Enumerative Induction’. This unit explains one of the common forms of induction. It includes the ideas of different philosophers on this topic. It also shows how general conclusions are formed from many cases.

The ninth unit is ‘Eliminative Induction’. In this unit, you will learn another important type of induction. It explains how we remove wrong possibilities to reach a correct conclusion. It also presents different views about this method.

The tenth unit is ‘The Method of Hypothesis’. This unit explains what a hypothesis is and how it is formed. It shows how hypotheses are used in reasoning and science. It also discusses some criticisms of this method.

The eleventh unit is ‘Hypothetical Reasoning’. This unit helps you understand reasoning through real-life and scientific examples. It shows how assumptions are tested in different situations. It also highlights the role of imagination in thinking.

The twelfth unit is ‘The Proof of Hypothesis’. This unit explains how hypotheses are tested and proved. It clearly distinguishes between empirical and theoretical hypotheses. It also shows how evidence supports a claim.

The thirteenth unit is ‘Tentative Acceptance of Hypothesis’. This unit explains why hypotheses are accepted only temporarily. It discusses ideas like consistency and usefulness. It also shows that knowledge can change with new evidence.

The fourteenth unit is ‘When Hypotheses Compete’. This unit explains what happens when more than one hypothesis is possible. It shows how we compare and analyse them. It also helps in choosing the best explanation.

The fifteenth unit is ‘Classification of Hypothesis’. This unit explains different types of hypotheses in a simple way. It helps you understand their differences and uses. It also shows how they are important in research and reasoning.

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.