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**SECOND SEMESTER 2020-2021**

# Course Handout Part II

Date: 16-01-2021

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

*Course No.* : HSS F236 / PHIL C221

## Course Title : Symbolic Logic

## Instructor-in-Charge : Pranesh Bhargava

**Scope and Objective of the Course:**

This course aims to introduce students to the field of Symbolic Logic. The projected outcome of the course is for the learner to have a better understanding of the nature of symbolic logic, its various technical aspects and its application in language.

**Textbooks:**

1. Copi, Irving M., *Symbolic Logic*, 5th Edition, Pearson Education, 1979 (Indian Reprint, 2006)

**Reference books**

1. R1. Carney, J.D, *Introduction to Symbolic Logic*, Englewood Cliffs, N.J., 1970
2. R2. Copi, Irving M, *Introduction to Logic*, Prentice Hall of India, N.D., 11th Edition, 2002

**Course Plan:**

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| --- | --- | --- | --- |
| **Lecture No.** | **Learning objectives** | **Topics to be covered** | **Chapter in the Textbook** |
| 1 | Develop an overview the nature of logical reasoning | Introduction to Logic | R2, Ch. 1 |
| 2 | Familiarize the major vocabulary of the subject | Key Concepts | R2, Ch. 1 |
| 3 | Determine how the premises support the conclusion. | Representing the Structure of Arguments | R2, Ch.1 |
| 4 | Analyze the relation between truth, validity and soundness to understand the nature of arguments clearly. | Truth, Validity and Soundness | Text Book, Ch. 1 |
| 5 | Understand the basis of division between categorical propositions in traditional logic. | Categorical Propositions:  Quantity, Quality and Distribution | R2, Ch.5 |
| 6 | Recognize the different ways in which the propositions are related to each other and the different opposition relations | Traditional Square of Opposition: Relations of Opposition | R2, Ch.5 |
| 7-8 | Identify the nature of categorical syllogism and the relevance of major, minor and middle terms in determining validity and to see the possible fallacies. | Categorical Syllogisms:  Major, Minor and Middle terms and Validity of Syllogisms, Rules and Fallacies. | R2, Ch.6 |
| 9-10 | Understand how to represent and check the validity of arguments by means of Venn diagrams | Venn Diagrams | R2, Ch. 6 |
| 11 | Analyze the value of symbolic logic and understand its different concerns. | Symbolic Logic: Introduction | Text Book, Ch. 1 |
| 12 | Recognize the value of sentential connectives in forming compound statements out of simple statements. | Sentential Connectives | Text Book, Ch.2 |
| 13 | Identify how to symbolically represent natural language so that the logical features could be easily located. | Symbolizing Natural  Language | Text Book, Ch.2 |
| 14 | Examine the nature of the arguments, which are composed of compound statements, as their validity depends heavily on the different ways the compound statements are related to each other. | Arguments Containing Compound Statements | Text Book, Ch.2 |
| 15 | Identify the important role of truth functional connectives like conjunction, disjunction, implication etc. in determining the truth-value of propositions. | Propositional Calculus: Role of truth-functional connectives | Text Book, Ch.2 |
| 16 | Construct truth tables of different truth functional connectives. | Truth-tables | Text Book, Ch.2 |
| 17-18 | Examine the validity of arguments mechanically using truth tables. | Testing Validity and Invalidity by Truth tables | Text Book, Ch.2 |
| 19 | Identify the formal features of arguments so that checking validity will be easier. | Argument Forms | Text Book, Ch.2 |
| 20 | Appraise the formal nature of different types of statement and to classify them into three groups: tautologies, contradictories and contingent. | Statement Forms | Text Book, Ch.2 |
| 21 | Assess whether a statement is a tautology or contradictory or contingent by means of truth tables. | Testing the Status of Statement Forms by Truth-tables | Text Book, Ch.2 |
| 22-23 | Review validity of arguments with the help of a set of elementary argument forms that can be applied to check validity mechanically. | Formal Proof of Validity: Rules of Inference | Text Book, Ch. 3 |
| 24-26 | Apply a set of logical equivalences in the process of arriving at the validity of arguments. | Rules of Replacement | Text Book, Ch. 3 |
| 27 | Prove certain arguments invalid without using truth tables and not employing the formal proof. | Proving Invalidity | Text Book, Ch. 3 |
| 28 | Understand the use of conditional proof to prove validity of arguments | Conditional Proof | Text Book, Ch. 3 |
| 29 | Employ the *reductio ad absurdum* method to assess validity of arguments | Indirect Proof | Text Book, Ch. 3 |
| 30-31 | Learn a method, which employs insights from truth table technique and *reductio ad absurdum* to check validity and the status of statements. | Shorter Truth table Technique | Text Book, Ch. 3 |
| 32-33 | Demonstrate how to symbolize statements that involve existential or universal quantifiers. | Quantification theory  Translation with Quantifiers | Text Book, Ch. 4 |
| 34 | Recognize the nature and function of the quantifiers | Universal Quantifier and Existential Quantifier | Text Book, Ch. 4 |
| 35 | Construct a modern square of opposition using quantifiers | Modern Square of Opposition | Text Book, Ch. 4 |
| 36 | Assess the validity of arguments that involve propositions with quantifiers. | Quantification Rules | Text Book, Ch. 4 |
| 37 | Examine the validity of arguments by using the quantification rules. | Proving Validity | Text Book, Ch. 4 |
| 38 | Demonstrate the invalidity of certain arguments by assigning truth-values. | Proving Invalidity | Text Book, Ch. 4 |
| 39 | Understand how to symbolize the statements which involve relations. | Symbolizing Relations | Text Book, Ch.5 |
| 40-42 | Inspect the attributes of relational statements. | Attributes of Binary Relations | Text Book, Ch.5 |

**Evaluation Scheme:**

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| --- | --- | --- | --- | --- |
| **Component** | **Duration** | **Weighting (%)** | **Date & Time** | **Nature of Component** |
| Other evaluation components | TBA | 30 | To be announced (TBA) | Open Book |
| Mid-semester Test | 90 minutes | 30 | 04/03 3.30 -5.00PM | Open Book |
| Comprehensive | 120 minutes | 40 | 12/05 AN | Open Book |

**Chamber Consultation Hour:** To be announced on CMS

**Notices:** Available on CMS

**Make-up Policy:** Only be given for genuine cases, as per the discretion of the instructor.

**Academic Honesty and Integrity Policy:** Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Dr. Pranesh Bhargava

**INSTRUCTOR-IN-CHARGE**