

A Modern  
Formal Logic  
Primer

Sentence Logic

Volume  
I

# Contents

<b>PREFACE TO VOLUMES I AND II: A Guide to the Primer</b>	<b>ix</b>
<b>1. BASIC IDEAS AND TOOLS</b>	<b>1</b>
1-1. Logic As the Science of Argument	1
1-2. Sentences and Connectives	4
1-3. Truth Tables and the Meaning of '¬', '&', and '∨'	7
1-4. Truth Functions	9
1-5. Compounding Compound Sentences	11
1-6. Rules of Formation and Rules of Valuation	16
<b>2. TRANSCRIPTION BETWEEN ENGLISH AND SENTENCE LOGIC</b>	<b>21</b>
2-1. Transcription vs. Translation	21
2-2. Grouping in Transcription	22
2-3. Adequacy of Transcriptions	24

<b>3. LOGICAL EQUIVALENCE, LOGICAL TRUTHS, AND CONTRADICTIONS</b>	<b>29</b>	<b>7. NATURAL DEDUCTION FOR SENTENCE LOGIC: Derived Rules and Derivations without Premises</b>	<b>94</b>
3-1. Logical Equivalence	29	7-1. Derived Rules	94
3-2. Substitution of Logical Equivalents and Some More Laws	33	7-2. Argument by Cases	99
3-3. Logical Truths and Contradictions	38	7-3. Further Derived Rules	102
3-4. Disjunctive Normal Form and the Sheffer Stroke	40	7-4. Derivations without Premises	106
<b>4. VALIDITY AND CONDITIONALS</b>	<b>46</b>	<b>8. TRUTH TREES FOR SENTENCE LOGIC: Fundamentals</b>	<b>113</b>
4-1. Validity	46	8-1. Proving Validity with Truth Trees	113
4-2. Invalidity and Counterexamples	47	8-2. The General Strategy for the Rules	119
4-3. Soundness	48	8-3. Proving Invalidity with Truth Trees	121
4-4. The Conditional	50	8-4. The Complete Rules for the Connectives	124
4-5. The Biconditional	54	8-5. In Which Order Should You Work on the Sentences in a Tree?	129
<b>5. NATURAL DEDUCTION FOR SENTENCE LOGIC: Fundamentals</b>	<b>59</b>	<b>9. TRUTH TREES FOR SENTENCE LOGIC: Applications</b>	<b>134</b>
5-1. The Idea of Natural Deduction	59	9-1. Application of the Rules to Complex Sentences	134
5-2. Subderivations	64	9-2. Other Uses for Truth Trees	139
5-3. The Complete Rules of Inference	68	<b>INDEX</b>	<b>147</b>
<b>6. NATURAL DEDUCTION FOR SENTENCE LOGIC: Strategies</b>	<b>75</b>		
6-1. Constructing Correct Derivations	75		
6-2. Recognizing the Main Connective	84		
6-3. Derivations: Overview, Definitions, and Points to Watch out for	88		