

**Mathematical Logic (REAS)
CTY Course Syllabus**

Day	Time of Day	Topics/Activities	Text covered
Day 1	Morning	Ice-breaker; Rules of conduct; Pre-Assessment Test; Connectives NOT, AND, OR; Translations; Logic puzzle; exercises with truth tables, translations, logic puzzle.	Jeffrey, Chapter 1: 1-1.4
	Afternoon	Conditional and biconditional; Exercises; Translations; Logic puzzle.	Jeffrey, Chapter 1, 1.5-1.10
	Evening	Exercises, Games	Jeffrey, Chapter 1, 1.18
Day 2	Morning	Tautologies, contradictory and contingent statements; Inconsistent and contingent sets of propositions; Validity; Counterexample; Game: Truth table races; Exercises	Jeffrey, Chapter 1, 1.11-1.17
	Afternoon	Trivially valid arguments; Logical equivalences; Introduction to truth trees; rules of inference; exercises; logical equivalences game	Jeffrey, Chapter 1, Chapter 2: 2-2.3
	Evening	Exercises, Games	Jeffrey, Chapter 1, 1.18
Day 3	Morning	Rules of inference reminder; Exercises with truth trees; Game: Truth tree races; Liar and truth teller puzzles; Grid puzzle.	Jeffrey, Chapter 2, sections 2.4-2.5

Day	Time of Day	Topics/Activities	Text covered
	Afternoon	Natural deduction: rules for $\&$, \rightarrow ; exercises	Forbes, Chapter 4
	Evening	Exercises	Forbes, Chapter 4
Day 4	Morning	Quiz; Natural deduction: rules for \sim ; exercises; rules for \vee ; exercises	Forbes, Chapter 4
	Afternoon	Exercises with proofs; Natural deduction rules: Constructive dilemma, Modus tollens, Disjunctive Syllogism	
	Evening	Exercises	
Day 5	Morning	Rules of natural deduction: Hypothetical Syllogism, Logical equivalences; Exercises;	Hurley, Chapter 7
	Afternoon	Game: Proof Golf	
	Evening (Sunday)	Homework; Review; Games	
Day 6	Morning	Introduce predicate logic; quantifiers; translations; exercises	Jeffrey, Chapter 3
	Afternoon	Introduce truth trees; rules for quantifiers; exercises	Jeffrey, Chapter 3
	Evening	Homework, Games	
Day 7	Morning	Multiple generality; Logic into English; Linkage; English into logic; exercises with translations and truth trees	Jeffrey, Chapter 4
	Afternoon	Truth trees and multiple generality; exercises	Jeffrey, Chapter 4
	Evening	Homework; games	

Day	Time of Day	Topics/Activities	Text covered
Day 8	Morning	Exercises with truth trees and translations in predicate logic.	
	Afternoon	Introducing semantics for predicate logic; interpretations	Forbes, Chapter 6
	Evening	Homework, games	
Day 9	Morning	Introducing the method of counterexample in predicate logic using interpretations; Exercises	Forbes, Chapter 6
	Afternoon	Introducing natural deduction in predicate logic: universal elimination, universal introduction, and existential introduction; Exercises	Forbes, Chapter 6
	Evening	Homework; Students choose their project topics; Games.	
Day 10	Morning	Natural deduction in predicate logic: Exercises with the four new rules for quantifiers.	Forbes, Chapter 6
	Afternoon	Introduce translations with identity; Proof Golf with predicate logic	
	Evening (Sunday)	Homework	
Day 11	Morning	Translations with identity; Introduce truth trees with identity; Exercises.	Jeffrey, Chapter 5

Day	Time of Day	Topics/Activities	Text covered
	Afternoon	Exercises; Library orientation.	
	Evening	Research in the library.	
Day 12	Morning	TA lecture: Set theory	
	Afternoon	Students work on their projects and discuss their ideas and questions with the instructor and the TA.	
	Evening	Research in the library: students complete reading assignments for their projects.	
Day 13	Morning	Post-Assessment test; TA lecture: Set theory.	
	Afternoon	Students finalize their projects.	
	Evening	Movie: <i>The Proof</i> ; Students prepare poster boards for their presentations.	
Day 14	Morning	Students present their projects; Lecture on completeness, soundness, decidability of the truth tree method; Functions, Robinson Arithmetic.	Jeffrey, Chapter 6, and last section of each of Chapters 2-4
	Afternoon	Lecture on modal logic	Forbes, Chapter 9 (“Modal Logic”)

Day	Time of Day	Topics/Activities	Text covered
	Evening	TA lecture: "Hotel Infinity"; Logic jeopardy!	
Day 15	Afternoon	Review on poster board; Saying good-bye.	