NEW YORK CITY COLLEGE OF TECHNOLOGY
The City University of New York
School of Arts & Sciences
Department of Social Science Course Outline

Course code: PHIL 2102
Course title: Logical Thinking
Class hours/credits: 3 class hours, 3 credits
Prerequisite: ENG 1101 or ENG 1101CO or ENG 1101ML
Pathways: Individual and Society

Catalog Description: Development of critical thinking skills. Topics include structure of arguments, nature of an inference, types of inductive and deductive arguments, common fallacies and other errors and deceptions in reasoning.

COURSE DESCRIPTION: An introduction to the basic principles that underlie critical thinking, including: recognizing premises and conclusion of an argument; language and meaning; common errors in reasoning; Aristotle's system of logic; the symbolic representation of simple and complex sentences; the idea of cause and effect and J. S. Mill's scientific method. The subject matter of this course does not assume any prior acquaintance with logic or mathematics.

RECOMMENDED/TYPICAL/REQUIRED TEXTBOOK (S) and/or MATERIALS*

- Hurley, Patrick. A Concise Introduction to Logic. 7th edition. Belmont, Ca.: Wadsworth Pub. Co., 2000.
- Copi, Irving M. and Keith Burgess-Jackson. Informal Logic, 10th ed. Upper Saddle River, NJ: Prentice Hall 1998. Barker, Steven, Elements of Logic, 6th Ed., McGraw-Hill, 2002.

*These are suggested texts; instructors may choose their own.

COURSE INTENDED LEARNING OUTCOMES/ASSESSMENT METHODS

LEARNING OUTCOMES	ASSESSMENT METHODS*
1. Understand and apply core logical concepts.	**1.** Oral discussion, exams, papers.
2. Recognize and identify both informal and formal fallacies.	**2.** Quizzes, oral discussion, exams, papers.
3. Recognize the parts of arguments and evaluate them for their validity.	**3.** Oral discussion, exams, papers
4. Connect logical thinking to scientific and philosophical thinking	**4.** Quizzes, oral discussion, exams, papers.

PATHWAYS INDIVIDUAL AND SOCIETY LEARNING GOALS

1. Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the relationship between the individual and society, including, but not limited to, anthropology, communications, cultural studies, history, journalism, philosophy, political science, psychology, public affairs, religion, and sociology.
2. Examine how an individual's place in society affects experiences, values, or choices.
3. Articulate and assess ethical views and their underlying premises.
4. Articulate ethical uses of data and other information resources to respond to problems and questions.

GENRAL EDUCATION LEARNING OUTCOMES/ASSESSMENT METHODS

LEARNING OUTCOMES	ASSESSMENT METHODS*
1. KNOWLEDGE: Develop knowledge from a range of disciplinary perspectives, and develop the ability to deepen and continue learning.	**1.** Quizzes, oral discussion, exams, papers.
2. SKILLS: Acquire and use the tools needed for communication, inquiry, analysis, and productive work.	2. Oral discussion, exams, papers
3. INTEGRATION: Work productively within and across disciplines.	**3.** Oral discussion, group work, and papers.
4. VALUES, ETHICS, AND RELATIONSHIPS: Understand and apply values, ethics, and diverse perspectives in personal, civic, and cultural/global domains.	**4.** Oral discussion, group work, and papers.

**may vary slightly per instructor to suit their own needs*

SCOPE OF ASSIGNMENTS and other course requirements A selection of the following assignments should be utilized*:

1. Study questions
2. Short answer essays
3. Exam review preparation
4. Group projects
5. Quizzes

**may vary slightly per instructor to suit their own needs*

METHOD OF GRADING – elements and weight of factors determining the students' grade
This is an example of grade breakdown*:

1. Assignments – 20%
2. Mid-term Exam – 25%
3. Final Exam – 30 %
4. Quizzes – 10%
5. Group project – 15%

**may vary slightly per instructor to suit their own needs*

ATTENDANCE POLICY
It is the conviction of the Department of Social Science that a student who is not in a class for any reason is not receiving the benefit of the education being provided. Missed class time includes not just absences but also latenesses, early departures, and time outside the classroom taken by students during class meeting periods. Missed time impacts any portion of the final grade overtly allocated to participation and/or any grades awarded for activities that relate to presence in class.

Instructors may including a reasonable "Participation" grade into their final grade calculations for this course.

STUDENT ACCESSIBILITY
City Tech is committed to supporting the educational goals of enrolled students with disabilities in the areas of enrollment, academic advisement, tutoring, assistive technologies, and testing accommodations. If you have or think you may have a disability, you may be eligible for reasonable accommodations or academic adjustments as provided under applicable federal, state, and/or city laws. You may also request services for temporary conditions or medical issues under certain circumstances. If you have questions about your eligibility and/or would like to seek accommodation services and/or academic adjustments, please email the Student Accessibility Center.

COMMITMENT TO STUDENT DIVERSITY
The Department of Social Science complies with the college wide nondiscrimination policy and seek to foster a safe and inclusive learning environment that celebrates diversity in its many forms and enhances our students' ability to be informed, global citizens. Through our example, we demonstrate an appreciation of the rich diversity of world cultures and the unique forms of expression that make us human.

ACADEMIC INTEGRITY POLICY STATEMENT
Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic in-

tegrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.

SAMPLE SEQUENCE OF TOPICS AND TIME ALLOCATIONS*

WEEK 1: Basic Concepts

Arguments, Premises, Conclusions, Illustrations, Descriptions, Explanations, Arguments and Conditional Statements.

WEEK 2: Deduction and Induction

Types of deductive arguments: argument from definition, mathematics, and categorical, hypothetical and disjunctive syllogisms. Types of inductive arguments: prediction, analogy, authority, generalization, signs, causal inference. Validity, Truth, Soundness, Strength, Cogency.

WEEK 3: Meaning and Definition

Terms; intension and extension of terms. Definitions and their purposes: stipulative, lexical, precising, theoretical and persuasive definitions. Definitional Techniques: Extensional (Denotative) Definitions; Intensional (Connotative) Definitions.

WEEK 4: Criteria for Lexical Definitions; Review for Exam 1

EXAM 1

WEEK 5: Fallacies

Definition of a fallacy; Distinction between informal and formal fallacies. Informal Fallacies Fallacies of Relevance: Argumentum ad Baculum - appeal to force Argumentum ad Misericordiam - appeal to pity Argumentum ad Populum - appeal to people; Argumentum ad Hominem - argument against the person Accident; Ignoratio Elenchi - missing the point; Straw Man; Red Herring.

WEEK 6: Fallacies of Weak Induction

Argumentum ad Verecundiam - appeal to authority Argumentum ad Ignorantiam - appeal to ignorance Hasty Generalization (Converse Accident). False cause: post hoc ergo propter hoc; non causa pro causa Slippery Slope; Weak analogy; Fallacies of Presumption, Ambiguity, and Grammatical Analogy; Fallacies of Presumption: Petitio Principii (Begging the question), Complex question; False Dichotomy; Suppressed Evidence; Fallacies of Ambiguity: Equivocation, Amphiboly Fallaci-

es of Grammatical Analogy: Composition, Division.

WEEK 7: Review Weeks 5 & 6 for Exam 2

WEEK 8:
EXAM 2

Categorical Propositions; The components of categorical propositions Quality, Quantity, and Distribution
Square of Opposition: Contradictory, Contrary, Subcontrary and Subalternation Relations; Venn Diagrams; Translating Ordinary Language Statements into Categorical Form

WEEK 9: Categorical Syllogisms

Standard Form, Mood, and Figure Rules and Fallacies; Ordinary Language Arguments Enthymemes and Sorities; Rules of inference: modus ponens, modus tollens, hypothetical syllogism, disjunctive syllogism, constructive dilemma, simplification, conjunction, addition.

WEEK 10: Rules of Derivation

Translate English sentences into logical form Operators governing logical relationships; Rules of inference: modus ponens, modus tollens, hypothetical syllogism, disjunctive syllogism, constructive dilemma, simplification, conjunction, addition; Apply rules of inference to arguments to assess validity.

WEEK 11:

Other deductive argument forms and fallacies Review weeks 8 and 9

WEEK 12: Induction

Analogical Reasoning; Casualty: necessary, sufficient, and necessary and sufficient conditions Mill's Methods, Probability.

WEEK 13: Statistical Reasoning

Sources of ambiguity and deception; Problems in sampling; The meaning of "average"; The importance of dispersion in a sample; The use of graphs and pictograms; The use of percentages for the purposes of comparison
WEEK 14: Hypothetical Reasoning

Four basic stages: Occurrence of, or identifying problem; formulating a hypothesis; drawing implications from the hypothesis; testing the implications

WEEK 15: Review for Final Exam

FINAL EXAM

Reviewed/Revised by: Laureen Park Date: Summer 2016
Revised by Peter Parides, Spring 2021