

# Possible Topics for Essay writing (and are not limited to :)

PHI 455: Philosophical Logic

July 19, 2021

The final paper (essay-1) is due on July 31, 2021(Saturday). Please submit it using turnitin platform. The paper should be between 4-6 pages, or around 3000 words. If you are having trouble coming up with a topic that interests you, please mail me.

The structure of the paper for an essay may include the following things:

- A statement of the problem.
- A brief philosophical/historical context (as appropriate).
- A brief summary of previous research/commentary on the problem (does not have to be exhaustive, but should cover the essential points and the theoretical framework).
- A discussion of why this previous work is inadequate (either because the argument is not sound or because it lacks wider applications).
- Your alternative( if possible)
- Bibliography or References (Atleast 5 in proper format)

## 1 Topics

Possible paper topics include (and are not limited to):

1. Classical Logic

- (a) The distinction between Inference and implication
- (b) Paradox of material Implication
- (c) Truth functional connectives and essential properties.
- (d) Russel's paradox: Resolution
- (e) Liars Paradox and self referential statements
- (f) Logicism: Mathematics reduce to Logic.
- (g) Fundamental Laws of Logic- its Importance
- (h) The Problem of Logical consequence: Etchemundy's critique
- (i) Characteristics of a mathematical proof.
- (j) Deductive, inductive and Abductive arguments in Logic.
- (k) The distinction between object and meta language: Resolution of liars paradox
- (l) Parlell between Euclid's Geometry and Aristotle's logic (if any?). Why there is not much interaction between them?
- (m) Rigor in the Euclid formal axiomatic theory
- (n) Euclid's fifth postulate: origin of proof.
- (o) Zeno's paradox and Motion paradox- Do we need to give up fundamental laws of Logic?
- (p) The problem of infinity
- (q) Cantor's Continuum Hypothesis
- (r) Merits and demerits of Aristotle's Logic
- (s) Does church-Turing thesis apply to the physical world?
- (t) A symbolic analysis of relay and switching circuits: Contribution of Boole/Claude Shannon.
- (u) Some Philosophical consequences of Gödel's incompleteness theorem.

## 2. Modal Logic

- (a) Aristotle on future contingent sentences:
- (b) Aristotle Modal Syllogisms

- (c) Philosophical significance of MODAL LOGIC
- (d) Indicative vs Subjunctive conditionals
- (e) The concept of *possible worlds* in Leibniz modal metaphysics.
- (f) Leibniz on necessary truths: Why does Leibniz think that our knowledge of necessary truth does not rely on the senses only? What is the other basis of our knowledge of necessary truths? To what extent does it rely on the senses?
- (g) Paradox of strict implication: a Way out
- (h) The difference between *de ...re* and *de...dicto* modalities.
- (i) **Deontic Logic Paradoxes:** Ross's paradox, Free Choice Paradox, Empty normative system, Chisolm's paradox, Forrester's paradox of gentle murder, Deontic detachment
- (j) Kant's notion of ought implies *can*
- (k) Contrary-to-duty imperatives.
- (l) Modal interpretation of Aslem's ontological proof for the existence of God.
- (m) Gödel's ontological proof for the existence of God, and problems.
- (n) Origin of Modal Logic: A historical survey
- (o) Defending material implication
- (p) Standard Gödel modal logic: characteristics
- (q) Limitations of possible worlds semantics
- (r) Quine's argument against Modal Logic
- (s) A Critique of Modal realism and Plurality of worlds.
- (t) Problem of Counterfactuals
- (u) David Lewis's possible worlds semantics of counterfactuals
- (v) Lewis Triviality theorem.
- (w) Probability and theory of conditionals
- (x) On the Significance of the Principle of Excluded Middle in Mathematics
- (y) Essential features of Intuitionism

### 3. Epistemic Logic

- (a) Knower's paradox
- (b) Muddy children puzzle using Kripke model.
- (c) Robert Aumann on Common Knowledge
- (d) The Problem of Logical Omniscience

### 4. Intuitionistic Logic

### 5. Topics in Fuzzy Logic:

### 6. Online References:

- (a) <http://www.jstor.org>
- (b) <http://www.philpapers.org>
- (c) <http://scholar.google.com>
- (d) <http://citeseerx.ist.psu.edu/>
- (e) <http://drops.dagstuhl.de/opus/suche/index.php>
- (f) <http://academic.research.microsoft.com/>

### 7. Useful Material:

- (a) <http://sites.google.com/site/theoremeorg/> [Mustvisitedwebpage]
- (b) <http://robotics.stanford.edu/~epacuit/classes/ml-notes.pdf>
- (c) <http://sakharov.net/foundation.html>
- (d) <http://www.cs..edu/davise/knowledge-tutorial.pdf>
- (e) <http://mally.stanford.edu/notes.pdf>
- (f) <http://philo.at/pipermail/phil-logic/>
- (g) <http://ocw.mit.edu/courses/linguistics-and-philosophy/24-244-modal-logic-fall-2009/lecture-notes/nyu>