Logic and Argumentation

All UG Programs

Course Category: Minor   **Schedule of Offering: Even Semester**

Course Sub-category: Skill development

Course Credit Structure: 3

- **Lecture: 3**
- **Tutorial: 0**
- **Practical: 0**

Contact Hours per week: 3 Hours per week

Course Instructors: R. Venkata Raghavan   Course Code: PS030

Stream: Philosophy and Psychology   Maximum Intake: 20

1. Introduction

The ability, on the one hand, to set out our own thoughts clearly, coherently, and persuasively and, on the other hand, to scrutinize arguments offered by others is a necessary skill in academics. Arguments are means by which we demonstrate our reasoning and justify our beliefs. Logically, every argument is an inference - deductive, inductive or otherwise. All inferences involve arriving, step by step, from what we know (or what is already accepted) to what we don't know or what we want to prove. The course has two major focus areas: the nature of inference and the fallacies therein. We shall be looking at two traditions: the Modern Western and the Classical Indian (mainly from the Nyāya perspective). From the former, we will learn some fundamental concepts in sentential logic and from the latter the basics of Indian theory of inference (anumāna). The second area i.e. fallacies (formal and informal) will also be studied from both perspectives. At the end of this course, the student should be able to set out their own arguments with clarity and draw out arguments from other works and evaluate them for their strengths and weaknesses.

2. Course Objectives

- To understand the nature and types of inference.
- To familiarize oneself with some common fallacies in reasoning.

- Acquiring the skill to analyze an argument in terms of certain formal and informal parameters.

3. Pre-requisites
None.

4. Readings
1. Irving Copi, Carl Cohen and Kenneth McMahon, **Introduction to Logic**, 14th Edition, Pearson Education, 2014. This will be used as the primary textbook for this course for Western Logic. (Hereafter referred to as Copi & Cohen)
2. Roy Perrett, **An Introduction to Indian Philosophy,** Cambridge University Press, 2016. (Hereafter Perrett 2016)
3. Bimal Krishna Matilal, **The Character of Logic in India**, Ganeri and Tiwari (eds.), SUNY Press, 1998. (Hereafter Matilal 1998)
4. Patrick J. Hurley, **A Concise Introduction to Logic,** 11th Edition, Cengage Learning, 2012. For more problems. (Hereafter Hurley 2012)
5. Apart from these, handouts and worksheets will be given for some specific topics.

5. Module-wise topics
This course is divided into 6 modules. Practise classes have been added at appropriate junctures to ensure a better understanding of the concepts.

1. **Introduction: What is Logic?   (4 sessions)**
   This is the introductory module wherein, we see what is the relationship between logic, inference, and argumentation. We will briefly see the historical development of Logic in the Western tradition, starting from Greek logic to modern symbolic logic of the 20th century. Similarly, in the Indian context, the evolution of Logic (nyāya) as a separate darsana.
   Topics:
      - Logic in Indian Philosophical perspective (2 sessions)

- Western Logic: An Introduction (2 sessions)

Readings:
A. Copi & Cohen, pp. 2-17
B. Matilal 1998, pp. 14-18.

2. Types of Inference   (8 Sessions)

Reasoning takes various forms. Consequently, the logical form of the inference involved also varies. In this module, we shall learn to identify some of the most common inference patterns.

Topics:
- Based on its logical form: Deductive, Inductive, Inference to Best explanation, Analogy, purvavat, seśavat and sāmānyatodṛṣṭam (4 sessions)
- Based on its purpose: Inference for self and Inference for others, Rhetorical (including chala, vitaṇḍa, and Jāti) and Rational inference (2 sessions)

Readings:
A. Copi & Cohen, pp. 18-26
B. Matilal 1998, 44-54

3. The basic structure of a Rational Inference (10 sessions)

This is one of the two central modules of the course. We shall learn the structure and components of inference as set out in the two traditions.

Topics:
- Indian Epistemology and the role of inference (1 session)
- Basic structure of Inference in Indian philosophy (2 sessions)
    - Sādhya, Hetu and Pakṣa
    - Vyāpti and its types

- Basic concepts of Sentential Logic (2 sessions)
  - Logical Connectives
  - Some valid forms of inference:Modus Tollens, Modus Ponens, Hypothetical Syllogism, Disjunctive Syllogism.
- Logical properties of an inference: Validity, Soundness and Convincingness (1 session)

Readings:
  A. Copi & Cohen, pp. 27-32, 287-321
  B. Perrett 2016, pp. 49-52,78-80

4. Evaluating an Inference (9 sessions)

What constitutes a good inference or a convincing argument ? How to test whether the components of the argument support the conclusion *in the right way?* This will be focus of this module.

Topics:
- Components that determine a valid inference: Indian Perspective (2 sessions)
- Formal methods: Casting arguments into one of the valid forms (1 session)
- Informal methods: Paraphrasing and Diagramming (2 session)

Readings:
  A. Copi & Cohen, pp. 34-43, 337-350

5. How not to argue (10 sessions)

This the other central module of the course. To know what are the common errors committed in reasoning, identifying them in a given argument and most importantly trying to avoid them in one's own reasoning will be the aim of this module.

Topics:
- Fallacies that make an inference invalid (1 session)

- Fallacies that make the components of inference invalid (2 sessions)
- Formal fallacies(1 session)
- Informal fallacies and Nigrahasthāna (3 sessions)

Readings:
  A. Copi & Cohen, selections from Chapter 4 (Fallacies).
  B. Perrett 2016**,** 80-82
  C. Matilal 1998, 81-86
  D. C.D.Sharma, **Critical Survey of Indian Philosophy**, Motilal Banarsidass, 1960, 201-203

6. **Arguments in different fields (4 sessions)**

   Module 2 focused on classification of arguments based on their logical form and purpose. However, arguments can vary depending on the discipline in which they are made (though the fundamental principles may be uniform). In this module, we will see how various disciplines, by their nature, favour (or allow) certain forms of reasoning and avoid (and disallow) some forms of inference.

   Topics:
   - Arguments in Science: An overview (1 session)
   - Argument in Social Sciences: An overview (1 session)
   - Arguments in Philosophy: An overview (1 session)
   - Legal Arguments: An overview (1 session)

   Readings:
   A. Hurley 2012, Section 9.2, 13.1, 13.2.

6. Pedagogy

Argumentation is a skill and to acquire it one needs practise. Thus, after some conceptual tools are given as part of lecture, there will be practise classes to see how the tools are used effectively. We will take actual arguments from various disciplines, media, popular internet forums so that students have first hand experience of how helpful these tools are.   The student is expected to participate actively in class.

7. Evaluation Pattern

Following is the evaluation pattern for this course

- End-sem exam: 40%
- Mid-sem exam: 30%
- Assignments (at least 6, final score will be average of the individual scores): 20%
- Debate (conducted towards the end of the course): 10%