

**UNIVERSIDAD TECNOLÓGICA DE PEREIRA**  
**FACULTAD DE BELLAS ARTES Y HUMANIDADES**  
**Licenciatura en Bilingüismo con Énfasis en Inglés**  
**2021-2**

**Asignatura:** Razonamiento lógico-matemático (L2)  
Logical-mathematical reasoning (L2)

**Código:** LB631

**Schoology code:** DG4R-TXV5-WPJNP

**Intensidad:** 2 horas semanales

**Horario:** Lunes 7:00am – 9:00am

**Créditos:** 1

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### **Presentation**

If you want to show your position in some debate, give a good job interview, make a good oral presentation or dissertation, or critically understand what is said to you... You must know how to argue well.

Think for example of politicians, or your parents or teachers. They are only considered as authorities if their actions and discourses are legitimate, coherent, and well-argued.

“Arguments are all around us. (...) We will view arguments as tools. To understand a tool, we need to know the purposes for which it is used, the material out of which it is made, and the forms that its takes” (Sinnott-Armstrong & Fogelin, 2010, pág. 1).

But most of the time, such arguments are badly formed. For that reason, we need to evaluate those arguments, learn how to make a good one, and detect a bad one. In that sense, the main objective of this course is to develop critical thinking, learning how to do good reasoning, identify fallacies and tricky arguments. All this through the principles of argumentation, revising such concepts as truth, validity, and argument.

The relevance and justification of a course in critical thinking is its close connection with skills evaluated in *Pruebas Saber Pro* in which the following modules are evaluated: critical reading, quantitative reasoning, written communication and English.

In addition to that, critical thinking is transversal to the competence of a future teacher, because it will allow the student to better analyze written arguments, to better understand complex texts, and to better participate in professional group discussions with colleagues or co-workers.

## Learning outcomes

By the end of the course, the student should be able to:

RESULTADO DE APRENDIZAJE DEL PROGRAMA	Learning outcomes of the course
Utiliza el español y el inglés con altos niveles de suficiencia en el ámbito social, académico y profesional, y con consciencia intercultural relacional, funcional y crítica.	Identify the main argument of a written passage or a conversation or speech.
	Identify argumentative errors in an argument.
Analiza, diseña y adapta instrumentos y estrategias para evaluar y autoevaluar tanto el desarrollo bilingüe y bicultural de los estudiantes como su propia práctica educativa a fin de reflexionar y plantear acciones de mejora que promueven su desarrollo profesional.	Evaluate evidence for and against an argument.
	Make appropriate inferences from the evidence to an argument.
Participa en espacios y actividades institucionales, curriculares y extracurriculares en los que se apropia y desarrolla su dimensión ética, socio política, corporal y espiritual en pro de la construcción de un Ethos democrático, político y en derechos humanos.	Develop a good argument in recognizing the importance to be honesty in their speech and works.
Participa en espacios y actividades institucionales, curriculares y extracurriculares en los que se apropia y desarrolla su dimensión ética, socio política, corporal y espiritual en pro de la construcción de un Ethos democrático, político y en derechos humanos	

## Methodology and evaluation activities

- Each session consists, at the beginning, of an exposition to clear up the concepts and resolve doubts from the students. Since the methodology follows *constructivist and communicative* learning principles, a requisite to participate in the session is to read the assigned material. Each student is expected to take part in his learning process. Then we will work together in workshops applying the concepts discussed.
- Workshops: Exercises to apply the concepts discussed in the session from the assigned reading material. Each workshop will be solved during the class, in groups.
- Partial exam: It is a critical reading activity in which the students must apply all the concepts studied until that session.
- Debates with Harvard case methodology: It is a group activity. Students will be divided into two or four groups and must prepare in advance the arguments for and against a topic chosen by the entire course. Then, they must present their views and evaluate the other party's arguments.

- Finding fallacies: Once the fallacies have been studied, students should bring daily examples of them (they can search commercials, social media, newspapers). Each session will be in charge of two groups that must also organize an activity for the other classmates.
- Final work: Students can choose between write an essay, make a podcast, make a video, make an interview... The objective is to defend their position on some issue or analyze someone else's arguments.  
The final work must include: 1) thesis, 2) arguments for and against, 3) conclusion, 4) present the formal logical scheme of two of the arguments exposed.  
As a suggestion you can work the arguments of the book "To Kill a Mockingbird", the movie "12 angry man", or the series "Chicago seven".

### Grades Percentage

Partial exam	18%
Workshops Session 1-6	12%
Workshops Session 9-14	10%
Debate	15%
Fallacies	20%
Final work	25%

### Summary of contents:

**Sessions 1-3**: Basic concepts

**Sessions 4-7**: Identification, analysis, and evaluation of deductive arguments.

**Sessions 9,11,13**: Identification, analysis, and evaluation of inductive arguments.

**Sessions 10,12,14**: Fallacies and applications.

### Detailed calendar:

Week	Date	Subject	Reading	Evaluation
1	30-08-2021		Introduction to the course. Basic concepts.	
2	6-09-2021	Identify an argument and put it in standard form.	- REQUIRED READINGS: - Rainbolt, G.; Dwyer, S (2012) Chapter 1. "Critical thinking and arguments" In <i>Critical Thinking. The art of argument</i> . - Sinnott-Armstrong, W; Fogelin, R. (2010) Chapter 1. "How to analyze arguments?" in <i>An</i>	Workshop

			<i>introduction to informal logic.</i> (pp. 1-9; Chapter 5)	
3	13-09-2021	Critical thinking	What is enlightenment? Immanuel Kant [ <a href="http://www.columbia.edu/acis/ets/CCREAD/etscc/kant.html">http://www.columbia.edu/acis/ets/CCREAD/etscc/kant.html</a> ]	Workshop
4	20-09-2021	Propositional logic	REQUIRED READINGS: -Critical thinking. 5.5 formal argument. Curtin University. Pp 1-11 OPTIONAL READING: Rainbolt, G.; Dwyer. S (2012) Chapter 5. "Propositional arguments" In <i>Critical Thinking. The art of argument.</i>	Workshop
5	27-09-2021	Evaluate deductive arguments (validity with truth tables)	Sinnott-Armstrong, W; Fogelin, R. (2010) Chapter 6. "Propositional logic"	Workshop
6	4-10-2021	Evaluate deductive arguments (Validity with Categorical propositions)	-Sinnott Armstrong, W; Fogelin, R (2010) Chapter 7. "Categorical logic"	Workshop
7	11-10-2021	PARCIAL EXAM		
8	18-10-2021	Inductive arguments and causality	REQUIRED READING: Sinnott-Armstrong, W; Fogelin, R (2010) Chapter 9 OPTIONAL READING: -Sinnott-Armstrong, W; Fogelin, R (2010) Chapter 8. "Arguments to and for generalization" - Rainbolt, G.; Dwyer. S (2012) Chapter 9. "Causal arguments" In <i>Critical Thinking. The art of argument.</i>	workshop
9	25-10-2021	Fallacies of relevance and some component fallacies	REQUIRED READING: <a href="http://web.cn.edu/kwheeler/fallacies_list.html">http://web.cn.edu/kwheeler/fallacies_list.html</a> PRESENTATIONS FALLACIES OF RELEVANCE: A. Ad hominem (Genetic fallacy; Personal attack) Ad populum (Bandwagon) Ad Verecundium (Improper authority; Biased authority; Appeal to authority) B. Ad misericordiam: (Appeal to emotion;	Workshop review and presentations

			<p>Appeal to pity)  Personal incredulity  Contradictory premises.</p> <p>COMPONENT FALLACIES</p> <p>A. False cause (Non causa pro causa; Post hoc; ergo proper hoc)  Non sequitur, slippery slopes</p> <p>B. Hasty generalization, Non true Scotsman, Misleading statistics</p>	
10	01-11-2021 Holly	Inferences to the best explanation and analogical arguments.	<p>REQUIRED READING:  - Analogical arguments  <a href="https://philosophy.hku.hk/think/arg/analogy.php#:~:text=Here%20are%20some%20examples%20%3A,complex%20system%20like%20a%20watch.">[https://philosophy.hku.hk/think/arg/analogy.php#:~:text=Here%20are%20some%20examples%20%3A,complex%20system%20like%20a%20watch.]</a></p> <p>OPTIONAL READING:  Sinnott-Armostrong, W; Fogelin, R. (2010) Chapter 10. in <i>An introduction to informal logic</i>.</p>	Reading comprehension
11	08-11-2021	Fallacies of ambiguity and more component fallacies.	<p>REQUIRED READING:  <a href="http://web.cn.edu/kwheeler/fallacies_list.html">http://web.cn.edu/kwheeler/fallacies_list.html</a></p> <p>COMPONENT FALLACIES (II)</p> <p>A. Petitio principio (Begging the question; Circular reasoning; Complex or loaded question); Either/or; black an with, false dilemma</p> <p>FALLACIES OF AMBIGUITY</p> <p>B. Equivocation, amphiboly, Composition and division.</p> <p>C. Fallacy fallacy; Burden of proof and Weak analogy.</p>	Presentations (optional readings in schoology)
12	15-11-2021 holly	Preparation of debate and final work		
13	22-11-2021	Component fallacies (II) and moral disengagement as evaluation of moral arguments	<p>A. Ignoratio Elenchi</p> <p>a. Irrelevant conclusion</p> <p>b. Red herring (Tu quoque; Strawman argument).</p>	
14	29-11-2021	DEBATE - RESPECTFUL DIALOGUE 1: "Putting a price tag on life" Harvard class with Michael Sandel 2: Bioethic debate: Designer childrens (With Michael Sandel) 3: Free topic (abortion, drug legalization, death penalty...)		
15	06-	<b>PRESENTATIONS OF FINAL WORK</b>		

	12-21	
16	13- 12- 2021	<b>PRESENTATIONS OF FINAL WORK</b>

**Bibliography:**

Groarke, Leo A.; Tindale Christopher W. (2004) Good reasoning matters! A constructive approach to critical thinking

Kant, Immanuel (1784) What is enlightenment?

Rainbolt, G.; Dwyer. S (2012) Critical Thinking. The art of argument.

Sinnott-Armostrong, W; Fogelin, R. (2010) An introduction to informal logic.