

Asignatura: Razonamiento Lógico Matemático (L2) –
Logical Mathematical Reasoning (L2)

Código: LB631

Intensidad: 2 horas Semanales

Créditos: 1

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Presentation and Rationale

Ever since the reformulation of calculus in the middle of the 19th century, mathematicians have been insistent upon maintaining a high standard of rigor. This led to the development of formal logic in the early 20th, using set theory as a foundation of mathematics around the same time. From this point, different areas and fields of knowledge (social sciences, linguistics, and philosophy, among others) adapted a logical approach to reasoning and problem-solving situations. In our field, professionals in the teaching of languages are expected to display and develop a conscious and high level of logical reasoning, conceived as a higher critical thinking skill in our area.

The *Licenciatura en Bilingüismo con Énfasis en Inglés* requires students to strengthen their reasoning, critical thinking and problem solving skills which will ultimately contribute to the national and international need of educating multilingual and multicultural users of English as a foreign language in our country.

This course responds to this necessity and aims at the training and development of critical and reflective teachers with the ability to adapt to diverse educational contexts, as well as the fostering of research initiatives, intercultural conscience and logical reasoning.

This course will enable students to clearly and deeply observe, identify issues, analyze, argument, propose logical solutions and reach a feasible conclusion to diverse educational and everyday situations.

¹ Taken from <https://www.siu.edu/~jloreau/2017-sp-math-223.html>

General Competences

Students in this course are expected to:

- Get acquainted with the general views of logical reasoning from the linguistic, and philosophical perspectives.
- Expose and understand the general definitions and principles of reasoning, logic and critical thinking.
- Raise awareness of the implications of logical reasoning and its impact on the teaching and learning processes.
- Integrate and propose different pedagogical alternatives to learning English through the development and direct application of logical reasoning and critical thinking.

Specific Competences

(Knowledge) In general terms, students are expected to explore, internalize, define, describe, compare and explain the concepts in the following list of items:

- Basic concepts of logic and reasoning (history and nature of logic)
- Principles of Logical Reasoning
- Theories of Argumentation: Deductive and Inductive reasoning
- Analysis of diagrams and problem solving
- Critical thinking in Language Learning
- Abstract reasoning and lateral thinking

(Skills and Principles)

- Carefully observe and notice patterns of information, behavior and speech.
- Identify main aspects of a text and scheme (general and central ideas).
- Interpret and analyze (inductively and deductively) a series of data sets or written information.
- Infer and argument (written and orally) in particular debatable situations.
- Reach and propose logical conclusions driven from true and solid propositions.
- Design schemes and propose activities/games for the teaching and learning of English as a foreign language considering the activation of critical thinking.

Language:

Students in this course are expected to portray an upper-intermediate usage and control of the foreign language (B1.2).

Productive Skills: Speaking and Writing

- Enter unprepared into conversations on familiar topics and produce clearly articulated speech directed to particular academic and non-academic audiences.
- Maintain a conversation or discussion by putting over a point of view clearly, but has difficulty engaging in debate.
- Explain why something is a problem, discuss what to do next, compare and contrast alternative, and give brief comments on the views of others.
- Write straightforward connected texts (mostly argumentative) related to contents of the course, by linking a series of shorter discrete elements into a linear sequence.
- Communicate with reasonable accuracy in familiar contexts; generally good control though with noticeable mother tongue influence. Errors occur, but it is clear what he/she is trying to express.
- Write short, simple essays, reports, give opinions and summarize accumulated factual information on familiar and non-routine matters related to the contents of the course.

Receptive Skills: Listening and Reading

- Identify the main conclusions in clearly signal led argumentative texts, as well as to recognize the line of arguments in the treatment of an issue and the significant points in straightforward articles on familiar subjects.
- Follow much of what is said that is related to the topics of the course, provided interlocutors avoid very idiomatic usage and articulate clearly.
- Identify unfamiliar words from the context on topics related to the particular theme explored in class.
- Extrapolate the meaning of occasional unknown words from the context and deduce sentence meaning provided the topic discussed is familiar.

Methodology

The approaches that structure the procedures of the course are based on the guidelines proposed by problem-based and project-based learning along with the communicative language teaching. Students will be encouraged to use their mother tongue to support the development of the foreign language (translanguaging). There will be in class discussions and debates to promote critical thinking and problem solving. Students will be asked to formulate a series of strong arguments to support their points of view.

Assessment and Evaluation

Your success will be dictated almost entirely by your ability to observe reality, identify and read critically particular issues encountered in different personal, academic and professional domains. The following chart presents the percentages for the assessment of the course.

Note: Your communicative ability (language use) will also be assessed; thus, points of the measurement of your performance can be taken due to language issues.

Product	Description	Percentage
Theoretical Partial Exam 1	Students are assessed the achievement and understanding of the basic concepts of logic, reasoning and argumentation through a multiple choice, true-false and matching exercise test.	30%
Case Analysis: Reading and Writing Test 2	Students read an argumentative text and answer some questions that require observation, inference and interpretation.	20%
Practical Task: Argument Analysis	Students tour around the campus analyzing samples of arguments. Students present a written report based on this analysis.	10%
Quizzes and in-and-out class work	Tasks, reading exercises, oral presentations, quizzes, debates and activities inside and outside the class through the course will be assessed.	10%
Final Oral Task: Debate	Students will engage on a two-part debate:	30%

	<ol style="list-style-type: none"> 1. Presenting a particular argument in front of an audience 2. Debate against the opposition using solid and supported arguments 	
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(Tentative) Course Schedule

The following chart presents the contents with the (tentative) schedule for the semester. Some dates and topics may be subject to modification if necessary.

Week	Topic and Tasks	Reference/ Materials
1	<i>Introduction to the course:</i> The Power of Observation Ground rules and course program	NA Syllabus
2	Basic concepts of logic and reasoning (history and nature of logic) What is Logic and Reasoning?	Hardegree, G (1999). <i>Symbolic Logic: A First Course</i> . Chapter 1: Basic concepts of Logic. McGraw-Hill Higher Education.
3	Principles of Logical Reasoning: Strong and Weak Arguments	Epstein, R. (2013). Ch. 3. What makes a good argument?
4	Theories of Argumentation: Deductive and Inductive arguments and reasoning	Hardegree, G (1999). <i>Symbolic Logic: A First Course</i> . Chapter 3. Deductive Logic Vs Inductive Logic ²
5	Theories of Argumentation: Validity and Soundness	Aaron Ancell: Fundamental Soundness: Video Analysis ³
6	First Partial Exam Students are assessed the achievement and understanding of the basic concepts of logic, reasoning and argumentation through a multiple choice, true-false and matching exercise test.	NA

² Also see https://www.youtube.com/watch?v=BwtCScUoL_w

³ Taken from <https://www.youtube.com/watch?v=3P0fUHUaZcs>

7	Critical thinking in Language Learning Pedagogical Implications	Cline, A. (2018). What is Critical Thinking? (Blog entry compilation)
8	Critical thinking in Language Learning Pedagogical Implications	Cline, A. (2018). What is Critical Thinking? (Blog entry compilation)
9	Abstract reasoning and Lateral Thinking	De Bono, E. (1967). Lateral Thinking. http://kioulanis.gr/rivips/images/Lateral_thinking.pdf https://www.edwddebono.com/lateral-thinking
10	Detecting Fallacies	Bradley H. Dowden (2011). Logical Reasoning. pp.264 - 282 (Oral Presentations)
11	Second Partial Task: Case analysis: Students read an argumentative text and answer some questions that require observation, inference and interpretation.	NA
12	What is an argument? Arguments “in the wild”: Field trip on Campus	NA
13	Constructing Arguments: What is a debate? How to debate: Body language and debate structure	Bradley H. Dowden (2011). Logical Reasoning. Ch. 7. Defending Against Deception. pp. 239 – 256 What is a debate? http://www.americandebateleague.org/what-is-debate.html http://parliamentarydebate.blogspot.com/2007/08/characteristics-of-debate.html
14	Logic and Reasoning in assessment (Saber PRO Tasks) Analysis of diagrams and problem solving ⁴	Módulo de orientación: Pruebas Saber PRO. Gilmartin, K., & Rex, K. (1999). Working with charts, graphs and tables.
15	Final Task: Oral Debate	

⁴ <http://academia.utp.edu.co/inteligenciainstitucional/>

