**SYLLABUS**

1. **Program details**

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| * 1. Higher education institution | West University of Timișoara |
| 1.2 Faculty / Department | Faculty of Sociology and Psychology |
| 1.3 Department | Psychology |
| 1.4 Field of study | Psychology |
| 1.5 Cycle of studies | BA |
| 1.6 Study program / Qualification | Psychology-Cognitive Science |

1. **Discipline details**

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| 2.1 Discipline name | | | Logic and Scientific Reasoning | | | | | |
| 2.2 Tenured teacher - course activities | | | Lect. univ. dr. Octavian Repolschi | | | | | |
| 2.3 Tenured teacher – seminar / laboratory activities | | | Lect. univ. dr. Octavian Repolschi | | | | | |
| 2.4 Study year | 1st | 2.5 Semester | | 1 | 2.6 Type of assessment | E | 2.7 Discipline regime | DS/DO |

1. **Estimated total time (hours per semester) of teaching activities**

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| 3.1 Number of hours per week | 3 | Of which: 3.2 course | | 1 | 3.3 seminar/laboratory | 2 |
| 3.4 Total hours from the curriculum | 42 | Of which: 3.5 course | | 14 | 3.6 seminar/laboratory | 28 |
| Time fund distribution: | | | | | | hours |
| Study based on the textbook, course material, bibliography, and notes | | | | | | 17 |
| Additional documentation in the library, on specialist electronic platforms / in the field | | | | | | 7 |
| Preparing seminars/labs, homework, papers, portfolios, and essays | | | | | | 28 |
| Tutoring | | | | | | 4 |
| Examinations | | | | | | 2 |
| Other activities | | | | | | - |
| 3.7 Total hours of individual study | **56** | |  | | | |
| 3.8 Total hours per semester | **100** | |  | | | |
| 3.9 Number of credits (ECTS) | **4** | |  | | | |

1. **Prerequisites (where necessary)**

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| 4.1 for curriculum | - |
| 4.2 for competencies | - |

1. **Conditions (where necessary)**

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| 5.1 for conducting the course | * for face-to-face lectures: room with screen and video projector, laptop; * for online lectures: laptop, internet access, access to Google Classroom, Google Meet, Google Forms; Classroom code: xgothhh |
| 5.2 for conducting the seminar/laboratory | * for face-to-face seminars: room with screen and video projector, laptop; * for online seminars: laptop, internet access, access to Google Classroom, Google Meet, Google Forms; Classroom code: xgothhh |

1. **Discipline objectives - expected learning outcomes to which the discipline's study and promotion contributes**

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| Knowledge | * identifies and describes the fundamental concepts and types of argumentation * identifies, analyzes and evaluates correctly the structures of argumentative texts; * identifies and describes the concepts and fundamental elements of scientific reasoning |
| Skills | * produces valid arguments using argumentation and scientific reasoning to find solutions to various scientific problems * critically builds new solutions based on a given set of arguments and data * formulates conclusions through analysis and logical evaluation to specific argumentative and/or scientific problems |
| Responsibility and autonomy | * accepts and tolerates different points of view in the process of argumentation * supports different points of view using argumentation and scientific reasoning * responsibly expresses one's own points of view in an argumentative and/or a scientific context |

1. **Contents**

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| 7.1 Course | Teaching methods | Observations |
| Introduction to Logic and Scientific Reasoning. Reasoning and Argumentation: Deductive, Inductive and Abductive Reasoning. Identifying the structure of an argument. Evaluation of arguments: premises, conclusion, assumptions. Toulmin model. | Interactive lecture | 2 h |
| Deductive Reasoning. Propositional Logic. Syntax and Semantics of Propositional Logic. Validity and invalidity. | Interactive lecture | 2h |
| Deductive Reasoning. Predicate Logic. Syntax and Semantics of Predicate Logic. Validity and invalidity. | Interactive lecture | 2 h |
| Inductive logic. Inductive Generalizations. Analogical Reasoning. Analogy and Similarity. Analysis and Evaluation. | Interactive lecture | 2 h |
| Statistical Reasoning. Logic and Statistics. Statistical Generalization. Correlation and Causality. Evaluating Correlations | Interactive lecture | 2 h |
| Explanation. Adequacy of Hypothesis.Testing Hypothesis. Plausability | Interactive lecture | 2h |
| Scientific Reasoning. Probability. Elementary Probability Ideas. Conditional Probability. Bayes’ Rule. The Bayesian Approach. | Interactive lecture | 2h |
| References:  Aliseda, Atocha. 2006. *Abductive Reasoning. Logical Invesigations into Discovery and Explanation.* Dodrecht: Springer.  Besnard, Philippe and Anthony Hunter. 2008. *Elements of Argumentation*. Cambridge, MA, London: The MIT Press.  Boolos, G., J. Burgess, and R. Jeffrey. 2002. *Computability and Logic.* Cambridge: Cambridge University Press.  Browne, M. Neil, and Stuart M. Keeley. 2007. *Asking the Right Questions. A Guide to Critical Thinking*. Eight Edition. Upper Saddle River, NJ: Paerson Prentice Hall.  Cottrell, Stela. 2005. *Critical Thinking Skills. Developing Effective Analysis and Argumentation.* New York: Palgrave MacMillan.  Eemeren, Frans H. van, Rob Grootendorst. 2004. *A Systematic Theory of Argumentation*. *A pragma-dialectical approach*. Cambridge, New York, Madrid, Cape Town, Singapore, São Paulo: Cambridge University Press.  Hacking, Ian. 2001. *An Introduction to Probability and Inductive Logic.* New York: Cambridge University Press.  Halpern, F. Diane. 2003. *Thought & Knowledge: An Introduction to Critical Thinking*. Mahwah, NJ, London: Lawrence Erlbaum Associates, Publishers.  Howson, Colin and Peter Urbach. 2006. *Scientific Reasoning: The Bayesian Approach.* Third Edition. Chicago and La Salle, Illinois: Open Court.  Hurley, J. Patrick, Lori Watson. 2018. *A Concise Introduction to Logic*. Thirteenth Edition. Australia, Brazil, Mexico, Singapore, United Kingdom, United States: Cengage Learning.  Jaynes, E. T. 2003 *Probability Theory: The Logic of Science*. Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo: Cambridge University Press.  Kelley, David. 2014. *The Art of Reasoning. An Introduction to Logic and Critical Thinking*. Fourth Edition. New York, London: W. W. Norton & Company , Inc.  Lambert, Ben. 2018. *A Student’s Guide to Bayesian Statistics*. Los Angeles, London, New Delshi, Singapore, Washington DS, Melbourne: SAGE Publications Ltd.  Pearl, Judea and Dana Mackenzie. 2020. *The Book of Why: The New Science of Cause and Effect.* New York: Basic Books.  Sider, Theodore. 2010. *Logic for Philosophy*. New York: Oxford University Press.  Toulmin, E. Stephen. 2003. *The Uses of Argument*. Updated Edition. Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo: Cambridge University Press.  Toulmin, E. Stephen, Richard Rieke, and Allan Janik. 1984. *An Introduction to Reasoning*. Second Edition. New York: Macmillan Publishing Co., Ind., London: Collier Macmillan Publishers.  Walton, Douglas. 2004. *Relevance in Argumentation*. Mahwah, NJ, London: Lawrence Erlbaum Associates, Publishers.  Walton, Douglas. 2006. *Fundamentals of Critical Argumentation*. Cambridge, New York, Madrid, Cape Town, Singapore, São Paulo: Cambridge University Press.  Walton, Douglas. 2008. *Informal Logic. A Pragmatic Approach.* Second Edition. New York: Cambridge University Press.  Weston, Anthony. 2017. *A Rulebook for Arguments.* Fifth Edition. Indianapolis/Cambridge Hackett Publishing Company. | | |
| 7.2 Seminar / laboratory | Teaching methods | Observations |
| Identifying the structure of an argument. Evaluation of arguments: premises, conclusion, assumptions. Toulmin model. | Discussions on the theoretical aspects of argumentation. Applications: identifying the structure of arguments; analyzing arguments. Representation of arguments using Diagrams and Toulmin model | 4 h |
| Propositional Logic | Discussions on the theoretical aspects of propositional logic. Applications: testing arguments for validity; fallacies | 4 h |
| Predicate Logic | Discussions on the theoretical aspects of predicate logic. Applications: rules of inference; validity and invalidity; fallacies | 4 h |
| Inductive Generalizations. Analogical Reasoning | Discussions on the theoretical aspects of inductive reasoning. Applications: analyzing arguments from analogy | 4 h |
| Statistical Reasoning. Correlation and Causality | Discussions on the theoretical aspects of statistical reasoning. Applications: evaluating statistics and correlations; | 4 h |
| Explanation. Testing Hypothesis. | Discussions on the theoretical aspects of Explanation and Hypothesis. Applications: testing hypothesis | 4 h |
| Probability. Bayes’ Rule and Bayesianism | Discussions on the theoretical aspects of probability. Applications: elements of probability, Bayes’ rule, testing hypothesis and learning from experience | 4 h |
| References:  Hacking, Ian. 2001. *An Introduction to Probability and Inductive Logic.* New York: Cambridge University Press.  Browne, M. Neil, and Stuart M. Keeley. 2007. *Asking the Right Questions. A Guide to Critical Thinking*. Eight Edition. Upper Saddle River, NJ: Paerson Prentice Hall.  Cottrell, Stela. 2005. *Critical Thinking Skills. Developing Effective Analysis and Argumentation.* New York: Palgrave MacMillan.  Howson, Colin and Peter Urbach. 2006. *Scientific Reasoning: The Bayesian Approach.* Third Edition. Chicago and La Salle, Illinois: Open Court.  Hurley, J. Patrick, Lori Watson. 2018. *A Concise Introduction to Logic*. Thirteenth Edition. Australia, Brazil, Mexico, Singapore, United Kingdom, United States: Cengage Learning.  Jaynes, E. T. 2003 *Probability Theory: The Logic of Science*. Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo: Cambridge University Press.  Kelley, David. 2014. *The Art of Reasoning. An Introduction to Logic and Critical Thinking*. Fourth Edition. New York, London: W. W. Norton & Company , Inc.  Lambert, Ben. 2018. *A Student’s Guide to Bayesian Statistics*. Los Angeles, London, New Delshi, Singapore, Washington DS, Melbourne: SAGE Publications Ltd.  Pearl, Judea and Dana Mackenzie. 2020. *The Book of Why: The New Science of Cause and Effect.* New York: Basic Books.  Sider, Theodore. 2010. *Logic for Philosophy.*. New York: Oxford University Press.  Toulmin, E. Stephen. 2003. *The Uses of Argument*. Updated Edition. Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo: Cambridge University Press.  Toulmin, E. Stephen, Richard Rieke, and Allan Janik. 1984. *An Introduction to Reasoning*. Second Edition. New York: Macmillan Publishing Co., Ind., London: Collier Macmillan Publishers.  Walton, Douglas. 2006. *Fundamentals of Critical Argumentation*. Cambridge, New York, Madrid, Cape Town, Singapore, São Paulo: Cambridge University Press.  Weston, Anthony. 2017. *A Rulebook for Arguments.* Fifth Edition. Indianapolis/Cambridge Hackett Publishing Company. | | |

1. **Correlation of discipline contents with the expectations of the representatives of the epistemic community, professional associations and representative employers in the field related to the program**

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| The content of the course is compatible with the content of the similar courses in undergraduate Cognitive Science programs taught at University of Bucharest, Babeș-Bolyai University, The University of Edinburg and with the expectations of the epistemic community. |

1. **Assessment**

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| Activity type | 9.1 Assessment criteria | 9.2 Assessment methods | 9.3 Weight of final mark |
| 9.4 Course | * knowledge and understanding of the fundamental concepts and theories of argumentation — deductive reasoning * proper application of the basic knowledge of argumentation - deductive reasoning | Midterm exam (fundamental concepts of argumentation, deductive reasoning) | 25% |
| * knowledge and understanding of the fundamental concepts and theories of argumentation — inductive reasoning * proper application of the basic knowledge of argumentation - inductive reasoning, scientific reasoning | Final exam (fundamental concepts of argumentation, inductive and scientific reasoning) | 40% |
| 9.5 Seminar / laboratory | Problem solving in seminar classes | Assignments and quizzes | 25% |
| Discussions and active participation in seminars | Class participation | 10% |
| 9.6 Minimum performance standard | | | |
| For Course/Exams: The final grade computed with the formula 25% Midterm Exam + 40% Final Exam should be at least 5 (five)  For Seminar: Assignments and Quizzes + 10% Class participation should be at least 5 (five). | | | |

Date of completion Tenure teacher

Lect. univ. dr. Octavian Repolschi

Date of approval in department Department Director