I. ASCRC General Education Form

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<tr>
<th>Group</th>
<th>III – Symbolic Systems</th>
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<tbody>
<tr>
<td>Dept/Program</td>
<td>Philosophy</td>
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<tr>
<td>Course #</td>
<td>211</td>
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<tr>
<td>Course Title</td>
<td>Introduction to Logic – Applied Logic</td>
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<tr>
<td>Prerequisite</td>
<td>None</td>
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<td>Credits</td>
<td>3</td>
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II. Endorsement/Approvals

Complete the form and obtain signatures before submitting to Faculty Senate Office.

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<tr>
<th>Please type / print name</th>
<th>Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td>Instructor</td>
<td>Armond Duwell</td>
<td>9/14/08</td>
</tr>
<tr>
<td>Phone / Email</td>
<td>243-6281</td>
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<tr>
<td>Program Chair</td>
<td>David Sherman</td>
<td></td>
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<tr>
<td>Dean</td>
<td>Jon Tompkins</td>
<td>9/6/08</td>
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III. Description and purpose of the course: General Education courses must be introductory and foundational. They must emphasize breadth, context, and connectedness; and relate course content to students’ future lives. See Preamble: http://www.umt.edu/faculty/senate/gened/GEPreamble_final.htm

IV. Criteria: Briefly explain how this course meets the criteria for the group. See: http://www.umt.edu/faculty/senate/ASCRCx/Adocuments/CRT_Criteria5-1-08.htm

**Criteria**

**Courses:**

1. Rigorously present a mapping between a real-world system and a human abstraction of the system.
2. Applies analysis, reasoning and creative thinking in the understanding and manipulation of symbolic codes.
3. Utilizes alternative methods of communication, perception, and expression in order to encourage rigorous thinking.

IV. Student Learning Goals: Briefly explain how this course will meet the applicable learning goals. See: http://www.umt.edu/faculty/senate/ASCRCx/Adocuments/GF_Criteria5-1-08.htm

1. Inductive logic seeks to present a normative theory of belief revision for reasoning in contexts of uncertainty. To do so, inductive logic deploys the probability calculus to represent uncertainty, and to model scientific reasoning.

2. As mentioned above, this course deploys the probability calculus to model scientific reasoning. A good deal of time in the course is spent on comparing and contrasting different possible interpretations of the probability calculus itself.

3. Inductive logic seeks to provide a normative theory of belief revision. What that means is that it seeks to discriminate between good and bad ampliative reasoning. This is definitive of rigorous thinking.
Learning Goals
Upon completion of this group, students will be able to:
1. Demonstrate an understanding of the symbols and the transformations of the system.
2. Relay and interpret information in terms of the given symbolic system.
3. Apply creative thinking using the symbolic system in order to solve problems and communicate ideas.

1. Students will have a command of the probability calculus.
2. Students will be able to model scientific reasoning using the probability calculus.
3. Students will be able to deploy the probability calculus to determine what beliefs or courses of action are best supported by available evidence in a variety of situations, especially scientific theory choice.

VII. Syllabus: Paste syllabus below or attach and send digital copy with form. The syllabus should clearly describe how the above criteria are satisfied. For assistance on syllabus preparation see: http://teaching.berkeley.edu/bgd/syllabus.html

See attached document

*Please note: As an instructor of a general education course, you will be expected to provide sample assessment items and corresponding responses to the Assessment Advisory Committee.
Philosophy 211 Induction and Scientific Reasoning
MW 3:10-4:30

Professor Armond Duwell
Office: LA 154
Phone: 406-243-6281
email: armond.duwell@umontana.edu
Office hours: Tues, 1-3

Textbook: Choice and Chance: An Introduction to Inductive Logic by Brian Skyrms

Additional readings will be posted on Blackboard.

Introduction:

This course is an introduction to inductive logic. Inductive logic seeks to identify the appropriate norms governing ampliative reasoning, reasoning which goes beyond what is deductively entailed by the premises of an argument. The probability calculus has become an incredibly valuable tool for modeling reasoning in contexts of uncertainty. In this class we will explore how the probability calculus is best used and interpreted in these contexts. Generally, the probability calculus will be used to represent to what degree premises support a conclusion, or how well evidence supports a hypothesis. Students in this course will come away understanding how to manipulate the probability calculus and how to deploy the probability calculus to guide their own reasoning and actions as well as represent scientific reasoning.

Learning Goals:

1. Students will have a command of the probability calculus.

2. Students will be able to model scientific reasoning using the probability calculus.

3. Students will be able to deploy the probability calculus to determine what beliefs or courses of action are best supported by available evidence in a variety of situations, especially scientific theory choice.

About homework:

You will have biweekly homework that must be submitted at the beginning of class on Monday when it is due. You are encouraged to collaborate with other people on homework, but you may not write the assignment up together. That means that you may not copy off of a single source for your assignments.

I will be posting the assignments on the Web, either on blackboard, or on another website, as well as any changes in schedule.

Grading and Exams:

Your final grade will consist of 20% HW, 20% Quiz, 30% Midterms, 30% Final Exam. Make up exams will be given only in the case of extreme circumstances, i.e. severe
illness, family death, etc. Proof of extreme circumstances is required in order for me to schedule a make up exam. For those of you that work, please make arrangements now so there will be no conflict of interest on exam dates.

**Classroom courtesy:**

Please turn off cell phones when you come into class. If you have to leave early, please indicate that to me before class begins, and let me know why you must leave early.

**Special Needs:**

Students with disabilities will receive reasonable modifications in this course. Your responsibilities are to request them from me with sufficient advance notice, and to be prepared to provide verification of disability and its impact from Disability Services. Please speak with me after class or during my office hours to discuss the details. For more information, visit the Disability Services for Students website at [www.umt.edu/dss](http://www.umt.edu/dss).

**Tentative Syllabus:**

Week 1: Introduction, Review of Deductive Logic

Read: Chapter 1

Week 2: Probability and Inductive Logic: Laying the groundwork

Read Chapter 2

Quiz

Week 3: The Problem of Induction

HW 1 Due.


Week 4: The Probability Calculus

Read Chapter 6.

Week 5: Interpretation of Probability, logical probability and frequency interpretations

HW 2 Due.

Read Chapter 7. Chapter 5 of Henry Kyburg's Probability and Inductive Logic, a and Hájek, Interpretations of Probability, Stanford Encyclopedia of Philosophy [just section on frequencies]
Midterm 1

Week 6: Interpretation of Probability Cont. Personalist interpretations and objective chance/propensity interpretations.


Week 7: Deductive Approaches to Confirmation

Read Earman & Salmon, The Confirmation of Scientific Hypotheses (excerpts), from Introduction to the Philosophy of Science [sections 2.2–2.4], Hempel, Studies in the Logic of Confirmation

Quiz

Week 8: Probabilistic Approaches to Confirmation

HW 3 Due

Read Fitelson, Inductive Logic, Salmon, Confirmation and Relevance, Earman & Salmon, The Confirmation of Scientific Hypotheses (excerpts) Maher, Probability Captures the Logic of Scientific Confirmation

Week 9: Logical Confirmation

Read Carnap, preface, sections 11–12, sections 43–45, and sections 87–88, from Logical Foundations of Probability (2ed), Popper, Degree of Confirmation, Kemeny and Oppenheim, Degree of Factual Support, Kyburg, Chapters 5 and 13 of Probability and Inductive Logic

Week 10: The Goodman Paradox

HW 4 Due.

Read Chapter 4, Goodman, The New Riddle of Induction, Chapter 3 of Fact, Fiction, and Forecast, and Fitelson, Goodman's 'New Riddle'

Midterm 2

Week 11: The Paradox of the Ravens

Read Hempel, Studies in the Logic of Confirmation, [pages 9–21], Fitelson, The Paradox of Confirmation

Week 12: Bayesian Solutions to Paradoxes of Confirmation
Read Howson and Urbach, Section on The Ravens Paradox, in Scientific Reasoning: The Bayesian Approach, Vranas, Hempel's Raven Paradox: A Lacuna In The Standard Bayesian Solution

Week 13: Bayesian Solutions cont. and start Bayesianism and Objectivity

HW 4 Due

Read Sober, No Model, No Inference: A Bayesian Primer on the Grue Problem, Start John Earman: Bayes or Bust? (ch. 6.1-6.8, 6.14)

Week 14: Bayesianism and Objectivity

Read John Earman: Bayes or Bust? (ch. 6.1-6.8, 6.14)

Week 15: Challenges to Bayesian Confirmation Theory

Read Glymour, Why I am Not a Bayesian, Fitelson, Old Evidence, Logical Omniscience & Bayesianism, Fitelson, "Likelihoodism, Bayesianism, and Relational Confirmation"

Week 16:
FINAL EXAM