Lingnan University  
Department of Philosophy – MA in Practical Philosophy Programme

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Probability and Scientific Method</th>
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<tr>
<td>Course Code</td>
<td>PHI514</td>
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<tr>
<td>Recommended Study Year</td>
<td>-</td>
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<tr>
<td>No. of Credits/Term</td>
<td>3</td>
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<tr>
<td>Mode of Tuition</td>
<td>Lecture and Tutorial</td>
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<tr>
<td>Class Contact Hours</td>
<td>2 hours lecture per week</td>
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<td>1 hour tutorial per week</td>
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<tr>
<td>Category in Major Programme</td>
<td>Philosophical Thinking</td>
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<tr>
<td>Prerequisite(s)</td>
<td>-</td>
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<td>Co-requisite(s)</td>
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<tr>
<td>Exclusion(s)</td>
<td>-</td>
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<td>Exemption Requirement(s)</td>
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Brief Course Description
“Probability is the very guide of life”, as Bishop Butler said in the 18th century. Nowadays, probability and statistics crowd in upon us. Births, marriages, deaths, drugs, commercial enterprises, and education – nothing escapes. Probability became the centrepiece of natural and social science. The course is intended as a survey of philosophical issues about probability and its relationship to scientific method. Topics include: interpretations of probability, the probability calculus, probability and inductive logic, paradoxes about induction, uncertainty and rational decision.

Aims
1. Introduce students to some central theories of probability and problems in the philosophy of probability;
2. Enhance students’ understanding of probability and its relationship to scientific method.

Learning Outcomes
1. Know some core theories of probability
2. Grasp some main problems in the philosophy of probability
3. Grasp the relation between probability and scientific method
4. Make decisions in accordance with the rules of probabilistic reasoning

Indicative Content
1. A brief history of probability
2. Interpretations of probability
   i. Probability as a measure of belief
   ii. Probability as relative frequency
   iii. Probability as the truth-frequency of types of arguments
3. The probability calculus
   i. Probability, arguments, statements, and properties
   ii. Disjunction and negation rules
   iii. Conjunction rules and conditional rules
   iv. Expected value of a gamble
   v. Bayes’ theorem
4. Four paradoxes about induction
   i. The classical problem of induction
   ii. The paradox of the ravens
   iii. The ‘grue’ paradox
   iv. The lottery paradox
5. Probability and scientific inductive logic
1. Hypothesis and deduction  
2. Quantity and variety of evidence  
3. Total evidence  
4. Convergence to the truth  

6. Uncertainty and rational decision  
   i. Framing the decision problem  
   ii. Decisions with uncertainty about the outcome  
   iii. The Expected Utility Method  
   iv. The Prisoner’s Dilemma

Teaching Method
Lectures and tutorial format.

Measurement of Learning Outcomes
Students should demonstrate the above mentioned knowledge, with its related capacity, in their submitted papers as well as tutorial presentations and discussions in the course.

1. Students will write a term-end paper and expected to summarize, synthesize and evaluate the core theories of probability.
2. Students will participate in certain amount of assignment to explicate the relation between probability and scientific method.
3. Student will engage in in-class discussion and will be expect to show their ability of confronting main problems in the philosophy of probability.
4. Students will be expected to make decisions in accordance with the rules of probabilistic reasoning via individual or group work/presentation.

Assessment
40% Tutorial performance and exercises  
60% Examination

Required Readings

Supplementary Readings
伊恩·哈金，劉錫譯，《馴服變動：歸納邏輯導論》, 北京：中央編譯出版社，2000 年