

COURSE TITLE	TEACHING PERIOD	CREDITS
PHILOSOPHY OF SCIENCE	2nd SEMESTER	6
PROFESSOR: Mauricio SUÁREZ	TIMETABLE:	THURS/FRIDAY 11:15-13:00

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COURSE OVERALL THEME: PHILOSOPHY OF PROBABILITY

The philosophy of probability and statistics is nowadays a central and entrenched field within the philosophy of science, bringing expertise in metaphysics, epistemology and methodology to bear on issues related to the nature of chance and probability. It is by now established that there are at least two different kinds of probability: objective and subjective. Objective probability, or chance, is inherently a feature of objects or systems in the world, and therefore independent of anyone's opinions or views. Subjective probability, or credence, is a measure of an agent's knowledge (or lack thereof) of events. The course will review the historical emergence of both types of probability, often conflated or run together in practice, and will then analytically discuss their main features.

MAIN AIMS

- (1) To appreciate the historical origin and evolution of the concepts of probability and chance
- (2) To gain some appreciation for the role of chance and risk in scientific research and in everyday life
- (3) To appreciate the basic elements of mathematical probability and statistics
- (4) To develop an understanding of the different philosophical interpretations of probability

CONTENTS (WITH TENTATIVE SCHEDULE)

COURSE PRESENTATION SESSION (01/02//2019)

INTRODUCTION (07/02/2019)

LECTURE 1 (08/02/2019): ARCHAEOLOGY OF KNOWLEDGE

Reading: Hacking, Emergence, Introduction; Foucault, Disorder of Things

LECTURE 2 (14/02/2019): A BRIEF PRE-HISTORY

Reading: Hacking, Emergence, Ch. 1-3

LECTURE 3 (15/02/2019): THE EMERGENCE OF PROBABILITY (I)

Reading: Hacking, Emergence, Chapters 4-8; Gillies, Chapter 1; Gigerenzer et al., Ch. 1

LECTURE 4 (21/02/2019): THE EMERGENCE OF PROBABILITY (II)

Reading: Hacking, Emergence, Chapters 4-8; Gillies, Chapter 1; Gigerenzer et al., Ch. 1

LECTURE 5 (22/02/2019): EQUIPOSSIBILITY

Reading: Hacking, Emergence, Ch. 14; Mellor, Ch. 2: I-II; Gillies, Ch. 2.

LECTURE 6 (28/02/2019): THE PRINCIPLE OF INDIFFERENCE

Reading: Mellor, Ch. 2: III-VI; Gillies, Ch. 3; Strevens, Chapters 3 & 4

LECTURE 7 (01/03/2019): CREDENCE

Reading: Hacking, Emergence, Chapters 9 & 10; Mellor, Ch. 5: I-III; Gillies, Ch. 4

SEMINAR 1 (07/03/2019): STUDENT PRESENTATIONS / SPEAKER

SEMINAR 2 (08/03/2019): STUDENT PRESENTATIONS / SPEAKER

LECTURE 8 (14/03/2019): ACTUAL FREQUENCIES

Reading: Hacking, Emergence, Ch. 11-13; Mellor, Ch. 3: I-V; Hajek (1998)

LECTURE 9 (15/03/2019): HYPOTHETICAL FREQUENCIES

READING: Hacking, Emergence, Ch. 15-18; Mellor, Ch. 3: VI; Gillies, Ch. 5; Hajek (2008)

SEMINAR 3 (21/03/2019): STUDENT PRESENTATIONS / SPEAKER

SEMINAR 4 (22/03/2019): STUDENT PRESENTATIONS / SPEAKER

LECTURE 10 (28/03/2019): THE REALITY OF CHANCE (I)

Reading: Hacking, Chance, Ch.1 & 23; Gigerenzer et al. Ch. 2-8

LECTURE 11 (29/03/2019): THE REALITY OF CHANCE (II)

Reading: Diaconis and Skyrms, Ch. 9; Suárez, 2013 and forthcoming; Mellor, Ch. 4: I-III.

SEMINAR 5 (04/04/2019): STUDENT PRESENTATIONS / SPEAKER

SEMINAR 6 (05/04/2019): STUDENT PRESENTATIONS / SPEAKER

SEMINAR 7 (11/04/2019): STUDENT PRESENTATIONS / SPEAKER

SEMINAR 8 (25/04/2019): STUDENT PRESENTATIONS / SPEAKER

SEMINAR 9 (26/04/2019): STUDENT PRESENTATIONS / SPEAKER

REFERENCES

Diaconis, P. and Skyrms, B. (2018), *Ten Great Ideas about Chance*, Princeton University Press.

Gillies, D. (2000), *Philosophical Theories of Probability*, London: Routledge

Gigerenzer, H. et al. (1990), *The Empire of Chance: How Probability Changed Science and Everyday Life*, Cambridge: Cambridge University Press.

Hacking, I. (1975), *The Emergence of Probability*, Cambridge: Cambridge University Press.

Hacking, I. (1980), *The Taming of Chance*, Cambridge: Cambridge University Press.

Hajek, A. (1997), "Mises – Redux: Fifteen Arguments against Finite Frequentism", *Erkenntnis*, 45, pp. 209-227.

Hajek, A. (2009), "Fifteen arguments against Hypothetical frequentism", *Erkenntnis*, 70, pp. 211-235.

Mellor, H. (2005), *Probability: A Philosophical Introduction*, London: Routledge.

Papineau, D. (2012), *Philosophical Devices*, Oxford: Oxford University Press.

Strevens, M. (2012), *Tychomancy*, Harvard: Harvard University Press.

Suárez, M. (2013), "Propensities and Pragmatism", *The Journal of Philosophy*, CX (2), pp. 61-102.

Suárez, M. (Forthcoming), "Philosophy of Probability", *Encyclopedia of Life Support Sciences (ELSS)*, Unesco, Dordrecht: Springer.

PEDAGOGY AND METHODOLOGY

The methodology employed in the course is that of the leading European universities in humanities and social sciences, according to standard rankings such as the ARWU at the University of Shanghai (<http://www.shanghairanking.com/FieldSOC2015.html>). The basic pedagogical concept is that philosophy is essentially a practical skill, a capacity to reason and argue critically and clearly about any topic. The exercise of this skill is concomitant to the activity of philosophical research. Therefore there will be an emphasis on the state of the art research on every topic. There will also be a mixed format of lectures and seminars; the former involve careful attention to the teacher's disquisition of a topic, and require some previous reading (as recorded in the syllabus; additional readings and literature is available on demand). The latter involve active participation in class-wide discussions led by the teacher, where students will try out their own ideas about the topic. This requires some careful thinking prior to the class, and possibly the occasional writing of a brief essay for discussion. Students may compile their own small biography on the topic, by means of the excellent resources available in the UCM philosophy library and with guidance from the outstanding library staff.

COURSE REQUIREMENTS

None – other than the acceptance of the methodology described above. An acquaintance with elementary probability theory would prove an advantage but it is not a requirement.

ASSESSMENT

The course will be assessed by means of a single exam or test that will take place during the second half of May. Students will be offered two main topics or themes extracted from the syllabus and will have to choose one on which to write a brief essay. The mark in this exam will contribute 66% of the overall final mark; the remaining 33% of the overall mark will be contributed by participation in the seminars, including regular attendance, contributions to the debates, and the presentation of some relevant reading or topic.

Alternatively, students may replace the examination with a home-written essay **not more than 3,000 words** in length on the issues covered in the course, to be submitted by the strict deadline of the end of the scheduled exam (**May 13, 2019 at 15:00**).