GRADUATE PROGRAM IN THE HISTORY AND PHILOSOPHY OF SCIENCE AND TECHNOLOGY

The Graduate Program in the History and Philosophy of Science and Technology (GPHPST) is organized by the Department of Philosophy and History of Science of the University of Athens and the Division of Humanities of the Department of General Studies of the National Technical University of Athens.

GENERAL DESCRIPTION - PURPOSE

The GPHPST is devoted to the study of the history and philosophy of science and technology. It involves two main areas of concentration:

a) Mathematics
b) Natural Sciences
c) The Social Sciences and the Humanities

The GPHPST aims at the promotion of research and the contribution to the growth of knowledge in the history, the philosophy and the methodology of Logic, Mathematics, the Natural Sciences and the Humanities, as well in the history and philosophy of Technology, in a Greek, a European and an international context.

The collaboration of the Department of Philosophy and History of Science of the University of Athens and of the Department of General Studies of the National Technical University of Athens, makes possible the pooling of resources for the advancement of research and the interdisciplinary study of the interactions between science and technology.

GRADUATE DEGREES

The GPHPST leads to the award of :

a) A Master's degree (MA)
b) A Doctoral Degree (PhD)

in "The History and Philosophy of Science and Technology".
The degrees are awarded jointly by the two collaborating departments.

ADMISSION REQUIREMENTS

The students admitted to the MA program each year are at most twenty-five (25) and the doctoral candidates at most twelve (12). All graduates of Greek and foreign accredited Universities are eligible. Students are admitted to the MA program on the basis of their general qualifications (academic performance at the undergraduate level, mastery of a foreign language, references), of a written exam and (possibly) of an interview. Doctoral candidates are admitted on the basis of their general qualifications (Master's degree, mastery of a foreign language, publications, thesis proposal) and of an interview. The requirement for a Master's degree is waived in the case case of exceptionally qualified candidates

DURATION OF STUDIES

MA Students are expected to complete both their coursework and their Master's thesis within a minimum of four (4) and a maximum of six (6) semesters, while PhD students are expected to finish their dissertation within a minimum of another six (6) and a maximum of another (12) semesters.

THE GRADUATE CURRICULUM

Students must take a number of courses and write a Master's thesis in order to be awarded an MA. The courses and seminars usually offered include the following:

A. Mandatory courses

1. Logic

B. Basic Electives

1. Philosophy
2. Philosophy of Science
3. Topics in the history of philosophy
4. Ancient Greek science and philosophy
5. Topics in the history of science and philosophy in the Middle Ages
6. History of Modern Philosophy
7. History of Science in the 16th and 17th centuries
8. Science since the 18th century to the present

C. Seminars

A variety of seminars on special issues in the history and the philosophy of science and technology

D. Special courses

Methodology of research

Students must satisfy the requirements for:

a) the mandatory Logic course
b) five out of the basic electives, which must include at least one in the area of the History of Philosophy, one in the area of the History of Science, and one in the area of the Philosophy of Science.
c) four seminars in areas of their choice and
d) the special course on the Methodology of Research which they may complete under the guidance of their academic advisors.

Requirements for courses and seminars, involve in class exams and/or take home exams, and/or term papers and longer research papers. All (semester) courses and seminars last twelve or thirteen weeks, meet once a week for three hours and amount to three credits each. The Master's thesis counts as the equivalent of 12 credits.

Doctoral candidates are expected:

a) to follow special seminars, as suggested by their supervisor and the other two members of their dissertation committee.
b) to present to the Department part of their research work in a lecture on a topic of their choice.
c) to take the special course on the Methodology of Research, in case they haven't done so already during their previous graduate studies
d) to write a doctoral disssertation conforming to the standards specified by the Greek law (2083/92, art.12)

STAFF

The teaching staff includes τhe twenty-four (24) members of the Department of the Philosophy and History of Science of the University of Athens and the ten (10) members of the Department of General Studies of the National Technical University

of Athens. Moreover, courses and seminars may be offered by invited members of accredited Greek and foreign institutions.

ACADEMIC EXCHANGES - EVENTS

Members of the faculty and students following the GPHPST have a chance to participate in exchange programs, such as the European program SOCRATES and other programs organized by the collaborating departments and foreign departments, on the basis of bilateral agreements. Members of the teaching staff undertake the obligation to assist foreign visiting students in their research and to evaluate the papers they may eventually submit. Students following the GPHPST also have the opportunity to follow lectures by Greek and foreign visitors and to participate in colloquia and conferences organized by the collaborating departments.

COURSES

The courses described are offered periodically on a two-year basis in a way that makes possible the fulfilment of distribution requirements.

LOGIC

A brief survey of the history of Logic - Introduction to the Propositional Calculus. -First-order languages - Basic theorems in metalogic (Completeness - Compactness) - Issues in the Philosophy of
Mathematics.

EPISTEMOLOGY

A critical survey of attempts to define knowledge as a correlation of concepts from Plato's Theatetus to the theory of Robert Nozick. A parallel discussion of the implications of related concepts, concerning their use in the epistemological enterprise of the definition of knowledge with a view to bringing to light a core of philo-sophical method.

PHILOSOPHY OF LANGUAGE

An intoduction to basic issues in the philosophy of language, focusing on the main theories of meaning from Frege to Putnam (with some views on truth). Other topics include the theory of speech acts and an examination of Quine's views on the inscrutability of reference. The material is presented through the analysis of a variety of texts by Frege, Russell, Wittgenstein, Carnap, Donnellan, Kripke, Putnam, Austin, Grice, Strawson, Quine, ao.

PHILOSOPHY AND THE SCIENCES IN THE TWENTIETH CENTURY

A survey of philosophical positions directly related to the development of the sciences in the twentieth century. A study of a schools and tendencies from the beginning of the century to the present, involving both analytic and continental philosophy, from Russell, Wittgenstein and logical positivism to French structuralism and poststructuralism. The course provides a first assesment of their interaction with the philosophy of science and science itelf.

FRENCH STRUCTURALISM AND POST-STRUCTURALISM

A historical account of the development of French structuralism and post-structuralism with a special emphasis on their interest for the philosophy of the social sciences and the humanities, and on their more general epistemological implications

DARWINISM

A systematic and critical study of the basic principles of Darwin's theory of natural selection and of its more general influence and its culturl implications. A historical account of the development of
different Darwinian schools. A critical assesment of recent influences of Darwinian thought in sociobiology, ethics, ecology and evolutionary epistemology.

ANCIENT PHILOSOPHY AND SCIENCE

An account of the origins of natural philosophy and science in the thought of the Presocratics. A critical discussion of Aristotle's natural philosophy and of his logical and scientific methodology, with a special reference to the commentators elaborating on his works.

HISTORY OF MODERN PHILOSOPHY : FROM DESCARTES TO HUME

A historical account of the development of modern philosophy from Descartes to Hume, based on the study of selected texts. The rise of the Enlightenment. Rationalism and Empiricism. A critical presentation and assesment of the views of Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume.

KANT'S CRITIQUE OF PURE REASON

A systematic study of Kant's first Critique (focusing on the Transcendental Aesthetic and the Transcendental Analytic) with a parallel assesment of the most important contemporary interpretations from the area of analytic philosophy -often influenced by Kantian construals of Wittgen-stein. The course provides a careful analysis of the role of the transcendental subject and aims at an evaluation of the intelligibility and the coherence of the doctrines of transcendental idealism. Kant's positions in other major works such as the Critique of Practical Reason are also taken into account

THE SCIENTIFIC REVOLUTION

Elements from the history of the Latin medieval science. The revolution in astronomy from Copernicus to Kepler, in the context of the reformation. Galileo: astronomy and mechanics, his relation to the church, the Jesuits and the court. F. Bacon and W.Gilbert: the experimental method, ancients and modrerns. Descartes. Le Monde. Newton, his science and elements from his methodology, alchemy, religious studies and politics. R.Boyle: the mechanical philosophy, the gentleman scientist, the laboratory and the technicians. The medieval Universities and the new scientific

institutions. Historiographical approaches to the scientific revolution, Koyre, Hessen, Merton, Butterfield, Kuhn, Sapin.

HISTORY OF SCIENCE: THE ENLIGHTENMENT AND THE 19th CENTURY

An account of the history of the natural, biological and social sciences of the 18th and the 19th centuries, through the examination of case studies. The topics analysed include: the vis -viva controversy, electricity and mathematical physics in the 18th century - Newtonian theory and the Enlightenment, natural law and social science, the revolution in chemistry -from "phlogiston" to oxygen, science and the industrial revolution, the romantic reaction against science and Naturphilosophie, the new institution of science in the 19th century, the wave theory of light, the conservation of energy and the beginnings of thermodyna-mics, the macroscopic approach to nature, the discovery of electromagnetism -ether and field physics, the introduction of the theory of probability to the explanation of natural and social phenomena, the atomic theory in chemistry, the microscopic theory of nature, the theory of evolution and the Darwinian revolution.

SEMINARS

SCIENTIFIC REALISM

This seminar examines recent discussions of the issue of scientific realism. The analysis moves from the historical origins of the problem in both science and philosophy to its contemporary manifestations. It focuses on a variety of anti-realist posititions (historicism, social constructivism, constructive empiricism, the natural ontological attitude) and on some realist attempts to respond to the anti-realist arguments (the causal theory of reference, the no-miracle argument, the resort to experimentation, the attack on the observable-unobservable distinction, etc.).

KUHN AND WITTGENSTEIN

Analysis of Kuhn's Structure of Scientific Revolutions in the light of the philosophy of the late Wittgenstein. Emphasis on the concepts of a "paradigm", a "language-game", "incommensurability", "following a rule", "seeing as ".

BELIEFS: SOURCES AND PROBLEMS OF CONTEMPORARY EPISTEMOLOGY

A systematic analysis of the epistemic status and role of belief, involving the study of texts by Hume, on causality and the uniformity of nature, the idea of the self and identity and on the "moral sense", and by Peirce on truth and custom.

SCEPTICISM

A historical and systematic account of different forms of ancient, modern and contemporary scepticism, based on the analysis of a variety of texts by philosophers including Sextus Empiricus, Descartes, Hume, Unger, Kripke etc.) The comparative elucidation and assesment of different sceptical and anti-sceptical arguments, will help cast light on the similarities and the differences between ancient and modern kinds of scepticism.

INDUCTION

1. A study of passsages concerning knowledge and probability from Hume's Treatise of Human Nature. Critical discussion of arguments aiming at disconnecting the descriptive character of inductive generalizations from claims og normative validity.

2. An examination of Bayes' theorem focusing on descriptive and normative elucida-tions of its meaning. Comparison of its typology to that of the semantic approach to probability by Rudolf Carnap. 3. A formal, comparative assesment of deductive and inductive inferences in the context of the evaluation of negative results pertaining to the concept of inductive support derived from the Popper -Miller theorem.

PHILOSOPHY OF PHYSICS

The development of quantume mechanics has played a significant role in modern philosophy, both as a source of metaphysical ideas and as an important example of a "scientific revolution". In the light of the quantum- mechanical framework, the topics under discussion include a reexamination of the traditional realism/antirealism debate, the relation among the theoretical terms and their corresponding entities, as well as the status of the concepts of object, truth and objectivity in modern science. Emphasis is given to the meaning of quantum probability as captured by Gleason's theorem and the holistic features of quantum entanglement. In this connection, we examine the problem of measurement in quantum mechanics, the question of completeness (analysis of the argument of Einstein, Podolsky and Rosen), and the implications of Bell's inequalities. The meaning of non-locality its juxtaposition to non separability, the Kochen-Specker argument and its relation to contextuality are also discussed.

CONCEPTUAL FOUNDATIONS OF SPACE-TIME THEORIES

Concise analysis of the concepts of space and time from Aristotle to Kant -The absolute view of space and time (Newton) -The relativistic view of space and time (Einstein versus Lorentz) -From space and time to space-time: Special theory of relativity - Integration of space-time with motion and matter: General theory of relativity - Conventionality and distant simultaneity - Determinism in relativity theory -Space-time substantivalism and the hole argument.

TOPICS IN METAETHICS

A survey of contemporary developments in the area of metaethics with a special emphasis on the debate on moral realism and the problem of moral motivation. An analysis of forms and schools of moral realism as well as of basic theses and arguments of realists and antirealists in metaethics. A study of the relations between ethics and meteathics and of the metaphilosophical and the practical relevance of metethical controversies.

PHILOSOPHY AND LITERATURE

This course provides a particular account that aims at bringing to light different kinds and levels of interaction between philosophy and literature. It begins by isolating some generally accepted characteristics of respectively philosophy and literature, emphasizing, on the one hand the cognitive aspirations of the former and the aesthetic function of the other. It then proceeds to distinguish between "external" relations of more or less easilly identifiable and separable elements having to do with the content of philosophical thought and the form of literary expression. After describing some possible uses of philosophy in literature and of literature in philosophy, it moves to a deeper level of mutual influence. Following Arthur Danto's analysis of the philosophical disenfranchisement of art, it discusses the contemporary tendency towards a philosophical disenfrachisement and points to an analogous, though converse tendency towards a literary disenfranchisement of philosophy. It puts forth certain remarks about this phenomenon, trying to detect some of its causes and highlighting the possible mediating role of recent literary theory. It concludes with an attempt at a short critical assessment of the development of the relations between philosophy and literature, leading to their parallel transformation through osmosis. It defends the thesis that we should resist this double disenfranchisement insofar as it seems to result in bad literature posing as philosophy and in bad philosophy posing as literature and could eventually bring about the impoverishment of two basic forms of human expression.

ECONOMICS AND SOCIAL PHILOSOPHY

Introduction. A historical review of the theory of rational choice. The concept of Homo Economicus. An outline of the standard model of rational economic behaviour. General consequences and applications of the model. Influences and extensions of the standard model to other social sciences. Main problems and criticisms. A discussion of the possible implicit psychological underpinnings of the rational choice model. Principles of the theory of social choice. Alternative theories of choice:1) The approach of Herbert Simon 2) Hierarchical choice. Rules, habits, customs and cognitive mechanisms. Links with similar approaches in psychology, sociology and political science. Applications to consumer theory, social theory, labour market, theory of the firm, job satisfaction theory and to the theory of macroeconomic policy. Interconnections between economics and cognitive science.

BASIC CONCEPTS OF THE THEORY OF EVOLUTION

Analysis of certain basic concepts and issues in the darwinian theory of evolution, including, systems of mating, the method of path coefficient. selection, mutation, migration and the concept of fitness.

TOPICS IN THE HISTORY OF GREEK MATHEMATICS

An analysis of selected texts - sources of Greek mathematics from the Pythagoreans to Diophantus and Pappus, with a parallel critical use of the secondary bibliography. The topics to be discussed include among others, the synopsis of the

history of Geometry by Proclus, the contents of the 2nd book of Euclid's Elements and Archimedes' "method".

THE SCIENCES IN BYZANTIUM

A study of the history of events and institutions related to the development of scientific thought in the byzantine world, from the reorganization of the university by the emperor Heracleius to the assimilation of Arabic influences and the last period of byzantine humanism. (Reference to the analysis of relevant manuscripts)

TOPICS IN THE HISTORY OF INSTITUTIONS OF MEDIEVAL EUROPE

A comprehensive approach to the study of Western Europe in the Middle Ages, based on the analysis of central social and political institutions of the period with an emphasis on issues of political ideology (especially imperial ideology) and on the relations with the Christian world in the East.

THE NATURAL SCIENCES IN THE PERIOD OF THE GREEK ENLIGTHENMENT I-II

A thorough study of the attempt to introduce Western philosophical and scientific ideas into Greek culture. An analysis of relevant texts by scholars and intellectuals of the Greek Enlightenment. An assesment of their relations with members of the Church, and defenders of the tradition.

TOPICS IN THE HISTORIOGRAPHY OF SCIENCE

This seminar focuses on contemporary trends in the historiography of science. The topics that are covered include: The history of the historiography of science in the 20th century, the relation between history and philosophy of science, sociological and feminist approaches to historiography, the social construction of scientific knowledge, the anthropology of the laboratory, the historiography of experimentation, research schools, national styles in science, scientific biographies.

TOPICS IN THE HISTORIOGRAPHY AND SOCIOLOGY OF SCIENCE

Contemporary discussions on history. H.Carr, H.White and his critics. Elements from the history of science, comparative readings of paradigmatic texts. T.S.Kuhn and the internal tensions in his work. The old sociology of knowledge, Mannheim, Merton. The strong program in the sociology of scientific knowledge, its relation to Wittgenstein's philosophy and its critics. Exemplary case studies, Forman, Shapin. Science studies in the works by Ravetz, Latour, Stiopin, Biagoli, Daston, Galison.