**COURSE OUTLINE**

**(1) GENERAL**

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| **UNIVERSITY / Department** | * NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS / Department of History and Philosophy of Science   in collaboration with:   * ARISTOTLE UNIVERSITY OF THESSALONIKI / Department of Philosophy and Education * UNIVERSITY OF PATRAS / Department of Philosophy * UNIVERSITY OF CRETE / Department of Philosophy and Social Studies | | | | |
| **STUDY LEVEL** | Postgraduate | | | | |
| **COURSE CODE** | VII | | **SEMESTER OF STUDY** | 2nd | |
| **COURSE TITLE** | Ancient Science and Philosophy | | | | |
| **INSTRUCTOR(S)** | Petros Bouras-Vallianatos & Michalis Sialaros | | | | |
| **TEACHING ACTIVITIES** | | **TEACHING HOURS PER WEEK** | | | **ECTS** |
| Seminars | | 3 | | | 10 |
| **COURSE TYPE** | specialization, skills development | | | | |
| **PREREQUISITE COURSES** | – | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS** | English | | | | |
| **COURSE OFFERED TO ERASMUS STUDENTS** | No | | | | |
| **COURSE WEBSITE (URL)** | <https://eclass.uoa.gr/courses/PHS555> | | | | |

**(2) LEARNING OUTCOMES**

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| **Learning Outcomes** | |
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| This module aims to introduce students to some of the most influential Greek scientific ideas from the sixth century BC to the sixth century AD, by exploring the multifaceted ways in which philosophy and science affected one another in various historical, cultural, social, political, and institutional settings. It will also pay attention to the reception of ancient Greek scientific ideas in medieval environments, including the Byzantine and the Islamicate World.  The objectives of this module are to:  (a) help students master some selected themes in ancient science and philosophy, with a special emphasis on astronomy, mathematics, and medicine;  (b) enable students to experience the richness of Greek scientific thought through the close study of ancient Greek texts in English translation;  (c) critically examine some key historiographical texts and learn how to evaluate primary and secondary sources in their own historical context;  (d) enable students to evaluate how the history of interactions between ancient science and philosophy has been studied over the last 100 years;  (e) critically discuss broader historical notions of continuity, transmission, and transformation of scientific theories and identify key historical questions;  (f) develop scholarly arguments in written and oral form;  (g) demonstrate independence of mind and initiative; intellectual integrity and maturity; an ability to evaluate the work of others, including peers. | |
| **General Skills** | |
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| * Independent work * Teamwork * Work in an international environment * Work in an interdisciplinary environment * Generating new research ideas * Exercise criticism and self-criticism * Promotion of free, creative and inductive thinking | |

**(3) COURSE CONTENT**

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| |  |  |  | | --- | --- | --- | | **Week** | **Topic** | **Instructor** | | **1** | Introduction | **MS & PBV** | | **2** | Presocratic Natural Philosophy | **MS** | | **3** | Hippocrates and the Rise of Rational Medicine | **PBV** | | **4** | Plato and Aristotle on Science | **MS** | | **5** | Euclid and the *Elements* | **MS** | | **6** | Anatomical Experimentation in Hellenistic Alexandria | **PBV** | | **7** | Galenic Medicine, Epistemology, and Philosophy | **PBV** | | **8** | Ptolemaic Astronomy | **MS** | | **9** | The Neoplatonic Tradition | **MS** | | **10** | The Reception of Ancient Medicine in the Middle Ages: Byzantine Medicine between Tradition and Innovation | **PBV** | | **11** | Translations of Greek Scientific Works into Arabic and the Birth of Islamicate Medicine and Science | **PBV** | | **12** | Essay presentation | **MS & PBV** | | **13** | Essay presentation | **MS & PBV** | |

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| **Week 2: Presocratic Natural Philosophy**  Early Greek philosophical thought began with cosmological speculation. In this framework, the so-called Presocratic philosophers (partly) abandon divine interventions and search for natural regularities in the world. This approach laid the foundations for what was later described as ‘science’. In this meeting, we will discuss the highlights of this fundamental shift.  **Pre-reading:** D. W. Graham (2018), ‘Physical and Cosmological Thought Before Socrates’ in *The Cambridge History of Science*, ed. A. Jones and L. Taub. Cambridge: Cambridge University Press, pp. 163-180. |
| **Week 3: Hippocrates and the Rise of Rational Medicine**  This class focuses on classical medical thought and its interrelation with early Greek philosophy. We will discuss the role of Hippocrates and his followers in rationalising ancient approaches to disease. Furthermore, it aims to introduce students to the Hippocratic understanding of disease through the theory of the four humours by closely analysing primary sources, including *On the Sacred Disease* and *On the Nature of Man*. Students will also be exposed to the notion of holism in light of interpretation(s) based on a close examination of the *On Airs, Waters, and Places*.  **Pre-readings:** Eijk, van der, P. 2018. ‘Medicine in Early and Classical Greece’, in *The Cambridge History of Science*, ed. A. Jones and L. Taub. Cambridge: Cambridge University Press, pp. 293-315. |
| **Week 4: Plato and Aristotle on Science**  By modern standards, neither Plato nor Aristotle can be described as scientists. Yet, somehow their works have been inextricably related to the development of classical science. In this meeting, we will examine this apparent paradox and evaluate the role Plato and Aristotle might have played in shaping our understanding of ancient Greek science.  **Pre-reading:** M. Sialaros (2019), 'Euclid of Alexandria: a Child of the Academy?' [B19]. |
| **Week 5: Euclid and the *Elements***  Although the legacy of Euclid’s *Elements* is globally recognized, this monumental treatise cannot be described as a work of philosophy. Be that as it may, the view that Euclid was influenced by philosophical ideas is, at least, as old as some of his late antique commentators. In this meeting, we will discuss the available information on Euclid and his works, and examine the possible interactions between mathematics and philosophy in the Hellenistic period.  **Pre-reading:** M. Sialaros (2021), ‘Euclid’, in *Oxford Classical Dictionary* [B21]. |
| **Week 6: Anatomical Experimentation in Hellenistic Alexandria**  This class deals with the Hellenistic medical tradition. First, we look at cases of human dissection and vivisection in Alexandria by contextualising them in light of the wider social, cultural, and political milieu. The class is also intended to introduce students to the main medical developments in the Hellenistic period, especially the contributions of Herophilus of Chalcedon and Erasistratus of Ceos to the understanding of the internal structure of the human body.  **Pre-reading:** Nutton, V. 2018. ‘Hellenistic and Roman Medicine,’ in *The Cambridge History of Science*, ed. A. Jones and L. Taub. Cambridge: Cambridge University Press, pp. 316-344. |
| **Week 7: Galenic Medicine, Epistemology, and Philosophy**  We will look at the second-century AD physician and medical author Galen, the most significant figure in the history of ancient medicine. First, we focus on Galen’s contributions to various medical fields, including diagnostics, prognostics, and therapy of disease. Special emphasis will be given on the importance of observation and experience in Galen’s scientific method. Second, we deal with the connection between philosophy and medicine in Galen’s works, which is an important feature of his thought-world, showing that the ideal physician should be armed with logic, physics, and ethics.  **Pre-readings:** Nutton, V. 2013. *Ancient Medicine.* London: Routledge, chs. 15-16. |
| **Week 8: Ptolemaic Astronomy**  The *Almagest* is, hands down, the most influential astronomical treatise of all times and, because of it, Ptolemy, the most famous ancient astronomer. It is well known that the *Almagest* discusses numerous astronomical topics, such as planets’ motions, the names of the constellations, the solar and lunar eclipses, etc. Nevertheless, the *Almagest* contains – and is, in fact, partly responsible for the canonization of—Aristotle’s worldview. In this meeting, we will discuss the multilevel interaction between philosophy and astronomy throughout Greek antiquity.  **Pre-reading:** A. Jones (2018), ‘Greco-Roman Astronomy and Astrology’ in *The Cambridge History of Science*, ed. A. Jones and L. Taub. Cambridge: Cambridge University Press, pp. 374-401. |
| **Week 9: The Neoplatonic Tradition**  In this meeting, we will place emphasis on two Neoplatonic deuteronomic treatises: Proclus’ *Commentary on Book I of Euclid’s Elements* and Marinus’ *Introduction to Euclid’s Data*. Both texts have traditionally been described as ‘commentaries’. We will question the validity of this idea by examining the ways in which Neoplatonic philosophers incorporated ancient science into their doctrines.  **Pre-reading:** R. Netz (1998), ‘Deuteronomic Texts: Late Antiquity and the History of Mathematics’[B44]. |
| **Week 10: The Reception of Ancient Medicine in the Middle Ages: Byzantine Medicine between Tradition and Innovation**  This class concentrates on the reception, adaptation, and transformation of ancient medicine in Byzantium. First, it deals with the development of medical theories on diagnosis and treatment of disease in early Byzantine Alexandria in the context of the philosophical and medical school practice. It then turns to examine medical innovations by middle and late Byzantine medical authors, with an emphasis in the fields of uroscopy and pharmacology.  **Pre-reading:** Bouras-Vallianatos, P. 2015. ‘Contextualizing the Art of Healing by Byzantine Physicians’, in B. Pitarakis ed., *Life Is Short, Art Long: The Art of Healing in Byzantium*. Istanbul: Pera Museum Publication, pp. 104–22. |
| **Week 11: Translations of Greek Scientific Works into Arabic and the Birth of Islamicate Medicine and Science**  The last meeting is devoted to the examination of the introduction of Greek scientific and philosophical knowledge to the medieval Islamicate World. Particular attention will be paid to the so-called ‘first translation wave’ of Greek texts from Greek into Syriac and Arabic in the ninth and tenth centuries. We shall then explore the development of medieval Islamicate science with a particular focus on the interrelation between medicine and philosophy in the works of al-Rāzī, Ibn Sīnā, and Ibn Rushd.  **Pre-reading:** Pormann, P. and E. Savage-Smith. 2007. *Medieval Islamic Medicine*. Edinburgh: Edinburgh University Press, chs. 1-2. |

**(4) TEACHING AND LEARNING METHODS – ASSESSMENT**

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| **TEACHING FORMAT** | Face to face, in classroom. |
| **USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES** | Learning process support through the e-class online platform. |
| **TEACHING STRUCTURE** | |  |  | | --- | --- | | ***Activity*** | ***Semester Workload*** | | Lectures, Seminars | 39 | | Presentation preparation | 21 | | Independent study | 120 | | Project (paper preparation and submission | 120 | | **Total**  (30 hours of work per credit unit) | ***300*** | |
| **STUDENT EVALUATION** | 1. Active participation in the course and presentation (20%)  2. Final essay (80%)  Students will be assessed through a 4,000-5,000 word essay (80%, n.b. the word limit includes footnotes but not bibliography) and a presentation (20%). Each weekly session includes a series of questions which serve as the background for the seminar discussion. Students may use one of these questions as the basis of their own essay. However, this is not obligatory; students are encouraged to form their own essay question, which must be agreed with the relevant course tutor. Citation: All assessed essays should include a complete bibliographical list of primary and secondary sources. The essay itself should be fully referenced. A styleguide will be provided at the beginning of the module. Essay Submission: The essay deadline will be uploaded on e-Class. |

**(5) RECOMMENDED BIBLIOGRAPHY**

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| **General works (A)**   1. Asper, M. 2007. *Griechische Wissenschaftstexte: Formen, Funktionen, Differenzierungsgeschichten*. Stuttgart: F. Steiner Verlag. 2. Conrad, L. et al. 1995. *The Western Medical Tradition: 800 BC to AD 1800*. Cambridge: Cambridge University Press. 3. Grmek, M., ed. 1998. *Western Medical Thought from Antiquity to the Middle Ages*. tr. A. Shugar. Cambridge: Cambridge University Press. 4. Jones, A. & L. Taub, eds. 2018. *The Cambridge History of Science: Volume I (Ancient Science)*. Cambridge: Cambridge University Press. 5. Lindberg, D.C. & A. H. Shank, eds. 2013. *The Cambridge History of Science: Volume IΙ (Medieval Science)*. Cambridge: Cambridge University Press. 6. Keyser, P. T. & J. Scarborough, eds. 2018. *Oxford Handbook of Science and Medicine in the Classical World*, edited by P. T. Keyser & J. Scarborough. Oxford: Oxford University Press. 7. Lindberg, D. C. 1992.  *The Beginnings of Western Science*. Chicago: University of Chicago Press. 8. Lloyd, G. E. R. 1970.  *Early Greek Science: Thales to Aristotle* & 1973: *After Aristotle*. New York: Norton & Company. 9. Longrigg, J. 1998. *Greek Medicine: From the Heroic to the Hellenistic Age*. London: Routledge. 10. *Complete Dictionary of Scientific Biography* (including the *Dictionary of Scientific Biography*, ed. C. C. Gillispie 1970-1980 and the *New Dictionary of Scientific Biography*, ed. by N. Koertge 2007). 11. Neugebauer, O. 1951. *The Exact Sciences in Antiquity*. Princeton, N.J.: Princeton University Press. 12. Van der Waerden, B. L. 1950. *Science Awakening* (*Ontwakende Wetenschap*). Groningen: P. Noordhoff.   **Topic-related works (B)**  **Week 2: Presocratic Natural Philosophy**   1. Lloyd, G. E. R. 1979. *Magic, Reason, and Experience: Studies in the origins and development of Greek science*, Cambridge: Cambridge University Press. 2. McKirahan, R. 1994. *Philosophy Before Socrates*. Indianapolis: Hackett Publishing Company. 3. O’Grady, P. F. 2002. *Thales of Miletus the Beginnings of Western Science and Philosophy*. Sydney: Ashgate. 4. Panchenko, D. 1993. ‘Thales and the Origin of Theoretical Reasoning’. *Configurations* 3, 387-414. 5. Dicks, D. R. 1970. *Early Greek Astronomy to Aristotle*. Bristol: Thames and Hudson. 6. Cornelli, G., McKirahan, R., and Macris, C., eds. 2013. *On Pythagoreanism*. Berlin/Boston: Walter de Gruyter. 7. Huffman, C. A., ed. 2014. *A History of Pythagoreanism*. Cambridge: Cambridge University Press. 8. Bernal, M. 1992. ‘Animadversions on the Origins of Western Science’. *Isis* 83 (4), 596-607.   **Week 3: Hippocrates and the Rise of Rational Medicine**   1. Craik, E. 2015. *The ‘Hippocratic’* Corpus*: Content and Context*. London: Routledge. 2. Dean-Jones, L. and R. M. Rosen, eds. 2016. *Ancient Concepts of the Hippocratic*. Leiden: Brill. 3. Eijk, van der, P. 2018. ‘Medicine in Early and Classical Greece’, in *The Cambridge History of Science*, ed. A. Jones and L. Taub. Cambridge: Cambridge University Press, pp. 293-315. 4. Jouanna, J. 1999. *Hippocrates*. tr. M. B. DeBevoise. Baltimore: Johns Hopkins University Press. 5. Nutton, V. 2013. *Ancient Medicine.* London: Routledge, chs. 4-6. 6. Pormann, P., ed. 2018. *The Cambridge Companion to Hippocrates.* Cambridge: Cambridge University Press. 7. Rocca, J. 2008. ‘Inventing an Ethical Tradition: A Brief History of the Hippocratic Oath,’ *Legal Ethics* 11:1: pp. 23-40.   **Week 4: Plato and Aristotle on Science**   1. Fowler, D. 1999. *The Mathematics of Plato’s Academy: A new Reconstruction*. 2nd ed. Oxford: Clarendon Press. 2. Knorr, W. R. 1986. *The Ancient Tradition of Geometric Problems*. Boston: Birkhäuser. 3. Burnyeat, M. F. 2000. ‘Plato on Why Mathematics is Good for the Soul’. In *Mathematics and Necessity*, edited by T. Smiley. Oxford: Oxford University Press. 4. Sialaros, Michalis (2019), 'Euclid of Alexandria: a Child of the Academy?', in Paul Kalligas, et al. (eds.), *Plato’s Academy: Its Workings and Its History* (Cambridge: Cambridge University Press). 5. McKirahan, R. D. 1992. *Principles and Proofs: Aristotle's Theory of Demonstrative Science*. Princeton: Princeton University Press.   **Week 5: Euclid and the Elements**   1. Sialaros, M. 2021. ‘Euclid’, in *Oxford Classical Dictionary*. 2. Mueller, I. 1981. *Philosophy of Mathematics and Deductive Structure in Euclid’s Elements*. Cambridge, MA: MIT Press. 3. Netz, Reviel 1999.  *The Shaping of Deduction in Greek Mathematics*. 4. Cuomo, S. 2001.  *Ancient* *Mathematics*. 5. Irby-Massie, G. L., and P. T. Keyser. 2002. *Greek Science of the Hellenistic Era*. London: Routledge.   **Week 6: Anatomical Experimentation in Hellenistic Alexandria**   1. Berrey, M. 2017. *Hellenistic Science at Court*. Berlin: W. de Gruyter. 2. Flemming, R. 2005. ‘Empires of knowledge: medicine and health in the Hellenistic World,’ in A. Erskine ed., *A Companion to the Hellenistic World.* Oxford: Oxford University Press, pp. 449-463. 3. Lloyd, G. E. R. 1984. ‘Hellenistic Science’, in F. W. Walbank, A. E. Astin et al. eds., *The Cambridge Ancient History*, vol. 7.1: *The Hellenistic World*. Cambridge: Cambridge University Press, pp. 321-352. 4. Longrigg, J. 1981. ‘Alexandrian Medical Science’, *History of Science* 19: pp. 155-200. 5. Nutton, V. 2013. *Ancient Medicine.* London: Routledge, chs. 9-10. 6. Nutton, V. 2018. ‘Hellenistic and Roman Medicine,’ in *The Cambridge History of Science*, ed. A. Jones and L. Taub. Cambridge: Cambridge University Press, pp. 316-344.   **Week 7: Galenic Medicine, Epistemology, and Philosophy**   1. Adamson, P., Hansberger R. and J. Wilberding, eds. 2014. *Philosophical Themes in Galen*. London: Institute of Classical Studies, 2. Boudon-Millot, V. 2012. *Galien de Pergame. Un médecin grec à Rome*. Paris: Les Belles Lettres. 3. Gill, C., Whitmarsh, T. and J. Wilkins, eds. 2009. *Galen and the World of Knowledge*. Cambridge: Cambridge University Press. 4. Hankinson, R. J., ed. 2009. *The Cambridge Companion to Galen*. Cambridge: Cambridge University Press. 5. Hankinson, R. J. and M. Havrda, eds. 2022. *Galen’s Epistemology: Experience, Reason, and Method in Ancient Medicine*. Cambridge: Cambridge University Press. 6. Mattern, S. 2013. *The Prince of Medicine: Galen in the Roman Empire*. Oxford: Oxford University Press. 7. Nutton, V. 2013. *Ancient Medicine.* London: Routledge, chs. 15-16.   **Week 8: Ptolemaic Astronomy**   1. Jones, A. 2017. *A Portable Cosmos: Revealing the Antikythera Mechanism, Scientific Wonder of the Ancient World*. Oxford: Oxford University Press.. *Selections Illustrating the History of Greek Mathematics*, 2 vols. Cambridge: HUP. 2. Feke, Jacqueline (2014), 'Meta-mathematical rhetoric: Hero and Ptolemy against the philosophers', *Historia Mathematica,* 41, 261-76. 3. Bowen, A. C., and B. R. Goldstein. 1994. ‘Aristarchus, Thales, and Heraclitus on Solar Eclipses.’ *Physics* 31: 689–729. 4. Wall, B. E. 1975. ‘Anatomy of a precursor: the historiography of Aristarchos of Samos.’ *Studies in Hist. and Philos. Sci.* 6 (3), 201-228. 5. Pedersen, Olaf and Jones, Alexander (eds.) (2011), *A Survey of the Almagest* (New York: Springer).   **Week 9: The Neoplatonic Tradition**   1. Netz, Reviel (1998), 'Deuteronomic Texts: Late Antiquity and the History of Mathematics', *Revue d’histoire des mathématiques,* 4, 261-88. 2. Morrow, G. R., ed. 1970. *Proclus: A Commentary on the First Book of Euclid’s Elements*. Princeton: Princeton University Press. 3. Sialaros, Michalis, et al. (2019), 'Searching for Definitions: Marinus’ Introduction to Euclid’s *Data*', *Sciamvs,* 20, 119-55. 4. Jones, Alexander (ed.), (1986), *Pappus of Alexandria: Book 7 of the Collection* 2 vols. (New York: Springer). 5. Cuomo, S. 2000. *Pappus of Alexandria and the Mathematics of Late Antiquity*. Cambridge: Cambridge University Press. 6. Brentjes, S. 2019. ‘Mathematical commentaries in Arabic and Persian – purposes, forms, and styles.’*Historia Mathematica* 47, 54-66. 7. Sialaros, Michalis, Christianidis, Jean, and Megremi, Athanasia (eds.) (2019), *On Mathemata: Commenting on Greek and Arabic Mathematical Texts* (Historia Mathematica Special Issue 47).   **Week 10: The Reception of Ancient Medicine in the Middle Ages: Byzantine Medicine between Tradition and Innovation**   1. Bouras-Vallianatos, P. 2015. ‘Contextualizing the Art of Healing by Byzantine Physicians’, in B. Pitarakis ed., *Life Is Short, Art Long: The Art of Healing in Byzantium*. Istanbul: Pera Museum Publication, pp. 104–22. 2. Bouras-Vallianatos, P. 2020. *Innovation in Byzantine Medicine: The Writings of John Zacharias Aktouarios (c.1275-c.1330)*. Oxford: Oxford University Press. 3. Bouras-Vallianatos, P. and B. Zipser, eds. 2019. *Brill’s Companion to the Reception of Galen*. Leiden: Brill, chs. 1-7. 4. Eijk, van der P. 2010. ‘Principles and Practices of Compilation and Abbreviation in the Medical “Encyclopaedias” of Late Antiquity’, in M. Horster and C. Reitz eds., *Condensing Text – Condensed Texts*. Stuttgart: Steiner, pp. 519–54. 5. Iskandar, A. 1976. ‘An Attempted Reconstruction of the Late Alexandrian Medical Curriculum’, *Medical History* 20: pp. 235–58. 6. Overwien, O. 2018. ‘Der medizinische Unterricht der Iatrosophisten in der “Schule von Alexandria” (5.‒7. Jh. n. Chr.): Überlegungen zu seiner Organisation, seinen Inhalten und seinen Ursprüngen’, *Philologus* (erster Teil) 162(1): 2–14; (zweiter Teil) 162(2): 265–90. 7. Scarborough, J., ed. 1983. ‘Byzantine Medicine’, *Dumbarton Oaks Papers*.   **Week 11: Translations of Greek Scientific Works into Arabic and the Birth of Islamicate Medicine and Science**   1. Bouras-Vallianatos, P. and B. Zipser, eds. 2019. *Brill’s Companion to the Reception of Galen*. Leiden: Brill, chs. 8-16. 2. Gutas, D. 1988. *Avicenna and the Aristotelian Tradition*. Leiden: Brill. 3. Gutas, D. 1998. *Greek Thought, Arabic Culture: The Graeco-Arabic Translation Movement in Baghdad and Early 'Abbasaid Society*. London: Routledge. 4. Pormann, P. and E. Savage-Smith. 2007. *Medieval Islamic Medicine*. Edinburgh: Edinburgh University Press. 5. Vagelpohl, U. and I. Sánchez. 2022. ‘Why do we translate? Arabic sources on translation’, in ed. D. Gutas, *Why Translate Science?*. Leiden: Brill, pp. 254-376. |