

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Economics and Political Sciences		
ACADEMIC UNIT	Department of Economics		
LEVEL OF STUDIES	Undergraduate studies		
COURSE CODE	ECO413	SEMESTER	8th
COURSE TITLE	Energy and Resource Economics		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures and exercises		6	7
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge		
PREREQUISITE COURSES:	Indicative prerequisites: Mathematics I, Microeconomic Theory I		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://eclass.uoa.gr/courses/ECON909/		

(2) LEARNING OUTCOMES

Learning outcomes <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i> <i>Consult Appendix A</i> • Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area • Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B • Guidelines for writing Learning Outcomes
Upon completion of the course, students will be able to understand and analyze the supply and demand of energy and natural resources, understand the role and changes in energy markets, and know the basic regulations in the energy and natural resources sectors and the policies that affect energy and natural resource markets. Upon completion of the course, students will be able to: • Understand basic principles governing the energy and natural resources market • Know the main micro- and macro-economic challenges related to the management of the energy and natural resources sector • Understand the political economy of energy and climate change • Know and analyze concepts such as: energy transition, natural resources management, regional energy policies, and natural resource utilization policies • Understand and critically analyze regulations and initiatives such as: the European Green Deal, the EU Green Taxonomy, the Sustainable Development Goals (SDGs) and

the United Nations Agenda for 2030 - Analyze from a scientific perspective the energy-natural resources-development relationship and the relationship energy-food-water-environment. - Synthesize the advantages and disadvantages of international actions related to energy and climate - Evaluate energy policies from a social, economic, and technological perspective																			
General Competences <i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i> <table> <tr> <td><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td><td><i>Project planning and management</i></td></tr> <tr> <td><i>Adapting to new situations</i></td><td><i>Respect for difference and multiculturalism</i></td></tr> <tr> <td><i>Decision-making</i></td><td><i>Respect for the natural environment</i></td></tr> <tr> <td><i>Working independently</i></td><td><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></td></tr> <tr> <td><i>Team work</i></td><td><i>Criticism and self-criticism</i></td></tr> <tr> <td><i>Working in an international environment</i></td><td><i>Production of free, creative and inductive thinking</i></td></tr> <tr> <td><i>Working in an interdisciplinary environment</i></td><td>.....</td></tr> <tr> <td><i>Production of new research ideas</i></td><td><i>Others...</i></td></tr> <tr> <td></td><td>.....</td></tr> </table>		<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>	<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>	<i>Team work</i>	<i>Criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>	<i>Working in an interdisciplinary environment</i>		<i>Production of new research ideas</i>	<i>Others...</i>		
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The course aims at: - Decision-making - Autonomous work - Promotion of free, creative, and inductive thinking - Search, analysis, and synthesis of data and information, using the necessary technologies - Adaptation to new situations - Teamwork - Work in an international environment - Work in an interdisciplinary environment - Generation of new research ideas - Design and management of projects - Respect for the natural environment - Exercise of criticism and self-criticism - Promotion of free, creative, and inductive thinking																			

(3) SYLLABUS

The course explores the theoretical and empirical perspectives of the economics of energy and natural resource demand and supply, energy markets, natural resource market structures, externalities, regulation, taxation, and other government interventions in the energy and natural resource sectors (with an emphasis on resources used to produce energy), energy efficiency, carbon emission reduction, and policy instruments affecting energy.

The course explores issues related to energy and natural resource management from a private and industrial perspective. The course also discusses the political economy of energy and climate change, the energy transition, developments and trends in the energy sector and natural resource management in Southeastern Europe and the Mediterranean region, regional energy and natural resource policies, regulations and initiatives such as the European Green Deal, the European Climate Law and the EU Green Taxonomy, the Sustainable Development Goals and the United Nations Agenda 2030.

The course discusses the energy-natural resources-development nexus and the energy-food-water-environment nexus from a scientific perspective.

The course is developed in the following thematic units:

1. Introduction to the economics of energy and natural resources: Economics of demand and supply
2. Energy markets, natural resource markets, networks, technology, and innovation
3. Conventional energy sources: Past, present, future

4. Renewable energy sources: Past, present, future
5. Energy models and future energy scenarios
6. International policy on energy, natural resources and climate change
7. Global and regional energy transition. Financial implications, employment, development and technological impacts
8. Energy-natural resources-development relationship
9. Social, economic, environmental, technological and managerial issues

The teaching and study program is summarized in the table below. References include the basic bibliography to which students should refer. Additional material (suggested indicative bibliography that students are advised to refer to for a better understanding of the course, scientific articles, press articles, etc.), as well as lecture slides, are posted on eClass.

Table 1: Teaching and study programme and indicative bibliography

Thematic unit	Bibliography
Introduction to Energy and Natural Resource Economics: Economics of Demand and Supply	Bradford, T. (2021). Ch. 1 Hansen, J.P., Percebois, J. (2022). Ενότητα 2: Ch. 1, 2, 3 Hussen, A. (2023).Ch.1 Nordhaus, W., D. (2023). Ch. 2-4
Energy Markets, Natural Resource Markets, Networks, Technology and Innovation	Bradford, T. (2021). Ch. 2 Hansen, J.P., Percebois, J. (2022). Ενότητα 2: Ch. 4, 5 Hussen, A. (2023).Ch.2, 3
Conventional Energy Sources: Past, Present, Future	Bradford, T. (2021). Ch. 12, 14 Hansen, J.P., Percebois, J. (2022). Ενότητα 3
Renewable Energy Sources: Past, Present, Future	Bradford, T. (2021). Ch. 7 Hansen, J.P., Percebois, J. (2022). Ενότητα 8
Energy Models and Future Energy Scenarios	Hansen, J.P., Percebois, J. (2022). Ενότητα 1: Ch. 4, 7
International Energy, Natural Resources and Climate Change Policy	Bradford, T. (2021). Ch. 16 Hansen, J.P., Percebois, J. (2022). Ενότητα 9 Nordhaus, W., D. (2023). Ch. 16-19 Hussen, A. (2023).Ch.9
Energy and environment: Global and regional energy transition	Bradford, T. (2021). Ch. 16 Hansen, J.P., Percebois, J. (2022). Ενότητα 9 Nordhaus, W., D. (2023). Ch. 22-24 Hussen, A. (2023).Ch.10
Energy-Natural Resources-Sustainable Development	Bradford, T. (2021). Ch. 15 Hansen, J.P., Percebois, J. (2022). Ενότητα 9 Nordhaus, W., D. (2023). Ch. 7-9 Hussen, A. (2023).Ch.10, 11
Social, Economic, Environmental, Technological, and Management Issues	Bradford, T. (2021). Ch. 3 Hansen, J.P., Percebois, J. (2022). Ενότητα 8:Ch.5, Ενότητα 9: Ch.3 Nordhaus, W., D. (2023). Ch. 13-15 Hussen, A. (2023).Ch.13

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face								
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of ICT for presentations during lectures. Use of the e-class electronic platform for posting learning materials and announcements. Use of email for communication with students. Use of the e-class electronic platform for posting assignments by students. Grades are recorded in MyUni. Students are encouraged to use search engines for scientific journals as well as large databases (World Bank, International Monetary Fund, Statistical Services, etc.)								
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	<table border="1"> <thead> <tr> <th>Activity</th><th>Semester workload</th></tr> </thead> <tbody> <tr> <td>Lectures</td><td>42</td></tr> <tr> <td>Study of course material</td><td>136</td></tr> <tr> <td>Course total</td><td>178</td></tr> </tbody> </table>	Activity	Semester workload	Lectures	42	Study of course material	136	Course total	178
Activity	Semester workload								
Lectures	42								
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STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Mixed assessment system with group work (20% of the final grade), presentation (30% of the final grade), and individual final examination (50% of the final grade). The exam syllabus, procedures, and assessment criteria are communicated to students from the beginning of the semester through the course guide posted on eClass. They are also made known during lectures and by posting relevant announcements and material on the eClass electronic platform. Group work and presentations can also be done in English. The assessment criteria follow the intended learning outcomes and are communicated from the beginning of the semester and are accessible to students through the course guide on eClass.								

(5) ATTACHED BIBLIOGRAPHY

In Greek

- Bradford, T. (2021). Energy Economics and the Energy System. Papazisis Publications
- Hansen, J.P., Percebois, J. (2022). Energy Economics. Propompos Publications
- Hussen, A. (2023). Principles of Environmental Economics and Sustainability. Kritiki Publications
- Nordhaus, W., D. (2023). The Green Spirit. Propompos Publications
- Tol S.J R., (2024). Climate Economics. Economic Analysis of Climate, Climate Change and Climate Policy. Gutenberg Publications

In English

- Bhattacharyya, S.C. (2019), Energy economics: Concepts, issues, markets and governance, 2nd ed., Springer.
- Creti, A. and Fontini, F. (2019), Economics of electricity: Markets, competition and rules, 1st ed., Cambridge University Press: London.
- Inkpen, A., Moffett, A. (2011). The global oil and gas industry: Management, strategy and finance. Pennwell Publications. ISBN: 978-1-59370-239-7. Google Books: [https://books.google.gr/books?id=aNLafH_o3GcC&printsec=frontcover&dq=1\)+Inkpen,+A.,+Moffett,+A.+\(2011\).+The+global+oil+and+gas+industry:+Management,+s+strategy+and+finance.+Pennwell+Publications.+ISBN:+978-1-59370-239-7&hl=en&sa=X&ved=2ahUKEwj3m-bbjcsAhUvzYUKHergB6oQ6AEwAXoECAIQAg#v=onepage&q&f=false](https://books.google.gr/books?id=aNLafH_o3GcC&printsec=frontcover&dq=1)+Inkpen,+A.,+Moffett,+A.+(2011).+The+global+oil+and+gas+industry:+Management,+s+strategy+and+finance.+Pennwell+Publications.+ISBN:+978-1-59370-239-7&hl=en&sa=X&ved=2ahUKEwj3m-bbjcsAhUvzYUKHergB6oQ6AEwAXoECAIQAg#v=onepage&q&f=false)
- Mulder, M. (2023). Regulation of Energy Markets: Economic Mechanisms and Policy Evaluation. Springer International Publishing.
- Nersesian, R., L. (2016). Energy Economics. Markets, History and Policy. Routledge.
- Schwarz, P.M. (2023) Energy economics. 2nd ed. Routledge.
- Spreight, J. (2011) Petroleum technology, Economics and Politics. Wiley. ISBN 978-1-118-01299-4. Google Books: <https://books.google.gr/books?id=COUkeS1TDLUC&pg=PT147&dq=Petroleum+technology,+Economics+and+Politics&hl=en&sa=X&ved=2ahUKEwi4o9GhiYLuAhVMCRAIHSaaDm4Q6AEwAHoECAYQAg#v=onepage&q=Petroleum%20technology%2C%20Economics%20and%20Politics&f=false>
- Tsani, S., Overland, I. (2021). Handbook of Sustainable Politics and Economics of Natural Resources. Edward Elgar Publishing. ISBN: 9781789908763.
- Tsani, S. (2020). Economic terms and local content policies for hydrocarbon exploration and production in Greece in Study Hydrocarbon Exploration and Production in Greece. Available here: https://www.google.com/url?q=https%3A%2F%2Fwww.greekhydrocarbons.gr%2Fnews_files%2FFHHRM_book.pdf&sa=D&sntz=1&usq=AFQjCNEa9e-1rhUoD_b8Tq0QLceae2fBTg
- Tordo, S. (2010). Petroleum Exploration and Production Rights: Allocation Strategies and Design Issues. World Bank (Available here: <https://openknowledge.worldbank.org/handle/10986/5954>)
- Tordo, S., Warner, M., Manzano, O., Anouti, Y. (2013). Local Content Policies in the Oil and Gas Sector. World Bank (Available here: <http://documents1.worldbank.org/curated/en/549241468326687019/pdf/Local-content-in-the-oil-and-gas-sector.pdf>)

Selected Studies

All studies and links can be found [here](#).

a. Stella Tsani (2022). European Green Deal and development perspectives for the Mediterranean region In Brears, R. (Ed.) The Palgrave Encyclopedia of Urban and Regional Futures Palgrave Macmillan, Cham, (2022).

b. Stella Tsani (2020). Energy resources, local content policies and economic growth: The case of hydrocarbons exploration in Greece. In Vlachos, V., Bitzenis, A. and Sergi, B.S. (Ed.) Modeling Economic Growth in Contemporary Greece (Entrepreneurship and Global Economic Growth), Emerald Publishing Limited, Bingley. ISBN: 978-1-80071-123-5

- c. Stella Tsani, Indra Overland. Sovereign Wealth Funds and public financing for climate action. Encyclopedia of the UN Sustainable Development Goals. Climate Action. Springer, 2020.
- d. Stella Tsani, Phoebe Koundouri, Ebun Akinsete (2020). Resource management and sustainable development: A review of the European water policies in accordance with the United Nations' Sustainable Development Goals, Environmental Science & Policy, 114 (2), (2020), 570-579.
- e. Stella Tsani. Public Policies for Just Transition: Local Content, Employment, and Human Capital in: Leal Filho W., Azul A., Brandli L., Lange Salvia A., Wall T. (eds) Decent Work and Economic Growth. Encyclopedia of the UN Sustainable Development Goals. Springer, Cham. (2020) ISBN: 978-3-319-71058-7.
- f. Stella Tsani, Natural resources, governance and institutional quality: The role of resource funds, Resources Policy, Volume 38, Issue 2, 2013, Pages 181-195
- g. Stella Tsani, Energy consumption and economic growth: A causality analysis for Greece, Energy Economics, Volume 32, Issue 3, 2010, Pages 582-590
- h. Stella Tsani (2020). Economic conditions and public policies of domestic potential for the exploration and exploitation of hydrocarbons in Greece, Hydrocarbons in Greece. The role of the Energy-Growth Nexus (EGN).
- i. Stella Tsani, Angeliki N. Menegaki, The Energy-Growth Nexus (EGN) Checklist for Authors, Editor(s): Angeliki N. Menegaki, The Economics and Econometrics of the Energy-Growth Nexus, Academic Press, 2018, Pages 347-376
- j. Angeliki N. Menegaki, Stella Tsani, Critical Issues to Be Answered in the Energy-Growth Nexus (EGN) Research Field, Editor(s): Angeliki N. Menegaki, The Economics and Econometrics of the Energy-Growth Nexus, Academic Press, 2018, Pages 141-184
- k. Stella Tsani, On the relationship between resource funds, governance and institutions: Evidence from quantile regression analysis, Resources Policy, 2015, Volume 44, 2015

Useful links

Top 100 economics blogs for 2019. Intelligent economist.

<https://www.intelligenteconomist.com/economics-blogs/>

International Energy Agency

<https://www.iea.org/>

Santiago Principles

<https://www.ifswf.org/santiago-principles-landing/santiago-principles>

United Nations Sustainable Development Goals

<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

IPCC — Intergovernmental Panel on Climate Change

<https://www.ipcc.ch/>

BP Statistical Review of the World Economy

<https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/downloads.html>

OPEC

https://www.opec.org/opec_web/en/

Extractive Industries Transparency Initiative

<https://eiti.org/>

Sovereign Wealth Fund Institute

<https://www.swfinstitute.org/>

Sovereign Wealth Fund Institute

<https://www.swfinstitute.org/>

Fund of Norway

<https://www.nbim.no/>

Oil and gas climate initiative

<https://oilandgasclimateinitiative.com/>

Renewable Energy World

<https://www.renewableenergyworld.com/>

GreenBiz

<https://www.greenbiz.com/>

Energy Live News

<https://www.energylivenews.com/>

International Renewable Energy Agency

<https://www.irena.org/>