

# Dimitrios Marinakis

## *Curriculum Vitae*



### **A. Contact**

Department of Mineral Resources Engineering  
School of Engineering  
University of Western Macedonia  
Koila, GR-50100, Kozani, GREECE  
Phone: +30 246 106 8089  
Email: [dmarinakis@uowm.gr](mailto:dmarinakis@uowm.gr)

### **B. Education**

#### *PhD in Hydrocarbon Field Engineering, 2012*

Technical University of Crete, Greece

Faculty School of Mineral Resources Engineering

*Dissertation:* Study of the formation and degradation conditions of multicomponent natural gas hydrates within sediments in a bathypelagic zone environment: The case of the underwater mountain «Anaximander»

*Supervisor:* Prof. Nikos Varotsis

#### *M.Sc. in Engineering - Economic Systems, 2003*

National Technical University of Athens, Greece

Faculty School of Electrical and Computer Engineering

(In collaboration with the Department of Economics of the School of Law, Economics & Political Sciences of the National and Kapodistrian University of Athens and the Department of Industrial Management and Technology of the University of Piraeus, Greece)

Major: Production Systems

*Thesis title:* Environmental impact study of vertically integrated olive processing for oil production

*Supervisor:* Prof. Frangiskos Batzias

#### *Integrated Master in Chemical Engineering, 1997*

National Technical University of Athens, Greece

School of Chemical Engineering

*Thesis:* Formation of monomolecular copper layer on silica-clay substrates for use as a selective adsorbent in the separation of gas hydrocarbon mixtures

*Supervisor:* Prof. Vasiliki Rigopoulou-Kasselouri

## C. Professional experience

2022- present Assistant Professor in the field of expertise of Petroleum Production Engineering at the Department of Mineral Resources Engineering, School of Engineering, University of Western Macedonia, Greece

- Drilling Technology
- Hydrocarbon Reservoirs Engineering
- Science and Technology of Geothermal Fields
- Oil & Natural Gas Engineering
- Safety and Environment in the production, transport and storage of hydrocarbons
- Advanced Techniques for the Utilization of Energy Sources
- Thermodynamics

2005-2022 Permanent Staff (2005-2015) - Laboratory Teaching Staff (2016-2022) at the School of Mineral Resources Engineering, Technical University of Crete, Greece

- PVT measurements and simulation for oil, gas and gas hydrates
- Core analysis of reservoir rocks (Permeability, porosity, pore size distribution, saturation in reservoir fluids)
- Rheological measurements of oil-water emulsions and drilling/cement slurries
- Upstream facilities teaching and simulation
- Flow assurance teaching
- Fluid mechanics teaching

2000-2002 Fluid Catalytic Cracking Production Engineer, Motor Oil Hellas – Corinth Refinery, Corinth, Greece

- Fluid catalytic cracking production engineer
- Surveillance during implementation and initial startup of new gasoline desulfurization and benzene removal units
- Participation in design and implementation of advance process control system for the FCC units (Honeywell Advanced Process Control)
- Participation in upgrading refinery's quality system to ISO 9000:2000

1997, 1999 Consultant / Researcher at Hydronomi and HYDRAM Consulting, Athens, Greece

- Pioneer works on rehabilitation of water pipeline network & leakage control. Application areas: Peristeri-Glyfada-Vouliagmeni
- Feasibility study for drying the wastewater sludge produced in the Athens wastewater treatment plant on Psyttalia

- Feasibility study for the rehabilitation of Galatsi - Menidi - Kiourka Water
- Designing of existing water pipeline network in AutoCAD and conversion to GIS
- Network assimilation on the computer and water flow calculation in the pipelines

1996-1997 Research assistant at the School of Civil Engineering, National Technical University of Athens, Greece

- Participation in the research on the characteristics and utilization of the sludge produced during the primary and secondary treatment of urban wastewater at the Wastewater Treatment Plant in Psyttalia, Athens
- Wastewater flow measurements and comparison with the electronic recordings (SCADA System) at the Wastewater Treatment Plant in Psyttalia. Data correlation and error analysis
- Installation and operation of equipment for real-time measurement and data log of PH and conductivity values at the Wastewater Treatment Plant in Psyttalia, Athens

## **D. Research project highlights**

1. Development of software for the simulation of the thermodynamic equilibrium of gas and liquid hydrocarbons for educational purposes – models of Cubic Equations.
2. Development of educational software for the simulation of gas–liquid hydrocarbon thermodynamic equilibrium using cubic equations of state models.
3. Development of software for the simulation of multiphase thermodynamic equilibrium involving gas hydrates in mixtures with and without the presence of a free gas phase.
4. Design and construction of experimental apparatuses for the measurement of PVT properties of petroleum reservoir fluids and for enhanced oil recovery (EOR) studies.
5. Design and construction of experimental apparatuses for the measurement of phase equilibria involving gas hydrates and for the characterization of natural gas hydrate reservoir properties.
6. Design and construction of an experimental apparatus for investigating near-wellbore permeability impairment caused by drilling fluid invasion under high-pressure and high-temperature conditions.
7. Investigation of the effect of chemical additives on the rheological and filtration behavior of drilling fluids and cement slurries.
8. Investigation of the effect of rock wettability on relative permeability curves.

## Q. Publications

### I. Articles in peer-reviewed journals

1. Christidis GE, Athanasakis N, **Marinakis D.**, “Rheological properties of magnesium bentonite and sepiolite suspensions after dynamic ageing at high temperatures”, *Clay Minerals*, vol. 59(2):113-126, 2024, <https://doi.org/10.1180/clm.2024.11>
2. Ismail I., Gaganis V., **Marinakis D.**, Mousavi R., Tohidi B., “Accuracy of different thermodynamic software packages in predicting hydrate dissociation conditions”, *Chemical Thermodynamics and Thermal Analysis*, vol.9, 100103, ISSN 2667-3126, 2023, <https://doi.org/10.1016/j.ctta.2022.100103>  
(<https://www.sciencedirect.com/science/article/pii/S2667312622000694>)
3. Vamvouka D., Esser K., **Marinakis D.**, “Characterization of Pyrolysis Products of Forest Residues and Refuse-Derived Fuel and Evaluation of Their Suitability as Bioenergy Sources”, *Applied Sciences*, vol. 13(3):1482, 2023, <https://doi.org/10.3390/app13031482>
4. Antoniou, E.; Fragkou, E.; Charalampous, G.; **Marinakis, D.**; Kalogerakis, N.; Gontikaki, E., “Emulating Deep-Sea Bioremediation: Oil Plume Degradation by Undisturbed Deep-Sea Microbial Communities Using a High-Pressure Sampling and Experimentation System”, *Energies*, vol.15(Issue13),4525, 2022. <https://doi.org/10.3390/en15134525>
5. Gaganis V.; **Marinakis D.**; Samnioti A., “A soft computing method for rapid phase behavior calculations in fluid flow simulations”, *Journal of Petroleum Science and Engineering*, vol. 205, 108796, 2021. <https://doi.org/10.1016/j.petrol.2021.108796>
6. **Marinakis D.**; Varotsis N.; Perissoratis C., “Gas hydrate dissociation affecting the permeability and consolidation behaviour of deep sea host sediment”, *Journal of Natural Gas Science and Engineering*, vol. 23, p.p. 55-62, 2015.
7. **Marinakis D.**; Varotsis N., “Solubility measurements of methane + ethane + propane mixtures in aqueous phase with gas hydrates at vapor unsaturated conditions”, *The Journal of Chemical Thermodynamics*, vol. 65, p.p. 100-105, 2013.
8. Gaganis V.; **Marinakis D.**; Varotsis N., “A general framework of model functions for rapid and robust solution of Rachford-Rice type of equations”, *Fluid phase equilibria*, vol. 322-323, pp. 9-18, 2012.

### II. Articles in peer-reviewed conferences

9. Mitsiopoulou Olga, Bellas Spyridon, **Marinakis Dimitrios**, “Geological formations for underground hydrogen storage in Western Macedonia, Greece”, *5<sup>th</sup> Annual Meeting of the Mediterranean Geosciences Union*, Athens Greece, Nov. 2025
10. Bellas Spyridon, Lazos Ilias, **Marinakis Dimitrios**, Vamvaka Agni, Kiliadis Adamantios, “Geochemistry of onshore gas manifestations and their geodynamic control, Northern Central Greece”, *4<sup>th</sup> Annual Meeting of the Mediterranean Geosciences Union*, Barcelona Spain, Nov. 2024 (Pending doi from Springer Nature <https://www.springernature.com/> )
11. Argyropoulou Christina, Gaganis Vassilis, **Marinakis Dimitris**, “Towards the Exploitation of Unconventional Heavy Oils: Electrostatic Technologies for the Minimization of Dehydration Cost.”, 2<sup>nd</sup> International Conference on Raw Materials and Circular Economy,

- Athens Greece, Aug. 2023, Materials Proceedings. 2023; 15(1):10  
<https://doi.org/10.3390/materproc2023015010>
12. Aslanidis, Panagiotis, **Marinakis, Dimitris**, Puntervold, Tina, Gaganis, Vasilis, and Nikolaos Varotsis, "Density Changes at Supercritical and Near-Critical Conditions by Increasing CO<sub>2</sub> Content in Synthetic Hydrocarbon Mixtures – A Comparison Between Experiments and Simulation Predictions." Paper presented at the *SPE EuroPEC - Europe Energy Conference* featured at the *83<sup>rd</sup> EAGE Annual Conference & Exhibition*, Madrid, Spain, June 2022. doi: <https://doi.org/10.2118/209663-MS>
  13. **Marinakis D.**, Aslanidis P., Gaganis B. "Experimental determination the change in density and swelling of mixtures of hydrocarbons with the addition of CO<sub>2</sub> at high temperatures and pressures", *1<sup>st</sup> Online Conference of Young Scientists «Mineral Resources-Environment-Chemical Engineering»*, Kozani, Greece, February 2021 (Online).
  14. Tallou C., Varotsis N., Giotis A., **Marinakis D.** "Laboratory study of the effect of the degree of wetting on the relative water-oil permeability curves in hydrocarbon reservoir cores", *1<sup>st</sup> Online Conference of Young Scientists "Mineral Resources-Environment-Chemical Engineering"*, Kozani, Greece, February 2021 (Online).
  15. **Marinakis D.**, Varotsis N., "Experimental Evidence of Gas Hydrates Dissociation Kinetics by Shifting their Equilibrium Conditions", *The 11<sup>th</sup> International Conference on Chemistry and Chemical Engineering – ICCCE2020*, Warsaw, Poland, July 2020 (Online).  
(Paper published at: *Journal of Physics: Conference Series*, vols. 1681, 012020)
  16. **Marinakis D.**, Varotsis N., "Helmholtz energy stability criterion combined with a dual stage phase split for robust multiphase equilibria simulation", *15<sup>th</sup> Joint European Thermodynamics Conference – JETC2019*, Barcelona, Spain, May 2019.
  17. **Marinakis D.**, Varotsis N., "Experimental study of the gas hydrates dissociation effect on the properties of the host marine sediment", accepted for presentation in the *4<sup>th</sup> World Multidisciplinary Earth Sciences Symposium - WMESS*, Prague, Czech Republic, September 2018.
  18. Lytra S., Christidis G.E., **Marinakis D.**, "Rheological properties of bentonite suspensions after dynamic aging at high temperatures", *16<sup>th</sup> International Clay Conference*, Granada, Spain, July 2017.
  19. Biotaki A., **Marinakis D.**, Kompitsaki M., Mavrigiannakis St., Kelessidis V.C., "The effect of mud contamination on the properties of a G-type cement slurry". Presented at the Annual European Rheology Conference - *AERC 2017* and the *26<sup>th</sup> Nordic Rheology Conference*, Copenhagen, Denmark, April 2017.  
Abstract at <http://www.aerc2017.dk/images/AERC2017-AbstractBook-20170322.pdf>
  20. Biotaki A., **Marinakis D.**, Zografou M., Kompitsaki M., Kelessidis V., "Rheological and filtration properties of newly developed class G-type cement slurries; Investigations for field use and comparison with performance of cement slurries using standard oil-well G-type cements", *11<sup>th</sup> HSTAM International Congress on Mechanics*, Athens, Greece, May 2016.
  21. **Marinakis D.**, Varotsis N., Perissoratis C., "Key sediment properties affected by the presence of gas hydrates in the 'Anaximander' deep sea mud volcanoes.", *9<sup>th</sup> International Conference on Gas in Marine Sediments*, Bremen, Germany, September 2008.

22. **Marinakis D.**, Varotsis N., "Dissociation of multi-component gas hydrates in clays and their impact on the mechanical properties of the host sediment", Conference Abstract p.69, *3<sup>rd</sup> International Conference on Submarine Mass Movements and their consequences*, Santorini, Greece, October 2007.
23. **Marinakis D.**, Varotsis N., Lazaridis M., "Effect of gas hydrate stability on climatic change. The case of 'Anaximander' mud volcanoes", Conference Abstract p.122, *10<sup>th</sup> International Conference on environmental science and technology*, Kos Island, Greece, September 2007.
24. Kelesidis V., **Marinakis D.**, Tsamantaki C., "Laboratory assessment of drilling fluid formation damage in sandstone cores and mitigation with lignite additives for high temperature fields", paper SPE-107762-MS, *SPE European Formation Damage Conference*, Scheveningen, The Netherlands, May 2007.
25. **Marinakis D.**, Varotsis N., "Natural gas hydrates in deep sea sediments: The effect of the host formation on pore pressure and on hydrate characteristics", *Geophysical Research Abstracts* vol. 9 No 10268, *European Geosciences Union General Assembly*, Vienna, Austria, April 2007.
26. **Marinakis D.**, Varotsis N., "Hydrates formed from dissolved natural gas in deep marine sediments", *5<sup>th</sup> International Workshop on Methane Hydrate Research & Development*, Edinburgh, UK, October 2006.
27. **Marinakis D.**, Varotsis N., Kostakis G., Christidis G, et.al. "Gas hydrate research overview in Greece", *5<sup>th</sup> International Workshop on Methane Hydrate Research & Development*, Edinburgh, UK, October 2006.
28. **Marinakis D.**, Varotsis N., Kostakis G., Christidis G, "How much gas hydrates can sediment host? Characteristics affecting sediment's store capacity", *2<sup>nd</sup> International Conference in Mineral Resources Management and Environmental Geotechnology*, Chania, Greece, September 2006.
29. **Marinakis D.**, Varotsis N., Pasadakis N., Yang J., Tohidi B., Perissoratis C., "Thermodynamic study of undersaturated Hydrates formed from a Gas Mixture in Marine Sediments", *VIII International Conference on Gas in Marine Sediments*, Vigo, Spain, September 2005.
30. Yang J., Llamedo M., **Marinakis D.**, Tohidi B., Varotsis N. "Successful Applications of a versatile ultrasonic system for gas hydrates in unconsolidated sediments", *Proceedings vol.1 Kinetics and Transport Phenomena* ISBN 82-519-2065-5, *5<sup>th</sup> International Conference on Gas Hydrates*, Trondheim, Norway, June 2005.
31. **Marinakis D.**, Varotsis N., Jinhai Y., Tohidi B. "The effect on the stability of the deep sea sediment caused by the dissociation of the contained gas hydrate: The case of the 'Anaximander' mud volcano sea bed", *32<sup>nd</sup> International Geological Congress*, Florence, Italy, August 2004.
32. **Marinakis D.**, Varotsis N., Yang J., Tohidi B., Perissoratis C. "Gas Hydrates in the East Mediterranean seabed: Energy potential and technological challenge", *Advances in Mineral Resources Management and Environmental Geotechnology Conference*, Chania, Greece, June 2004.

33. Yang J., **Marinakis D.**, Tohidi B., Varotsis N. "Sediment geomechanical response to hydrate dissociation by depressurization: An experimental study", Geophysical Research Abstracts vol.6 No 07022, *European Geosciences Union General Assembly*, Nice, France, April 2004.
34. Batzias F. A., Sidiras D. K., **Marinakis D.** "A GIS - Based Mapping of Pollution Caused by an Olive Pomace Oil Mill Operating in a NATURA 2000 Protected Area", *2<sup>nd</sup> International Conference on Ecological Protection of the Planet Earth*, Sofia, Bulgaria, June 2003.

### **III. Participation in conferences**

35. Petkidis D., Pavloudakis F., Marinakis D., Triantafyllou E. D., "Material recovery from end-of-life wind and photovoltaic systems: Linking circular economy and mineral processing methods in post-mining areas under energy transition", *2<sup>nd</sup> International EnviroMining Conference 2026*, 26 -27 May 2026.
36. Marinakis D., Pavloudakis Fr., "Mineral Resources and Energy Transition: Risks and Opportunities for Western Macedonia", *Panhellenic Conference on Energy & Sustainable Development – Smart Regions, Strategic Investments, Higher & Vocational Education*, Amyntaio 11-13 May 2026.
37. Argyropoulou Chr., Gaganis V., **Marinakis D.**, "Utilization of Unconventional Heavy Oils: Electrostatic Technologies to Minimize Dewatering Costs", *2<sup>nd</sup> Research Symposium of the University of Western Macedonia*, Kozani, 12-13 June 2025.
38. Varotsis N., **Marinakis D.**, Karantzi K., Manoutsoglu E., E.Christidis G., Perdicatsis V., Kotsakis G., Perissoratis C., Ioakim Ch. "Sedimentary and sediment stability studies on the Mud Volcanoes (MVs) of the 'Anaximander' Mountains, Eastern Mediterranean." *3<sup>rd</sup> Annual meeting of Hotspot Ecosystem Research on the Margins of European Seas (HERMES)*, Carvoeiro, Portugal, March 2008.
39. Perissoratis C., Ioakim Chr., Zacharaki P., Lykousis V., Sakellariou D., Kormas K., Woodside J., Amann H., Maggiuli M., Daehlmann A., De Lange G., Casas D., Ercilla G., Meyn V., Varotsis N., **Marinakis D.** "Exploration and Evaluation of the Eastern Mediterranean Gas hydrates and the Associated Deep Biosphere", *EUROCEAN 2004*, Galway, Ireland, May 2004.

### **IV. Chapters in Academic and Technical Textbooks**

40. Yiotis A., **Marinakis D.**, " Hydrocarbon Reservoir engineering ", *Hellenic Academic ebooks – Kallipos project*, 2022. <http://dx.doi.org/10.57713/kallipos-258>
41. Varotsis N., **Marinakis D.**, " Hydrocarbon production process and reservoir behavior", *in Textbook on Oil and Gas Exploration, Production and Refining*, Technical Chamber of Greece, February 2014.
42. **Marinakis D.**, "Basic hydrocarbon processes in refineries", *in Textbook on Oil and Gas Exploration, Production and Refining*, Technical Chamber of Greece, February 2014.

## F. Participation in Research Programs

### 1. EMPHASIS – Empowering Higher Education for Sustainable Practices and Energy Efficiency

The objective of the project is to foster an energy and environmental culture within Higher Education through the integration of innovative learning tools, digital platforms, and sustainable practices. The research project is funded by the European Program ERASMUS-EDU-2024-CBHE-STRAND-1 (101179723) and brings together a consortium of universities and industrial partners from across Europe and the Western Balkans.

Scientific Coordinator: Prof. K. Tsanaktsidis

Project Budget: 400,000 €

Duration: Nov.2024 – Oct.2026

### 2. Hydrogen storage in geological structures of Western Macedonia (WM set for H<sub>2</sub> reservoirs).

The aim of the project is to assess selected areas of Western Macedonia with regard to their potential for underground hydrogen storage in geological reservoirs. The research is funded under the scheme “Funding of Research Proposals through the Research Committee of the University of Western Macedonia”.

Scientific Coordinator: Ass. Prof. D. Marinakis

Project Budget: 6,000 €

Duration: Jun.2025 – Aug.2026

### 3. X-PRESS - eXtreme environments: High PRESSure Sampling and experimentation system for deep sea hydrocarbon releases.

The X-PRESS project aims to develop advanced instrumentation for high-pressure sampling and ex situ experimentation while preserving in situ pressure conditions throughout the experimental process. The project investigates the hydrocarbon biodegradation potential of deep-sea microbial communities in the Eastern Mediterranean, with emphasis on natural attenuation under bathypelagic conditions. It also evaluates the effectiveness of existing oil-spill dispersants and supports the development of new formulations suitable for deep-sea releases of live crude oil.

Scientific Coordinator for the Institute of Geoenergy: Prof. N. Kalogerakis

Project Budget: 200,000 €

Duration: Apr.2022 – Jul.2025

### 4. HEALMED: Self-healing capabilities of the Eastern Mediterranean Sea from accidental deep-sea oil releases.

The HEALMED project aims to assess the self-remediation capacity of the Eastern Mediterranean Sea following accidental deep-sea oil releases. The project simulates deep-sea oil spill conditions in a bioreactor system under in situ environmental parameters to investigate the fate and biodegradation of oil within hydrocarbon plumes. It further evaluates oil degradation with and without biostimulation agents and examines the succession of hydrocarbon-degrading microbial communities in relation to degradation progress over time and distance.

Scientific Coordinator for the Institute of Geoenergy: Dr. Evina Gontikaki

Duration: 2018 – 2021

### 5. Contribution to the Development of an Open-Access Electronic Textbook within the KALLIPOS+ Project on **Petroleum Reservoir Engineering.**

Participation in the writing of an open-access electronic academic textbook within the

KALLIPOS+ project, focusing on Petroleum Reservoir Engineering.

Scientific Coordinator for the Technical University of Crete: Ep.Prof. A. Giotis

Estimated Duration: 15 Jul. 2021 – Dec.2022

**6. Analysis of Geochemical and Petrophysical Properties of Rock, Oil, and Core Samples from the Conventional Hydrocarbon Areas of Katakolo and Ioannina.**

The project involved the analysis of geochemical and petrophysical characteristics of rock samples, crude oil samples, and reservoir core samples from the conventional hydrocarbon areas of Katakolo and Ioannina.

Scientific Coordinator for the Technical University of Crete: Prof. N. Pasadakis

Duration: 1 – 30 Sept.2017

**7. Development of Innovative Self-Healing Cements for Oil, Gas, and Geothermal Wells.**

The aim of the project was to determine the composition of oil-well cement slurries containing different types of chemical additives, with optimized rheological and fluid-loss properties. Mixtures prepared with Greek Class G cement were tested and their performance was compared with that of a commercially available reference cement. An elastomeric additive was also incorporated in order to develop an elastic, self-healing cement slurry, and its rheological and filtration behavior was investigated.

Scientific Coordinator for the Technical University of Crete: Prof. V. Kelesidis

Funding Bodies TITAN cement S.A., GEOTECH Georesource Technology S.A., ENDITECH S.A.

Project Budget: 67,000 €

Duration: Apr.2015 – Jun. 2015

**8. Preparation of a Textbook entitled “Operation of Petroleum Extraction and Production Units”.**

The textbook was developed for reskilling staff in petroleum and natural gas reservoir exploitation processes, as well as for introductory training in the theoretical principles and basic technologies of crude oil refining and petroleum product production. The project also included the preparation of an assessment questionnaire for trainees upon completion of the training program.

Scientific Coordinator for the Technical University of Crete: Prof. N. Varotsis

Funding Body: Technical Chamber of Greece

Project Budget: 20,000 €

Duration: Jan.2014 – Jun. 2014

**9. Study of the Effect of Hydrochloric Acid on the Permeability and Grain-Size Distribution of Petroleum Reservoir Core Samples.**

Reservoir core samples were saturated with 15% hydrochloric acid in order to investigate its effect on permeability and grain-size distribution. One of the core samples was subjected to repeated acid treatment to evaluate the impact of prolonged acidization on rock properties.

Scientific Coordinator for the Technical University of Crete: Prof. N. Varotsis

Funding Body: Kavala Oil S.A.

Project Budget: 5,000 €

Duration: Nov. 2009 – Jan. 2010

**10. Experimental study and Modelling of Gas Hydrate Migration Mechanisms in Subsea Sediments, Formation Conditions, and Natural Gas Release Rates.**

The aim of the research was to investigate the mechanisms governing the propagation

of the initial gas hydrate formation front as it migrates toward shallower marine depths, in relation to geological parameters and the mineralogical composition of the sediments. The study also examined hydrate dissociation rates and the consequent release of enclosed natural gas into the marine environment. In addition, the research included an assessment of the environmental impacts associated with the release of natural gas from natural gas hydrate deposits.

Scientific Coordinator for the Technical University of Crete: Prof. N. Varotsis

Funding Body: European Social Fund & National Resources EPEAEK II - Pythagoras II

Project Budget: 90,000 €

Duration: 2005 – 2007

**11. Study on the Minimization of Formation Damage in Reservoir Rock Cores Caused by Drilling Fluids in Oil and Gas Production Wells through the Addition of Greek Lignite.**

The project investigated drilling muds containing different types of Greek lignite after artificial thermal ageing. Rheological and filtration performance, as well as filtration through rock cores, were compared with corresponding results obtained from drilling fluids without lignite additives and from muds containing commercially available imported lignite specifically used in drilling fluid systems.

Scientific Coordinator for the Technical University of Crete: Prof. V. Kelessidis

Funding Body: European Social Fund & National Resources EPEAEK II - Pythagoras II

Project Budget: 50,000 €

Duration: 2005 – 2007

**12. Innovative Process for Water Desalination and Concentration of Aqueous Waste Solutions Using Gas Hydrates.**

The project was carried out in collaboration between the Technical University of Crete and the Technological Educational Institute of Kavala. Its objective was to investigate azeotropic gas mixtures of Xe and HFC-134a for gas hydrate formation under pressure and temperature conditions close to ambient. The results were intended to support the design of a fluidized-bed system for seawater desalination and wastewater treatment.

Scientific Coordinator for the Technical University of Crete: Prof. N. Varotsis

Funding Body: European Social Fund & National Resources EPEAEK II - ARCHIMIDIS II.

Project Budget: €75,000

Duration: 2005 – 2007

**13. Investigation of the Effect of Mineralogy and Overburden Pressure on the Thermodynamic Stability and Formation Kinetics of Structure II Gas Hydrates in Subsea Sediments.**

The project was conducted in collaboration with the Gas Hydrate Research Centre of Heriot-Watt University, Edinburgh, United Kingdom. It focused on the effect of sediment mineralogy and overburden pressure on the thermodynamic stability and formation kinetics of Structure II gas hydrates in subsea sediments.

Scientific Coordinator for the Technical University of Crete: Prof. N. Varotsis

Funding Body: EU Research Access to the European infrastructure for energy reserve optimization, EIERO. Duration: Oct. 2003 – Dec.2003

**14. Exploration and Evaluation of the Eastern Mediterranean Sea Gas hydrates and the Associated Deep Biosphere.**

The project was carried out in collaboration with eight European universities and research institutes. Its objective was to explore areas of the Eastern Mediterranean Sea

where multicomponent natural gas hydrates occur and to conduct laboratory studies and simulations of hydrate behavior within sedimentary formations under bathypelagic-zone conditions. The exploration activities focused geographically on the Anaximander submarine mountains, at an average water depth of approximately 2000 m and seabed temperatures between 12 and 14°C.

Scientific Coordinator for the Technical University of Crete: Prof. N. Varotsis

Funding Body: EU Framework Energy, Environment and Sustainable Development, EC CONTRACT EVK3-CT-2002-00068.

Project Budget: €2,642,100.

Duration: 2002 – 2005

## G. Teaching Experience

### I. Teaching Courses

#### A. Undergraduate Programs

##### a. Department of Mineral Resources Engineering, Faculty of Engineering, University of Western Macedonia

- 2025-            *Transport phenomena, 4<sup>th</sup> semester.*
- General form of transport equations
  - Viscosity and momentum transfer
  - Mass transfer equation
  - Heat transfer
  - Equation of energy transfer in open continuous flow systems
- 2025-            *Thermodynamics, 3<sup>rd</sup> semester.*
- Thermodynamic variables
  - Power production and cooling processes
  - Phase equilibrium
- 2023-            *Drilling Technology, 7<sup>th</sup> semester.*
- Machinery (pumps, drill string, generators, derrick)
  - Pore pressure in the underground formation
  - Mud pressure in the borehole, fracture pressure of the rock.
  - Stresses along the drill string.
  - Well control basics
  - Types of drilling equipment and applications
- 2023-            *Hydrocarbons Reservoir Engineering, 8<sup>th</sup> semester.*
- Hydrocarbons formation, mitigation and storage mechanism
  - Oil / gas properties and volumetric factors
  - Fluid phase equilibria of hydrocarbons
  - Reservoir rock properties (porosity, permeability, rel permeability, capillary pressures).
- 2023-            *Science and Technology of Geothermal Fields, 8<sup>th</sup> semester.*
- Types of Geothermal fields
  - Machinery (production pipelines, steam turbines)
  - Geothermometers
  - Properties of geothermal fluids
  - Geothermal exploration, sites of geothermal interest
  - Power and thermal uses / cogeneration.
  - Cost and environmental impact of geothermal exploitation
- 2023-            *Safety and Environment in Hydrocarbons Production and Distribution, 8<sup>th</sup> semester.*
- Safety assessment of major accidents

- MSDS and material hazard identification codes in transportation, handling and storage
  - Fire and blast prevention: safety issues and design practices
  - Firefighting control
  - Environmental assessment of oil/gas projects
  - Sustainability and accountability issues
- 2023- *Oil & Natural Gas Engineering, 9<sup>th</sup> semester.*
- Estimation of reservoir fluids (Volumetric and Material balance methods)
  - Well productivity (VLP and IPR curves and interpretation)
  - Flow assurance of oil/gas and production fluids pipeline
  - Upstream facilities (primary separation, oil/gas/water stream conditioning)
  - Storage facilities
  - Offshore transportation of oil and gas
- 2023- *Advanced Methods of Energy Sources Exploitation, 9<sup>th</sup> semester.*
- Gasification and liquification of coal
  - Underground gasification
  - Briquetting and carbonization (coking) processes
  - Dual power cycle, cogeneration and hybrid systems
  - Energy storage systems: hydroelectric, underground, mechanical.
  - Energy storage systems: hydroelectric, underground, mechanical.

#### **b. School of Mineral Resources Engineering, Technical University of Crete**

- 2016-2022 *Applied Fluid Mechanics, 6<sup>th</sup> semester.*  
(Co-teaching with Assist. Prof. A. Yiotis)
- Basic principles and application
  - Bernoulli and Euler equations
  - Mechanical equipment, pumps, turbines.
  - Fluid Mechanics Problems and Solutions
- 2020-2022 *Reservoir Engineering, 7<sup>th</sup> semester.*  
(Co-teaching of the course with Assist. Prof. A. Yiotis)
- Phase equilibrium, oil PVT empirical equations, cubic equations of state
  - Fluid sampling methods and laboratory studies
  - Types and characteristics of hydrocarbon reservoirs
  - Waxes - asphaltenes - hydrates
- 2020-2022 *Oil and Gas Production Engineering, 8<sup>th</sup> semester.*  
(Co-teaching with Assist. Prof. A. Yiotis)
- Core sampling methods and laboratory studies
  - Reservoir production techniques
  - Flow in porous media

#### **B. Postgraduate Programs**

**a. MSc Program in Modern Exploitation of Marble and Natural Stones**

Department of Mineral Resources Engineering, Faculty of Engineering, University of Western Macedonia

- 2026- *Marble processing and circular economy, 2<sup>nd</sup> semester*
- Marble Quarrying and Processing
  - Sustainability and Circular Economy
  - Valorisation of Quarry Waste and Filler Materials
  - Regulatory Framework for Fillers and Investment Plan for a Marble Waste Processing Unit
  - Engineered Marble and Decorative Stones
  - Utilisation of Marble and Natural Stone Aggregates in Construction Applications
  - Life Cycle Assessment (LCA), Environmental Product Declarations (EPD), and Carbon Footprint of Natural Stones
- 2025- *Techniques for the Exploration and Characterization of Marble and Natural Stone Deposits, 1<sup>st</sup> semester*
- Geological mapping
  - Collection of geological data from the surface, Geophysical methods
  - Seismic reflection and refraction, magnetic and gravitational methods,
  - Sample drilling
  - Collection and analysis of qualitative and quantitative quarry production data

**b. MSc Program in Sustainable Technologies of Energy Resources and Raw Materials**

School of Mineral Resources Engineering, Technical University of Crete

- 2024- *Reservoir Engineering for hydrocarbon production, storage and CCS, 1<sup>st</sup> semester.*
- Reservoir management
  - Resource and production estimation (IPR, VLP)
  - Flow assurance
  - Phase separation in surface facilities
  - CO<sub>2</sub> and hydrogen storage

**c. Joint MSc Program in Management and Transmission of Oil, Natural Gas and Hydrogen**

Department of Mineral Resources Engineering, Faculty of Engineering, University of Western Macedonia

Azerbaijan State Economic University (UNEC)

- 2024- *Storage, transportation and distribution technologies through pipelines and tankers of oil, natural gas and hydrogen, 2<sup>nd</sup> semester.*
- Two lectures on:

- Flow assurance: Basic Principles, flow restriction problems, routine operations
- Storage tanks, Oil/Gas tankers, LNG transfer operations

2024- *Oil, Natural Gas and Hydrogen technologies, 1<sup>st</sup> semester.*

Two lectures on:

- Reservoir Assessment, Geophysical data
- Oil/Gas Ustream Sector

#### **d. MSc Program in Petroleum Engineering**

**School of Mineral Resources Engineering, Technical University of Crete**

2020-2021 *Reservoir Engineering (Oil Production), 1<sup>st</sup> semester.*

*(Co-teaching with Assist. Prof. A. Yiotis)*

2020-2021 *Special Topics in Petroleum Engineering, 2<sup>nd</sup> semester.*

*(Co-teaching with Assoc. Prof. V. Gaganis)*

Forecast of thermodynamic behaviour of mixtures using software (PVT-Design, t-Navigator)

2019-2021 *Data Analysis and Modeling in Petroleum Engineering, 1<sup>st</sup> semester. (Co-teaching with Assoc. Prof. V. Gaganis)*

- Advanced numerical analysis topics
- Using Matlab and Excel to numerically solve phase equilibrium problems

2016-2019 *Reservoir Engineering (Oil Production), 1<sup>st</sup> semester.*

*(Co-teaching with Prof. N. Varotsis)*

- Tutorial exercises problems of Reservoir Engineering (Reservoir Mechanics)

2016-2019 *Special Topics in Petroleum Engineering, 2<sup>nd</sup> semester.*

*(Co-teaching with Prof. N. Varotsis)*

- Tutorial exercises Property Forecast PVT hydrocarbons in reservoir conditions using the WinProp software of the company Computer Modelling Group,

2015-2020 *Production engineering, 2<sup>nd</sup> semester.*

*(Co-teaching with Assoc. Prof. V. Gaganis, Prof. B.Tohidi)*

- Oil, production water and natural gas production facilities
- Flow Assurance

## **II. Laboratory Teaching and Exercises**

### **A. Undergraduate Program**

**School of Mineral Resources Engineering, Technical University of Crete**

2013-2022 *Applied Fluid Mechanics, 6<sup>th</sup> semester.*

- Viscosity measurements and rheogram construction
- Pressure drop measurements of waterflow in an annular pipeline
- Settling velocities of spherical solids a Newtonian fluid

- 2004-2022 *Reservoir Engineering, 7<sup>th</sup> semester.*
- Constant mass study
  - Two-phase flash study
- 2004-2022 *Reservoir Exploitation, 8<sup>th</sup> semester.*
- Helium porosimetry
  - Pore size distribution with mercury porosimetry
  - Permeability of rock cores, Klinkenberg correction coefficient
  - Connate water saturation of rock cores

### **III. Supervisor in Diploma Thesis**

#### **A. Undergraduate Program**

**Department of Mineral Resources Engineering, Faculty of Engineering, University of Western Macedonia**

1. Bakartzaki G., "CO<sub>2</sub> Disposal in Underground Formations, with Emphasis on the Greek Context", 2023–2024.
2. Alexandris A., "Design Parameters for Fluid Transmission Pipelines from Geothermal Reservoirs", 2023–2025.
3. Belenioti M., "Evaluation of Empirical Correlations for the Prediction of Petroleum Fluid Properties", 2023–present.
4. Mavridis A., "Design of a Surface Separator Network for Educational Purposes", 2023–2025.
5. Misopapa M., "Analysis of a Transmission Network for Hydrogen Storage Reservoirs", 2023–present.
6. Lamperi V., "Geothermal Potential in Greece: Exploration and Applications", 2023–2025.
7. Serdaris S., "Separation Technology for Hydrocarbon Reservoir Production Fluids, with Emphasis on Downhole Separation", 2023–present.
8. Koufounakis A., "Underground Reservoirs for Hydrogen Storage and Production: Characteristics, Geographical Distribution, and Prospects", 2023–2024.
9. Konstantinou A., "Procedures and Design of Safety Systems in Hydrogen Production, Transportation, and Storage Facilities", 2023–present.
10. Fragou A., "Production of Synthesis Gas (Syngas) from Lignite Deposits and Processing for Use in Fuel Cells", 2023–2025.
11. Zountsa V., "Design of an Oil Production Well for Educational Purposes", 2024–present.
12. Stogianni I., "Design of a CO<sub>2</sub> Injection Well for Educational Purposes", 2024–present.
13. Petrou M., "Technical and Computational Methods for Assessing the Stability of Oil and Gas Production Wells", 2024–present.
14. Ferai M., "Regulations, Standards, and Safety Practices for Hydrogen Production, Transportation, and Storage", 2024–2025.
15. Noti I., "Hybrid Energy Stations in Western Macedonia: Current Status and Prospects", 2024–present.
16. Georgiadou S., "Regulations, Standards, and Safety Practices for Hydrogen Production, Transportation, and Storage", 2024–present.

17. Tzitzikas N., "Simulation of Hydrogen Production and Storage in an Underground Reservoir", 2025–present.
18. Anestakis D., "Mapping the Characteristics of Energy and Emissions Trading Markets in Greece", 2025–present.
19. Belevlis Ev., "Analysis of Equipment Certification Methods in Oil Refinery Facilities", 2025–present.
20. Pilitzidis M., "Hydrothermal Liquefaction of Olive Mill Sludge for Bio-Crude Production", 2025–2026.
21. Avraam G., "Repurposing Oil and Gas Reservoirs for Underground Hydrogen Storage and CO<sub>2</sub> Injection: Multiphase Flow Simulation and Energy Assessment", 2026–present.
22. Soufleri Ch., "Investigation of the Upgrading of Residual Biomass Pyrolysis Bio-Oil through Catalytic Hydrotreatment", 2026–present.

### **B. MSc course in Petroleum Engineering**

#### **School of Mineral Resources Engineering, Technical University of Crete**

1. El-Khoury J., "Artificial intelligence for downhole tools", 2021.
2. Lianos D., "In line measurements of oil/gas production fluids", 2021.
3. Georgantas K., "LNG Transportation and Storage: Techniques and Standards", 2020.
4. Dimou N., "Gas hydrate formation in oil/gas pipelines: Simulation, prevention and technological challenges", 2020.
5. Krsmanović V., "Gas hydrate reservoirs: Detection, simulation and production technologies", 2020.
6. Xynolopoulos N., "Basic Design of Gas Process Train in Upstream Facilities", 2019.
7. Yusuf S.A., "Basic Design and simulation of gas production pipelines", 2019.
8. Fragou E., "LNG production technologies and process simulation", 2019.
9. Mohsin A., "Basic Design of Oil Process Train in Upstream Facilities", 2018.
10. Siaw Clement G., "Basic Design and Simulation of Oil Production Pipelines", 2018.
11. Argyropoulou Chr., "Heavy and Extra Heavy Oil: Midstream processes and transportation", 2017.
12. Dalamagka D., "Pressure maintenance in oil production pipelines: Equipment and simulation", 2017.
13. Papakostas V., "Oil-in-Water emulsions: Techniques and processes for maximizing the oil recovery in high water cut oil wells", 2017.
14. Savvidou D., "Water-in-Oil emulsion treatment of Crude Oil effluent: Techniques, additives and simulation", 2017.
15. Klothakis A., "Basic Design of Oil Process Train in Upstream Facilities", 2016.

### **Γ. Doctoral Programme**

**Department of Mineral Resources Engineering, Faculty of Engineering, University of Western Macedonia**

1. Mitsiopoulou Olga ""Underground Hydrogen Storage in the Region of Macedonia", Co-supervisors: Assist. Prof. D. Marinakis, Principal Researcher Dr. Bellas Spyridon, 2025-

#### **IV. Participation in examination committees for PhD dissertations**

1. Member of the Seven-Member Examination Committee for the PhD dissertation of Mr. V. Vasileiadis, entitled "Mathematical Approach to Variations in Physicochemical Properties of Mixtures of Petroleum Distillation Products with Alternative Fuels", Doctoral Programme, Department of Chemical Engineering, University of Western Macedonia, Kozani, 2025.
2. Member of the Three-Member Advisory Committee for the doctoral research of Ms. Ch. Tallarou, entitled "Integrated CO<sub>2</sub> Capture Scheme from Biogas Using Gas Hydrates and Conversion into Biomass in a Microalgae Bioreactor", Doctoral Programme, School of Mineral Resources Engineering, Technical University of Crete, Chania, 2025–present.

#### **V. Laboratory supervisor in dissertations**

##### **A. Undergraduate Curriculum**

###### **School of Mineral Resources Engineering, Technical University of Crete**

1. Sdoukou E., "Tuning of a Cubic Equation of State for the Simulation of Hydrocarbon Thermodynamic Behavior under Reservoir Conditions Using Empirical Correlations", 2022.
2. Kiaitsis Tr., "Modelling Compositional Variation with Depth in Undersaturated Hydrocarbon Reservoir Fluids: Application to a Mediterranean Oil Reservoir", 2022.
3. Antoniadis G., "Lumping and Characterization Methods for the Heavy Fraction of Hydrocarbon Mixtures for Improved Simulation of Fluid Thermodynamic Behavior under Reservoir Conditions", 2021.
4. Atsaros F., "Experimental Density Measurements of Hydrocarbon Mixtures under High-Pressure and High-Temperature Conditions and Assessment of the Accuracy of Volume-Translation Methods for Their Prediction Using Cubic Equations of State", 2021.
5. Tallarou Ch., "Experimental Investigation of the Effect of Rock Wettability on Water–Oil Relative Permeability Curves in Hydrocarbon Reservoir Core Samples", 2021. This work was awarded second place in the Bachelor's Division of the 2021 SPE Europe Regional Paper Contest, organized by the Society of Petroleum Engineers (SPE) [https://www.tuc.gr/index.php?id=2786&tx\\_news\\_pi1%5Bnews%5D=21374&tx\\_news\\_pi1%5Bcontroller%5D=News&tx\\_news\\_pi1%5Baction%5D=detail&cHash=f5a9fe88c2db62e853f063f16f15e7dd](https://www.tuc.gr/index.php?id=2786&tx_news_pi1%5Bnews%5D=21374&tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Baction%5D=detail&cHash=f5a9fe88c2db62e853f063f16f15e7dd)
6. Nikolaou G., "Development of a Laboratory Methodology and Performance of Water–Oil Relative Permeability Measurements on Reservoir Rock Samples", 2021.
7. Psarras D., "Sensitivity Analysis and Quality Control of Laboratory Measurements in Differential Liberation Studies of Petroleum Reservoir Fluids", 2021.

8. Vryoni G., "Experimental Study of Cuttings Transport and Deposition in Horizontal Wells", 2020.
9. Proestakis E., "Effect of Salinity on the Solubility of Hydrate-Forming Gases in Water-Hydrocarbon Liquid Mixtures", 2017.
10. Aslanidis P., "Experimental Determination of Density Variation and Swelling of Hydrocarbon Mixtures with CO<sub>2</sub> Addition under High-Pressure and High-Temperature Conditions", 2016.
11. Michailidi M., "Experimental Determination of Phase Densities and Isothermal Compressibility Coefficients of Hydrocarbon Mixtures with Carbon Dioxide under High-Pressure and High-Temperature Conditions", 2015.
12. Zervopoulou St., "Experimental Determination of the Gas Deviation Factor (z-factor) of Hydrocarbon Mixtures with Methane", 2013.
13. Mahmoud R., "Experimental Determination of the Compressibility Factor (z-factor) of Hydrocarbon Gas Mixtures with High CO<sub>2</sub> and N<sub>2</sub> Content", 2009.

***B. Postgraduate Program "Geotechnology and Environment"***

**School of Mineral Resources Engineering, Technical University of Crete**

14. Vallianou-Setta D., "Treatment of Produced Water from Oil Wells: Processes and Technologies", 2018.
15. Mahmoud R., "Development of an Experimental Apparatus for Measuring the Gas Deviation Factor of Petroleum Fluids under High-Pressure and High-Temperature Conditions and Comparison with Equation-of-State Computational Models", 2013.

***Γ. MSc in Oil & Gas Technology***

**School of Technological Applications, former ATEI of Eastern Macedonia and Thrace**

16. Bekiary G., "Solubility of hydrate forming hydrocarbon gases in aqueous mixtures at marine sediments conditions", 2016.

## **VI. Participation in the preparation of laboratory dissertations**

### **A. Undergraduate Programs**

#### **School of Mineral Resources Engineering, Technical University of Crete**

1. Vlachos G., "Rheological properties of betonite and palygorskite slurries after maturation at high temperatures", 2020.
2. Athanasakis N., "Rheological properties of magnesium bentonites and sepiolite slurries under high temperature conditions", 2019.
3. Ntalakou T., " Development of laboratory methodologies for the creation and characterization of petroleum emulsions ", 2017.
4. Lytra S., " Rheological properties of betonite slurries after maturation at high temperatures", 2016.

## **VII. Participation in Guest Lectures**

1. Presentation on "Health and Safety in Labs" at a joint event of the Department of Chemical Engineering of the University of Western Macedonia with the Texas A&M Energy Institute, Apr. 2025.
2. Presentation on "Working with high-pressure equipment in the field of oil and gas" at a lecture of the Postgraduate Program "*Energy Investments and Environment*" of the Department of Chemical Engineering of the University of Western Macedonia, May 2025.
3. Presentation on "Aspects of energy transition: Lessons learned from the case of Western Macedonia" at the *2<sup>nd</sup> Summer School on Energy Transition and Geothermal Energy*, Institute of Geoenergy of the Foundation for Research and Technology-Hellas, Chania, July 2025.

## **VIII. Administration for Educational Visits**

1. Educational visit of the Department of Mineral Resources Engineering to the oil extraction facilities of Energean in Kavala, Oct. 2024.
2. Educational visit of the Department of Mineral Resources Engineering to the facilities of the HELLENiQ ENERGY Oil Refinery in Thessaloniki, June 2025.

## H. Reviewer in international journals

1. Journal of Natural Gas Science & Engineering
2. Energy and Fuels
3. Applied Sciences
4. RSC Advances
5. SPE Journal

## I. Research performance

Google Scholar link: <https://scholar.google.com/citations?user=Jd2X6iIAAAJ&hl=en>

Citations: 160, (Jun. 2026)  
h-index: 7, (Jun. 2026)  
i-index: 7, (Jun. 2026)

Scopus link: <https://www.scopus.com/authid/detail.uri?authorId=57194539429>

No of Documents: 13, (Jun. 2026)  
Total citations: 105, (Jun. 2026)  
h-index: 6, (Jun. 2026)

ORCID link: <https://orcid.org/0000-0003-1467-2601>

ORCID ID: 0000-0003-1467-2601  
No of Documents: 9, (Jun. 2026)

Web of Science link: <https://www.webofscience.com/wos/author/record/MZS-0164-2025>

Web of Science ResearcherID: MZS-0164-2025  
No of Documents: 9, (Jun. 2026)  
Total citations: 81, (Jun. 2026)  
h-index: 5, (Jun. 2026)

## I. Foreign Languages

English: C2  
German: C1

## **IA. Administrative work**

### **I. Participation in committees**

1. Member of the Evaluation Committee for Adjunct Teaching Staff, Department of Mineral Resources Engineering, 2023–present.
2. Member of the Committee for the Student Admission Examinations, Department of Mineral Resources Engineering, 2024–present.
3. Member of the Internal Audit Group, Department of Mineral Resources Engineering, 2023–present.
4. Member of the Evaluation Committee for the Undergraduate Scholarships, Department of Mineral Resources Engineering, 2023–present.
5. Alternate Member of the Evaluation Committee for the Practical Training Program, Department of Mineral Resources Engineering, 2023–present.
6. Member of the Coordinating Committee of the MSc Programme in Marble and Natural Stones, Department of Mineral Resources Engineering, 2025.
7. Member of the Equipment Acceptance Committee within the framework of the “Universities of Excellence” project, Special Account for Research Funds, University of Western Macedonia, 2024–present.

### **II. Project Manager**

1. Support for the research, educational, developmental, and operational needs of the Department of Mineral Resources Engineering, from April 2023 onwards, with a total budget of €28,000 (last updated: June 2025).