



المعهد البترولي

THE PETROLEUM INSTITUTE

جامعة و مركز ابحاث University and Research Center

## GRADUATE STUDENT HANDBOOK - SPRING 2012



Your guide to studying and living with The Graduate School







# GRADUATE STUDENT HANDBOOK

**SPRING - 2012**

**THE PETROLEUM INSTITUTE, ABU DHABI, UAE**



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# Message from Acting President and Provost

## Ahlan Wasahlan!



Greetings from the Petroleum Institute – a diverse, stimulating and inviting community committed to your success.

The PI was launched in 2001 with the mission to provide world class university education in engineering and applied sciences, operate as a leading international research center that fosters the creation of knowledge for the benefit of the regional oil and gas industry, and provide continuing education opportunities to professionals. The PI is financially supported and governed by the Abu Dhabi National Oil Company (ADNOC) and its international partners (British Petroleum, Shell, Total and Japan Oil Development Company). At the same time, we collaborate with leading research

universities in US, Europe and Asia in graduate education and research.

Our faculty is very diverse in terms of their national background creating a truly international environment. Most of them have substantial industrial and academic expertise from leading corporations and universities. In addition, we have the opportunity to host visiting faculty for a short or longer period of time for the benefit of our students, researchers and faculty.

PI faculty and students are in a unique position to work on real life exciting engineering research projects hand-in-hand with colleagues from our industrial partners. This environment gives the opportunity to our students to be fully equipped with knowledge and experience for their future professional careers.

I encourage you to explore carefully the full range of our academic opportunities where you will find inspiration and support to fulfill your educational and career goals. I also invite you to visit our campus in person to experience all that PI has to offer.

I look forward to meeting you at PI.

A handwritten signature in blue ink, appearing to read 'Ismail A. Tag', written over a light blue horizontal line.

**Dr. Ismail A. Tag**

*Acting President and Provost*

STUDENT  CENTER



# Message from the Associate Provost for Graduate Studies

## Marhaba!



I am pleased to introduce this year's Graduate School student handbook, and to encourage your interest in the Graduate School. I hope you will read the following pages, which provide you with information concerning the programs of study, the values it promotes in its students, and the culture of professional development and learning at the institution.

When you pursue the path of higher education in Engineering, it is the most important investment of your time, your energy, and your resources. At Graduate School we will assist you in setting and fulfilling all your goals, whether educational or professional, by giving you the highest quality of learning possible. We will help to promote the fullest development of all our students through support in the intellectual, social, and emotional aspects of your academic career.

PI is a remarkable place to study as it possesses the ability and commitment to prepare leaders for industry, academia, government or services world wide. The Student Handbook is an indispensable tool, offering a wide range of information on academic programs, and the services available to you.

I would like to wish you a successful, fruitful, and pleasurable time learning and growing with us as a member of the Graduate School, and I trust that your academic experience at the Graduate School will be fulfilling.

A handwritten signature in blue ink, appearing to read 'Ioannis G. Economou', with a long horizontal stroke extending to the right.

**Dr. Ioannis G. Economou**

*Associate Provost for Graduate Studies  
and Professor of Chemical Engineering*

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# The Graduate School

The Petroleum Institute (PI) was created in 2001 with the goal of establishing itself as a world-class institution in engineering education and research in areas of significance to the oil and gas and the broader energy industries. The PI's sponsors and partners include Abu Dhabi National Oil Company (ADNOC) and four major international oil companies, such as BP, JODCO, Shell, and Total.

The Graduate School was established in 2011 with the mission to manage and direct Graduate Studies at PI in order to provide quality services that contribute to the achievement of PI's strategic objectives.

The Graduate School is responsible for the day-to-day management of the PI graduate programs, development of new graduate programs, coordination of the recruitment of new graduate students, collaboration with ADNOC and its operating companies to ensure that the graduate programs are in-line with their needs for highly skilled engineers, and enhancement of the collaboration of the Institute with partner universities in the USA, Europe and China.

The Graduate School advises and supports PI undergraduate students regarding their plans for graduate studies at PI and abroad while it coordinates recruiting of the graduating Master students by ADNOC and its operating companies.

## Master of Engineering degrees are offered in the following areas:

- Chemical Engineering
- Electrical Engineering
- Health, Safety & Environment Engineering
- Mechanical Engineering
- Petroleum Engineering

## Master of Science degrees are offered in the following areas:

- Applied Chemistry
- Chemical Engineering
- Electrical Engineering
- Mechanical Engineering
- Petroleum Engineering
- Petroleum Geosciences

# Institutional Mission and Goals

The Petroleum Institute will provide a world-class education in engineering and applied sciences in order to support and advance the petroleum and energy industries. The Institute is committed to academic excellence, and to fostering an intellectual environment that leads to the development of our graduates as whole persons and as the future leaders in their respective fields of expertise in the United Arab Emirates and beyond.

## To achieve its mission The Petroleum Institute:

1. offers programs of instruction leading to baccalaureate degrees to produce graduates that have the skills, knowledge, and competencies that meet the needs of ADNOC and its other sponsors;
2. practices and infuses in its students the highest standards of health, safety, and environmental awareness;
3. manages the content, quality, design and continuous innovation of its academic programs in a manner that creates and sustains a reputation for institutional excellence and earns local, regional and international accreditation;
4. provides programs of study leading to relevant post-graduate degrees and foster the creation and dissemination of knowledge that is pertinent to the needs of industry and enriches the academic programs of the PI;
5. provides professional outreach and continuing education programs that serve the on-going needs of practicing professionals;
6. operates as a center of excellence for education, research, and professional service that interconnects globally with regional and international industrial constituents, and with international partners in education and professional societies;
7. fosters technological innovation and entrepreneurship leading to development of advanced processes and products that provides for economic expansion and promotes business development opportunities.



*I like the teachers and the staff. They make you feel comfortable and you can easily approach them to share new ideas.*

Salem Nasser Ahmed Saleh AL Hammami  
Petroleum Geosciences

# Profile of the PI Graduate

Recognizing that the most immediate and dominant product of The Petroleum Institute will be the graduates, the institutional educational goals are captured in the following attributes that reflect “the whole person development” of the graduating student:

- The graduating student will exhibit applied and theoretical competence in a field of technical specialization, and will be oriented in engineering practices germane to the oil, gas and petrochemical industries. The student will have the resourcefulness and capability to apply scientific and engineering principles in solving a wide variety of technical problems.
- The graduating student will appreciate the critical role played by verbal, written and graphical communications in engineering practice and project management, and will have the corresponding skills to communicate with a range of audiences, and the skills to employ information technologies where appropriate.
- The graduating student should acknowledge that technologies, economies and societies are in a continuous state of evolution, and should therefore have the flexibility to manage a career path that changes over time, and that is supported by life-long learning, critical thinking, teamwork, leadership and the ability to span several disciplines.
- The graduating student should understand the global nature of modern engineering and business. In order to succeed in this international arena, the student should have an awareness of customary practices in different countries and the influence of diverse cultures.
- The graduating student should have the professional integrity and maturity to serve humanity and its highest values, and should always make ethical decisions as they relate to society, corporate operations, technology, and the environment.



*It has been a refreshingly learning experience. It has impressive facilities and a beautiful environment.*

Sara Mohammed Rashed Saeed Nasser Al Dhaheri  
Chemical Engineering

# Graduate Programs

## Types of Programs

**Master of Engineering (M.Eng.):** The Master of Engineering programs at PI are directed toward engineers that would like to pursue advanced studies and intend to have a professional career in industry. Graduate courses emphasize applications of fundamental engineering concepts to industrial problems. The M.Eng. programs consist of graduate core and elective courses and research work to be used for the student's Master of Engineering project report. Advanced technical as well as business management elements are taught. PI offers M.Eng. programs in:

- Chemical Engineering
- Electrical Engineering
- Health, Safety and Environment Engineering
- Mechanical Engineering
- Petroleum Engineering

**Master of Science (M.Sc.):** The Master of Science programs at PI emphasize fundamental concepts and are designed for students that want later in their career to be involved in research, either through a PhD degree or in a corporate environment. The M.Sc. programs consist of graduate core and elective courses and research work to be used for the student's Master Thesis. PI offers M.Sc. programs in:

- Applied Chemistry
- Chemical Engineering
- Electrical Engineering
- Mechanical Engineering
- Petroleum Engineering
- Petroleum Geosciences



*It is a melting pot of creative minds. It makes this world a smaller place by bringing creative minds from many countries.*

Ahmed Faissal El Ali  
Mechanical Engineering

# Applied Chemistry

## Mission

To provide a high quality education in applied chemistry, and to produce research chemists with an engineering background who are capable of fulfilling some of the key research and technical needs of the petroleum industry. The program is specifically tailored for the petroleum industry and will help graduates to prepare for successful careers, and meet the needs and expectations of PI sponsors from the oil and gas, and broader energy sectors.

## Exciting Research in Applied Chemistry

- Polymers and Nanomaterials Chemistry
- Petroleum Production & Process Chemistry
- Industrial Catalysis
- Fuels and Alternative Energy Sources
- Corrosion Science & Physical Chemistry
- Environmental Science & Water Technology
- Computational Chemistry
- Organometallics / Applied Inorganic Chemistry
- Modern Instrumentation and Applied Organic Chemistry
- Spectrochemical Studies

## Graduate Program

- Master of Science (33 credits)

# Chemical Engineering

## Mission

To provide a world-class education in chemical engineering science and practice, and to produce graduates and future leaders who are capable of meeting or exceeding the needs and expectations of PI sponsors from oil and gas, and broader energy industry. In addition, graduates will engage in life-long learning that will enable them to keep abreast of and effectively contribute to their advancement in the profession.

## Exciting Research in Chemical Engineering

- Heterogeneous catalysis and reaction engineering
- Process simulation and optimization
- Gas processing and treatment
- Alternative energy resources
- Asphaltene studies and modeling
- Desalination of sea water through gas hydrates
- Ionic liquids and applications
- Thermodynamics and phase equilibria
- Nanotechnology and its applications
- Oil spill cleanup and recovery
- Wastewater treatment
- Polymer science
- Polymer composites: synthesis and characterization and applications
- Rheology of polyolens-graphene composites

## Graduate Program

- Master of Science (33 credits)
- Master of Engineering (33 credits)

# Electrical Engineering

## Mission

To provide a world-class education in electrical engineering with emphasis on power and control systems engineering that prepares graduates for successful professional careers in ADNOC, other sponsors, and the broader energy industry, and a life time of learning that will enable them to continue their education throughout their career.

## Exciting Research in Electrical Engineering

- Real Time Digital Simulation
- Stability Improvement with Grid connected Solar Form/Hybrid System
- Different MPPT Techniques for Photovoltaic System and Designing Improved MPPT Techniques Considering Cost and Efficiency
- Control Strategy for Hybrid Power System – Perspective Isolated Networks and Remote areas
- Enhanced Oil Recovery Using Electrical Methods
- Smart Grid Applications

## Graduate Program

- Master of Science (33 credits)
- Master of Engineering (36 credits)