



# 2017



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# 1. ABOUT MSRC

Mining Studies & Research Center (MSRC), Faculty of Engineering, Cairo University, is a national consultancy house that provides consultations, material testing & engineering studies for companies and corporations working in the fields of Petroleum and Petrochemical Engineering, Mining Engineering, Mineral Processing, Natural Gas Engineering and Metallurgical Engineering. Mining Studies and Research Center (MSRC) was founded in 2002. The main objective of this research center is to become a national consultancy office geared up to perform specified engineering studies. For the past 10 years, MSRC has delivered several projects, consultation studies and continuing education programs in the fields of Mining and Petroleum Engineering.

MSRC's mission is to provide practical mining, metallurgical, petroleum and chemical engineering services and utilize state-of-the art technologies to deliver innovative solutions for the oil, gas and petrochemicals industries. Our target is to present focused engineering solutions which take into consideration the economic, environmental, and technological circumstances.

MSRC runs a postgraduate program in the area of petroleum and natural gas engineering. The petroleum and natural gas engineering diploma, professional diploma and M. Sc. programs aim to teach and train engineers from other disciplines to work in the field of oil and gas production, separation, measurements and instrumentation, sweetening, transportation and storage, liquefaction, processing & petrochemicals. The graduate engineers would be able to fulfil the needs of the gas industry in Egypt as well as worldwide.

MSRC has full access to all experts from the staff of Faculty of Engineering and other Cairo University Faculties and Laboratories in almost all fields of specialties. Those can be easily and directly contacted by MSRC for their cooperation with research teams working on their assigned projects. This profile presents the capabilities and experiences of the research teams and groups of MSRC.





# 2. MSRC BUSINESS POTENTIAL

We offer engineering services and technical consultations in the following fields:

- Exploration, development, exploitation and evaluation of mineral resources, and oil & gas reserves.
- Geological, mineralogical and petro-graphical studies of mineral deposits, ornamental stones and building materials.
- Field & laboratory testing to determine physical, chemical and mechanical properties of rocks that lead to structural and mining applications.
- Feasibility studies for mining, petroleum and metallurgical projects.
- Laboratory and pilot testing for processing of minerals and flow sheet design.
- Design of open cast, underground mines and quarries.
- Investigation and testing of oil and gas samples, PVT analysis, and reservoir rocks.
- Drilling, production, reservoir, EOR, and reservoir simulation.
- Metal extraction, heat treatment, corrosion and metal protection, alloys & new materials, inspection and testing of metals & alloys.
- Underground water prospecting and production engineering.
- Environmental Impact Assessment (EIA) for mining, petroleum and chemical industries.
- Specialized and tailored training and continuing education programs in all the above fields.





# 3. MSRC RESEARCH AND ACADEMIC POTENTIAL

The main objective of MSRC is to provide up-to-date, knowledge-based and learner-focused education at two levels of graduate education and in continuing education courses, as well. Our strategic target is to develop the professional potential of the Egyptian oil and gas sector engineers. The academic programs offered by MSRC encourage the participating candidates to enhance their work experience, regularly engage in self-improvement and actively participate in research and development studies. Our research and academic activities focus on two main areas: research and graduate studies; and continuing education and capacity building, as described here-in-after.

## **3.1. RESEARCH AND GRADUATE STUDIES ACTIVITIES**

One of the most vital channels of cooperation between MSRC and the Egyptian petroleum sector is the post graduate studies interdisciplinary program "Petroleum and Natural Gas Engineering and Technology", which is deliberately offered to engineers working in the oil and gas sector. This program is mainly composed of three elements, the Academic Interdisciplinary Diploma in Petroleum and NG Engineering, the Professional Interdisciplinary Diploma in Petroleum and NG Industry and the applied M. Sc. in petroleum and NG Technology.

The Petroleum and Natural Gas Engineering Diploma aims to teach and train engineers from a variety of disciplines to work in the fields of oil and gas production, separation, instrumentation, sweetening, transportation, storage and processing; in addition to the field of petrochemical and environmental engineering. The Professional Interdisciplinary Diploma aims to provide the Egyptian labour market in the field of oil and gas industry with nonengineering labour fully aware of the basic elements of the industry. The M. Sc. in Petroleum and Natural Gas Technology is primarily concerned with applied research and focuses on developing practical solutions to the problems facing the companies operating in Petroleum and NG industry through its various stages.

# 3.1.1. PETROLEUM AND NATURAL GAS ENGINEERING INTERDISCIPLINARY DIPLOMA

Oil and gas sectors employ engineers from different disciplines to work in the field of oil and gas industry (production, processing, manufacturing and petrochemicals). Some of these engineers do not exhibit the required basic knowledge about petroleum and natural gas





production and processing. Therefore, a postgraduate program to qualify engineers from different disciplines to be familiar with petroleum and NG engineering and technology is of great importance to the Egyptian labour market.

The Faculty of Engineering at Cairo University established the Petroleum and Natural Gas Engineering Diploma (PNGED) in 2004 in an attempt to supply the Egyptian oil and gas labour market with engineers familiar with the main stages of oil and gas industry. The target of PNGED is to harmonize the basic knowledge among graduates from various disciplines and thus prepare graduates to initiate career in any field related to petroleum and natural gas industry. The engineers graduating from this program would be able to satisfy the needs of the petroleum and gas industry in Egypt as well as worldwide.

This diploma is designed to host graduates with B. Sc. degree in Petroleum, Chemical, Mechanical or Electrical Engineering disciplines. The program builds upon the foundation of capabilities developed in the undergraduate engineering study, and it focuses on the fundamental knowledge and skills associated with the field of petroleum and NG Engineering.

# 3.1.2. PROFESSIONAL INTERDISCIPLINARY DIPLOMA IN PETROLEUM AND NATURAL GAS TECHNOLOGY

The program is directly comparable to the postgraduate diploma offered by the Faculty of Engineering at Cairo University. It is open to candidates who already have B.Sc. in Science. As such, it is particularly suited to non-engineers working in the field of Petroleum and Natural Gas Industry and aim to become familiar with the engineering practice related to their profession.

The program aims to provide a study opportunity which enables the candidates to acquire basic knowledge and understanding of the fundamentals relevant to the profession of Petroleum and NG Industry. Students will develop the appropriate intellectual skills required to plan, design, analyse, execute and manage industrial petroleum and NG projects.

The minimum entrance qualification is a B.Sc. in Science (such: as geosciences, physics, chemistry or geology) from any Egyptian university or its equivalent from any academic institution approved by the Egyptian Supreme Council of Universities.





# 3.1.3. INTERDISCIPLINARY MASTER OF SCIENCE IN PETROLEUM AND NATURAL GAS TECHNOLOGY

M. Sc. in Petroleum and Natural Gas Technology is a multi-disciplinary Master of Science program implemented under the supervision of MSRC. A steering committee is formed for running the master with the membership of the Faculty Vice dean for post graduate affairs, the Director of the Mining Studies and Research Center, representatives of the concerned Faculty departments and representatives of the Petroleum and Natural Gas sector and relevant holding and associated companies and affiliates.

Considering the permanent and continuing approach of the companies operating in the field of Petroleum and NG industry to develop and keep up with the latest and most recent technologies, the Master in "Petroleum and Natural Gas Technology" resembles an ideal model opening a permanent channel between the scientific research and the industrial sector through an apparent win-win deal. The Master of Science in "Petroleum and Natural Gas Technology" is primarily concerned in applied research, which focuses on developing practical solutions to the problems facing the companies operating in Petroleum and NG industry through its various stages. Consequently, this master achieves sound benefits to all elements of the scientific research process: the student or researcher, the supervisor, the institution or college and finally the industrial firm or company.

### **3.2. CONTINUING EDUCATION AND CAPACITY BUILDING**

Working under the umbrella of Cairo University, we believe that community capacity building is our duty. We offer customized, on job training, continuing education courses in all engineering disciplines pertinent to the oil and gas sector. We provide the oil and gas workforce with the necessary knowledge and essential skills they need for career development. Soft skills courses are a main integral part of our capacity building continuing education courses. Our courses integrate a well-structured study plan, tailored course material, up-to-date implementation and evaluation techniques, together with professional specialists thus creating an enhanced learning experience.





# 4. MSRC CONSULTATION GROUPS

MSRC has full access to all experts from the staff of Faculty of Engineering and other Cairo University Faculties and Laboratories in almost all fields of specialty. Our consultation groups perform specialized technical studies and provide consultation services to the petroleum and petrochemical companies in all engineering disciplines, as listed below.

# 4.1. PETROLEUM AND PETROCHEMICAL ENGINEERING GROUP

- Development and evaluation of oil and gas reserves.
- Drilling, production and reservoir studies
- Enhanced Oil Recovery studies
- Reservoir simulation studies
- Process Integration and Optimization studies for refineries and petrochemical plants

## 4.2. CHEMICAL AND ENVIRONMENTAL ENGINEERING GROUP

- Surface facilities revamp studies
- Surface facilities operation problems studies and solutions
- Process Integration and Optimization
- Feasibility studies for different chemical engineering companies
- Produced water treatment
- Environmental Impact Assessment for engineering projects
- Evaluation of environmental impact assessment studies
- Solutions and plans for an environmentally friendly workplace

# 4.3. MATERIALS ENGINEERING GROUP

- Developing plans and specialized studies for efficiency enhancement of industrial operations
- Formulating plans and protective maintenance systems for different equipment and industrial machines
- Providing studies in materials evaluation, Failure analysis, and the reasonable solutions for sudden malfunctions in machinery and equipment
- Conducting specialized studies for corrosion problems
- Preparing and revising the technical specifications folder and participating in all specialized tender panels





## 4.4. MINING ENGINEERING GROUP

- Evaluation of mineral resources reserves
- Geological, mineralogical and petro-graphical studies

## 4.5. ELECTRICAL ENGINEERING GROUP

- Designing and implementation of automatic operation and control panels for different machinery and operation units in all petroleum and mining fields
- Development of specialized software for the purposes of design and operations facilitation
- Setting protective maintenance plans against electrical malfunctions
- Implanting and evaluating all automatic operational and control panels
- Fixing and rehabilitation of all electronic control cards

## 4.6. MECHANICAL ENGINEERING GROUP

- Planning for the protective maintenance of all mechanical equipment and operational lines
- Designing and supervising the rehabilitation operations of all mechanical equipment.
- Introducing the necessary plans to provide the energy needs and improve the operational quality of different industrial units
- Providing studies to determine the optimum energy utilization scenarios
- Providing alternative energy resources studies

# 4.7. IRRIGATION AND HYDRAULICS GROUP

- Underground water studies
- Flood risk assessment studies

### 4.8. CIVIL ENGINEERING GROUP

- Technical Studies: Feasibility Studies Traffic Studies Project Evaluations -Environmental Studies - Cost Control and Value Engineering Studies
- Structural Analysis and Design
- Design process management for other trades
- Electromechanical studies and designs
- Infrastructure networks studies and design
- Roads Networks Designs and Traffic studies
- Preparing of tender documents
- Tender analysis and contracting
- Construction management and supervision
- Commissioning and handing over.





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# 5. MSRC CONSULTANTS

## 5.1. PETROLEUM AND PETROCHEMICAL ENGINEERING GROUP

- Dr. Helmy Sayyouh Professor of Petroleum Eng. Cairo University
- Dr. Sayed El-Tayeb Professor of Petroleum Eng. Cairo University
- Dr. Khaled Ahmed Abdel Fattah Professor of Petroleum Eng. Cairo University
- Dr. Ahmed El-Banbi Professor of Petroleum Eng. Cairo University
- Dr. Mohamed Samir Senior Reservoir Engineer MSRC Consultant
- Eng. Mohamed El-Tayeb Teaching assistant of Petroleum Eng. Cairo University
- Eng. Omar El-Khatib Teaching assistant of Petroleum Eng. Cairo University
- Eng. Aktham Teaching assistant of Petroleum Eng. Cairo University

# 5.2.CHEMICAL AND ENVIRONMENTAL ENGINEERING GROUP

- Dr. Sahar Mohamed El-Marsafy Professor of Chemical Eng. Cairo University
- Dr. Samia Sobhy Mohamed Professor of Chemical Eng. Cairo University
- Dr. Nabil Mahmoud Abdel Moniem Professor of Chemical Eng. Cairo University
- Dr. Hanem Abdel Rahman Sibak Professor of Chemical Eng. Cairo University
- Dr. Tamer Samir Associate Professor of Chemical Eng. Cairo University
- Eng. Azza Nour El-Deen Former General Manager Process and Operation Department – ENPPI – MSRC Consultant
- Eng. Hala Ibrahim Former General Manager Process and Operation Department Cairo Oil Refining Company (CORC) – MSRC Consultant
- Dr. Shereen Kamel Associate Professor of Chemical Eng. National Research Center – MSRC Consultant
- Eng. Mohamed Ibrahim Mennesy Teaching assistant of Chemical Eng. Cairo University

# **5.3. MATERIALS ENGINEERING GROUP**

- Dr. Abdel Razik Abdel Halim Professor of Metallurgical Eng. Cairo University
- Dr. Ahmed El-Shiekh Professor of Metallurgical Eng. Cairo University
- Dr. Hafez Abdel Azeem Professor of Metallurgical Eng. Cairo University
- Dr. Walid Mehrez Associate Professor of Metallurgical Eng. Nuclear Materials Authority
- Dr. Hussien Mohamed Associate Professor of Metallurgical Eng. Azhar University
- Dr. Wael Fathy Hozayfa Associate Professor of Metallurgical Eng. Azhar University





# 5.4. MINING ENGINEERING GROUP

- Dr. Mohamed El-Wageeh Professor of Mining Eng. Cairo University
- Dr. Ahmed El Kammar Professor of Petroleum Geology Cairo University

# 5.5. ELECTRICAL ENGINEERING GROUP

- Dr. Ahmed Alaa El-Kousy Professor of Electrical Eng. Cairo University
- Dr. Adel Diaa Shaltout Professor of Electrical Power Eng. Cairo University
- Dr. Ahmed Kamel Professor of Electrical Control Eng. Cairo University
- Dr. Hanafi Hassan Professor of Electrical Power Eng. Cairo University
- Dr. Essam Abuel Dahab Professor of Electrical Power Eng. Cairo University
- Dr. Waheed Ghareeb Professor of Computer Science Eng. Ain Shams University

# 5.6. MECHANICAL ENGINEERING GROUP

- Eng. Sherif Haddara Former Minister of Petroleum and Mineral Resources Egypt MSRC Consultant
- Dr. Hindawy Salem Mohamed Professor of Mechanical Eng. Cairo University
- Dr. Adel Khalil Professor of Mechanical Eng. Cairo University
- Eng. Hassan Abdel Monem Project Manager Former Worley Parson's, Egypt
- Eng. Fathy Morgan Project Manager Former Worley Parson's, Egypt
- Staff of Mechanical Engineering Department Alexanderia University

# 5.7. IRRIGATION AND HYDRAULICS GROUP

- Dr. Ahmed Wagdi Professor of Irrigation and Hydraulics Eng. Cairo University
- Dr. Kamal El-Deen Milad Soliman Professor of Irrigation and Hydraulics Eng. Cairo University
- Dr. Mohamed Sherif El-Manadily Professor of Irrigation and Hydraulics Eng. Cairo University

### **5.8. CIVIL ENGINEERING GROUP**

- Dr. Mohamed Taha Professor of Civil Eng. Cairo University
- Dr. Adel El-Shazly Professor of Surveying Eng. Cairo University
- Dr. Mohamed El-Sayed Associate Professor of Civil Eng. Cairo University
- Dr. Abdel Dayem Sadek Ph. D. Holder of Civil Eng.– Senior Civil Engineer Concrete and Steel Structures
- Eng. Ahmed Hussien Senior Civil Engineer Concrete and Steel Structures
- Eng. Marwa El-Sheikh Senior Civil Engineer Public Works





# 6. MSRC CLIENTS

- Egyptian Petroleum Corporation (EGPC) •
- Sahara Oil & Gas •
- Al-Suez Oil Company (SUCO) •
- AL AMAL Petroleum Company (AMAPETCO) •
- Egyptian Environmental Affairs Agency (EEAA) •
- Petro-Shahd Petroleum Company
- General Petroleum Company (GPC) ٠
- West Bakr Petroleum Company •
- Petro Dara Petroleum Company •
- Town Gas Egypt ٠
- El-Wastani Petroleum Company •
- North Bahariya Petroleum Company (NORPETCO) •
- Al-Ofok Trading & Contracting Company .
- Belayim Petroleum Company (PETROBEL) •
- **GESCO** for Petroleum Services
- The Tourism Development Authority (TDA) •
- El-Waha Petroleum Company
- El-Raghy International for Agriculture investment
- Tunisian Petroleum Authority (Etap) •
- Eastern Company Egypt •
- **Orascom Construction Industries** •
- Egyptian Constructing Company •
- Al-Nasr Constructing Company
- Arab Contractors Company •
- Cairo Electricity Production Company
- Land Research Institute •
- Bamaj Company •
- Semaf Railway Factory, Egypt





# 7. MSRC PREVIOUS WORK

# 7.1. MATERIALS ENGINEERING PROJECTS

Project Name	Company	Date
Fabrication of machinery spare parts	Eastern Company Egypt	On-going project from 2014 till present
Performing tests on drilling tubes	GESCO for Petroleum Services	November 2015 March 2015 February 2014
Analytical study to determine the reasons of a tank collapse	ODE Company	October 2013
Analytical study to determine the reasons of a pipe sample collapse	GESCO for Petroleum Services	August 2013
Analytical study to determine the reasons of samples collapse	North Bahariya Petroleum Company (NORPETCO)	July 2013 June 2011
Analytical study to determine the reasons for pipe collapse inside oil wells	Al-Suez Oil Company (SUCO)	February 2012 June 2011 January 2010
Analytical study to determine the reasons of pipes collapse inside wells	PetroShahd Petroleum Company	January 2012 December 2011
Performing tests to measure the thickness of a wall and the pressure inside a $CO_2$ cylinder	Al-Ofok Trading & Contracting Company	February 2011
Failure analysis tests	Anriga Steel Industries Company	October 2010 February 2010
Failure analysis tests	Engineer Mahmoud Allam	October 2010
Tests and analyses	Orascom Construction Industries	June 2010
Tests and Analyses	Egyptian Constructing Company	May 2010
Failure Analysis Study	Belayim Petroleum Company (PETROBEL)	March 2010
Failure Analysis of a turbine rotation columns	Al-Suez Oil Company	March 2010 February 2010
Tests and Analyses	Al-Nasr Constructing Company	March 2010 February 2010





Tests and Analyses	Arab Contractors Company	January 2010
Technical study about the collapse of a part of a wall	Taoboscop Company	December 2009
Tests and Analyses	Cairo Electricity Production Company	November 2009
Marioteya Bridge Tests	Semaf Company	October 2009
Failure Analysis Check and Report	Quality Control Office	September 2009

## 7.2. ENVIRONMENTAL ENGINEERING PROJECTS

Project Name	Company	Date
Solid wastes management plan and design of the waste collection area in Ras El-Dip Oil Field	Al Amal Petroleum Company	October 2016
Technical study about safety of UPVC water pipes	Egyptian Drinking Water Company	April 2015
Evaluation of Environmental Impact Assessment study for different industrial enterprises	EEAA	7 studies in 2013 5 studies in 2012 7 studies in 2011
Environmental Impact Assessment (EIA) study for West Qaroun Oil Field	Sahara Oil & Gas	March 2012

# 7.3. PETROLEUM ENGINEERING PROJECTS

Project Name	Company	Date
Root cause failure analysis for surface	West Bakr Oil	On-going project
facilities tanks in West Bakr Oil field	Company	
Root cause failure analysis for pipeline	West Bakr Oil	On-going project
system in West Bakr Oil field	Company	
Initial feasibility study to determine possibility of application of EOR methods in West Qaroun field	Sahara Oil & Gas	February 2012





# 7.4. CHEMICAL ENGINEERING PROJECTS

Project Name	Company	Date
Tests and performance analysis of floor tiles	Al Sherbeeny Company	January 2015 October 2011

### 7.5. IRRIGATION AND HYDRAULICS ENGINEERING PROJECTS

Project Name	Company	Date
Technical study for protection of surface facilities location against flash flood	AL AMAL Petroleum Company	January 2012

# 7.6.CIVIL ENGINEERING PROJECTS

Project Name	Company	Date
Development of the design and preparation of the required tender folders for TDA garage	Tourism Development Authority (TDA)	August 2016
Performing a surveying job to determine the coordinates of Granite quarry	Karen Splind Company	December 2015

# 7.7.MECHANICAL ENGINEERING PROJECTS

Project Name	Company	Date
Performance evaluation tests for diesel samples	EGPC	June 2016





# 7.8. SHORT COURSES

A number of short courses and OJT in the following areas are offered to the General Petroleum Company (GPC) and the Tunisian Petroleum Corporation (ETAP) from 2011 and till present.

Course
Well Stimulation
Introduction of Seismic Stratigraphy & Exploration
Artificial Lift Methods
Mud Engineering
Basic Petroleum Economics
Basics & Structural Geology
Basics & Drilling Engineering
Fundamentals of Enhanced Oil Recovery
Directional & Horizontal Drilling
Power System Analysis
Electrical Protection
Basics of Seismic Exploration





# 8. MSRC LOCATION AND FACILITIES

The headquarters of MSRC is located at the fourth floor of the Mining, Petroleum and Metallurgical Engineering Department – Faculty of Engineering – Cairo University. The premise encompasses the Director main office to which attached a Secretary desk equipped with all necessary office facilities, two well-furnished air-conditioned meeting rooms each of which is equipped with LCD screen, one lecture hall fitting 100 attendees and an air-conditioned study classroom with enough comfortable space for 30 attendees; both equipped with a data show and a white board. We also have full access to all Cairo University facilities and services including specialized laboratories, computer labs, teaching halls, auditoriums, training rooms and meeting halls.

## **CONTACT US**

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