

# Chemical Engineering

2016/2017

## Program Guide



College of Engineering  
University of Ha'il



جامعة حائل  
University of Ha'il

Ha'il / Kingdom of Saudi Arabia

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## About the Program

The Department of Chemical Engineering (CHE), established in 2009, is one of the most important scientific departments at the Faculty of Engineering at the University of Hail. The aim of the CHE program is to graduate qualified chemical engineers to cater the growing needs of industrial and government sectors in the Kingdom of Saudi Arabia.



Chemical Engineering relies on chemistry, physics, mathematics, computer basics, applied engineering and economic sciences for the design and operation of the various production units to convert raw materials to more useful industrial products both effectively and economically. The CHE program curriculum is therefore tailored to include core courses such as:

Principles of Chemical Engineering, Physical, Analytical and Organic Chemistry, Chemical Engineering Thermodynamics, Principles of Materials Science and Engineering, Transport Processes of Fluid Mechanics, Heat and Mass, Separation Processes, Kinetics and Reactor Design, Modeling and Simulation of Chemical Processes, Process Dynamics and Control, and Engineering Economics and Design Principles. In addition, students take "Integrated Design Course" project in which they advance their skills, knowledge and abilities. CHE Students also spend 28-week duration of training in industry, a real world work environment, where their technical knowledge, communication and practical skills are enhanced.

The CHE Department also works to develop, communicate, and apply scientific research, community services, and professional developments. The department's faculty members who are drawn globally from internationally reputed institutions, are of high qualifications, outstanding teaching experience and research expertise in the various areas of Chemical Engineering.





## Program Vision

The Department of Chemical Engineering seeks to achieve leadership in the Arab world through excellence in engineering education, research and community service.



## Program Mission

The Department of Chemical Engineering at the University of Hail is committed to graduating chemical engineers equipped with adequate knowledge and skills needed to tackle the challenging tasks ahead in their professional careers, conducting innovative research in chemical engineering areas, and providing great services to the profession and society.





## Program Objectives

The CHEP objectives are:

1. Prepare students capable of demonstrating excellence in the technical knowledge and skills in the field of chemical engineering.
2. Prepare students with a solid foundation in mathematics, physical sciences and technical skills needed in their onward professional career and their further post-graduate studies.
3. Prepare students with sufficient knowledge and skills in the use of computer tools, and are able to analyze experimental data and to apply it in the design of chemical engineering systems.
4. Enhance students' ability to effectively communicate technical and professional information in written, oral and graphical forms.
5. Foster within our students a commitment to protect the public interest, health, safety and environment and to maintain the highest ethical and professional standards towards employers and community at large.
6. Prepare students to be interested, motivated, and capable of pursuing continued life-long learning.
7. Instill within our students using counseling and academic advising the technical and communication skills that will prepare them for supervisory roles in industry.
8. Prepare students for rapidly changing technological environments with the core knowledge central to multidisciplinary development and personal improvement throughout their professional careers.



## Career Opportunities

- \* Petroleum industries
- \* Petrochemical industries
- \* Food industries
- \* Pharmaceutical industries
- \* Cement industries
- \* Production and development of fertilizer plants
- \* Glass industries
- \* Ceramic industries
- \* Desalination and water treatment plants
- \* Labs for standards and metrology and quality control



- \* Education and graduate studies
- \* Environmental laboratories
- \* University laboratories
- \* Most governmental sectors
- \* Research centers
- \* Natural gas production and processing plants
- \* Mining industries
- \* Modelling and simulation of industrial processes
- \* Power plants
- \* Fields of renewable energies

## Facilities

The laboratories of CHE Department house the most modern equipment to fit both the needs of research and teaching of the curriculum of the CHE program.

The CHE Department laboratories are as follows:

### **Chemical Engineering Lab I:**

The Chemical Engineering lab I offers experiments on fluid mechanics, heat transfer, thermodynamics and diffusional mass transfer.

### **Chemical Engineering Lab II:**

The Chemical Engineering lab II offers experiments on stage-wise operations, process dynamics and control, and kinetics and reactor design.

### **Physical Chemistry Lab:**

The Physical Chemistry lab offers experiments on conductivity, electrochemistry, chemical kinetics, and transport properties of gases and liquids.

### **Analytical Chemistry Lab:**

The Analytical Chemistry lab offers experiments on gravimetric and volumetric techniques and experiments related to qualitative and quantitative analysis using various instrumental techniques.

### **Organic Chemistry Lab:**

The Organic Chemistry lab offers experiments on basic spectroscopic techniques, and laboratory synthesis of organic chemicals and multistep synthesis.





## Research Interests

The CHE faculty have research expertise in the various areas of chemical engineering such as:

1. Combustion Gases Desulfurization
2. Polymer Compatibility, Modification, Degradation and Stabilization
3. Nano-materials Application in Industrial Processes
4. Solid Wastes Utilization
5. Water Treatment and Desalination
6. Retorting, Combustion and Gasification of Solid Fuel
7. Rheological Characterization of Non-Newtonian Substances
8. Renewable and Alternative Energies
9. Pollution Control
10. Petroleum and Gas Production
11. Quality and Academic Accreditation
12. Porous Solid Catalysts
13. Solution Thermodynamics
14. Energy Sources Utilization
15. Iron and Steel Industries
16. Chemical Processes Simulation and Modeling
17. Drying of Alimentary Products