Faculty of Dentistry

Faculty Contact:
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E-mail: tlalkhatib@kau.edu.sa
Website: http://dentistry.kau.edu.sa

History:
Establishment of the Faculty of Dentistry was in 1985. The program started in 1987.

Vision:
The faculty is committed to the vision of becoming the best Dental institution in the nation, regionally recognized for innovation and leadership in Dentistry and its applications.

Mission:
To graduate dynamic dentists capable of delivering high quality dental care in all dental specialties including Implantology using advanced techniques in oral diagnosis and treatment. To use preventive measures, apply managerial skills and optimally utilize auxiliary personnel in order to achieve high dental health care standards. To demonstrate sensitivity and responsibility towards the social and cultural community and individual patient needs. To provide high standard dental consultation for the public sector.
Faculty of Dentistry

Unique Features
Collaboration with Tufts University

Graduation Requirements
In order to qualify for Bachelor or Dental Medicine and Surgery (B.D.S) degree, students must successfully complete 228 credit hours during a time frame of Six (6) years. In addition, student must also complete one obligatory year for clinical practice (Internship Program).

Credit are distributed as follows:
1. (14) Credit hours of the university requirements
2. (24) Credit hours of preparatory year requirements,
3. (190) Credit hours of faculty courses, made up of
   • 29 Credit hours of Joint Courses
   • 46 Credit hours of compulsory OMR courses
   • 30 Credit hours of compulsory PDS courses
   • 34 Credit hours of compulsory CDS courses
   • 51 Credit hours of compulsory OBCS courses

Faculty Courses:
Students must complete 190 credit hours of the following faculty courses

Credit Hours  190

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<th>No.</th>
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Total: 190

**Public Journals:**

Publications: Life and Health
Publication Name: Faculty of Medicine
Contact No.: Dr. Abdul-ghani Mira Ext No: 20217
Email: amira@kau.edu.sa
Website: http://www.kau.edu.sa/amira

Publications: Journal of King Abdulaziz University, Medical Science
Publication Name: Faculty of Medicine
Contact No.: Prof. Tarek Lotfi Alkhateeb
Email: tlalkhatib@kau.edu.sa
Website: http://dentistry.kau.edu.sa

**Affiliated Centers:**

Center Name: King Fahad Research Centre
Background: Research Programs
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Email: kfmrc@kau.edu.sa
Website: www.kfmrc.kau.edu.sa

Center Name: Tufts University
Background: Dentistry Collaboration
Contact No.: 001-617-6360355
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Website: www.tufts.edu
Department of Conservative Dental Sciences

Department Contact:
Chairman’s Office
Tel: 6401000 Ext. 22322 Fax: 6403316
E-mail : mgholman@kau.edu.sa
Website : http://dentistry.kau.edu.sa

History:
The Department was established in 1985.

Vision:
We are committed to reaching the optimal performance level in Dentistry.

Mission:
To develop the student’s scientific and technological knowledge, enhance their cognitive research capabilities and advance their clinical skills.

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Department Study Plan:
Department Core Courses (Credit Hours  34)

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Course Descriptions:

**CDS 311: Pre-clinical Operative Dentistry**
A study that helps to assist students in developing the manual skills required to perform basic technical procedures used in restorative dentistry and principles, and familiarizes them with instruments and materials used in various types of cavity preparation and with criteria and techniques.

**CDS 411: Operative Dentistry**
A study that looks into procedures for performing cavity and tooth preparation and proper selection of restorative material. The didactic part of the course will review diagnostic procedures, administration of local anesthetics, use of rubber dam, protection of the dental pulp, and techniques for restoring endodontically treated teeth.

**CDS 422: Preclinical Endodontics**
A designed study that helps to familiarize dental students with materials and instruments used in endodontics. The objective is to assist students in developing the manual skills required to perform basic technical procedures used in endodontics.

**CDS 511: Operative Dentistry**
The didactic part of the course will deal with technical details acquired in Dental lab. 2. The syllabus would help to provide motivation for the student to continue independent study and to participate in research.

**CDS 522: Endodontics**
The study is of two main components. The first is a classroom lecture series, which correlates between clinical and biological principles of endodontics. The second is the clinical experience to perform endodontic treatment for single and multicanaled teeth.

**CDS 333: Biomaterials**
A study that helps dental students to select, manipulate and evaluate dental materials based on a scientific understanding of their structure and properties, to recognize the limitations of dental materials and the reasons for their clinical failures and to work in a dental laboratory with the different materials.
## FACULTY MEMBERS

<table>
<thead>
<tr>
<th>Professors</th>
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| **Adel Mohialdean Alkhodary**  
Biomaterials  
1982 Cairo University, Egypt  
aelkodary@kau.edu.sa  
http://aelkodary.kau.edu.sa/ |  
Hanan Kamal Abo-alsoud  
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http://haboalsaad.kau.edu.sa/ |
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| **Fadel Sobhi Othman**  
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| **Hanaa Mohamed Jamjoom**  
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**Prof. Mohamed M. Shehata** |

<table>
<thead>
<tr>
<th>Associate Professors</th>
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| **Abdul-ghani Ibrahim Mira**  
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**Khaled Ahmed Abdel-wahab**  
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**Laila Ahmed Bahammam**  
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http://lbahammam.kau.edu.sa/ |
|  
**Emad Mahmoud Khattab**  
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**Mohamed Khalil Youisf**  
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http://myousf.kau.edu.sa |
Department of Oral Basic and Clinical Sciences

Department Contact:

Chairman’s Office
Tel: 6401000 Ext. 21206 Fax: 6403316
E-mail: asalghamdi2@kau.edu.sa
Website: http://dentistry.kau.edu.sa

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   • 51 Credit hours of compulsory OBCS courses
Students should be able to identify, discuss and describe pathologic characteristics of x-radiation and to make students familiar with the requirements of an acceptable diagnostic radiograph, to study intraoral and extra oral normal radiographic anatomical landmark, photography in dental practice, as well as the interpretation of radiographic changes associated with various local systemic diseases.

OBCS 468: Oral Diagnosis and Treatment Planning
This course prepares the students for handling patients in the clinic, thorough history taking, clinical examination both extra and intra oral as general assessment of the patient conditions. Also, the primary course includes different laboratory investigations and their applications in the field of dentistry, together with handling of medically involved patients. The course also prepares students to formulate and rationalize a preliminary treatment planning for their patients. The lectures will be reinforced with demonstration and clinical training and the student should demonstrate skill in applying local anesthesia for dental patients.

OBCS 411: Oral Biology and Nutrition
The course will correlate basic science information relevant to the clinical practice of dentistry. The disease processes that the dentist is diagnosing and treating will be discussed in terms of basic biological phenomena through case presentations and problem solving. Students will attend lectures on food and nutrition as applied to clinical dentistry in order to give appropriate dietary advice.

OBCS 545: Periodontics
The relationship between periodontal diseases with other clinical disciplines of dentistry will be presented. Students will also be expected to learn more advanced aspects of the relationship between periodontal diseases and systemic conditions. The students should be aware of the objectives, indications and contraindications of the various surgical periodontal procedures. The course shall depend on lectures and clinical experiences in the treatment of advanced non-complicated periodontal cases.

Course Descriptions:

OBCS 334: Oral Pathology
Students should be able to identify, discuss and describe pathologic conditions of the soft and hard tissue of the oral cavity and related structures. Each disease and disease category will be considered as to etiology, clinical, radiographic and histological manifestations along with expected prognosis. The topics will include developmental and acquired abnormalities of the teeth and surrounding structures including salivary gland diseases, and malignancies. The course consists of lectures, problem-solving, group discussions, microscopic study and viewing of radiographs.

OBCS 445: Periodontics
The course deals with a review of the histology, ultra-structure, biochemistry, physiology and morphology of the periodontium. The histopathological and radiographic changes in various classes of periodontal disease and their clinical correlation are presented. Dental plaque, calculus, local irritants and systemic conditions as etiological factors in periodontal diseases are discussed. The course also includes an introduction to the basic principles of the immune system of the periodontium in health and its changes in various disease processes. The students will also learn to examine, record and diagnose periodontal diseases, formulate treatment plans and proceed to learn the theory of various methods of treatment.

OBCS 322: Oral Histology
The course deals with histological, ultra structural and developmental aspects of hard and soft, oral and para-oral structures such as teeth, periodontium, salivary glands and oral mucosa. The composition of calcified tissues including enamel and dentine will be considered. The students shall correlate morphological structure with function.

OBCS 377: Oral Radiology
The objectives of this course are to introduce the common characteristics of x-radiation and to make students familiar with the types of x-ray machines and their components, radiation hazards and radiation safety measures. The objectives also include introduction and training of students on the various intraoral, extra oral radiographic exposure procedures and recent specialized radiographic techniques as well as film, processing techniques.

OBCS 477: Radiology
The objectives of this course are to familiarize students with the requirements of an acceptable diagnostic radiograph, to study intraoral and extra oral normal radiographic anatomical landmark, photography in dental practice, as well as the interpretation of radiographic changes associated with various local systemic diseases.

Course Descriptions:

OBCS 334: Oral Pathology
Students should be able to identify, discuss and describe pathologic characteristics of x-radiation and to make students familiar with the requirements of an acceptable diagnostic radiograph, to study intraoral and extra oral normal radiographic anatomical landmark, photography in dental practice, as well as the interpretation of radiographic changes associated with various local systemic diseases.

OBCS 445: Periodontics
The course deals with a review of the histology, ultra-structure, biochemistry, physiology and morphology of the periodontium. The histopathological and radiographic changes in various classes of periodontal disease and their clinical correlation are presented. Dental plaque, calculus, local irritants and systemic conditions as etiological factors in periodontal diseases are discussed. The course also includes an introduction to the basic principles of the immune system of the periodontium in health and its changes in various disease processes. The students will also learn to examine, record and diagnose periodontal diseases, formulate treatment plans and proceed to learn the theory of various methods of treatment.

OBCS 322: Oral Histology
The course deals with histological, ultra structural and developmental aspects of hard and soft, oral and para-oral structures such as teeth, periodontium, salivary glands and oral mucosa. The composition of calcified tissues including enamel and dentine will be considered. The students shall correlate morphological structure with function.

OBCS 377: Oral Radiology
The objectives of this course are to introduce the common characteristics of x-radiation and to make students familiar with the types of x-ray machines and their components, radiation hazards and radiation safety measures. The objectives also include introduction and training of students on the various intraoral, extra oral radiographic exposure procedures and recent specialized radiographic techniques as well as film, processing techniques.

OBCS 477: Radiology
The objectives of this course are to familiarize students with the requirements of an acceptable diagnostic radiograph, to study intraoral and extra oral normal radiographic anatomical landmark, photography in dental practice, as well as the interpretation of radiographic changes associated with various local systemic diseases.
OBCS 223: Dental Anatomy & Occlusion
This course deals with anatomy and morphology of primary and permanent dentition as well as the sequence of tooth eruption and surface anatomy of the oral cavity. The course includes study of static occlusion and these factors concerned with the development and stability of masticatory system. Student will relate morphology to function and will exercise their technical abilities to develop skills needed for practice.

OBCS 556: Oral Medicine
The students shall acquire the clinical skills to differentiate between various types of oral diseases and the ability to correlate radiographic and histopathological features with the clinical findings. Students shall also be able to relate oral disease to systemic conditions.

Professors

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Oral Pathology
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Dr. Emam M. Helmi

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Department Contact:
Chairman’s Office
Tel: 6401000 Ext. 20090 Fax: 6403316
E-mail: tmarghalani@kau.edu.sa
Website: http://dentistry.kau.edu.sa

History:
The Department was established in 1985.

Vision:
We are committed to reaching the optimal performance level in Dentistry.

Mission:
To develop the student’s scientific and technological knowledge, enhance their cognitive research capabilities and advance their clinical skills.

Departmental Requirements:
In order to qualify for a Bachelor of Dental Medicine and Surgery (B.D.S) degree, students must successfully complete 228 credit hours during a time frame of Six years. In addition, students must also complete one obligatory year for clinical practice (Internship Program).

Credit are distributed as follows:

1. (14) Credit hours of the university requirements
2. (24) Credit hours of preparatory year requirements,
3. (190) Credit hours of faculty courses, made up of
   • 29 Credit hours of join programs
   • 46 Credit hours of compulsory OMR courses
   • 30 Credit hours of compulsory PDS courses
   • 34 Credit hours of compulsory CDS courses
   • 51 Credit hours of compulsory OBCS courses
Department Study Plan:
Department Core Courses (Credit Hours  46)

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<th>No.</th>
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<td>6</td>
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<tr>
<td>7</td>
<td>OMR</td>
<td>611</td>
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<td>8</td>
<td>OMR</td>
<td>412</td>
<td>Pain Control &amp; Anesthesia</td>
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<td>9</td>
<td>CCC</td>
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<td>Adult &amp; Geriatric Comprehensive Care</td>
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<td><strong>Total</strong></td>
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</table>

Course Descriptions:

OMR 323: Preclinical Removable Prosthodontics
The students will gain experience in the fabrication of maxillary and mandibular complete dentures. The clinical and laboratory procedures will be taught and their interdependence stressed.

OMR 423: Preclinical Prosthodontics
The first part the student will study the partial denture components, and principles of partial denture design. The students will do all the necessary steps for construction of chromium-cobalt metallic framework as well as acrylic partial dentures. The second part The student will be taught how to manage and treat fully edentulous patients following standardized techniques.

OMR 412: Pain Control and Anesthesia
The course will provide a review of applied anatomy and it includes theoretical and practical aspects in the selection and use of different anesthetic agents and sedative. The lectures will be reinforced with demonstration and clinical training and the student should demonstrate skill in applying local anesthetic agents and sedative.

OMR 534: Fixed Prosthodontics
This course allows transition of the previous preclinical course, and provides clinical involvement that is critical to upgrade the abilities of diagnosis, treatment planning, preparation, construction, cementation and follow up of the Fixed Prosthodontics cases.

OMR 434: Fixed Prosthodontics
The objective is to assist students in developing the manual skills required to perform basic technical procedures used in fixed prosthodontics. The course includes study of masticatory system and occlusion and its relation to fixed prosthodontics.

OMR 511: Oral Surgery
The student will practice diagnosis, extraction of teeth, removal of remaining roots, impacted teeth, epicoectomy and removal of cysts. The course will also provide a review of applied anatomy and different methods of pain control.

OMR 523: Removable Prosthodontics
The student will be able to complete all stages concerning various laboratory and clinical procedures. This is the first clinical course in removable partial dentures. The students will be taught how they manage and treat partially edentulous patients following standardized techniques.

OMR 611: Oral Surgery
The student will participate in diagnosis, observe and assist in treatment of facial bone fractures, preprosthetics surgery, orthognathic and tempromandibular joint surgery. Students will attend lectures and perform minor oral surgical procedures as well as attend major oral surgical operations.
Faculty of DENTISTRY

Department of Oral and Maxillofacial Rehabilitation

Professors

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Years</th>
<th>Location</th>
<th>Email</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fahmi Abdulaal Mobarek</td>
<td>Oral Surgery</td>
<td>1994</td>
<td>Cairo, Egypt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farouk Abdulazeem Mohamed</td>
<td>Oral Surgery</td>
<td>1985</td>
<td>Cairo, Egypt</td>
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</tr>
<tr>
<td>Mahmoud Mohamed Alsmahi</td>
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</tr>
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<tr>
<td>Mohamed Mohamed Alshehimi</td>
<td>Oral surgery</td>
<td>1986</td>
<td>Cairo, Egypt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mostafa Abdulmohessen Aboalsoud</td>
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<tr>
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</tr>
</tbody>
</table>

Associate Professors

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Years</th>
<th>Location</th>
<th>Email</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmed Omar Alyamani</td>
<td>Oral Surgery</td>
<td>2002</td>
<td>Boston, USA</td>
<td><a href="mailto:avamani@kau.edu.sa">avamani@kau.edu.sa</a></td>
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</tr>
<tr>
<td>Amal Hussain Mobarek</td>
<td>R. Prosthodontics</td>
<td>2002</td>
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</tr>
<tr>
<td>Salma Ahmed Bahannan</td>
<td>F. Prosthodontics</td>
<td>1989</td>
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<td><a href="http://sbahannan.kau.edu.sa">http://sbahannan.kau.edu.sa</a></td>
</tr>
<tr>
<td>Fahad Hassan Banasar</td>
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<td><a href="http://mhamed.kau.edu.sa/">http://mhamed.kau.edu.sa/</a></td>
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Assistant Professors

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<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Years</th>
<th>Location</th>
<th>Email</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ayman Abdulaziz Aldhrrab</td>
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<td>2008</td>
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<td>Khaled Mostafa Abdulaziz</td>
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</tr>
</tbody>
</table>
Department of Preventive Dental Sciences

Department Contact:
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Website: http://dentistry.kau.edu.sa

History:
The Department was established in 1985.

Vision:
We are committed to reaching the optimal performance level in Dentistry.

Mission:
To develop the student’s scientific and technological knowledge, enhance their cognitive research capabilities and advance their clinical skills.

Departmental Requirements:
In order to qualify for a Bachelor of Dental Medicine and Surgery (B.D.S) degree, students must successfully complete 228 credit hours during a time frame of Six years. In addition, students must also complete one obligatory year for clinical practice (Internship Program).

Credit are distributed as follows:
1. (14) Credit hours of the university requirements
2. (24) Credit hours of preparatory year requirements,
3. (190) Credit hours of faculty courses, made up of
   • 29 Credit hours of join programs
   • 46 Credit hours of compulsory OMR courses
   • 30 Credit hours of compulsory PDS courses
   • 34 Credit hours of compulsory CDS courses
   • 51 Credit hours of compulsory OBCS courses
Department Study Plan:
Department Core Courses (Credit Hours  30)

<table>
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<th>No.</th>
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<tr>
<td>1</td>
<td>PDS</td>
<td>334</td>
<td>Biostatistics &amp; Methods of Scientific Research</td>
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<td>Community Dental Practice</td>
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Total 30

Course Descriptions:

PDS 334: Biostatistics & Methods of Scientific Research
A study that aims to teach students principles of biostatistics and its application in dentistry as well as research methodology and retrieval of medical data using electronic means such as bit net, gulf net and internet.Student will be able to conduct applied research projects in dentistry.

PDS 511: Pediatric Dentistry
A study that focuses on the theory and practice of effective child management, preventive dental practices and maintenance of primary dentition in good health. Another objective of this course includes care for special patients beyond the age of adolescent, who demonstrate mental, physical or emotional problems.

PDS 422: Orthodontics
Enables students to recognize the importance of coordinating treatment timing as it coincides with facial, dental and somatic growth.

PDS 615: Comprehensive Pediatric Care
This course aims to discover the clinical judgment, technical knowledge and skills each student in the final year of study has acquired in terms of the ability to deliver high quality dental care to children.

PDS 626: Comprehensive Orthodontic Care
Focuses on the orthodontic practices applicable to the general dental practices. Students are trained in the values of dental and medical consultation, referral system as well as patient auditing and recall system to be able to apply the principles of children’s dentistry and orthodontics to a good standard in general practice and to have a sound foundation for continuing postgraduate education.

PDS 633: Community Dental Practice
This course designed to prepare students for the practice of dentistry by introducing the environment (population, dental practices, organizations and community agencies) in which they will fulfill their professional role.
## Faculty Members

<table>
<thead>
<tr>
<th>Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmed Rami Afify</td>
<td>Hatem Al-sayed Ahmed</td>
<td>Iman Anwar Aloshairy</td>
</tr>
<tr>
<td>Orthodontics, Dentistry 1993 Alexandria University, Egypt</td>
<td>Community Dentistry 1997 Tanta University, Egypt</td>
<td>Pediatrics Dentistry 2006 Ain shams, Egypt</td>
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</tr>
<tr>
<td>Azza Mohamed Hanno</td>
<td>Omar Abdul-sadek Al-meligy</td>
<td>Dania Ibrahim Alagili</td>
</tr>
<tr>
<td>Pediatrics Dentistry 1979 Alexandria University, Egypt</td>
<td>Pediatrics Dentistry 2001 Alexandria University, Egypt</td>
<td>Community Dentistry 2006 Alabama, USA</td>
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</tr>
<tr>
<td>Hala Abbass Amer</td>
<td>Ali Habiballah Akbar</td>
<td>Fadia Mohammed Allhummayani</td>
</tr>
<tr>
<td>Community Dentistry 1989 Alexandria University, Egypt</td>
<td>Orthodontics Dentistry 2001 Illinois University, USA</td>
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<tr>
<td><a href="mailto:hamir@kau.edu.sa">hamir@kau.edu.sa</a></td>
<td><a href="mailto:aakbr@kau.edu.sa">aakbr@kau.edu.sa</a></td>
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<tr>
<td>Hassam Ismail Gaznawi</td>
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<td><a href="mailto:zmurshid@kau.edu.sa">zmurshid@kau.edu.sa</a></td>
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History:
The Ministry of Petroleum established the Center of Applied Geology in 1970. This was later changed to the Institute of Applied Geology in 1975 when it became part of King Abdul Aziz University. The department of Geology, Faculty of Sciences merged it into one of its departments and renamed it the Faculty of Earth Science in 1978.

Vision:
The faculty is committed to becoming a leading center in Earth Sciences and their applications. FES aims to promote the field’s general awareness, to offer technical services to the community and to contribute to the developmental plans of Saudi Arabia and to utilize the full potential of its natural resources.

Mission:
The principal aims of the FES are to provide educational opportunities in all fields of Earth Sciences, to conduct applied research that meets the needs of Saudi Arabia by collaborating with public and private institutions, to keep abreast of new developments in the field especially in the environmental area, and to offer technical assistance.

Unique Features:
The faculty has succeeded in becoming an outstanding research centre in earth sciences at both national and international levels.
Students must complete 40 credit hours of the following faculty courses

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<th>No.</th>
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Total credit hours required for graduation from FES (136 Hours)

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The faculty includes the following 6 departments:

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<tr>
<td>Department of Mineral Resources &amp; Rocks</td>
<td>B.Sc., M.Sc. &amp; PhD</td>
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<tr>
<td>Department of Hydrogeology</td>
<td>B.Sc., M.Sc. &amp; PhD</td>
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<tr>
<td>Department of Petroleum Geology &amp; Sedimentology</td>
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<tr>
<td>Department of Structural Geology &amp; Remote Sensing</td>
<td>B.Sc., M.Sc. &amp; PhD</td>
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<tr>
<td>Department of Engineering &amp; Environmental Geology</td>
<td>B.Sc., M.Sc. &amp; PhD</td>
</tr>
<tr>
<td>Department of Geophysics</td>
<td>B.Sc., M.Sc. &amp; PhD</td>
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Public Journals

Publications : Journal of King Abdul-Aziz University: Earth Sciences
University : King Abdul-Aziz
Contact No. : 6952326 Ext No: 52326
Email : ear.spu@kau.edu.sa
Website : http://www.kau.edu.sa/fes
History:
The Engineering Geology Department was established in 1974. The Environmental Geology option was approved and added to the department in 2001, which was subsequently changed to the Engineering and Environmental Geology Department.

Vision:
We are committed to reaching the highest level in teaching and research, using advanced technology in the fields of Engineering, Environmental Geology and Geological Hazards.

Mission:
Our mission is to apply geology to mining and civil engineering works and environmental aspects. We aim to graduate engineering geology or environmental geology professionals who can perform site investigations and evaluate potential engineering or natural hazards.

Departmental Requirements:
To earn a degree in Engineering Geology and Environmental Geology, students must complete a total of 136 credit hours distributed as follows.

- 49 Credit hours of departmental core courses
- 36 credit hours of compulsory EEG Courses for Engineering Geology
- 33 credit hours of compulsory courses for Environmental Geology.

Specializations:
The department offers two specializations, Engineering Geology and Environmental Geology.
### Department Study Plan:

#### Department Core Courses: (Credit Hours 49)

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<th>Course Code:</th>
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### Requirements for Engineering Geology: (Credit Hours 36)

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#### Total 36 22 8 6

**Engineering and Environmental Geology**
Requirements for Environmental Geology: (Optional) (Credit Hours 33)

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Total 33 21 6 6

**Course Descriptions:**

**EEG 201: Introduction to Environmental and Engr. Geology**
This course contains environmental concepts and their related fundamentals. Topics covered include geological processes and its relation to the geological hazards; Natural resources (energy, mineral and aggregate); The sources and types of environmental pollution; Types of waste disposal; Soil and rock engineering properties and their problems; geological influence in civil works. **Prerequisites:** EMR201, CHEM101

**EEG 232: Terrain Analysis**
Introduction to rock physiography, terrain evaluation systems using PUCE techniques, predicting the engineering properties of igneous, metamorphic and sedimentary rocks, case history studies. **Prerequisites:** EMR 201, ESR431

**EEG 311: Engineering Properties of Soil**
Geotechnical problems associated with soil, physics and index properties, soil classification systems, permeability capillarity and type of stress, compressibility and shear strength, soil improvement application, field trip. **Prerequisites:** EMR201, MATH101

**EEG 312: Soil Mechanics**
Types and conditions of foundations, bearing capacity theories in shallow foundations, settlements in cohesive and cohesion less soils, deep foundations, earth pressures and lateral supports, seepage analysis and stability of slopes, field applications, and two field trips. **Prerequisites:** EGG311, EGG321

**EEG 321: Mechanics of Material**
The course is designed to give students knowledge about principles of statics. Topics include: Unit systems, vectors, resultants, equilibrium of forces, centroids, moments, stress and strain and their relationships, Hookes Law, compound stresses, material failure criteria, Mohr Circle. **Prerequisites:** EMR201, MATH101

**EEG 322: Rock Mechanics**
Concept of Rock Mechanics. Studying the stress-strain relationships. Studying the engineering properties of both intact rock and discontinuity surfaces. Applying the intact rock and the discontinuity surfaces classification systems. Behavior and classification of Rock Masses. Laboratory sessions (works) for the physical and mechanical behavior of rocks. (2 days Field Trips). **Prerequisites:** EMR201, MAT101

**EEG 331: Rock in Construction**
Introduction to geological. Considerations of the source of construction materials, Quarries and their products. Methods of samples and size gradation of aggregate. Classification of aggregate. Testing the physical, chemical and mechanical properties of coarse and fine aggregates. Road Pavement materials. Building and ornamental stones, Building blocks and their types, Riprap and filter, Types of Cements & their materials. Concrete mix design. **Prerequisites:** EMR 201/ MAT101

**EEG 341: Engineering Geology**
Engineering Descriptions, Engineering geological considerations, description of soils and rock masses. Classification of rock masses for engineering purposes. Engineering geological maps and their applications. Rock and soil improvement such as grouting, drains and reinforcement of ground (2 days Field Trips) **Prerequisites:** EEG311 EEG322

**EEG 342: Geotechnology**
General considerations of ground behavior during construction and maintenance stages. Planning a monitoring program. Instrumentation transducers. Measurements of groundwater level and pressure. Measurements of total stress and stress changes in soil and rocks. Measurements of deformation, load and strain in structural elements. **Prerequisites:** EEG311, EEG322

**EEG 351: Soil Pollution**
Study of all aspects in the pollution of soil. **Prerequisites:** EEG201, EEG311
EEG 399: Training in the Specialization
Concepts of engineering geological mapping and site testing. Methods of field classification for soils and the determination of its physical properties such as field density test for soil & size, shape of particles. Classification & the source of Wadi (Valley) soils and natural aggregates. Measurement of the shear strength of soil using field equipment and identification of rock type estimations. Geo-mapping (Field trip for 28 days).

**Prerequisites:** EEG311, EEG322

EEG 408: Seminar
Training in research in geological databases and writing scientific reports. A series of lectures on selected topics representing recent development in the fields of engineering geology or environmental geology. Students are asked to select and study one topic, write a technical report and present it in a public lecture.

**Prerequisites:** EEG 408

EEG 441: Site Investigation
General considerations of planning of a site investigation program. Drilling and boring equipments and its application in investigation for soils and rocks. Disturbed and undisturbed sampling. In-situ testing to determine the strength of the soils or rocks. Laboratory testing of samples collected from the sites. Report writing and interpretation of the site engineering geological characteristics. Four days field trips.

**Prerequisites:** EEG312, EEG322

EEG 443: Application in Engineering Geology
Engineering geological considerations while investigating highways, bridges, slopes, dams, tunnels, rivers, beaches, sabkhas, sand dunes, and selected sites for urban areas. Methods of analysis and presentation of engineering geological data. Engineering geological reports. Case studies.

**Prerequisites:** EEG 341

EEG 451: Waste Disposal in Soils and Rocks
General principles of waste disposal and associated problems; landfills impoundment, location, design, and sealing of reposito-ries, construction of repositories, pollutant migration in soils and rocks, leachates and gas generation, water balance for landfill, waste extraction & in-situ treatment of pollutants, geomembranes and clay liners, collection and removal systems, stability of landfills remediation and monitoring. Field trips to disposal sites.

**Prerequisites:** EEG201, EEG322

EEG 452: Environmental Geotechnology
Fundamentals of environmental geotechnology, review of earth materials and geological processes affecting them. Geotechnical design of solid and hazards waste landfills, preliminary groundwater contamination site assessments, contaminant technology and design, field and laboratory hydraulic conductivity, groundwater monitoring. Evaluation of the environmental aspects associated with mineral exploitation, oil and groundwater; impact.

**Prerequisites:** EEG 201

EEG 454: Geohazards
General considerations of hazardous earth processes such as floods, landslides, subsidence, earthquakes and related phenomena, volcanic activities, coastal hazards, desertification, and sand dunes migration.

**Prerequisites:** EEG 201

EEG 456: Assessment of Geohazards
Impact of environmental hazards due to floods, desertification, landslides, subsidence, coastal hazards, and urbanization. Discussion on worldwide case studies and their remedial measures, and review of geohazard cases in the Kingdom. Field trips and laboratory sessions.

**Prerequisites:** EEG 454

EEG 499: B.Sc. Project
Topic will be selected within the fields of engineering geology or environmental geology by the student supervised by the department. Students carry out an investigation and perform tests both in the field and laboratory, write a scientific report and present their findings in a public lecture (Field trip for 21 days).

**Prerequisites:** EEG 399

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**FACULTY MEMBERS**

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---

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Department Contact:
Chairman’s Office
Tel: 69552892  Ext. 52892  Fax: 6952095  Ext. 52095
E-mail: maalgarni@kau.edu.sa
Website: http://earthscience.kau.edu.sa

History:
The Geophysics Department was established in 1987 offering a B.Sc. Program which was soon followed with M.Sc. and Ph.D. programs.

Vision:
Commitment to reaching the highest levels of teaching. Produce professional Geophysicists who can play leading roles in industry, research, teaching, and public services related to exploration.

Mission:
Provide students with the skills required to become independent lifelong learners able to adapt positively to the rapidly changing workplace and world. Develop students’ abilities to work individually and in teams. Improve students’ critical awareness of the natural world and the role of their chosen discipline.

Departmental Requirements:
To earn a degree in Geophysics, students must complete a total of 136 credit hours distributed as follows:
- 43 credit hours of departmental core courses according to specialization and
- 34 credit hours of compulsory EGP courses.
## Department of Geophysics

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### Requirements for EGP: (Geophysics) (Credit Hours 34)

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**Total 34 19 9 6**
Course Descriptions:

EGP 211: Introduction to Geophysics
Introduction to the physics of the earth including earthquakes, earth gravity, magnetism, plate tectonic theory, introduction to seismic exploration methods, resistivity, gravity and magnetic methods, radiometry and thermal methods, well logging and instrumentation.
Prerequisites: EMR201, PHYS101

EGP 312: Physics of the Earth
Introduction to field theory, earth gravitational field and its components, methods of measuring absolute value of the gravitational acceleration, earth figure, earth magnetism: source, components and variations. Main geometric field, dipole method. Measurements and computations of fields’ intensity. Paleomagnetism, Seismic waves and their propagations; earthquakes; tectonic earthquakes in the Arab world and plate tectonics.
Prerequisites: EGP211, PHY 101

EGP 321: Seismic Exploration
Properties of elasticity, seismic waves and their propagation, derivation of wave equation, reflection and refraction methods, field acquisition techniques, reflection and refraction digital data processing, sonic logging, shear wave techniques and their applications. Field trip.
Prerequisites: EGP211, PHY202, MATH202

EGP 331: Geo-electric Exploration
Electrical properties of rocks and minerals, field instrumentation of data acquisition, arrays, A.C. and D.C. resistivity measurement systems. Self-potential induced polarization, and telluric. Data presentation and their quantitative and qualitative analyses. Field examples of exploration for groundwater and mineral resources. Selected field studies and field trips.
Prerequisites: PHY202, EGP211

EGP 341: Magnetic and Gravity Exploration
Magnetization effects, elements of magnetic field, geomagnetic field, diurnal variations of magnetic field, induced and remnant magnetization, magnetic anomalies of deep buried bodies, instruments for geomagnetic measurements and their calibration. Various magnetic surveys, data reduction, normal and diurnal corrections. Gravitational field, field intensity measurements, instruments and survey methods etc.
Prerequisites: EGP211, PHY202, MATH202

EGP 371: Seismic Exploration for Petroleum
Theory of seismic methods, geometry of seismic wave paths, field equipment and instruments, land and marine seismic explorations, improvement in data treatments, analysis of seismic sections and their correlation case histories of hydrocarbon reservoir explorations.
Prerequisites: EGP 211

EGP 372: Earthquake Engineering
Magnitude and intensity of earthquake and mechanics of its occurrence. International seismic zones. Danger and seismic hazards. Groundwater motions and soils liquefaction during the ground shaking. Dynamics of the earthquake-resistant construction and their main characteristics.
Prerequisites: EGP 211

EGP 399: Training in the Specialization
This course deals with training the students to become more familiar with geophysical survey using different geophysical techniques. Training in specialized companies in geophysics. Students had present a report about the scientific and practical information which they have obtained in this period of time. 30 days field trip.
Prerequisites: EGP321,331,333

EGP 408: Seminar
Series of scientific papers about selected topics showing the current trends of research and studies in the field of geophysics. Students will be assigned to study such material and prepare the report about the topic for presentation as lecturer using up-to-date techniques.
Prerequisites: EGP321,331,341

EGP 411: Vibratory System
Principles of vector algebra, Newton’s laws of motion, harmonic motions, general motion of three degrees of freedom of a free particle, dynamics of particles with respect to rotational axes. Effects of rotation of earth, Spherical pendulum.
Prerequisites: EGP321, MAT203, PHYS203

EGP 412: Linear Analysis System
Study of analog systems, Laplace transforms, Fourier transforms, emphasis on geophysical applications, and computer use.
Prerequisites: EGP321, MATH203

EGP 413: Seismology
Prerequisites: EGP321, 411,412

EGP 431: Electromagnetic Exploration
Principles of electromagnetic theory, mutual inductance, concurrence of electromagnetic fields, phase and amplitude relations, electromagnetic instruments, ground electromagnetic survey systems, time domain electromagnetic, telluric and magnetotelluric systems, airborne electromagnetic systems, electromagnetic field procedures, data processing and interpretation, field examples and field trips.
Prerequisites: PHY203,EGP331, EGP341

EGP 451: Borehole Geophysics
Principles of well logging. Self-potential, resistivity, sonic rays, density and neuron logs. Relationships between well measure-
ments and rock properties. Dip measurements of shale beds and
their problems. Interpretation of water and oil bearing beds.

**Prerequisites:**
EPS211, EGP211, ESR211

**EGP 471: Geophysical Applications**
Study of significance of shallow geophysical exploration meth-
ods in determining groundwater aquifers of different kinds and
the buried environmental targets. Exploration for oil and ores.
Determination of geologic structures.

**Prerequisites:**
EPS211, EGP211

**EGP 491: Geophysical Data Processing**
Discrete Fourier transform, fast Fourier transform, convolu-
tion, auto-correlation and cross-correlation, sampling theorem
(aliasing, truncation of analytic signal, Nyquist frequency), Z-
transforms, digital filters, 2-D Fourier transform, emphasis on
computer applications.

**Prerequisites:**
EGP341, 331, 321.

**EGP 499: B.Sc. Project**
This is a multidisciplinary design course that integrates funda-
mentals and design concepts in geological, geophysical explora-
tion. Students work in integrated teams consisting of students
from each of the disciplines. Multiple open-end design problems
in geophysical exploration and field development, including the
development of a prospect in an exploration play and a detailed
field survey, 21-day field trip.

**Prerequisites:**
EGP399, 408, 341

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### Professors

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Website: http://earthscience.kau.edu.sa

History:

The Department of Mineral Resources and Rocks was established in 1970 under the name of Department of Economic Geology within the framework of the Institute of Applied Geology.

Vision:

Commitment to reaching highest levels of performance in teaching and research.

Mission:

Offering technical assistance and consultations to organizations, companies, and citizens. Graduating qualified and experienced geologists to deal technically with rocks and mineral deposits and construct geologic maps.

Departmental Requirements:

To earn a degree in Mineral Resources & Rocks, students must complete a total of 136 credit hours distributed as follows:

- 56 credit hours of core EMR courses
- 37 hours of compulsory courses according to specialization.
### Department Requirements:

#### Department Core Courses: (Credit Hours 56)

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**Department of Mineral Resources and Rocks**
Course Descriptions:

EMR 201: Physical Geology
This course is designed to introduce the internal and external processes that operate within the Earth. Topics include: Relationship between the earth and the globe. Different spheres of the earth and its zones. Introductory notes about common minerals and different types of rocks. Magma generation and types, Volcanoes, Plate Tectonics, Earthquakes. External processes of the earth.

EMR 202: Introduction to Mineralogy
Topics include: Atoms and ions – Types of chemical Bonds – Introduction to crystal chemistry – Definition and characteristics of crystals – Crystal symmetry (axis of symmetry, plane of symmetry, center of symmetry, complete symmetry formula) - crystallographic axes and axial angles – Intercepts, parameters and Miller indices – Cubic system (Hexoctahedral class) – Tetragonal system.

EMR 211: Optical Mineralogy

Prerequisites: EMR 202

EMR 231: Economic Geology
An introduction to economic geology and the main aspects of mineral resources and their utilities.

1. The course includes identification of materials (metallic and non-metallic minerals, gemstones and dimensional stones).
2. Definitions of common terms used by economic geologists, and the classifications of economic ores.

Prerequisites: EMR 202

EMR 241: Principle of Geochemistry
Atoms – Elements – Periodic Table
2. The chemical composition of earth materials and its relation to universe composition
3. Physiochemical basis controlling abundance and distribution of elements in earth
4. Introduction of geochemistry of igneous, sedimentary and metamorphic rocks, hydrosphere and atmosphere
5. Geochemical cycle.

Prerequisites: EMR 201, CHEM 101

EMR 301: Systematic Mineralogy

Prerequisites: EMR 211 CHEM 101

EMR 302: Volcanology

Prerequisites: EMR 304

EMR 311: Ore Mineralogy
Classification of ore minerals and their physical and chemical properties. Stability of ore minerals and their types of equilibrium in binary and ternary systems for some oxides, sulfides, and sulfate salts. Solid solutions and segregation. Ore minerals in aqueous medium; old and recent mineralizing fluids.

Prerequisites: EMR 231

EMR 331: Geology of Mineral Deposits

Prerequisites: EMR 231 EMR 241

EMR 332: Ore Microscopy

Prerequisites: EMR 331

EMR 334: Geochemical Techniques
Instrumental techniques for mineral identification such as X-ray diffraction, differential thermal analysis, infrared. Staining techniques for microscopic identification. Instrumental methods for determination of the chemical composition including major and trace elements of the geological samples such as atomic absorption, X-ray fluorescence, radiometric and mass spectrometric methods. Correlation between the various analytical methods.

Prerequisites: EMR 241
Department of
Mineral Resources and Rocks

EMR 399: Training in Specialization
Field training to recognize mineral deposits, their occurrence in nature and their methods of study. Three weeks training in a specialized company as required by the department.
Prerequisites: ESR 301 EMR 332

EMR 408: Seminar
Series of lectures on selected topics representing modern orientations and studies in the fields of mineral resources, minerals, rocks and geochemistry. Each student will be assigned a topic of current geological interest on which he will be expected to prepare and present a talk using modern techniques.
Prerequisites: EMR 399

EMR 421: Igneous Petrology
Prerequisites: EMR 304

EMR 421: Advanced Metamorphic Petrology
Prerequisites: EMR 304

EMR 431: Geology of the Kingdom
Groups and rock formations of the Arabian Shield and the sedimentary cover and basis of their classification. Chemical composition and isotopic age of rock units of the shield. The implication of the different orogenic cycles and geologic events on the rocks of the shield and the sedimentary cover such as regional metamorphism, deformation, faulting and igneous plutonic activity accompanying them.
Prerequisites: ESR 301

EMR 432: Industrial Minerals and Rocks
The course is concerned with the main properties of gemstones, industrial minerals and rocks, their classification according to genesis and their overall economic aspects. Occurrence of industrial minerals and rocks in different geologic environment and mineralogical composition will be also handled. Preparation of industrial mineral and rocks and their suitability for the different uses in addition to economic considerations.
Prerequisites: EMR 231

EMR 433: Mining Geology
Different definitions in this domain. Preparation of subsurface maps, cross-sections and composite maps. Surface mining methods including placer deposits, open pit, solution mining using water pressure. Subsurface mining methods including room and pillar, cut and fill, shrinkage stooping, block caving, mineralogical and structural bottoming of ore. Support, drilling, and ventilation in mines. Laboratory study.
Prerequisites: EMR 231

EMR 434: Mineral Deposits of the Kingdom
Metallic ores, minerals, and industrial rocks in Saudi Arabia, their classification, their occurrence in the Arabian and sedimentary cover. Geological and structural setting for each occurrence of mineralization separately, its connection to similar sites, relation of mineralization to host rocks, changes in the mineralization and host rocks during the various geologic ages. Mineralogical and geochemical characteristic.
Prerequisites: EMR 431

EMR 441: Isotope Geology
Prerequisites: EMR 241

EMR 442: Geochemistry of Mineral Deposits
Geochemical factors affecting the distribution and concentration of elements of economic importance in the various rocks. Geochemistry of mineralizing fluids and their reactions with surrounding rocks. Geochemical conditions favorable for deposition of minerals of economic importance. Study of the various geochemical environments and their properties in formation of mineral deposits.
Prerequisites: EMR 332

EMR 443: Geological and Geochemical Exploration
Introduction to the principles of geological and geochemical exploration. Methods of using geological guides in exploration of various mineral deposits. Use of technical and geochemical calculations in geochemical exploration of ore and mineral deposits. Methods of planning and execution of complete exploration programs and examples. Interpretation of geochemical data and preparation of geological and geochemical exploration reports.
Prerequisites: EMR 231 EMR 241

EMR 499: B. Sc. Project
Each student will be assigned a field and laboratory project for at least three weeks. Students must submit a final scientific report and present a talk under the supervision of a staff member of the department. Training in a specialized company.
Prerequisites: EMR 399
### Professors

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<th>Country</th>
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<tr>
<td>Abdel-Khader Mohamed Moghazi</td>
<td>Geochemistry</td>
<td>1995 Alexandria University, Egypt</td>
<td>Egypt</td>
<td><a href="mailto:amoghazi@kau.edu.sa">amoghazi@kau.edu.sa</a></td>
<td><a href="http://amoghazi.kau.edu.sa">http://amoghazi.kau.edu.sa</a></td>
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<tr>
<td>Essam Yahia Al-filali</td>
<td>Petrology</td>
<td>1987 Manchester University, U.K.</td>
<td></td>
<td><a href="mailto:ealfilali@kau.edu.sa">ealfilali@kau.edu.sa</a></td>
<td><a href="http://ealfilali.kau.edu.sa">http://ealfilali.kau.edu.sa</a></td>
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<tr>
<td>Abdel-monem A. El-Dougdoug</td>
<td>Ore Geology &amp; Exploration</td>
<td>1984 Minnesota University, U.S.A.</td>
<td>U.S.A.</td>
<td><a href="mailto:aeldougdoug@kau.edu.sa">aeldougdoug@kau.edu.sa</a></td>
<td><a href="http://aeldougdoug.kau.edu.sa">http://aeldougdoug.kau.edu.sa</a></td>
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<tr>
<td>Abdul-aziz Abdul-Malik Radain</td>
<td>Petrology</td>
<td>1978 Western Ontario, Canada</td>
<td>Canada</td>
<td><a href="mailto:amoghazi@kau.edu.sa">amoghazi@kau.edu.sa</a></td>
<td><a href="http://amoghazi.kau.edu.sa">http://amoghazi.kau.edu.sa</a></td>
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<tr>
<td>Adel Abdullah Surour</td>
<td>Mineralogy</td>
<td>1993 Cairo University, Egypt</td>
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<td><a href="mailto:aeldougdoug@kau.edu.sa">aeldougdoug@kau.edu.sa</a></td>
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<td>Ali Abdel-Latif Masaed</td>
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<tr>
<td>Mohammed Rashad Moufti</td>
<td>Volcanology</td>
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<td>Talal Mustafa Qadhi</td>
<td>Economic Geology</td>
<td>1991 Abdul-aziz University, Saudi</td>
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### Associate Professors

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<td>Ahmed Ali Madani</td>
<td>Minerals/Petrology</td>
<td>2001 Cairo University, Egypt</td>
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<td><a href="mailto:amadani@kau.edu.sa">amadani@kau.edu.sa</a></td>
<td><a href="http://amadani.kau.edu.sa">http://amadani.kau.edu.sa</a></td>
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<tr>
<td>Asaad Mohammed Moufti</td>
<td>Geochemistry</td>
<td>1988 University of Strachclyde, UK</td>
<td>UK</td>
<td><a href="mailto:amoufti@kau.edu.sa">amoufti@kau.edu.sa</a></td>
<td><a href="http://amoufti.kau.edu.sa">http://amoufti.kau.edu.sa</a></td>
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<td>Hesham Abdo Harby</td>
<td>Economic Geology</td>
<td>1997 Univ. of Western Australia, Australia</td>
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<tr>
<td>Ahmed Hasan Mohamed</td>
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<td><a href="http://habdelnaby.kau.edu.sa">http://habdelnaby.kau.edu.sa</a></td>
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<tr>
<td>Yahia Hassan Dawood</td>
<td>Isotope/Geochemistry</td>
<td>1998 Ain Shams University, Egypt</td>
<td>Egypt</td>
<td><a href="mailto:ydawood@kau.edu.sa">ydawood@kau.edu.sa</a></td>
<td><a href="http://ydawood.kau.edu.sa">http://ydawood.kau.edu.sa</a></td>
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### Lecturer

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<td>Ismail Mohammed Abugahayar</td>
<td>Minerals/Petrology</td>
<td>1978 King Abdul-aziz, Saudi Arabia</td>
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<td><a href="mailto:iabugahayar@kau.edu.sa">iabugahayar@kau.edu.sa</a></td>
<td><a href="http://iabugahayar.kau.edu.sa">http://iabugahayar.kau.edu.sa</a></td>
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**Faculty of Earth Science**

**Department of Mineral Resources and Rocks**

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**FACULTY MEMBERS**
Department of
Petroleum Geology and Sedimentology

Department Contact:
Chairman’s Office
Tel: 6951919     Ext. 51919     Fax: 6952095     Ext. 52095
E-mail  : ear-eps@kau.edu.sa
website  : http://earthscience.kau.edu.sa

History:
The department is an applied division of the Faculty of Earth Sciences. It was established in 1987 with the merger of the department of Petroleum Geology and the department of Sedimentology, Stratigraphy, and Paleontology (both established in 1978).

Vision:
Sustain and develop its identity as a research and teaching body of the highest quality. Provide an outstanding educational environment, supporting study across a broad range of academic disciplines and serving major industrial professions. Graduate students equipped with high personal and professional achievements.

Mission:
To graduate students with a high level knowledge of industrial technology, and its relevance to cultural and commercial contexts. To enhance employment, providing direct evidence of technical, problem-solving, research, and communications ability.

Departmental Requirements:
To earn a degree in Petroleum Geology & Sedimentology, students must complete a total of 136 credit hours distributed as follows:
• 47 credit hours of departmental core courses
• 40 credit hours of compulsory EPS courses according to specialization.
Department Requirements:

Department Core Courses: (Credit Hours 47)

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Course Descriptions:

**EPS 211: Sedimentation and Stratigraphy**
Sedimentary processes and sedimentary environments. Textures and structures of the sediments and sedimentary rocks. Stratigraphic description of the sedimentary facies. Stratigraphic columnar section, correlation and classification. **Prerequisites:** EMR 201

**EPS 212: Historical Geology**
Chronological classification of the most important sedimentary basins of the world. Evolution of configuration of the earth’s crust in terms of plate tectonics, and type-sections of the major time-stratigraphic units. Evolution of the principal forms of life through geological time. **Prerequisites:** EPS 211, EPS 231
EPS 399: Training in the Specialization
Students will be trained for two months during summer period; they will apply various tasks, related to petroleum geology in one of the national oil companies. Duties include most of the surface geological tasks and lab training. The subsurface geological analyses include the analysis of drilling, cutting, well long evaluation, interpretation of seismic cross sections, and the methods of reservoir development and production operations.

Prerequisites: EPS321,341, 342

EPS 408: Seminar
The focus is on a series of talks on selected topics representing the latest orientations and studies in the fields of petroleum geology and sedimentology. Every student will be assigned a topic relevant to the current geological interest on which he will be expected to prepare and present a talk using up to date techniques.

Prerequisites: EPS-399, 343

EPS 411: Palaeo-Sedimentary Environments
Environment and facies recognition. Physical, chemical and biological parameters controlling the environment and the facies. Recent environments as a key to identify the ancient counterparts, including continental, transitional and marine environments.

Prerequisites: EMR408, EPS 321

EPS 421: Clastic Sedimentary Petrology
Origin of clastic sedimentary rocks. Classification and mineralogical composition. Petrographic features and diagenetic processes for different types of clastic rocks (one day field excursion around Jeddah in working days).

Prerequisites: EMR 304

EPS 441: Petroleum Development Geology
Systems of units and the basic calculations required for the petroleum geologists. Introducing some computer software relevant to petroleum development calculations. Subsurface pressures and abnormally high pressures. Rock properties including lithology, porosity, permeability and compressibility. Fluid properties and phase behavior. Mutual properties of rocks and fluids including relative permeability and capillary pressure.

Prerequisites: EPS 343

EPS 442: Middle East Oil and Gas Fields

Prerequisites: EMR 431, EPS441

EPS 443: Properties of Petroleum Reservoirs
Overview of reservoirs rock, fluid, and rock-fluid properties. Fluid flow through porous media and Darcy’s law. Material balance calculations for oil and gas reservoirs. Basic concepts of petroleum reservoir simulation. A closer look at the simulation
process. Data gathering and input for reservoir simulators. Analysis of simulation results. Term Project.

**Prerequisites:** EPS 441

**EPS 444: Seismic Stratigraphy**
Seismic reflection principles, application of seismic parameters and attributes to determine the depositional environment and fluid contents of the strata with emphasis on applied general principles of analysis of seismic attributes.

**Prerequisites:** EPS 341, EGP371

**EPS 445: Sequence Stratigraphy and Basin Analysis**

The sequence stratigraphic model. Sequence boundaries, diagenesis related to unconformities, incised valleys, slope fans, basin floor fans and prograding complexes. Incised valley fills.

**Prerequisites:** EPS 211

**EPS 499: B.Sc. Project**
As a partial fulfillment of the B.Sc. degree in Petroleum Geology and Sedimentology, every student is asked to study one of the national oil or gas fields or to study the sedimentary succession that has a major impact on petroleum generation, migration, and accumulation. A full report must be written and findings must be presented.

**Prerequisites:** EPS 408, 441

---

### Professors

- **Mahmoud Ahmed Aref**
  Stratigraphy/Sedimentation
  1993 Cairo University, Egypt
  maref@kau.edu.sa
  http://maref.kau.edu.sa/

- **Mohammed Hussain Basyoni**
  Stratigraphy/Sedimentation
  1984 East Anglia University, U.K.
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### Associate Professors

- **Hassan Sulaiman Naji**
  Petroleum Reservoirs
  1993 Colorado School of Mines, U.S.A
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- **Mohamed Yousef Bakr**
  Petroleum Geochemistry
  1984 Hokkaido, Japan
  mbakr@kau.edu.sa
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- **Rushdi Jamal Taj**
  Stratigraphy/Sedimentation
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### Assistant Professors

- **Abdul-Rahman Mohammed Alisaa**
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  2003 Ohio State Univ, U.S.A
  aalissa@kau.edu.sa
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- **Mohammed Hamed Mandourah**
  Paleontology/Hist.Geology
  1984 Bristol University, U.K.
  mmmandourah@kau.edu.sa
  http://mmmandourah.kau.edu.sa/

### Lecturer

- **Khalid A. Bagabas**
  Microfossils
  1986 King Abdul-Aziz, Saudi Arabia
  kbagabas@kau.edu.sa
  http://kbagabas.kau.edu.sa
History:
The Department of Structural Geology was established in 1978 as one of the departments in the Faculty of Earth Sciences. It was later renamed the Department of Structural Geology and Remote Sensing.

Vision:
Commitment to deal with the geologic and environmental conditions as envisaged from aerial photographs and satellite images.

Mission:
Qualifying students in the fields of structural geology, photogeology, and Remote Sensing and GIS techniques. Applications of remote sensing and GIS techniques in different areas of earth Sciences. The utilization of Remote Sensing and GIS techniques in structural geology and in solving some environmental problems and in urban planning.

Departmental Requirements:
To earn a degree in Structural Geology & Remote Sensing, students must complete a total of 136 credit hours distributed as follows:
- 47 credit hours of departmental core courses
- 34 credit hours of compulsory ESR courses according to specialization.
### Department Requirements:
**Department Core Courses:** (Credit Hours 47)

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**Total:** 34 19 9 6

### Course Descriptions:

**ESR 211: Introduction to Structural Geology**
Definition and scope of structural geology. Classification and uses of primary structures. Mechanical behavior of rocks during deformation; folding, faulting and jointing. Planar and linear structures. Emplacement of igneous bodies. Introduction to deformation of lithosphere.

**Prerequisites:** EMR 201

**ESR 231: Introduction Photogeology and Geomorphology**

**Prerequisites:** EMR 201
ESR 301: Field Geology
Recognition and description of rocks in the field and their plotting in geologic maps. The use of compass and aerial photographs in location, measuring stratigraphic sections and geologic parameters. Preparation of geologic maps by mapping a small area and training the students on how to write a geologic report.
Prerequisites: ESR 211

ESR 302: Geologic Surveying
Prerequisites: ESR211, ESR231

ESR 303: Geological Mapping
The course covers in detail the basic techniques of geologic mapping. It considers in brief the standard scales of geologic maps and the used universal and local coordinate systems. Topics include: procedures followed in the different mapping techniques, preparation of base maps, steps of field work and construction of geological cross-sections, use of recent equipments and techniques to facilitate the process of mapping.
Prerequisites: ESR 301

ESR 301: Analysis of Directional Data
The artesian/stereographic analysis of directional data, classification and symmetry, calculation of mean vector and fold axes. Correction of measurement of elementary data. Applications of descriptive geometry in solving some of the faulting and fault intersection problems.
Prerequisites: ESR 301

ESR 313: Fracture Analysis
Analysis and classification of fracture data. The effect of fracture on the physical and mechanical behavior of rocks. The relationships between shear planes and stress axes. The effect of external agents such as pressure and temperature on the mechanical behavior of rocks.
Prerequisites: ESR 301

ESR 321: Analysis of Map Data
Converting maps into digital forms. The use of computer applications in documenting and processing map data and preparation of compiled maps. Uses of compiled maps for geological mapping and exploration of natural resources. Geographic Information Systems (GIS) and their applications in earth sciences.
Prerequisites: ESR 301

ESR 331: Introduction to Photogrammetry
Prerequisites: ESR 231

ESR 332: Photogeology
Prerequisites: ESR 301

ESR 399: Training in the Specialization
Prerequisites: ESR301, ESR331

ESR 401: Selected Topic in Structural Geology & Remote Sensing
A research study on a topic in structural geology or Remote Sensing, which conforms to the needs and requirements of the student’s field of specialization.
Prerequisites: ESR 399

ESR 408: Seminar
A series of scientific seminars on selected topics that represent modern research fields in structural geology and remote sensing. Each student will be assigned a research topic on which he will be expected to prepare and present a talk using up to date techniques.
Prerequisites: ESR 399

ESR 411: Advanced Structural Geology
Prerequisites: ESR 399

ESR 412: Geotectonics
Theory of continental drift, sea floor spreading paleomagnetism, plate tectonic theory. Orogenic and related processes. Regional depressions.
Prerequisites: ESR 211

ESR 421: Principles of Remote Sensing
Basic concepts of Remote Sensing including electromagnetic spectrum and the energy interactions. Resolutions in satellite images, space platforms and sensors. Acquisition of satellite data. Rectification of digital satellite images, processing, analysis and interpretation of data.
Prerequisites: ESR231, ESR331
ESR 423: Computer Processing of Satellite Data
Remote sensing systems characteristic and orbits. Processing of satellite images in geological applications. Pre-processing treatments comparison and rectification of digital scenes, computer classification of satellites digital data and construction of thematic maps.
Prerequisites: ESR 301/ESR 421

ESR 424: Remote Sensing in Environmental Geology
Aspects dealing with engineering geology and environment. Remote sensing view.
Prerequisites: EEG201, ESR301

ESR 431: Geomorphology
Methods and objectives of geomorphologic studies. Discussion on various aspects of geomorphologic features and methods of control. Analysis of earth shaping processes, slope and deformation of drainage systems, types of peninsulas. Eolian landforms, arid land cycle, and coastal shaping earth processes, Volcanic and glacial landforms.
Prerequisites: ESR 301

ESR 499: B.Sc. Project
Students will perform a detailed structural study of a selected area; draw a detailed structural map in which small-scale structural elements would be studied; delineate structural patterns and represent them in 3-D diagrams and analyze them stereographically, compare and relate them to regional structural pattern. Students will also be required to explain the chronological relationships between stratigraphy and structural events...
Prerequisites: ESR 301/ESR 399

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E-mail: ear.ehg@kau.edu.sa
website: http://earthscience.kau.edu.sa

History:

The Hydrogeology department was established in 1970 as an independent department in the center of Applied Geology for graduate studies offering B.Sc, Higher Diploma, M.Sc, and PhD. Degrees. The center joined King Abdul-Aziz University in 1975 to become the Institute of Applied Geology and subsequently the Faculty of Earth Sciences.

Vision:

The main objective of the Department of Hydrogeology is to provide students with the latest developments in hydrogeology assisted by integration with modern technology such as remote sensing, GIS, geophysics, computer programming and statistics.

Mission:

Graduating highly qualified students and improving their skills in subjects related to the field of Hydrogeology to make more competitive in the job market. Contributing towards the development of Saudi Arabia. Becoming a notable department in research and consultations.

Departmental Requirements:

To earn a degree in Hydro-Geology, students must complete a total of 136 credit hours distributed as follows:

- 48 credit hours of departmental core courses
- 39 credit hours of compulsory EPS courses according to specialization.
## Department Requirements:

### Department Core Courses: (Credit Hours 48)

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**Total:** 39 25 8 6

## Course Descriptions:

**EHG 201: Data Processing and Statistical Geology**
Definition of terms, measure of central tendency, measure of dispersion, linear regression, time series, preparation of geological data, data processing utilizing computer software.

**Prerequisites:** MATH101, EMR 201

**EHG 202: Aspects of Scientific Research**
General principles and procedure used in scientific research including defining the problem and how to solve it through the necessary studies. Analysis and interpretation of laboratory tests, report writing. More emphasis will be directed toward how to write a research proposal and a research paper.
Department of Hydrogeology

EHG 311: Applied Hydrology
Hydrologic Cycle - Precipitation - Surface Runoff – Hydrographic analysis and its components – Flood Prediction – Field trip for one day in Jeddah District.
Prerequisites: MATH101, EMR201

EHG 312: Elements of Flow Through Porous Media
Concept of porous media, hydraulics and engineering properties, laboratory and field measurement, and methods. Darcy law and application, steam-flow.
Prerequisites: MAT101, EMR201

EHG 313: Groundwater Geology
Groundwater occurrence in igneous, metamorphic and sedimentary rocks-Influence of the geological structure on groundwater flow- Aquifers types and their characteristics.
Prerequisites: ESR 211, EHG 311

EHG 314: Introduction to Groundwater Hydrochemistry
Physical and chemical characteristics of water, water types, water sources, salinity, chemical composition of groundwater, general processes affecting the water quality, representing the water analysis of data graphically (manually and by using computer programs
Prerequisites: CHEM101, EMR 241

EHG 315: Groundwater Hydraulics
Basic definition, steady and unsteady state flow. Groundwater flow towards wells. Pumping tests and evaluating their data using various techniques. Recovery tests. Well interfering. This course includes a 3-day field trip
Prerequisites: EHG 312

EHG 316: Introduction to Hydrogeology
Prerequisites: MATH101, ESR211

EHG 399: Training in Specialization
Methods of field investigation of groundwater resources, well inventory, chemical and physical properties of groundwater. Measurements of surface water discharge. Soil infiltration, porosity and permeability. Pumping and recovery tests. Writing scientific report and drawing hydro geological maps for the studied area (field trip 21 days).
Prerequisites: EHG 315/EGP471

EHG 401: Statistical Geology
The development of statistical methods useful in geology, including principal concepts, descriptive statistics, multiple regression, random variables, probability distributions, and estimation and testing hypotheses.
Prerequisites: EHG 201

EHG 408: Seminar
Series of lectures on selected topics representing modern orientations and studies in the field of hydrogeology. Each student will be assigned a topic of current hydro geological interest on which he will be expected to prepare and present a talk using modern techniques.
Prerequisites: DEP. APPROVAL

EHG 411: Technology of Water Wells
Determining the suitable well location, well design characteristics, well completion and well development, large diameter wells, well screens types and gravel packs, well efficiency and well losses, well maintenance and rehabilitation.
Prerequisites: EHG 315

EHG 412: Management and Planning of Groundwater Resources
Groundwater planning and management, definition of management and planning, water systems, concepts and fields of water management, data needed for management and its elements, planning principles and steps applied to groundwater resources, optimization analysis, optimal management and sensitivity analysis, cost-benefit analysis, multi-objective project analysis, financial and economic analysis.
Prerequisites: EHG 315

EHG 413: Hydrogeology of Saudi Arabia
Introduction to hydrology of Saudi Arabia, factors controlling the natural resources types, aquifers, hydro geological classification of sedimentary aquifers and their characters, water problems, case studies.
Prerequisites: EHG 399

EHG 414: Isotope Hydrology
Atomic Structure, radiation activity in elements and measurements, isotopes types, environmental isotopes, application of environmental isotopes in groundwater.
Prerequisites: EHG 314

EHG 415: Groundwater Pollution
Introduction and definition of pollution, Water contamination sources (surface – subsurface). This includes types of contamination, characteristics of contamination sources, radioactive contamination, trace and heavy metals contamination, solute plume shape in different media, watching of contamination, numerical and analytical methods of solute transport, contamination remediation and control, case studies.
Prerequisites: CHEM101, EHG314

EHG 418: Environmental Hydrology
The water cycle and its different elements and the importance of hydrology to society and the environment in which we live, and a statistical analysis of hydrological data. Mobile mechanical sediment rivers and the calculation methods of sedimentation rate. Analysis of the curves of water, the risk of flooding and ways to avoid. This course contains the environmental concepts and its related basic fundamentals.
Prerequisites: EEG 201
EHG 416: Introduction to Groundwater Modeling

Prerequisites: EHG 315

EHG 499: B.Sc. Project
Each student is required to conduct outﬁeld study of a certain area for a period of at least ten days supervised by the department staff. At the end of the project, students must submit a report and give a short lecture in which they explain the details of their study. The project encompasses two essential parts: ﬁeld and lab work.

Prerequisites:

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