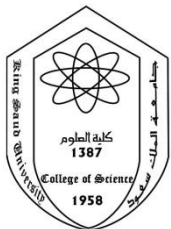


KINGDOM OF SAUDI ARABIA



**MINISTRY OF HIGHER EDUCATION
KING SAUD UNIVERSITY
COLLEGE OF SCIENCE
DEPARTMENT OF GEOLOGY AND GEOPHYSICS**

GEOLOGY AND GEOPHYSICS

DEPARTMENT HANDBOOK

2010

PREFACE

The King Saud University was established in 1957 and the Department of Geology in its College of Science was founded in 1958 (1378 H). This closely corroborated to the International Geophysical Year observed globally in 1957. The Department successfully completed Golden Jubilee in 2008, when, it was expanded to incorporate the Geophysics teaching curriculum and renamed as the Department of Geology and Geophysics. This could be achieved by diversifying the teaching and research programs at the University in order to cater to the needs for an ever increasing number of qualified earth science graduates in the Kingdom.

The Department of Geology and Geophysics is housed in a three-storied building in the Science College (building-4), in the main compass of King Saud University. It is recognized as one of the distinguished science departments in the Arab World because of its teaching standard, wide range of course options offered in the disciplines of geosciences, intense laboratory and field training imparted to students, focus on cultivating the student capability for independent thinking and research, using modern educational tools for classroom teaching, well equipped laboratories and museum, maintenance of a reasonably good teacher-student ratio, specialist laboratories for Petroleum Geology, Geophysics, Hydrogeology, GIS and the Seismic Studies Centre for seismic monitoring at national level in Saudi Arabia and seismological research studies.

The Department is enriched by its scientific interaction with other academic institutions and agencies in Saudi Arabia, including the Saudi Geological Survey, King Abdulaziz City for Science and Technology, ARAMCO etc. and also by means of academic exchanges with internationally renowned research laboratories in countries like U.S.A., Germany and U.K. The Department of Geology and Geophysics has a group of recognized staff with broad specialties in different geological and geophysical branches. The majority of them got their Ph.D. degrees from high ranked universities in USA, UK, Germany and France. The department staff is assisted with staff assistants and non-academic technicians. Recently and with the support of the new University policy to strengthen the Academic departments by hiring new full time faculty; and continuing and improving support of existing faculty.

The department follows a generous policy in encouraging sabbatical and study leave as well as other scientific visits to its faculty. All such measures help sustaining a good academic and research environment in the Department. The department has recently started taking out an Earth Science journal -- Arabian Journal of Geosciences, published by the Springer (Germany). The journal has already been well acclaimed in the scientific world.

Dr. Saad M. Al Mogren

Chairman, Department of Geology and Geophysics

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DEPARTMENTAL CHAIRMEN SINCE 1959

Dr. Ibrahim A. Farag	1959-1961
Dr. Khouda Mohamed	1962-1964
Dr. Hamed M. Al Badry	1965-1967
Dr. Ibrahim A. Farag	1967-1973
Dr. Abdullah A. Alhumdan	1974-1976
Dr. Taleb M. S. Obeid	1976-1978
Dr. Abdalmalek A. Alkhayal	1978-1980
Dr. Fayez Sh. Anan	1980-1982
Dr. Abdalmalek A. Alkhayal	1982-1986
Dr. Ali A. Al Furaih	1986-1988
Dr. Mohamed A. Meshref	1988-1990
Dr. Ahmed A. Al Mohandes	1990-1992
Dr. Abdalmalek A. Alkhayal	1992-1997
Dr. Mohamed E. Al Dabbagh	1997-2001
Dr. Abdulaziz M. Al Bassam	2001-2003
Dr. Nasser S. Al Araify	2003-2007
Dr. Abdullah M. Al Amri	2007-2010
Dr. Saad M. Al Mogren	2010-.....

ACADEMIC PROGRAMS OFFERED

The Department offers two undergraduate programs leading to B.Sc. degrees in Geology and Geophysics as well as two postgraduate programs leading to M.Sc. in Geology and Geophysics. Details of the course modules for these programs are described in this handbook.

MISSION

To provide basic geological, geophysical and hydrogeological concepts, skills and creative thinking within a high caliber environment that provide society with knowledge and trained personnel and produces competitive graduates capable of meeting the educational and developmental needs of the Kingdom of Saudi Arabia in all domains relevant to Geology, Geophysics and Hydrogeology and its applications.

VISION

To be a leader in fields of Geology, Geophysics and Hydrogeology, their applications and culture to contribute to building the knowledge society.

ACADEMIC GOALS OF THE DEPARTMENT

1. To develop qualified and skilled manpower in the fields of Geology, Geophysics, and Hydrogeology at undergraduate level and also to train specialist Postgraduates in these fields.
2. Applied research in Earth Sciences, including hydrogeological studies focused on Saudi Arabia.
3. To operate Seismic Studies Centre for seismic monitoring as well as for seismological research studies in Saudi

Arabia.

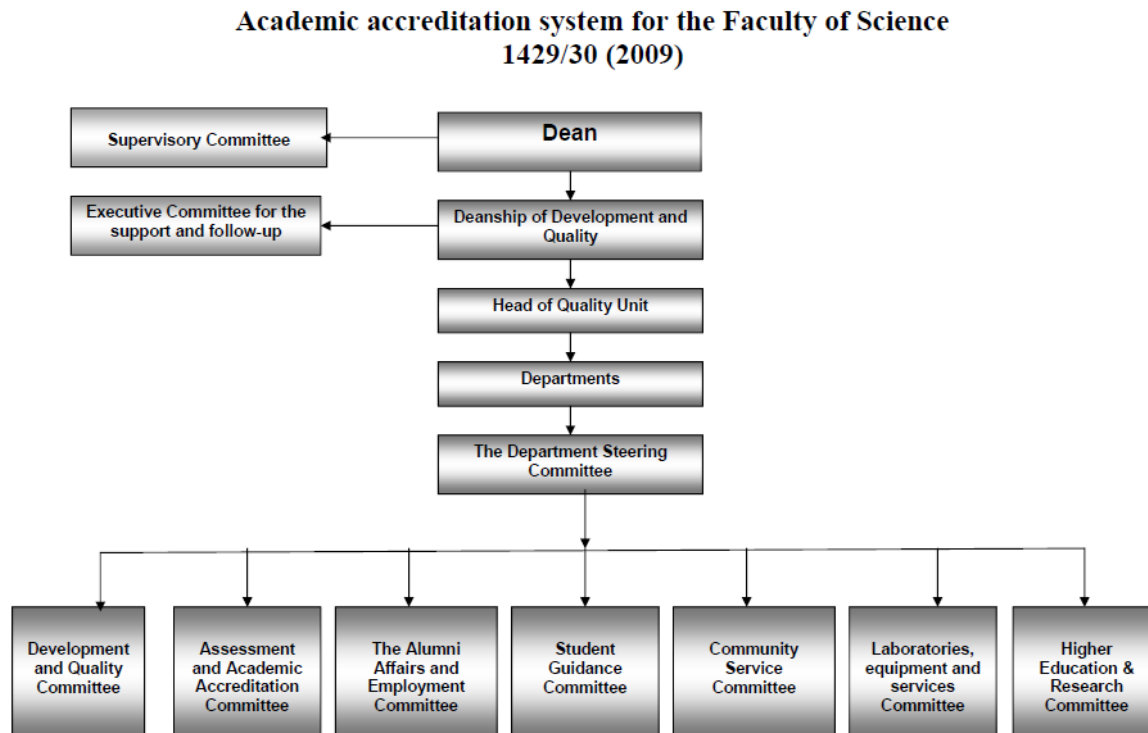
4. Writing and translating to Arabic language the main books in these fields.
5. Organizing scientific meetings, seminars, workshops and conferences in the field of Earth Sciences.

SCIENTIFIC SCALES AND BENCHMARKS

The benchmark department for both the Geology and Geophysics programs will be the Department of Geosciences in the University of Calgary, Canada.

Academic accreditation will be sought from the ASIIN e.V. , Akkreditierungsagentur für Studiengänge der Ingenieurwissenschaften, der Informatik, der Naturwissenschaften und der Mathematik e.V., (Accreditation Agency for Degree Programmes in Engineering, Informatics, the Natural Sciences and Mathematics), Germany.

ACADEMIC ACCREDITATION COMMITTEES



MAIN FIELDS OF EMPLOYMENTS

1. Ministry of Petroleum and Mineral Resources, KSA.
2. Ministry of Agriculture, KSA.
3. Mineral and Oil Companies.
4. ARAMCO and other overseas companies operating for petroleum exploration in the Kingdom.
5. Engineering Companies.

6. Civil Defense, KSA.
7. Military Survey and Meteorological Agencies, KSA.
8. Private Sector companies e.g. Cement and Ceramic Companies and Agriculture Development Companies.
9. Research agencies like KACST in Riyadh.
10. Teaching departments at the Universities Community Colleges and High Schools in the Kingdom.

PROGRAM COORDINATOR AND ACADEMIC GUIDANCE

- **Geology Program:**

Program Coordinator	Contact	Academic Guidance	Contact
Dr. Osama M. Kaoud Kassem	E-mail: okassem@ksu.edu.sa Office Phone: 4676351 Office Location: AB 64 Address: P.O Box. 2455, Riyadh , 11451, Saudi Arabia Fax : 966 1 4673662	Dr. Mohamed N. Al-Sabrouty	E-mail: sabrouty@ksu.edu.sa Office Phone: 4676213 Office Location: 2B 124 Address: P.O Box. 2455, Riyadh , 11451, Saudi Arabia Fax : 966 1 4673662

- **Geophysics Program:**

Program Coordinator	Contact	Academic Guidance	Contact
Prof. Hesham M. Al-Araby	E-mail: elarabi@ksu.edu.sa Office Phone: 4676208 Office Location: 2B 132 Address: P.O Box. 2455, Riyadh , 11451, Saudi Arabia Fax : 966 1 4673662	Prof. El- Khedr H. Ibrahim	E-mail: eibrahim@ksu.edu.sa Office Phone: 4676244 Office Location: 1B 52 Address: P.O Box. 2455, Riyadh , 11451, Saudi Arabia Fax : 966 1 4673662

MAIN SCIENTIFIC AWARDS

Prof. Abdullah M. Al-Amri, the Chairman of the Geology and Geophysics Department is a Prize holder of Arab Admirable Achievers Award, Abha City Prize for Scientific Contributions, Golden Distinguished Researcher Award, KACST, and AL-Maraee Prize for Scientific Innovation

STUDY SYSTEM AT THE COLLEGE OF SCIENCES

Study at the College of Sciences has been moving according to the following:

1. The school year is mainly two regular semesters and a summer one, if it is available.
2. The academic level is an indication of the level. The number of levels to graduate is at least eight levels according to the study plan approved.
3. The term of the level is a full semester (not less than 15 weeks) and this term does not include the periods of registration and final exams.
4. The summer semester period is not less than eight weeks doubled in time allocated for teaching each course.
5. A number of courses (subjects) are taught during the academic level according to the program of each specialty in the different departments.
6. Students have to study 136 class units (credit hours) to obtain a bachelor's degree as follows:
 - A. The student studies a number of 31 class units during the preparatory year (two semesters in one academic year).
 - B. The student studies 97 class units of study (optional + mandatory) at program of specialization in various college departments throughout the six semesters following the preparatory year (beginning with the third semester).
 - C. University Requirements: The student selects 8 class units of the requirements of the university out of 22 optional course units during the period of study at the college.
- 7 - The student chooses the specialty department before the end of the preparatory year according to the conditions set by each department.

1. The New Academic System (e-Register)

Registration is the cornerstone of the academic system, the center of the educational process, and the first step to start university life. The new academic system (e-Register) gives new students the following opportunities:

1. To create an e-mail through the site of Deanship of Electronic Transactions and Communications

<http://www.ksu.edu.sa/sites/KSUArabic/Deanships/Computer/Pages/>

2. To have an access to the academic system through the link: <http://edugate.ksu.edu.sa>

Then, he enters a user name and password obtained making his e-mail accounts.

3. Online Registration (registration, adding, and dropping): a student can register -in person- from any place where he is during the registration, dropping, and addition period specified in the academic calendar. There is no need for the student to visit the college or department to do the following:

- A. Registration: Registration of courses and deciding on the number of hours required to study.
 - B. Adding and dropping: The applicant may drop and add courses during the first week of the class year. The study load does not have to be less or more than the course load allowed.
4. To view the course schedule of the college and the available/closed groups.
 5. To view the study schedule of the student and print it.
 6. To view the academic record and print a copy of it (so far unofficial).
 7. To view results of final exams as soon as done.
 8. To view the plan of study and courses that he passed and the ones he has to study.
 9. To know about penalties imposed on the student.
 10. To view the financial rewards.
 11. To make suggestions and write complaints.
 12. To write the academic performance evaluation of faculty members.
 13. To exchange electronic messages and change the password.
- * If there any problems while registering, please consult the college registration office (room 1 a 7 - Building 4).

2. Rules and Mechanisms for Registration of Courses

- **The study course** is a module that meets needs of the level specified in the approved plan of study in each specialty (program). The course has a number; code, title, and description according to the different departments (see the Department Manual Guide).
- **The study course** is divided into a set of theoretical lectures and practical lessons (study units) given weekly during the academic level.
- **The class unit** is a weekly theoretical lecture that is not less than fifty minutes, or a practical lesson which is not less than one hundred minutes.
- **The registration of courses** for all students is done automatically through the website <http://edugate.ksu.edu.sa>
- **Levels of study** vary in the number of units of stud, from 12 to 20, units of study for each level.
- **Courses are registered** automatically at the beginning of the following semester for the student's convenience. Then, he can modify the course schedule by adding or dropping.
- **The following table shows** the student's study load in proportion to the cumulative average:

GPA	2	2.5	3	3.5	4	4.5	5
Hours allowed for registration	14	15	16	17	18	19	20

- **Processes of dropping and adding** are done by the student electronically in the first week of the semester through accessing the gate of the academic system of the University Deanship of Admission and Registration (<http://edugate.ksu.edu.sa>)
- **No student has the right to register** a course without passing its Prerequisite course.
- **Students who have no difficulties** because of failure in the courses are registered in the courses of the level gradually beginning with the lower levels, according to the study plans approved.
- **Students who have study difficulties** are registered in courses that ensure their minimum study load in each semester taking into account the following points:
 - No conflict in the course study schedule.
 - Meet the previous requirements of the course or courses to be registered.

Calculating the average and cumulative GPA

Average and cumulative GPA is calculated every semester for the student automatically by the system. To know how to calculate the averages, you should follow the following steps:

Calculating the semester average:

GPA is calculated considering the following points:

1. Knowing the number of hours of courses.
2. knowing the mark obtained in each course.
3. Knowing the corresponding grade of each mark.
4. Knowing the value of each grade.
5. Knowing points = number of hours of the course × value of the grade
6. Total points obtained in all courses of the semester.
7. Total number of hours registered in the semester.
8. Average is calculated every semester according to the following equation:

GPA=	$\frac{\text{Total points (Article 6)}}{\text{Number of hours of registration in the semester (item 7)}}$
------	-----------------------------------------------------------------------------------------------------------

The following table shows the percentage of grades, grade and value obtained by the student in each course, which is used to calculate the points:

Mark	Grade	Letter Grade	Value of Grade
From 95-100	Excellent +	A+	5.00
From 90 to less than 95	Excellent	A	4.75
From 85 to less than 90	Very Good+	B+	4.50
From 80 to less than 85	Very Good	B	4.00
From 75 to less than 80	Good +	C+	3.5
From 70 to less than 75	Good	C	3,00
From 65 to less than 70	Pass +	D+	2.5
From 60 to less than 65	Pass	D	2.00
Less than 60	Failure	E	1,00
Absence from lectures, 25% or more	Debarred	H	1,00

Calculating the average cumulative:

GPA semester rate is calculated as follows:

- 1) The grand total of points (for all semesters that have been studied.)
- 2) The grand total of credit hours (for all semesters that have been studied).
- 3) The cumulative average is calculated according to the following equation:

GPA =	$\frac{\text{total points total}}{\text{Grand total of credit hours}}$
-------	------------------------------------------------------------------------

Here is an example to calculate the grades above:

Calculating the grade of the first semester:

Course	Credit Hours	Mark	Grade	Grade Value	Points
Phys 101	4	67	D+	2.5	$4 \times 2,5 = 10$
Cheimis101	4	73	C	4	$4 \times 3 = 12$
Eng 121	3	77	C+	3.5	$3 \times 3,5 = 10,5$
Arab 101	2	81	B	4	$2 \times 4 = 8$
	13				40.5
GPA = total points ÷ hours of registration per semester = $40,5 \div 13 = 3,12$					

Calculating the grade of the second semester:

Course	Credit Hours	Mark	Grade	Grade Value	Points
Math 101	3	61	D	2	$3 \times 2 = 6$
Stat 101	3	73	C	3	$3 \times 3 = 9$
Computer Science 206	3	80	B	4	$3 \times 4 = 12$
Arab 103	3	88	B+	4.5	$3 \times 4,5 = 13,5$
Islam 101	2	92	A	4.75	$2 \times 4,75 = 9,5$
Eng 122	3	97	A+	5	$3 \times 5 = 15$
	17				65
GPA = total points ÷ hours of registration to chapter = $65 \div 17 = 3.82$					

Calculating the average cumulative:

$$\text{GPA} = \text{total points} \div \text{total hours of the semester} = 105,5 \div 29 = 3,64$$

Dropping and adding of a course:

- The process of dropping and adding is done through portal <http://edugate.ksu.edu.sa> during the first week of the semester but the number of credit hours registered has to be at least 12 hours.
- The student may drop only one course, five weeks at least, before the final exams begin due to an acceptable excuse to Dean of the College. The student has the right to apply for such an excuse at a maximum of four courses during the whole period of study at the college.

Attendance, postponement and dropping out of school:

- The student must be regular in attendance to achieve at least 75% of lectures and lab classes
- If any student has a percentage of absence of 25% or more in any course, this denies him access to the final exam of this course and his result is F.
- A student may apply for postponement of the study before the beginning of the semester for an excuse accepted by the College Board should. The postponement should not exceed two consecutive semesters or three semesters as a maximum duration while studying at the college.
- The University Council may, in case of necessity, exempt the previous provision.
- If a student drops out of the college for one semester without a request to postpone his registration, the University has the right to cross out his registration. The University Council has the right to do this for a less period of time.
- The student has no right to be a visiting student at another University of another if he drops out of the College of Sciences.

Visiting Student:

The visiting student is a student who studies some courses at another university or at a branch of the university to which he belongs without being transferred. The courses he studied are accredited according to the following regulations:

- The student has to have a class record (grade point average) for, at least, two semesters at his college before he applies for a visiting student.
- The student must obtain a prior approval of the Faculty for the student to allow him to study as visiting student who has to specify the courses that will be studied and the Faculty requirements to obtain a specific grade to offset the course. He is directed to study due to an official letter from the Deanship of Admission and Registration.
- He has to join a college or a university officially recognized.
- That the courses outside the university, under consideration by the student, must be equivalent in their description to the university courses and of no less units of study for any of the courses contained in the graduation requirements.
- The maximum of total units of study that can be calculated from outside the university is twenty percent (20%) of the total units to graduate at King Saud University.
- The courses that are studied by the visiting student are not included in the cumulative average. These courses are recorded in his academic record.
- The student must provide the Deanship of Admission and Registration with the results he obtained during the first two weeks of study in the semester following a period of study as a visitor. If not reported, at that period, his results are discarded for those semesters.

Dismissal from the university:

The student is dismissed from the university in the following cases:

- If he receives three consecutive warnings due to a cumulative average below a minimum of (2).
- The student may be given a fourth opportunity by the Council of the University based on the recommendation of the Faculty Council to raise his cumulative GPA by studying the courses that are available.

- University Council may give the dismissed students -because of warnings- an opportunity that does not exceed two semesters as a maximum.
- If the student does not fulfill his graduation requirements at the college in a period of up to half of the period prescribed for graduation in addition to the duration of the program.
- The student is given an exceptional opportunity by the University Council to meet the graduation requirements up to a maximum period not exceeding twice the original term specified for graduation.
- University Council may allow dismissed students, due to exhaustion of failure times, to attend twice the length of the program. That period does not have to exceed an utmost of two semesters.

Examinations and Grades:

- The College Council - based on the proposal of the department council- specifies mark of from (40%) to (60%) of the final grade of the course.
- The semester work mark of a course is calculated in one of the following two methods:
 - Oral or practical tests, research or other types of classroom activity or from all or some of them in addition to at least one a written test .
 - Two written exams at least.
- It is permissible for the council of the department that teaches the course – due to the recommendation of the course professor - to allow the student to complete the requirements of any course in the following semester and to give the student a grade of I (incomplete) in his academic record and not to be included in the GPA or cumulative. Only the grades received by the student after completing the requirements of that course are considered.
- If ever one-semester did not change the grade incomplete (I), the student is given an F and it is calculated in the GPA and cumulative.
- The grades obtained by the student in each course are calculated according to the schedule mentioned above.

Restrictions of the Final Examination:

- No student may be tested in more than two courses in one day.
- The student is not allowed to enter the final exam after half an hour of its beginning, and is not allowed to leave the exam room before half an hour after its beginning.
- The College Council - due to recommendation from the Council of the relevant department - may specify the period of at least one hour ,and a maximum of three hours, for a final written exam .
- Cheating in the exam, initiating it, or violating of instructions and rules of testing are actions punishable according to regulations of students discipline issued by the University Council.
- The College Council, in charge of teaching a course, in cases of necessity, has to approve re-marking of the answer sheets in a period of time not later than the beginning of the following semester in accordance with the following rules:
 - A student may apply for re-marking the answer sheets of only one course per semester.
 - The student -who wishes to remark his answer sheets-, may apply for re-marking them to the department that examines this course not later than one month after taking the final exam.
 - A student, who has already applied for re-marking his answer sheets and proved the invalidity of his application, should never apply for re-marking his answer sheets in any exams in the future.

Transferring:

First: Transferring from one college to another within the university:

- It is permissible with the consent of the respective deans of the colleges to transfer from one college to another in accordance with the conditions approved by the College Council, which the student wishes to transfer to.

- The student's academic record of the college has to show all courses previously studied, including grades and semester and cumulative rates throughout the study at the college from which he is transferred.

II: Transferring from one major to another within the College:

- The student may, after the approval of the Dean, transfer to another specialty within the College according to the guidelines established by the College Council.
- The student's academic record of the college has to show all courses previously studied, including grades and semester and cumulative rates throughout the study at the college from which he is transferred.

UNDERGRADUATE COURSE PLAN FOR B.Sc. IN GEOLOGY

Preparatory Year (31 credit hours)

Course	Name	Credit	
Lang 140	English Language (1)	8	E
Lang 150	English Language (2)	8	E
Math 140	Introductory Mathematics	2	E
Math 150	Calculus	3	E
Method 140	Learning, Thinking & Research skills	3	E
Tech 140	Computer Skills	3	E
Science 150	Communication Skills	2	E
Health 150	Health and Fitness	1	E
ENT 101	Entrepreneurship	1	E
Total Credit		31	

University Compulsory Courses (8 credit hours)

Course	Name	Credit
Islam 101	Introduction of Islamic Culture	2
Islam 102	Islam and Building up the Society	2
Islam 103	Economic System in Islam	2
Islam 104	Fundamentals of Islamic Policies	2

Compulsory Courses from outside the Department (13 credit hours)

Course	Name	Credit
Chem 103	General Chemistry	3 (3+0+0)
Chem 104	Experimental General Chemistry	1 (0+0+1)
Phys 101	General Physics	4 (3+1)
Stat 100	Statistics & Probability	3 (2+1)
Chem 253	Analytical Chemistry	2 (1+1)

Compulsory Departmental Courses (69 credit hours)

Course	Name	Units	
Geo 101	Physical Geology	4 (3+1)	E
Geo 106	Historical Geology	3 (2+1)	E
Geo 221	Mineralogy	3 (2+1)	E
Geo 236	Stratigraphy & Sedimentology	3 (2+1)	E

Geo 243	Invertebrate Paleontology	3 (2+1)	E
Geo 262	Environmental Geology	2 (2+0)	E
Geo 323	Igneous & Metamorphic Petrology	3 (2+1)	E
Geo 334	Sedimentary Petrology	3 (2+1)	E
Geo 380	Plate Tectonics	2 (2+0)	E
Geo 381	Structural Geology	3 (2+1)	E
Geo 383	Remote Sensing	3 (2+1)	E
Geo 386	Geology of the Arabian Shield	2 (1+1)	E
Geo 392	Geological Reports	1 (1+0)	E
Geo 399	Field Geology	6 (0+6)	E
Geo 406	Data Analysis in Geology	2 (1+1)	E
Geo 452	Petroleum Geology	3 (2+1)	E
Geo 450	Ore Geology	3 (2+1)	E
Geo 455	Hydrogeology	3 (2+1)	E
Geo 473	Engineering Geology	2 (2+0)	E
Geo 478	Spatial Information Systems	2 (1+1)	E
Geo 482	Sedimentary geology of Saudi Arabia	3 (2+1)	E
Geo 498	Geological Seminar	1 (1+0)	E
Geo 499	Research Project	3 (0+3)	E
Gph 201	Principles of Geophysics	3 (2+1)	E
Gph 301	Geophysical Exploration	3 (2+1)	E

Elective Courses (15 credit hours)

Course	Name	Credit	
Geo 242	Micropaleontology	3 (2+1)	E
Geo 301	Geomorphology	3 (2+1)	E
Geo 341	Paleobotany	3 (2+1)	E
Geo 342	Paleoecology	3 (2+1)	E
Geo 361	Principles of Geochemistry	3 (2+1)	E
Geo 421	Volcanology	3 (2+1)	E
Geo 431	Carbonate Rocks	3 (2+1)	E
Geo 432	Quaternary Geology	3 (2+1)	E
Geo 435	Oceanography	2 (2+0)	E
Geo 441	Vertebrate Paleontology	3 (2+1)	E
Geo 445	Sedimentary Basin Analysis	2 (1+1)	E
Geo 454	Mining Geology	2 (1+1)	E
Geo 456	Applications in Petroleum Geology	2 (2+0)	E
Geo 483	Regional Geology of the Middle East	2 (2+0)	E
Geo 495	History of Geology	1 (1+0)	E
Geo 496	Specialized Topics	1 (1+0)	E
Gph 341	Geophysical well logging	3 (2+1)	E
Astr 101	Introduction to solar and stellar systems	3 (2+1)	
Bot 101	General Botany	3 (2+1)	
Zoo 103	Principles of General Zoology	3 (2+1)	E
Admin 101	Principles of Administration	3 (3+0)	
Bus 101	Principles of Business Administration	3 (3+0)	
Mis 101	Management Information Systems	3 (3+0)	

Econ 101	Principles of Microeconomics	3 (3+0)	
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GEOLOGY COURSE PLAN

3rd Level		
Course	Name	Units
Islam 101	Islamic culture	2(2+0)
Geo 101	Physical Geology	4 (3+1)
Chem 103	General Chemistry(1)	3 (3+0)
Chem 104	Experimental General Chemistry(1)	1 (0+1)
Phys 101	General Physics	4 (3+1)
Stat 100	Statistics & probability	3 (2+1)
Total Credit		17

4th level		
Course	Name	Units
Islam 102	Islam & Society	2 (2+0)
Chem 253	Analytical Chemistry	2 (1+1)
Geo 221	Mineralogy	3 (2+1)
Geo 106	Historical Geology	3 (2+1)
Gph 201	Principles of Geophysics	3 (2+1)
Elective Course		3
Total Credit		16

5th Level		
Course	Name	Units
Geo 236	Stratigraphy & Sedimentology	3 (2+1)
Geo 243	Invertebrate Paleontology	3 (2+1)
Geo 262	Environmental Geology	2 (2+0)
Geo 381	Structural Geology	3 (2+1)
Geo 323	Igneous & Metamorphic Petrology	3 (2+1)
Elective Course		3
Total units		17

6th Level		
Course	Name	Units
Islam 103	Economic System in Islam	2(2+0)
Geo 334	Sedimentary Petrology	3 (2+1)
Geo 392	Geological Reports	1 (1+0)
Geo 383	Remote Sensing	3 (2+1)
Geo 386	Geology of the Arabian Shield	2 (1+1)
Geo 380	Plate Tectonics	2 (2+0)
Elective Course		3
Total units		16

Summer Semester		
Course	Name	Units
Geo 399	Field Geology	6 (0+6)
Total units		6

7th Level		
Course	Name	Units
Gph 301	Geophysical Exploration	3 (2+1)
Islam 104	Fundamentals of Islamic Policies	2 (2+0)
Geo 478	Spatial Information Systems	2 (1+1)
Geo 450	Ore Geology	3 (2+1)
Geo 406	Data Analysis in Geology	2 (1+1)
Geo 499	Research Project	3 (0+3)
Elective Course		2
Total units		17

8th Level		
Course	Name	Units
Geo 473	Engineering Geology	2 (2+0)
Geo 498	Geological Seminar	1 (1+0)
Geo 452	Petroleum Geology	3 (2+1)
Geo 482	Sedimentary geology of Saudi Arabia	3 (2+1)
Geo 455	Hydrogeology	3 (2+1)
Elective Course		2
Elective Course		2
Total units		16

COURSE DESCRIPTION FOR B.SC. IN GEOLOGY

Geo 101: Physical Geology 4(3+1)

Introduction to physical geology and minerals – volcanism and intrusive igneous rocks – weathering, soil, sediments and sedimentary rocks – metamorphism and metamorphic rocks – water courses and groundwater – glaciers and glaciations – deserts and coasts – geological structures – earthquakes – plate tectonics – mountain belts and continental growth – earth resources. (One day field trip)

Geo 106: Historical Geology 3(2+1)

Essentials of earth history – uniformitarianism – the law of superposition – unconformities – mountain building – stratigraphic units – fossils and fossilization – correlation – absolute time and radiometric ages – plate tectonics – evolution of the lithosphere and biosphere through geologic time. (One day field trip)

Geo 221: Mineralogy 3(2+1)

Crystallization in solutions and magma – crystal symmetry – crystal forms and habits – crystallographic systems – crystal lattices – chemical and physical properties of minerals – classification and nomenclature of minerals – origin and distribution of minerals - physics of light and its interaction with crystalline matter – the polarizing microscope – thin section preparation – refraction indices – optical indicatrix – optical sign determination – mineral identification – qualitative and quantitative analysis of minerals. (One day field trip)

Geo 236: Stratigraphy and Sedimentology 3(2+1)

Erosion, transport and sedimentation – grain morphology – porosity, permeability and diagenesis – classification of sedimentary rocks – sedimentary structures – stratigraphic units and correlation – seismic stratigraphy – sequence Stratigraphy – use and interpretation of stratigraphic maps and sections. (One day field trip)

Geo 242: Micropaleontology **3(2+1)**

Marine ecology and zoning – classification of marine organisms – collection and preparation of samples – study of the most important microfossils including: foraminifera, radiolaria, ostracods and conodonts in terms of soft tissue, shell morphology, ecology and evolution.

Geo 243: Invertebrate Paleontology **3(2+1)**

Introduction – conditions and processes of fossilization – types of preservation – the fossil record – index fossils – biological classification – study of the most important invertebrate phyla: sponges, corals, coelenterates, mollusks, echinoderms, brachiopods, annelids, arthropods and graptolites – trace fossils. (One day field trip)

Geo 262: Environmental Geology **2(2+0)**

Geologic factors influencing the environment – air, water and soil pollution – radioactive waste disposal – geohazards including: earthquakes, volcanoes, floods, soil erosion and landslides – desertification – population expansion and depletion natural resources – pollution associated with the extractive industries. (One day field trip)

Geo 301: Geomorphology **3(2+1)**

Natural processes that create landforms and landscapes - physics and chemistry of weathering and soil formation - dynamics of mass wasting - streams and glaciers - karst processes - topographic response to tectonic and climatic forces - terrain analysis utilizing geomorphic field data, remote sensing imagery, and numerical models - natural hazards. (One day field trip)

Geo 320: Petrology **3(2+1)**

Extrusive and intrusive igneous rocks – classification and field relations of igneous rocks - weathering – clastic sedimentary rocks – carbonates and evaporites – metamorphism and metamorphic rocks – metamorphic zones and facies – a brief summary on the Arabian Shield and the sedimentary cover in Saudi Arabia. (Two days field trip)

Geo 323: Igneous and Metamorphic Petrology **3(2+1)**

Origin and composition of magma – magmatic differentiation – volcanism and its products – emplacement mechanisms of plutonic rocks – geochemistry of igneous rocks and its relationship with their tectonic settings – types of metamorphism- field relations – metamorphic textures – metamorphic zones – metamorphic reactions and P-T-t paths. (Three days field trip)

Geo 334: Sedimentary Petrology **3(2+1)**

Grain morphologies and statistical distribution of grain size – classification of sedimentary rocks - mineral composition of detrital rocks and its relationship to the tectonic setting – diagenesis – carbonate rocks and evaporites – phosphorites – ironstones – siliceous rocks – coal and coalification processes. (Two days field trip)

Geo 341: Paleobotany **2(1+1)**

Fossil record of the plant kingdom – ancient environments and plant diversity through the geologic record – origin of life in the Archean – cyanobacteria – emergence and diversity of fungi – appearance of ferns and mosses – vascular plants – dominance of angiosperms in the Mesozoic and Cenozoic.

Geo 342: Paleoecology**2(1+1)**

The nature and classification of environments – comparison with living representatives – evidence of biological activity and associated sediments – lateral and vertical variations – geographical distribution of assemblages – trace fossils – biodiversity – environmental changes through geologic time. (One day field trip)

Geo 361: Principles of Geochemistry**3(2+1)**

Meteorites and origin of the solar system - distribution of elements – isotope geology and radiometric age determination – basic thermodynamics – reaction kinetics - crystal chemistry – water chemistry – organic geochemistry – oxidation and reduction – chemical evolution of magma – metamorphic reactions - hydrothermal processes and ore genesis.

Geo 380: Plate Tectonics**2(2+0)**

Geophysical and geological observations related to plate tectonic theory - marine magnetic and paleomagnetic measurements - seismicity and volcanism of plate boundaries - reference frames and absolute plate motions - Interpretations of geologic phenomena in the context of plate tectonics – ocean trenches and island arcs - plate tectonic evolution of the ocean basins and continents.

Geo 381: Structural Geology**3(2+1)**

Stress, strain and rock deformation - kinematic analysis – interpretation of geologic maps – stereographic projections - joints – strike-slip faults – dip-slip faults – geometry of folds – foliation and lineation – balanced cross-sections - rheology – microscopic structures – orogenic belts and plate tectonics. (Three days field trip)

Geo 383: Remote Sensing**3(2+1)**

Basics of remote sensing – electromagnetic spectrum – types of sensors and platforms – acquiring and processing primary data – spatial corrections – types of filters - image enhancement - interpretation – classification methods – principal component analysis – thermal and radar imaging - geologic applications.

Geo 386: Geology of the Arabian Shield**2(1+1)**

Origin of the Arabian Shield – stratigraphic schemes – igneous and tectonic activity – island arc and microcontinents - allochthonous terranes – ophiolites and sutures – correlation with the Nubian Shield – the Pan-African episode – Archean terranes in the Arabian Shield – ore deposits in the Arabian Shield. (Three days field trip)

Geo 392: Geologic Reports**1(1+0)**

Using terms and expressions in their proper geologic context – organizing data - stratigraphic and geographic names - maps and drawings – references and appendices – training on selected local examples.

Geo 399: Field Geology**6(6+0)**

A 45 day summer field camp devoted to training on mapping and exploration techniques including: field relation of igneous and metamorphic rocks – making stratigraphic sections and traverses – measurement of structures – using global positioning systems – making topographic and geologic maps – report writing.

Geo 406: Data Analysis in Geology**2(1+1)**

Sampling methods – data distributions - precision and accuracy - confidence intervals - least squares methods - correlation - time series analysis - multivariate techniques - cluster analysis – principal component analysis – kriging - using statistical software packages - geologic modeling.

Geo 421: Volcanology**2(1+1)**

Internal structure of the Earth and magma genesis – distribution of active volcanoes and their relationship to plate tectonics – internal structure of volcanoes – volcanic ejecta – types of eruptions - classification of volcanoes – mid-ocean ridge volcanism – island arcs – intra-plate volcanism – hot spots – volcanic activity in Saudi Arabia. (Three days field trip)

Geo 431: Carbonate Rocks**2(1+1)**

Types of carbonate rocks - carbonate minerals - classifications of limestones - limestone diagenesis – depositional environments and facies – lacustrine deposits – coral reefs – pelagic sediments - dissolution and transformation – cementation – silicification - dolomitization – evaporites and sabkhas – geologic record of carbonate rocks. (One day field trip)

Geo 432: Quaternary Geology**2(2+0)**

Characteristics, distribution, and origin of recent deposits - stratigraphy and chronology - paleosols - formation of landforms – glacial and inter-glacial periods – glacial deposits and landforms - changes in sea level – biodiversity and extinction – appearance of man. (One day field trip)

Geo 435: Oceanography**2(2+0)**

Physical processes in the oceans – waves, currents and tides – formation of ocean basins – turbidity currents and deep sediment transport – earthquakes and tsunamis – marine chemistry – coastal processes – life in the oceans – ocean mineral resources - changes in the oceanic ecosystem.

Geo 441: Vertebrate Paleontology**2(1+1)**

Origin and classification of chordates – extraction and study of vertebrate fossils – the main vertebrate classes and the appearance in the geologic record – fish and amphibians – age of the dinosaurs – birds – appearance of mammals – primates and hominoids – mass extinction.

Geo 445: Sedimentary Basin Analysis**2(1+1)**

Stratigraphic and facies analysis – sub-surface methods – stratigraphic correlations – biostratigraphy and biozones – sequence stratigraphy - basin maps – paleocurrent analysis - subsidence and burial history – basin models – basin classification – processes generating oil, gas and coal. (Two days field trip)

Geo 450: Ore Geology**3(2+1)**

Basic definitions – morphology of ore bodies – ore textures – theories of ore genesis – classification of ore deposits – orthomagmatic deposits – diamonds and kimberlites – the carbonatite environment – volcanogenic massive sulphides - greisen and skarn – hydrothermal deposits – strata-bound deposits – sedimentary Fe and Mn deposits – metamorphic ores - supergene enrichment – industrial minerals. (Three days field trip)

Geo 452: Petroleum Geology**3(2+1)**

Physical properties of oil, gas and connate water – porosity and permeability and the effect of diagenesis – origin, migration and accumulation of oil – oil traps and seals – drilling methods - oil exploration – formation evaluation – chemistry and grades of crude oil – reserve estimation - oil in Saudi Arabia. (Two days field trip)

- Geo 454: Mining Geology** **2(1+1)**
 Reconnaissance exploration – remote sensing – geochemical exploration – geophysical exploration – drilling methods - evaluation techniques – feasibility studies mine mapping – surface and underground mining methods – mineral processing and metallurgy – mining in Saudi Arabia. (Three days field trip)
- Geo 455: Hydrogeology** **3(2+1)**
 Geologic factors controlling the flow of groundwater – porosity and permeability – groundwater flow - types of aquifers – Darcy's law – groundwater wells – chemistry of groundwater – groundwater exploration – seawater encroachment – groundwater pollution - groundwater resources in Saudi Arabia. (Three days field trip)
- Geo 456: Applications in Petroleum Geology** **2(2+0)**
 Geologic and seismic exploration – methods and problems of production – tectonic settings of oil-producing basins – depositional environments and oil and gas quality – detailed study of hydrocarbon field in and outside the Kingdom. (Two days field trip)
- Geo 473: Engineering Geology** **2(2+0)**
 Soil classification – construction problems related to swelling and shrinking soils – soil mechanics - rock mechanics - dimension stones – aggregates and crushed rocks – site inspection – tunneling – water reservoirs and dams – roads and bridges – environmental impact - geohazards. (One day field trip)
- Geo 478: Spatial Information Systems** **2(1+1)**
 The concept of GIS – maps and spatial analysis – data entry, storage and retrieval – computer-based processing of geologic data – vector and raster data models and analysis – linking digital maps and attribute information - spatial interpolation - practical application through a real-life GIS project.
- Geo 482: Sedimentary Geology of Saudi Arabia** **3(2+1)**
 Sedimentary basins of Saudi Arabia – Phanerozoic stratigraphic units – sedimentary cycles – intra-basin stratigraphic correlations – biostratigraphy – major structural trends – economic geology of the cover rocks. (Three days field trip)
- Geo 483: Regional Geology of the Middle East** **2(2+0)**
 Precambrian relationships in the Arabian-Nubian Shield – the Arabian Shelf and its northerly extension – tectonic movements related to the opening of the Red Sea – Arabian Plate movement and the creation of Zagros and Taurus belts – oil and mineral resources of the Middle East.
- Geo 495: History of Geology** **1(1+0)**
 Beginnings of earth sciences and the contribution of Arab and Muslim scholars – evolution of modern concepts in geology – emergence of the main disciplines of earth sciences - catastrophism and uniformitarianism – plutonists and neptunists – geologic controversies on the ice age, granitization and age of the Earth – continental drift and the theory of plate tectonics.
- Geo 496: Specialized Topics** **1(1+0)**
 Advanced study of detailed aspects of certain geological problems chosen by the student, which is summarized in a brief report.

Geo 498: Seminar in Geology**1(1+0)**

Group discussion of advanced geologic subjects with students giving brief presentations on the more salient aspects of these subjects.

Geo 499: Research Project**3(3+0)**

Training on geologic research methods through an integrated field and laboratory study of an area or topic chosen by the student and his supervisor. (Three days field trip)

UNDERGRADUATE COURSE PLAN FOR B.Sc. IN GEOPHYSICS

Preparatory Year (31 credit hours)

Course	Name	Credit	
Lang 140	English Language (1)	8	E
Lang 150	English Language (2)	8	E
Math 140	Introductory Mathematics	2	E
Math 150	Calculus	3	E
Method 140	Learning, Thinking & Research skills	3	E
Tech 140	Computer Skills	3	E
Science 150	Communication Skills	2	E
Health 150	Health and Fitness	1	E
ENT 101	Entrepreneurship	1	E
Total Credit		31	

University Compulsory Courses (8 credit hours)

Course	Name	Credit
Islam 101	Introduction of Islamic Culture	2
Islam 102	Islam and Building up the Society	2
Islam 103	Economic System in Islam	2
Islam 104	Fundamentals of Islamic Policies	2

Compulsory Courses in the department (58 Hours)

GPH 201	Principles of Geophysics	3(2+0+1)	(E)
GPH 211	Gravity & Magnetic Exploration	3(2+0+1)	(E)
GPH 221	Seismic Exploration	3(2+0+1)	(E)
GPH 231	Geoelectric & Electromagnetic Exploration	3(2+0+1)	(E)
GPH 313	Seismology	3(2+0+1)	(E)
GPH 341	Geophysical Well Loggings	3(2+0+1)	(E)
GPH 361	Geophysical Techniques	1(0+0+1)	(E)
GPH 381	Geophysical Reports	1(1+0+0)	(E)
GPH 390	Radiometric and Geothermal methods	2(2+0+0)	(E)
GPH 391	Field Geophysics	4(0+0+4)	(E)
GPH 401	Physics of the Earth	2(2+0+0)	(E)
GPH 412	Engineering Seismology	2(2+0+0)	(E)
GPH 411	Geophysical Data Processing	3(2+0+1)	(E)
GPH 485	Seminar	1(1+0+0)	(E)
GPH 498	Research Project	3(0+0+3)	(E)
GEO 101	Physical Geology	4(3+0+1)	(E)
GEO 221	Mineralogy	3(2+0+1)	(E)
GEO 236	Principles of Stratigraphy & Sedimentation	3(2+0+1)	(E)
GEO 320	Petrology	3(2+0+1)	(E)
GEO 381	Structural Geology	3(2+0+1)	(E)
GEO 452	Petroleum Geology	3(2+0+1)	(E)
GEO 478	Geographical information systems	2(1+0+1)	(E)

Compulsory Courses from other departments (28 Hour)

Chem 101	General Chemistry	4(3+0+1)	(E)
Phys 101	General Physics (1)	4(3+0+1)	(E)
PHYS 102	General Physics (2)	4(3+0+1)	(E)
PHYS 201	Mathematical Physics	3(2+1+0)	(E)
PHYS 221	Electromagnetism	3(3+0+0)	(E)
MATH 111	Integral Calculus	4(3+1+0)	(E)
MATH 200	Differential and Integral Calculus	3(3+0+0)	(E)
MATH204	Differential Equations	3(3+0+0)	(E)

Elective Courses in the department (34 Hour)
(The student selects 11 hours)

GPH 317	Time series analysis	2(2+0+0)	(E)
GPH 319	Petrophysics	2(2+0+0)	(E)
GPH 416	Seismotectonics of the Middle East	2(2+0+0)	(E)
GPH 424	Environmental Geophysics	2(2+0+0)	(E)
GEO 323	Igneous and Metamorphic Petrology	3(2+0+1)	(E)
GEO 333	Sedimentary Petrology	3(2+0+1)	(E)
GEO 383	Remote Sensing	3(2+0+1)	(E)
GEO 386	Geology of Arabian Shield	2(1+0+1)	(E)
GEO 455	Hydrology	3(2+0+1)	(E)
GEO 482	Sedimentary Geology of the Kingdom	3(2+0+1)	(E)
PHYS 232	Vibrations and Waves	3 (2+0+1)	(E)
MATH 244	Linear Algebra	3(3+0+0)	(E)
STAT 100	Introduction of Statistics	3(2+1+0)	(E)
BUS 101	Principles of Business Administration	3(3+0+0)	(A)
ECON 101	Principles of Microeconomics	3(3+0+0)	(A)

IDEAL PLAN FOR THE PROGRAM OF B.SC. IN GEOPHYSICS

3rd Level

		Credit hours	Prerequisite
GEO 101	Physical Geology	4(3+0+1)	
PHYS 101	General Physics	4(3+0+1)	
CHEM 101	General Chemistry	4(3+0+1)	
MATH 111	Differential Calculus (2)	4(3+1+0)	Math150
ISLAM 101	Introduction to Islamic Culture	2(2+0+0)	
<i>Total Units</i>		<i>18</i>	

4th Level

GPH 201	Principles of Geophysics	3(2+0+1)	Phys101,Math150
GEO 221	Mineralogy	3(2+0+1)	Geo101
PHYS 102	General Physics (2)	4(3+0+1)	
MATH 200	Differential Calculus and Integration	3(3+0+0)	Math 111
ISLAM 102	Islamic Society	2(2+0+0)	
<i>Total Units</i>		<i>15</i>	

5th Level

		Credit hours	Prerequisite
GPH 211	Gravity & Magnetic Exploration	3(2+0+1)	Gph 201
GPH 221	Seismic Exploration	3(2+0+1)	Gph 201
GEO 236	Principles of Stratigraphy & Sedimentation	3(2+0+1)	Geo 221
GEO 320	Petrology	3(2+0+1)	Geo 221
PHYS 201	Mathematical Physics	3(2+1+0)	Phys 101
ISLAM 103	Economic System in Islam	2(2+0+0)	
<i>Total Units</i>		<i>17</i>	

6th Level

GPH 231	Geoelectric & Electromagnetic Exploration	3(2+0+1)	Gph 201
GPH 361	Geophysical Techniques	1(0+0+1)	Gph 201
GPH 381	Geophysical Reports	1(1+0+0)	Geo381(Co requisite)
GEO 381	Structural Geology	3(2+0+1)	Geo236
PHYS 221	Electromagnetism	3(3+0+0)	Phys101
MATH204	Differential Equations	3(3+0+0)	Math200
Elective Course		3	
<i>Total Units</i>		<i>17</i>	

Summer Term (Field)

GPH 391	Field Geophysics	4(0+0+4)	Gph211, Geo320, Geo236, Geo381
<i>Total Units</i>		<i>4</i>	

7th Level

GPH 313	Seismology	3(2+0+1)	Gph 201
GPH 341	Geophysical Well Loggings	3(2+0+1)	Gph 201
GPH 411	Geophysical Data Processing	3(2+0+1)	Gph211, Gph221
GPH 498	Research Project	3(0+0+3)	Gph391, Gph381
Elective Course		3	
Elective Course		3	
<i>Total Units</i>		<i>18</i>	

8th Level

GPH 390	Radiometric and Geothermal methods	2(2+0+0)	Gph 201
GPH 401	Physics of the Earth	2(2+0+0)	Gph313
GPH 412	Engineering Seismology	2(2+0+0)	Gph313
GPH 485	Seminar	1(1+0+0)	
GEO 478	Geographical information systems	2(1+0+1)	Geo381
GEO 452	Petroleum Geology	3(2+0+1)	Geo381, Geo236
ISLAM 104	Political System in Islam	2(2+0+0)	
Elective Course		2	
<i>Total Units</i>		<i>16</i>	

COURSE DESCRIPTION FOR B.SC. IN GEOPHYSICS**GPH 201: Principles of Geophysics****3(2+1)**

Physical and mathematical laws and its relation to the Earth properties. Elasticity theory and properties of wave propagation in seismic reflections, refractions, wave equations, seismic wave characteristics, Potential field theories, Principles of different exploration techniques. Interpretation of earth's structures from geophysical data.

GPH 211: Gravity and Magnetic Exploration**3(2+1)**

Introduction, Importance of gravity and magnetic exploration methods and its use. Instruments for gravity and magnetic measurements. Gravity and magnetic surveying. Data reduction, and processing. Application of the gravity and magnetic methods to oil, mineral and groundwater exploration. Interpretation of Aeromagnetic maps. Qualitative and quantitative interpretation of gravity and magnetic data. (Field applications – Two days)

GPH 221: Seismic Exploration**3(2+1)**

Introduction, Importance of seismic exploration. Seismic waves and factors affecting its propagation. Seismic velocities. Reflection and refraction. Time-distance relations for reflected and refracted seismic waves in layered media. Instrumentation and field procedures. Seismic sources. Corrections of seismic data, Seismic noise. Multiple seismic reflections. Measurements of seismic velocities. Data reduction and qualitative and quantitative interpretation. Seismic migration. Seismic Stratigraphy. (Field applications – Two days)

GPH 231: Geoelectric and Electromagnetic Exploration**3(2+1)**

Introduction. Importance of the electrical and electromagnetic methods and their applications. Electrical conductivity of rocks. Basic theory of direct current conduction and EM induction. Time domain and frequency domain systems. Transient EM. Induced and spontaneous polarization. Down-hole electric and EM techniques. Instrumentation. Field procedures. Qualitative and quantitative interpretation. (Field applications – Two days)

GPH 301: Geophysical Exploration**3(2+1)**

Magnetic and gravity exploration; Geoelectrical Methods; Electrical resistivity, Self-Potential and Induced Polarization; electromagnetic Methods; Seismic methods; Seismic Reflection and refraction methods; seismology; Ground Penetrating Radar, Radioactive and thermal methods. Different application for natural resources exploration. Qualitative and quantitative interpretation of geophysical exploration methods. (Field applications – Two days)

GPH 312: Earthquake Seismology**3(2+1)**

Earthquakes, Causes, Types. Historical background. Earthquake measurement instruments. Seismic wave propagation in spherically Earth and travel time graphs. Earthquakes source parameters, magnitudes, intensity scales. Processing of Earthquakes data. Earthquakes mechanisms. International observatory networks. Internal structure of the Earth. Solutions of Earthquake focal mechanism. Heterogeneity and inelasticity.

GPH 317: Time Series Analysis**2(2+0)**

Different types of Fourier series analysis. Digital filtering. Matrix processing techniques. Waves polarity analysis. Application of inverse linear and non-linear theories in solving geophysical problems.

GPH 319: Petrophysics**2(2+0)**

A review of rocks (sedimentary, igneous and metamorphic), Physical properties of rocks and fluids that affect the distribution and movement of fluids such as oil, gas, water, or contaminants in porous media including porosity, permeability, capillary pressure, surface and interfacial tension, Wettability, and viscosity. Darcy's law for anisotropic porous media.

GPH 341: Geophysical Well Logging**3(2+1)**

A review of rocks (sedimentary, igneous and metamorphic), Physical properties of rocks and fluids that affect the distribution and movement of fluids such as oil, gas, water, or contaminants in porous media including porosity, permeability, capillary pressure, surface and interfacial tension, Wettability, and viscosity. Darcy's law for anisotropic porous media.

GPH 361: Geophysical Techniques**1(1+0)**

Principles, design and operating of various geophysical instruments. such as seismic, earthquakes recording, magnetic, gravity, electric and self potential. Maintenance and operation. (Weekly Field applications)

GPH 381: Geophysical Reports**1(1+0)**

Writing scientific papers, Theses and reports. Methods of criticism. Geophysical terminologies. Geophysical data presentation. Structure of a geophysical report. How to write an ideal technical report and scientific paper. Manifestation of results.

GPH 390: Radiometric and Geothermal methods**2(2+0)**

Rocks radiation. Theory of radioactivity and half life. Instruments for measuring natural radiation. Radiometric survey on land and from air. Interpretation of radiation readings. Temperature of the Earth and its relation to the radioactive materials. Theory of Heat flow. Temperature gradient with depth and its change with time and location. Geothermal measurements. The use of radiometric and geothermal methods in modern applications.

GPH 391: Field geophysics**4(4+0)**

Field study in a summer field camp for forty five days. Introduction to different geologic and geophysical techniques for topographic and geologic mapping. Developing subsurface geologic maps for selected areas under study. Basic geologic relationships with emphasis on geologic structures and stratigraphic correlation for different types of rocks. Geophysical field measurements, data collection, reduction, analysis and interpretation, weekly reports and final project team report.

GPH 401: Physics of the Earth**2(2+0)**

Structure of the Earth as deduced from geophysical methods: the crust, mantle and core, their physical and Chemical properties. Terrestrial heat flow, convection currents and phase transitions. Geomagnetism and paleomagnetism. Relation between seismology, global gravity, densities, earth's magnetism and the structure of the Earth. Plate tectonics. Hydrostatic sphere. Free oscillations of the Earth. Principles of the isostasy.

GPH 412: Engineering Seismology**2(2+0)**

Probabilistic and deterministic theory. Different kinds of earthquake sources and its relation to faulting mechanism. Seismic risk and hazard, Seismic zoning. Attenuation relations, soil liquefaction. Earthquake response of structures, design of earthquake - resistant structures.

GPH 413: Geophysical Data Processing**3(2+1)**

Theory of frequency filtering. Separation techniques for regional and residual fields in space and frequency domain. Methods to calculate the second vertical derivatives for potential fields. Downward and upward Modeling magnetic data. Ambiguities in interpretation of potential fields data interpretation. Linear analysis theory for digital data. Fast forward and inverse Fourier analysis and its application in data processing. Seismic data enhancement. Advanced seismic data interpretation. Seismic stratigraphy and direct detection of hydrocarbons.

GPH 416: Seismotectonics of the Middle East**2(2+0)**

A comprehensive study of the tectonics of the Middle East. Arabian plate boundaries, Correlation between earthquake occurrences and tectonically active regions. Red Sea spreading , Dead Sea transform fault system . Atlas Mountains, Afar triangle, and Arabian Gulf. Crustal Structures.

GPH 424: Environmental Geophysics**2(2+0)**

The use of all geophysical methods (Seismic, gravity, Magnetic, Ground Penetrating Radar, Electric, and Radiometric) in solving environmental problems. Pollution determination and monitoring. Site selection for waste disposal. Geophysical impact assessment of engineering structures to ensure its safety and suitability for environment protection.

GPH 485: Seminar**1(1+0)**

Discussion of up-to-date geophysical hot subjects. Weekly presentation by senior students.

GPH 499: Research Project**3(3+0)**

Senior students engage in an independent research with faculty supervision. Investigation of any selected problems in applied or theoretical geophysics. Written report is required.

GRADUATE PROGRAMS LEADING TO M.Sc. GEOLOGY and M.Sc. GEOPHYSICS

Graduate courses for Master degree studies have various domains e.g. studies on minerals and fossils, structural, geophysical and hydrogeological studies. These studies enrich the way of thinking of students toward working in a variety of geosciences profession in exploration and production companies dealing with petroleum, mineral, mining, ground water, geological mapping, site selection and engineering projects; besides the teaching profession.

Aims:

- 1) To offer M. Sc. courses in Geology as well as in Geophysics.
- 2) To prepare a graduate student for Ph.D. program in various fields of Geology and Geophysics.
- 3) To develop the graduate's academic capability to carry out independent scientific research and to present the research results in both applied and academic fields.
- 4) To ensure the availability of highly trained indigenous scientific manpower in the fields of geosciences.
- 5) To cultivate interest on geoscientific problems concerning the Kingdom of Saudi Arabia and its neighborhood.
- 6) To train the student on the uses of advanced technology.

Admission Requirements for Graduate Program

(A) Conditions of Admission

In addition to the conditions and Regulations of the College of Graduate Studies at the University, the applicant has to appear in an interview to be conducted by the Departmental Admission Committee. Should any written or oral test would be required by the Department will be organized to evaluate the student's English language level.

(B) Requirements

- 1) A successful study 24 units by which the student can select some of them with the help of a specialized guidance committee.
- 2) The course GEO 600 (M.Sc. Thesis), that includes the preparation and writing the thesis in about one year. The research must be supervised by a member or more from the teaching staff of the department. A thesis should be written and submitted, then the student should pass an examination accordingly.

(C) Student's Guidance Committee.

A specialized guidance committee that consists of two or three members from the teaching staff members of the department will be dedicated for each student. The purpose of this committee is to define the student educational goal, according to his desire, supervised by a committee member.

COURSE DESCRIPTION FOR M.Sc. IN GEOLOGY

GEO 501: Advanced Geology of Saudi Arabia

3(2+1)

Study of Precambrian with emphasis on the development structure and correlation of the Arabian Shield. Correlation, Paleogeography of the Paleozoic, Mesozoic and Cenozoic sedimentary formations. Field applications.

GEO 522: Advance Igneous Petrology

3(2+1)

Evolution and development of igneous rocks, illustrating the magma behavior by different diagrams as AFM. Igneous rocks classification and their field relations. Tectonic movements. Volcanism and Volcanoes. Thermodynamics of rocks. Special reference on problems about the origins of selected rock types from the Arabian Shield. Field work.

GEO 523: Advance Metamorphic Petrology

3(2+1)

Origin and classification of metamorphic rocks textures, structures and reactions and their relationship. Physical and chemical principles of the metamorphic minerals, rocks and paragenesis. Metamorphism, metamorphic belts, problems associated with the reactions, progress of metamorphism, and relation to tectonism and tectonic theory. Cataclastic metamorphism and its significance. Facies and subfacies of metamorphic rocks illustrating metamorphism and origin by diagrams e.g., FMA, AKF, ACF. Field work.

- GEO 532: Advance Stratigraphy** **3(2+1)**
 Latest developments, chronologic and chronostratigraphic records, principles and applications of correlation. Stratigraphic maps, biostratigraphy, lithofacies changes. Correlation in important sedimentary basins. Field applications.
- GEO 533: Advanced Sedimentary Rocks** **3(2+1)**
 Bedding and depositions, Sedimentary structures, of eolian, alluvial deposits, shallow and deep marine deposits, and the interaction with wave, tides, and oceanic currents. Field applications.
- GEO 534: Carbonate Rocks and Evaporites** **3(2+1)**
 Carbonate sedimentation, marine evaporities, Carbonate facies, facies diagenesis, facis models, Coase histories.
- GEO 536: Recent Sediments** **2(2+0)**
 Weathering Denudation and rates of disposition, lithification and diagenesis of alluvial. Eolian, glacial and marine sediments.
- GEO 542: Invertebrate Palaeontology (I)** **3(2+1)**
 Systematic Palaeontology, Morphology, Origin, Classification,. The concept of species, Phylogeny, Organic evolution. Stratigraphy and the use of Paleontologic data.. Field excursions.
- GEO 543: Invertebrate Palaeontology (II)** **3(2+1)**
 Systematic description of Cinidaria, Bryozoa, Brachiopoda, Annelida, and Arthropoda. Palaeoecology, Paeobiogeography. Origin and Evolution. Field excursions.
- GEO 544: Invertebrate Palaeontology (III)** **3(2+1)**
 Systematic decription of the chiton, Gastropoda, Bivalvia, Cephalopoda, Echinodermata and Graptolithina. Palaeoecology, Palaeobiology, Origin and evolution. Field excursions.
- GEO 547: Advanced Microfossils** **3(2+1)**
 Advanced study of Microfossils with special emphasis on the most important stratigraphic groups and their Taxonomy.
- GEO 548: Advance Paleocology** **2(2+0)**
 Skeletal mineralogy, trace chemistry and distribution of trace element in skeletons and their paleoecological significance. Oxygen and carbon stable isotopes, Growth mechanism of different groups adaptive functional morphology, Population dynamics, opportunistic and equilibrium species. Types of dispersion. Ecosystems and communities.
- GEO 554: Mining Geology** **3(2+1)**
 Application of Geologic Methods of Exploration and prospecting Mining Methods. Mapping Study of Geologic setting and structures of ore deposits. Evaluation and Estimation of ore reserves. Study of major associations of ore deposits.
- GEO 555: Hydrogeology Advanced** **3(2+1)**
 Study of the climatic factors that affect the aquifer recharge. Estimation of the amount of recharge reaching the saturated zone. Determination of the physical properties which control the flow through aquifers, such as porosity, permeability, hydraulic, conductivity, and storage. Analysis of pumping test data. Study of the partial differential equation that describe ground water flow through porous medium. Solving the flow equation by using numerical methods and simple computer models. Study of the chemicals dissolved in war and their thermodynamic equilibrium status in order to solve some related problems.
- GEO 556: Advanced Petroleum Geology** **3(2+1)**
 Sedimentary processes and accumulation of organic matter. Transformation of organic matter, Kerogen - Oil shales and petroleum. Nature of petroleum reservoirs Oil exploration, case histories.

GEO 561: Advanced Geochemistry**3(2+1)**

The Phase Rule. Phase Relations and its relationship with textures and fine structures. Thermometry. Barometry. Mineralization, Deposition, and Replacement reactions. Magmatic Evolutions. Mineralizing solution, and distribution of Chemical elements and complex Ions. Stable isotopes and their cycles. Late stage magmatic processes. Sedimentation, chemical sediments, and Hydrous solutions under low temperatures. Hydrogeochemistry. Application problems

GEO 564: Geochronology**2(2+0)**

Absolute estimation and measuring geologic times. Study of fundamental measurements used in geologic research. Radioactive isotopes and their analytical methods. Potassium - Argon, Rubidium - Strontium, Uranium - Lead, Lead - Lead, and Carbon 12 - Carbon 14 systems and their Application to study the absolute ages of rocks especially in Precambrian Shields. Application problems.

GEO 566: Mineral Geochemistry**3(2+1)**

Stability of minerals, Geochemistry of Transition and Trace Elements. Application of thermodynamic laws and crystal chemistry to study minerals and rocks Phase Equilibrium. Application problems.

GEO 572: Applied Geophysics**3(2+1)**

Application of the reflection seismic and the gravity methods for prospecting of oil. Application of resistivity and refraction seismic methods for search of ground water. Application of the magnetic and electromagnetic methods for mineral exploration.

GEO 573: Interpretation of Well Logging**3(2+1)**

Principles of well logging (self potential and resistivity, neutron and sonic logs; applications in determining rock porosity, fluid content, type of rocks thickness, dip and strike of formation; utilization of logging data in determining production pay - zone, producing applications.

GEO 586: Geodynamics**3(2+1)**

Study of earth major structures. Principles of isostasy. Orogenic movements, Continental drift, Sea - floor spreading potential causes of earth deformation. Methods of study. Gained results, Data processing. Recent hypothesis and theories.

GEO 598: Seminar Geology**1(1+0)**

Discussion of various topics in geology, given by graduate students under faculty supervision.

GEO 599: Special Topics**1(1+0)**

Lecturing and discussion of different geologic topics selected and given by the faculty member holding the class.

GEO 600: Research Project**6(6+0)**

M. Sc. Thesis research project prepared by the student including field work, laboratory experiments and writing the thesis.

COURSES FOR M.SC. IN GEOPHYSICS**FIRST LEVEL:**

No.	COURSE No. & SYMBOL	COURSE TITLE	UNITS
1	513 GPH	Advanced Seismic Exploration Methods	3 (2+1)
2	521 GPH	I. Geophysical Applications in Groundwater	3 (2+1)
3	565 GPH	II. Seismotectonics of the Arabian Plate	2 (2+0)
	Total		8 units

SECOND LEVEL:

No.	COURSE No. & SYMBOL	COURSE TITLE	UNITS
1	531 GPH	III. Potential Field Theory	3 (2+1)
2	553 GPH	Geophysical Data Processing	2 (1+1)
3	575 GPH	Selected Topics in Geophysics	2 (2+0)
	Total		7 units

THIRD LEVEL:

The Department will choose 9 Units

No.	COURSE No. & SYMBOL	COURSE TITLE	UNITS
1	517 GPH	IV. Quantitative Seismology	3 (3+0)
2	519 GPH	Seismic Hazards	3 (3+0)
3	535 GPH	Geodesy	3 (3+0)
4	541 GPH	Environmental Geophysics	3 (3+0)
5	543 GPH	Engineering Geophysics	3 (3+0)
6	555 GEO	Advanced Hydrogeology	3 (2+1)
7	586 GEO	Dynamic Geology	3 (2+1)
8	593 CE	Earthquake Engineering	3 (3+0)
	Total		24 units

THE FOLLOWING LEVELS:

No.	COURSE No. & SYMBOL	COURSE TITLE	UNITS
1	600 GPH	V. Thesis	6 (0+6)

COURSE DESCRIPTION FOR M.SC. GEOPHYSICS

513 GPH: Advanced Seismic Exploration Methods

3(2+1)

Review of theories of seismic waves, recording, and data acquisition. Land and marine refraction procedures. Analog and digital data processing of refraction and reflection. Digital filtering and computer techniques in seismic data processing. Time and depth sections in model interpretation. Case histories.

517 GPH: Quantitative Seismology

3(3+0)

Elastic theory. Application of differential equations in three dimension media. Studies of sources of earthquake mechanisms and dynamics. Solutions of focal mechanism, free oscillation of the earth. Application of inverse problems in seismology. Design and analysis of digital seismic networks.

519 GPH: Seismic Hazards

3(3+0)

Earthquake prediction. Mapping of maximum intensity and acceleration of earthquakes. Quantitative and qualitative studies on earthquake risk sources and modeling. Field expedition. Programs for assessment of earthquake risk.

521 GPH: Geophysical Applications in Groundwater

3(2+1)

The use of advanced geoelectrical, electromagnetic and radiometric methods in delineating surface and groundwater. Intercalation of fresh water and salt water. Determination of three dimension of aquifers. Observation of groundwater pollution. Interpretation of subsurface models. Selected world groundwater aquifers and case histories.

- 531 GPH: Potential Field Theory** **3(2+1)**
 Potential field theory. Uses of the potential theory in gravity, magnetic and electrical methods. Upgraded technology in the interpretation of Free air, Bouguer, isostatic, and magnetic anomalies. Advanced technologies in the interpretation of electromagnetic curves and modelling of different gravity and magnetic maps.
- 535 GPH: Geodesy** **3(3+0)**
 Determination of Geoid from gravity methods. Reference spheroid-absolute gravity observations and gravimeters. the earth's internal structure-attraction of standard bodies. Green's and Clairant's theories. Reference spheroid and standard gravity formulae. Stocke's integral masses outside the geoid, gravity anomalies . Geoid surveys, gravity as a guide to internal densities. Determination of the recent movements of the earth's crust.
- 541 GPH: Environmental Geophysics** **3(3+0)**
 Uses of Geophysical methods (seismic, gravity, ground penetrating radar, electrical and radioactive) in solving environmental problems. Detection locations and follow-up of pollution. Determination of the suitability of sites for dumping all kind of wastes. Determination of current displacement and fracture zones. Geophysical assessment for insuring the safety of engineering structures and their environmental conservation. Case histories.
- 543 GPH: Engineering Geophysics** **3(3+0)**
 Theory of rock mechanics. Applications of shallow geophysical techniques (seismic refraction and electrical resistivity) in investigating geological characteristics of building foundations, dams and hidden channels as well as determining mechanical behavior of soil. Using electrical methods in delineating fresh water/salt water interface. Applications of geothermal reservoir as an energy source.
- 553 GPH: Geophysical Data processing** **2(1+1)**
 Review of Fourier Transforms, Fast Fourier Transforms and time series analysis. Fast Fourier transform application in window functions. Computer techniques in spectral analysis for global, regional and local data. Numerical solutions and digital applications of transforms and filters in the treatment of geophysics data. Examples and case histories.
- 555 GEO: Advanced Hydrogeology** **3(2+1)**
 Lithostratigraphic investigation of water-bearing zones. Mechanics of water flow in porous media which includes water flow net and delineating of hydrogeological zones. Pumping tests. Design of groundwater wells. Chemical analysis and thermodynamics of ground water. Applications of geophysical methods in determining thickness of water-bearing zones. Case histories.
- 565 GPH: Seismotectonics of the Arabian Plate** **2(2+0)**
 Studies on tectonics of the Arabian shield and plate. Historical and recent seismicity and its relation to active faults. Crustal deformation studies using global positioning system. Examples and case histories of crustal structures.
- 575 GPH: Selected Topics in Geophysics** **2(2+0)**
 Discussion of recent and case history of research projects in geophysical domain and its application, variable subjects will be presented according to current research projects and the visiting professors.
- 586 GEO:GEODYNAMICS** **2(2+0)**
 Studies on earth structure. Isostasy of earth's crust. Geosynlines and continental drift. Ocean bottom spreading. Application of modern theories in interpretation of the probable reasons of earth movement.
- 593 CE: Earthquake Engineering** **3(3+0)**
 Earthquake motions and their engineering interpretations. Earthquake effect on foundations. Dynamic stability of earth structures. Earthquake codes for design and construction. Liquefaction and cyclic conditions.
- 600 GPH: M.Sc. Thesis** **6(0+6)**

FACILITIES OF TEACHING AND LEARNING

Over the years the department has developed the basic infrastructure and laboratories for imparting education to students as well as for faculty research. The Department maintains well equipped geological, hydrogeological and geophysical instrumentation laboratories, Geological Museum, educational tools including projection and reprographic facilities, multimedia projectors, well furnished classrooms, seminar hall for graduate students, library, computational laboratories and eLab etc., these details are listed elsewhere in the Departmental website. Some such equipments and instruments are: Polarizing Microscopes, Scanning Microscope, XRF, XRD, Microprobe, GIS system, Absolute Gravimeter, Proton Precession Magnetometer, Broadband Seismometers etc. The Departmental Library maintains a good collection of both Topographical and Geological Maps for greater part of Quadrangles in the Kingdom. The Department also has the basic infrastructure arrangement for Summer Field Training of students.

A- DEPARTMENT LIBRARY

The department of Geology and Geophysics has a small library that is located in the second floor of building-4 of College of Science. The library has a small reading hall surrounded by shelves that carry a good collection of textbooks, journals, geological and topographic maps. This library serves the students of the geophysics program in parallel with the huge university central library (Prince Salman library). Regarding the geophysics program, the both libraries suffer from the lack of up-to-date geophysics books that made available through the digital library that made available to the University staff and students.



The library contains a good collection of textbooks, journals, geological and topographic maps.

B- GEOLOGICAL MUSEUM

The Department maintains a Geological Museum for student training and other educational programs where different types of rocks and minerals identifying the earth's constituents are maintained. The Museum was founded

in 1406 H (1986), but it is already enriched with a variety of collections. It is located in the first floor of building-4 of College of Science. Also it maintains a good collection of fossils mainly from Saudi Arabia. The Museum is a valuable resource for students, research workers, and other enthusiasts with an interest to learn about geology in general, and Saudi Arabia in particular. This is more so, since, Saudi Arabia encompasses a stable shield, huge sedimentary basins and a large igneous province, where, a wide variety of rocks, minerals and fossils are found. Moreover, geologists view Saudi Arabia as the gateway between Africa and mainland Asia – a fact of high importance in studying the natural history of the earth. The Museum supports teaching and research in Earth Sciences and Natural History at King Saud University, Riyadh. It also supports active fossil-research program in the Department. As a museum of Practical Geology, it illustrates the application of geology to the useful purposes of life.

The Museum is housed on the second floor in the Department. It is also open to VIPs and visitors daily for two hours between 10-12 a.m., Saturday through Wednesday. Visits are organized by the Museum Supervisor, for which, the Chairman of the Department (Tel. 467-6212) is to be contacted. Described below are the main features of the Museum and its collections.

The Museum contains a large number of rock samples and fossils collected from Saudi Arabia and the regions worldwide; these are cataloged as rock, mineral and fossil specimens. It includes collections of minerals, rocks and fossils of more than 20,000 samples. Meteorites and their effects on the earth surface are also considered within the main topics of the museum. Mineral collections are exhibited according to the crystal chemical classification whereas geological processes form the basis of the rock and ore collections. Paleontological collections provide an introduction to the development of life on earth. The museum collection is furnished with modern show-cases.



Dinosaur model in the geological museum



Oil well model

C- LABORATORY/RESEARCH FACILITIES

1. Petrographic preparation Laboratory: equipped with Rock Cutting Machines, Polishing and Thin-section preparation.
2. Petrologic research microscopes with attached photographic facilities.
3. GIS Laboratory with a server, 5 terminals, one A0 scanner, one A0 plotter, and 3 color laser printers.
4. Geophysical exploration equipments, including 24 - channel Seismometer, Magnetometer, Gravimeter, Resistivitymeter and Ground Penetrating Radar.
5. Borehole logging and Video Imaging Systems.
6. Petroleum Geology Laboratory.
7. Surveying equipments, which include three electronic total station units, Hand GPS – 20 numbers, Theodolites - 2 numbers.
8. Computer Laboratory for processing and interpretation of geological, geophysical and hydrogeological data.



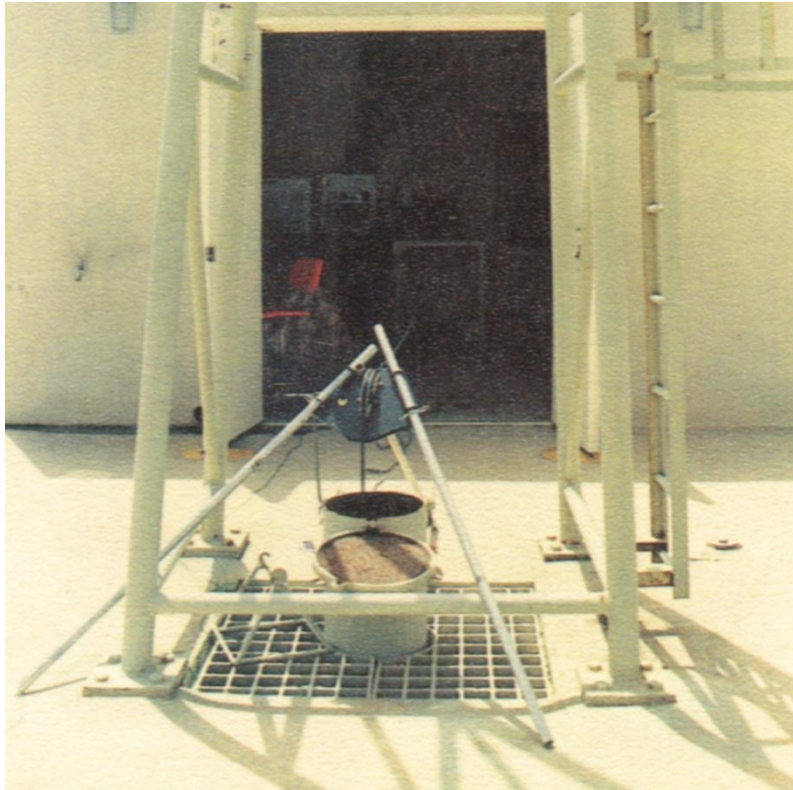
Petrographic preparation Laboratory



Mineralogy and Optics laboratory



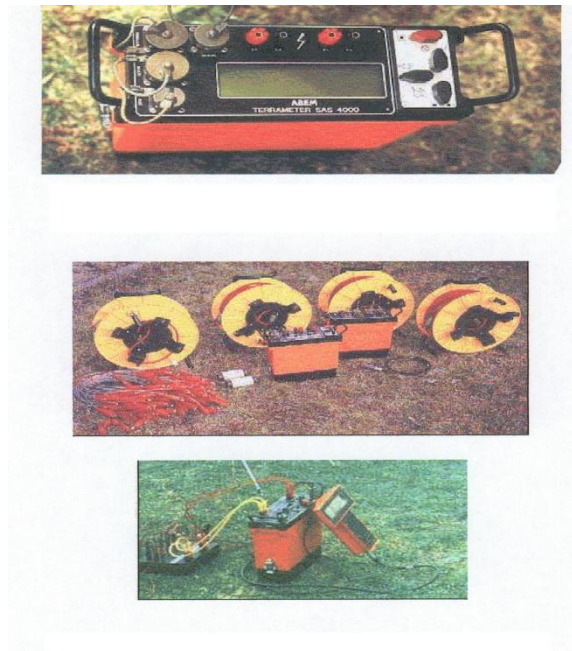
Differential Global Positioning System (DGPS)



Exploratory water well



Ground Penetrating Radar



Resistivitymeter



Magnetometer



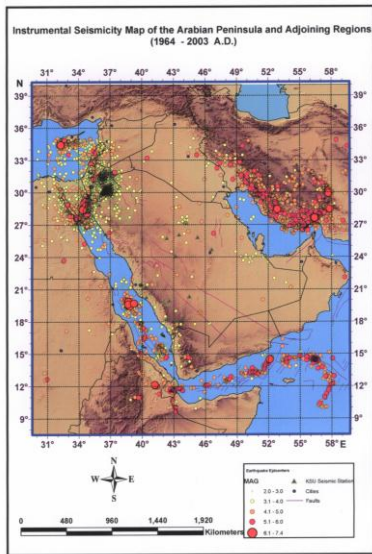
Computer Laboratory for processing and interpretation of hydrogeological data



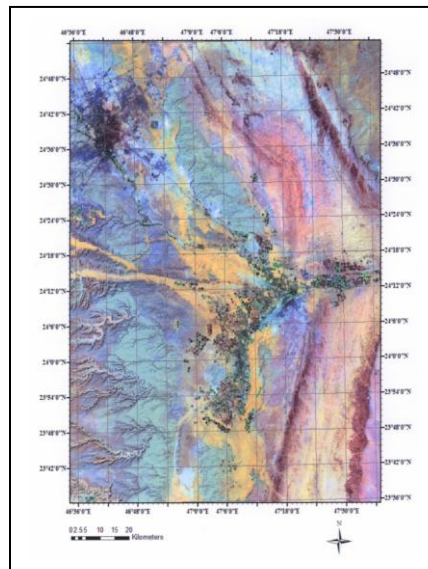
Borehole logging and Video Imaging Systems



Geographic Information System (GIS) laboratory

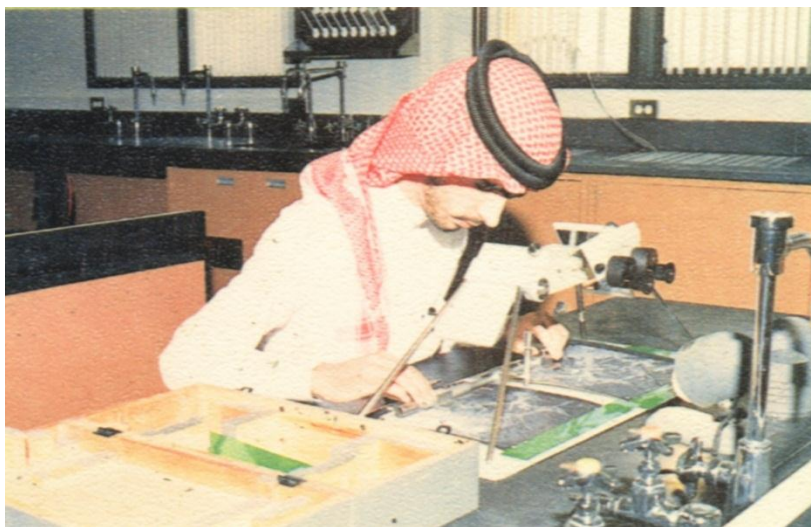


Kharg satellite image



GIS outputs

Distribution of earthquakes in the Arabian plate



Stereoscope

D- TEACHING CLASSROOMS

The department of Geology and Geophysics contains many laboratories that used as lecturing classrooms which are located in the department and share lecturing rooms with other programs inside the College of Science. The capacity of the lecturing classrooms varies from 30 to 40 students. Most of these classrooms equipped with audiovisual facilities such as follow:

Lecturing classrooms	Location	Capacity	Facilities
54 1B	Department	30	Datashow
60 1B	Department	30	Datashow
62 1B	Department	30	none
68 1B	Department	30	none
70 1B	Department	30	Datashow
72 1B	Department	30	none
48 1B	Faculty	40	audiovisual facilities
41 1B	Faculty	40	audiovisual facilities

E- FIELD EXPERIENCE ACTIVITIES

The field experience in the Geology and Geophysics programs is achieved through short field trips (up to three days) and one long field training course (35 days). The field activities supervision staff help in planning and scheduling activities for students, provide students with material support (geophysical tools, maps, air photos, software), moral support (advices, teaching, knowledge, experience, encouragement, etc) and assessment of performance, practices, activities and understanding. Students are thoroughly prepared through briefings and descriptive material for participation in the field experience through the following activities:

1. announcement for students to join the field, before at least the mid of 2nd semester
2. study the students' applications and their academic applicability to join the trip
3. lecturing to explain the plan and targets of the field trip and their duties and responsibilities
4. lecturing on safety aids
5. Distribute notices on their needs in the field (e.g. camp gear, clothing, shoes, drafting supplies, etc.).
6. Distribute notices on safety in the field and risks

Follow up meetings and classes with staff and students, at least one week before field trip are organized in which students can reflect on and generalize from their experience

The Department arranges summer field training camp for students for in areas of geological interest within the Kingdom when the students are trained on geological and topographic mapping techniques, to study geologic relationships with emphasis on stratigraphic interpretations of rocks. The students are trained to identify, describe, classify and interpret the different faunal contents and different geological structures.

In the field the students are also trained how to carry out different geophysical surveys; including the seismic (refraction and reflection), gravity, magnetic, electrical, and electromagnetic methods. Training is also imparted to students on geophysical data analysis and their geologic interpretation. For effective training purposes, the students are grouped and guided by the Departmental faculty and staff. Students are required to prepare written field reports upon completion of field training for evaluation.



☐ Studying geological structures during the field training



Geophysical survey during the field training

F- PROVISION OF FACILITIES AND EQUIPMENT

Each year King Saud university council board assign a budget for the provision of equipments in the College of Science and consequently the Dean of the college divides this received amount equally among the college departments and asks the department heads to submit their needs for the equipments in view of the available budget. The department head asks the equipment and laboratory committee in the department to submit the list of the required equipments according to the priorities agreed upon in the committee in view of the questionnaire collected from the faculty members in the department. Each year King Saud University council board assign a budget for the College of Science and consequently the Dean of the college divides this received amount equally among the college departments.

The budget allocated for the geological and geophysical programs depends on the available budget at the university to be distributed equally among different programs and not on the needs of the specific program. The program manager could ask for more budgets, if he has a good specific reason and according to the availability of more funds in the university this request could be agreed on.

The laboratories and equipment committee in the department is responsible for the investigation of the financial planning and management and formulate the evaluation upon discussing the related issues of this standard with the department head and the previous department head to get their experiences and correlate this with the actual situation to end up with a realistic conclusions.

G- RESEARCH

Faculty members have a several research activities both in sharing of scientific research or participate in projects supported and funded by the international and national organizations as listed in the following table. In addition, the university research centre annually calls for small research projects and funds them. Most of the research published in cited scientific journal beside that, most members of our department supervising the student research projects both of the undergraduate or graduate students with field studies required in the study and/or the

program. As well as, M. Sc. theses supported and funded by the university and research centers. On the other hand, the department was keen to increase the participation of staff members in conducting studies and projects for the community to benefit from the expertise of the department in solving existing problems in the country. The following table presents examples of the joint research projects carried by the geophysics program faculty in collaboration with national and international scientists.

COLLABORATED INSTITUTIONS

Regular contact is maintained with international scientists, keeping them informed about institutional developments, inviting their participation in scientific activities, and encouraging them to cooperate and participate in solving problems through joint projects and/or consultation.

In addition, the department of Geology and Geophysics is very keen to invite specialists from the industry to part time teaching. In addition, specialist from industry and other governmental institutions share the department staff in the supervision of the postgraduate research and undergraduate field studies. The matter of inviting one from industry and/or governmental institutions to attend the staff meeting is being discussed by the different departmental committees in order to share the department and its administration in putting the research policies.

REVIEW OF COURSES

A course planning committee is formed by the department counsel to study all feedback from the institutions that have employed our graduates to summarise the important changes required in our courses. Also all course reports are overviewed to find out difficulties facing some lecturers in completing their course objectives due to the lack of knowledge or skills in the students.

The graduate surveys also give some indication about the missing areas that were expected by the students. Finally, each staff member was asked to rewrite his course syllabus to suit this information and some new courses were suggested by the committee and assigned to the staff members in this field to write the new syllabus.

The desired bench mark for our course content in the Geology and Geophysics programs is that for Calgary University, Canada. All course content is updated and some new courses have been added in the program's plans as part of our development plan to add modern knowledge.

This change in the courses will be applied gradually. So, in the year 2008-2009, our students have started joining the Preparatory Year Program. Next year, 2009-2010, we will implement the changes in the 3rd and 4th levels (i.e. second year).

STUDENT EVALUATIONS

Each course taught by the Department undergoes a student evaluation. These evaluations are served electronically through the Deanship of registration and admission of King Saud University. An example of the forms used and a full description of evaluation process can be found at the deanship web site. The numerical results of the course evaluations are made available to the University board (university Rector, Dean, Head of Department) while the numerical scores and the comment sheets go directly to individual faculty members. The university board uses these data to keep tabs on how students perceive the quality of the courses, and to look for problematic patterns with certain courses or faculty members. Individual faculty members use the evaluations to monitor student perception of their courses, and to make improvements and adjustments as appropriate.

GRADUATE STUDENT QUALITY AND PREPARATION


The Department of Geology and Geophysics works closely with a fair number of its own students and other students from other universities, who continue their postgraduate degrees in the Department. This means that the department has frequent opportunities to see how its own students' preparation compares with that of students educated elsewhere. This has long provided an implicit feedback loop with regards to observing our own graduates' preparation for advanced study.


EDUCATIONAL ASSISTANCE FOR STUDENTS

The Department of Geology and Geophysics, College of Science and King Saud University systems provide the students of the programs with a comprehensive range of student support services that help the students to gain the best from their studies. A brief details of which are:


- 1- Every staff member has at least two hours per week to meet the students in his office. These hours are called office hours that aim to provide the students with opportunity to meet the course instructor within the days of study, help students to make a regular review of their academic progress and provide students with academic advice.
- 2- Disabled students have a good care from the University and the Faculty by offering suitable tools and facilities to simplify and make their study life very easy.
- 3- Student Handbook is provided to the new students. This handbook contains the essential information regarding departments, programs, courses, grading system, registration system and available services. In addition to that the academic departments provide their handbooks that also help students with the available programs, courses, student assessment methods and grading system.
- 4- Academic Advisor is available in order to monitor the progress and assistance and/or counseling the individual students especially those facing difficulties
- 5- Librarian Facilities where there Prince Salman Library presents strong research and learning base for all staff and students. In addition, the department small library that provides staff and students with periodicals, maps, Atlas, and geophysical and geological reports and textbooks.
- 6- Student activities such as sports, cultural, arts and social activities are available to students who share these activities. These activities are fully supported and supervised by the student administration.
- 7- Student accommodation: The students who come from outside Riyadh are offered accommodation in KSU student hostels.
- 8- Medical and health support to program students is available at the University educational hospitals which located inside the University campus.


FACULTY MEMBERS


Name	Prof. Abdullah M. Al-Amri	
Qualification	Ph.D. Geophysics (Earthquake Seismology), University of Minnesota , Minneapolis , MN , USA , 1990 (1410 H)	
Profession	Professor	
Administrative tasks	<ul style="list-style-type: none">- Ex. Chairman of Geology and Geophysics Department, KSU- Supervisor of seismological studies center- KSU- Chairman of the Saudi Saudi Society for Earth Sciences- Editor-in-Chief, Arabian Journal of Geosciences- Main investigator of the Empty Quarter Research chair	
Memberships	<ul style="list-style-type: none">- Seismological Society of America- American Geophysical Union- European Association for Environmental and Engineering Geophysics- Board council of the Saudi Society for Earth Sciences- Board council of the Middle East Seismic Forum, USA- National Committee for Assessment and Mitigation of Earthquake hazards in Saudi Arabia- Editorial Board of the Iranian Journal of Seismology- Editorial Board of the Journal of Science, KSU- Saudi Building Code	
Research	<ul style="list-style-type: none">- Consultant for The Saudi Geological Survey- Supervising several M.Sc. theses- Consultant of the Military Survey Administration , Ministry of Defense and Aviation- External examiner for M.Sc. and Ph.D. theses- Prize holder of Arab Admirable Achievers Award, Abha City Prize for Scientific Contributions, Golden Distinguished Researcher Award, KACST, and AL-Maraee Prize for Scientific Innovation- Published several scientific papers	
Contact	E-mail: amsamri@ksu.edu.sa Address: P.O Box. 2455, Riyadh , 11451, Saudi Arabia Tel. : 966 1 4676198 - 966 1 4676212 Fax : 966 1 4673662 Department web site: http://geo.ksu.edu.sa	


Name	Prof. Ali A. Al-Furaih	
Qualification	Ph.D. Geology (Micropaleontology and Biostratigraphy), University of Leicester , United Kingdom , 1977 (1397 H)	
Profession	Professor	
Administrative tasks	- Ex. Dean of Graduate College, KSU - Ex. Chairman of Geology and Geophysics Department, KSU - Ex. Supervisor of seismological studies center- KSU	
Memberships	- Saudi Society for Earth Sciences - British Society of Micropaleontology - International and British Societies of Paleontology	
Research	- Study of Jurassic microfauna in Saudi Arabia - Study of stratigraphic paleoecology of Hanifa Formation in Saudi Arabia - Study of recent Ostracods in the Arabian Gulf and Red Sea - Supervising several M.Sc. theses - External examiner for M.Sc. and Ph.D. theses - Published several scientific papers	
Contact	E-mail: furaih @ksu.edu.sa Address: P.O Box. 2455, Riyadh , 11451, Saudi Arabia Tel. : 966 1 4676198 - 966 1 4676212 Fax : 966 1 4673662 Department web site: http://geo.ksu.edu.sa	


Name	Prof. Ahmed A. Al-Muhandes	
Qualification	Ph.D. Geology (Mineralogy and chemistry of minerals and rocks), University of Manchester , United Kingdom , 1977 (1397 H)	
Profession	Professor	
Administrative tasks	<ul style="list-style-type: none">- Ex. Vice-Dean of students affair, KSU- Ex. Vice-Dean of College of Science, KSU- Ex. Chairman of Geology and Geophysics Department, KSU- Ex. Supervisor of Department of Astronomy, KSU- Ex. Director of translation center, KSU	
Memberships	<ul style="list-style-type: none">- British Geological Society- Saudi Society for Earth Sciences- British Society of Mineralogy- American Society of Mineralogy	
Research	<ul style="list-style-type: none">- Study of basic and ultrabasic rocks and gemstones in Saudi Arabia- Study of evaporate minerals (gypsum and anhydrite) and clay minerals- External examiner for M.Sc. and Ph.D. theses- Published several scientific papers	
Contact	E-mail: mohandis @ksu.edu.sa Address: P.O Box. 2455, Riyadh , 11451, Saudi Arabia Tel. : 966 1 4676198 - 966 1 4676212 Fax : 966 1 4673662 Department web site: http://geo.ksu.edu.sa	


Name	Prof. Saleh M. Okla	
Qualification	Ph.D. Geology (Stratigraphy and Petroleum Geology), University of Indiana , USA , 1976 (1396 H)	
Profession	Professor	
Administrative tasks	- Ex. Dean of students Registration, KSU	
Memberships	- American Association of Petroleum Geologists - Saudi Society for Earth Sciences	
Research	- Study of microfacies in several geological formation made up of carbonates in Saudi Arabia - Supervising several M.Sc. theses - External examiner for M.Sc. and Ph.D. theses - Published several scientific papers	
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Name	Prof. Hassan O. Sendy	
Qualification	Ph.D. Geology (Geochemistry), University of London , Queen Mary College , United Kingdom, 1982 (1402 H)	
Profession	Professor	
Administrative tasks	- Member in some committees in the department of Geology and Geophysics, KSU	
Memberships	- British Geological Society - Saudi Society for Earth Sciences - International Society of Geochemistry	
Research	- Study of Arabian Shield tectonics and igneous and metamorphic rocks, - Study of geochemistry of igneous and metamorphic rocks - Study of geochemistry of water - Interested in Geomorphology, Geoarcheology and Engineering Geology - External examiner for M.Sc. and Ph.D. theses - Published several scientific papers	
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Name	Prof. Goma A. Al-Allawy	
Qualification	Ph.D. Geology (Economic Geology), University of Indiana , USA , 1985 (1405 H)	
Profession	Professor	
Administrative tasks	- Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	- American Geological Society - Saudi Society for Earth Sciences	
Research	- Study of mineral ores - Prospecting of economic ore deposits - Interested in Environmental Geology and mineralogy - External examiner for M.Sc. and Ph.D. theses - Published several scientific papers	
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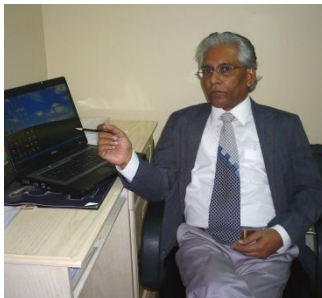
Name	Prof. Abdul Aziz M. Al-Bssam	
Qualification	Ph.D. Geology (Geology and chemistry of groundwater), University of Birmingham , United Kingdom , 1987 (1408 H)	
Profession	Professor	
Administrative tasks	<ul style="list-style-type: none">- Ex. Vice-Dean of College of Science, KSU- Consultant in Saudi Ministry of water and electricity- Ex. Chairman of Geology and Geophysics Department, KSU	
Memberships	<ul style="list-style-type: none">- Board council of the Saudi Society for Earth Sciences- Consultant of the International Organization of Prince Soltan of water- International Society of Water Resources- Ex. Board council of Water Sciences and Technology- British Geological Society- Saudi Society for Earth Sciences	
Research	<ul style="list-style-type: none">- Used computer programs in designing models of flow and chemistry of groundwater- Supervising several M.Sc. theses- External examiner for M.Sc. and Ph.D. theses- Published "Groundwater" book- Translated into Arabic a book entitled " Water in the Middle East- probable conflicts and hopeful cooperation"- Published several scientific papers in the field of Hydrogeology	
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Name	Prof. Hesham M. Al-Araby	
Qualification	Ph.D. Geophysics (Potential methods), Cairo University, Cairo, Egypt, 1990 (1410 H)	
Profession	Professor	
Administrative tasks	<ul style="list-style-type: none">- Ex. Manager of information and data analysis laboratory in Cairo University Center for Environmental Hazard Mitigation- Supervisor of Geographic Information System unit- KSU- Coordinator of Geophysics Program	
Memberships	<ul style="list-style-type: none">- Geophysical Society of Egypt- Saudi Society for Earth Sciences	
Research	<ul style="list-style-type: none">- Application of geographical information systems GIS in geophysical research projects- Conducting more than ten projects for water shade and flash flood analysis to protect existing and planed urban communities- GIS Applications in Geophysical Environmental Hazard Mitigation- Integrated interpretation of different geophysical branches to solve environmental problems- Magnetic and geoelectric studies for groundwater exploration- Supervising several M.Sc. and Ph.D. theses- External examiner for M.Sc. and Ph.D. theses- Published several scientific papers	
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Name	Prof. El- Khedr H. Ibrahim	
Qualification	Ph.D. Applied Geophysics (Geomagnetic), Channel System between Mansoura University, Mansoura, Egypt and Belmot University, United Kingdom, 1993 (1413 H)	
Profession	Professor	
Administrative tasks	<ul style="list-style-type: none">- Head of the Development and Quality Committee in the Department of Geology and Geophysics, KSU- Member of the Steering Committee in the Department of Geology and Geophysics, KSU- Member of the Evaluation and Academic Accreditation Committee in the Department of Geology and Geophysics, KSU- Ex. Vice-head of the Quality Unit, College of Science, Mansoura University, Egypt	
Memberships	<ul style="list-style-type: none">- Geophysical Society of Egypt- Saudi Society for Earth Sciences- Geological Society of Egypt	
Research	<ul style="list-style-type: none">- Application of Geomagnetic in geophysical research projects- Application of Refraction Seismic and Geoelectric in geophysical research projects- GIS Applications in Geophysical Environmental Hazard Mitigation- Integrated interpretation of different geophysical branches to solve environmental problems- Supervising several M.Sc. and Ph.D. theses- External examiner for M.Sc. and Ph.D. theses- Published several scientific papers	
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Name	Prof. Essam Abd El-Motaal Mohamed	
Qualification	Ph.D. Geology (Structural Geology), Al-Azhar University, Cairo, Egypt , 1993 (1413 H)	
Profession	Professor	
Administrative tasks	<ul style="list-style-type: none">- Member in some committees in the Department of Geology and Geophysics, KSU- Member of the Alumni Affairs and Employment Committee in the Department of Geology and Geophysics, KSU- Member of the Students' Guidance Committee in the Department of Geology and Geophysics, KSU	
Memberships	<ul style="list-style-type: none">- Saudi Society for Earth Sciences- Geological Society of Egypt- Egyptian-Dutch Friendship Society	
Research	<ul style="list-style-type: none">- Structural architecture and tectonic evolution of the Red Sea Rift (specially its coastal plain)- Analysis of the structural features and constructing block diagrams to interpret their evolution- Neotectonic evolution of the Nile Delta and Red Sea Rift- Structures of the Syrian Arc System- Tectonics and morphotectonics of the Gulf of Suez, Egypt- Neotectonics and seismotectonics of the Gulf of Suez and Gulf of Aqaba- Using Remote Sensing techniques in assessment of the natural hazards and land-use- Supervising several M.Sc. and Ph.D. theses- External examiner for M.Sc. and Ph.D. theses- Published several scientific papers	
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Name	Prof. Ashraf M. Wali	
Qualification	Ph.D. Geology (Salt Geology), Institute of Geology and Mineral Deposits, Academy of Mining and Metallurgy, Cracow, Poland, 1981 (1401 H)	
Profession	Professor	
Administrative tasks	- Accreditation consultant- Vice-deanship for Development and Quality, College of Science, KSU	
Memberships	- American Association Petroleum Geologists - Geological Society of Egypt - Sedimentological Society of Egypt - Arab Society of Mining and Petroleum - Board member, National Committee of Marine Sciences - Board member of Mineral Resources - Member of the Egyptian Geographical Society - Member of Geological Sciences Committee	
Research	- Out-burst gas from blasting “Cones of explosion” in salt mines (Poland and USA) - Evaluation of salt production from Sayahas “El-Arish, Ismalya and Suez”, Egypt - Salt evaluation and economic beneficiations of Western Desert natural saline lakes, Egypt - Study of the effects of Sayah salts on soil deterioration, West of Damietta, Egypt - Sayaha salt effects of coastal areas and its environmental hazardous West of Damietta till Rosetta, Egypt - Supervising several M.Sc. and Ph.D. theses - External examiner for M.Sc. and Ph.D. theses - Published several scientific papers	
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Name	Prof. Manoj Mukhopadhyay	
Qualification	Ph.D. Geophysics, Indian School of Mines, Dhanbad; National Geophysical Research Institute (Hyderabad), India, 1976 (1396 H).	
Profession	Professor	
Administrative tasks	<ul style="list-style-type: none">- Ex. Head of Department of Applied Geophysics, Indian School of Mines, Dhanbad, India- Ex. Coordinator, M.Tech. (Petroleum Exploration) program, ISM Dhanbad, India- Ex. Advisor to Director, ISM Dhanbad, India	
Memberships	<ul style="list-style-type: none">- Saudi Society for Earth Sciences	
Research	<ul style="list-style-type: none">- Seismotectonics of the Himalayas and Burmese-Andaman Arc- Proterozoic Plate Tectonics in Canadian Shield- Gravity Interpretation Studies- Geodynamic Modeling- Petroleum Geosciences	
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Qualification	Ph.D. Geophysics (Seismology), University of Manchester , United Kingdom , 1997 (1417 H)	
Profession	Professor	
Administrative tasks	- Ex. Chairman of Geology and Geophysics Department, KSU	
Memberships	- Board member of the Saudi Society for Earth Sciences - British Royal Society of Earth Scientists, London - American Geophysical Union	
Research	- Study of natural hazards e.g. earthquakes, volcanoes, landslides..etc. - Study local seismic activity - Study artificial seismic activity - Study the crustal structure of the Arabian Peninsula - Developing the local seismic observatory stations - External examiner for M.Sc. and Ph.D. theses - Published several scientific papers	
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Name	Prof. Mohamed T. Hussein	
Qualification	Ph.D. Geology (Hydrogeology), University of , Grenoble, France, 1980 (1400 H)	
Profession	Professor	
Administrative tasks	<ul style="list-style-type: none">- Departmental Board Secretary, Department of Geology and Geophysics, KSU- Ex. Head of Hydrogeology Department, Faculty of Earth Sciences, King Abdulaziz university- Vice-President, Red Sea university, Sudan	
Memberships	<ul style="list-style-type: none">- Saudi Society for Earth Sciences- Geological Society of Africa- Geological Society of France- Geological Society of London- International Society of Thermal Techniques- The International Association of Hydrological Sciences (IAHS)	
Research	<ul style="list-style-type: none">- Hydrogeological studies of dry regions- Environmental Geology- Applications of recent techniques in exploration and evaluation of groundwater resources- Supervising several M.Sc. theses- External examiner for M.Sc. and Ph.D. theses- Published several scientific papers in the field of Hydrogeology	
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Name	Dr. Ahmed A. Al-Aswad	
Qualification	Ph.D. Geology (Stratigraphy), University of Indiana , USA , 1986 (1406 H)	
Profession	Associate Professor	
Administrative tasks	<ul style="list-style-type: none">- Consultant in High education council, Saudi Arabia- Ex. Director of study affairs in the Saudi Cultural Bureau, Washington, USA- Ex. Supervisor of seismological studies center, KSU	
Memberships	<ul style="list-style-type: none">- American Society of Sedimentary Geology- American Association of Petroleum Geologists- Saudi Society for Earth Sciences	
Research	<ul style="list-style-type: none">- Study of strata, depositional environment and Diagenesis- Interested in economic aspects in sedimentary rocks and Environmental Geology- Translation of geologic terminology into Arabic- Published several scientific papers	
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Name	Dr. Ahmed M. Al-Saleh	
Qualification	Ph.D. Geology (Petrology/Chemistry), University of Liverpool , United Kingdom , 1993 (1413 H)	
Profession	Associate Professor	
Administrative tasks	- Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	- Saudi Society for Earth Sciences - Geological Society of London - Society of Applied Geochemistry - Society of Economic Geology	
Research	- Study of the origin and evolution structure of the Arabian Shield - Study of geochemical prospecting of mineral ores - Study of environmental influence of mining - Supervising several M.Sc. theses - Published several scientific papers	
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Name	Dr. Mohamed N. Al-Sabrouty	
Qualification	Ph.D. Geology (Palynology), Languedoc University, Montpellier, France, 1985 (1405 H)	
Profession	Associate Professor	
Administrative tasks	<ul style="list-style-type: none">- Academic Coordinator in Department of Geology and Geophysics, KSU- Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	<ul style="list-style-type: none">- Saudi Society for Earth Sciences- Geological Society of Egypt- French Association of Palynologists in France	
Research	<ul style="list-style-type: none">- Creating computer programs in Palynological studies- Study of deformation of pollen grains and spores to determine the direction of environmental pollution- Environmental Geology- Supervising several M.Sc. theses- External examiner for M.Sc.- Published several scientific papers	
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Name	Dr. Mahmoud A. Galmad	
Qualification	Ph.D. Geology (Minerals and Rocks), Cairo University, Cairo, Egypt , 1996 (1416 H)	
Profession	Associate Professor	
Administrative tasks	- Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	- Saudi Society for Earth Sciences - Geological Society of Egypt - Mineralogical Society of Egypt - Sedimentological Society of Egypt	
Research	- Description and interpretation of thin sections of sedimentary rocks - Study of Heavy Minerals - Study of diagenesis in sedimentary rocks - Study deposits of phosphate, coal and evaporates - Supervising several M.Sc. theses - Published several scientific papers	
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Name	Dr. Osama E. Attia	
Qualification	Ph.D. Geology (Sedimentary rocks and Sedimentation), Cairo University, Cairo, Egypt , 1993 (1413 H)	
Profession	Associate Professor	
Administrative tasks	- Vice-Deanship Consultant for Academic Affair, College of Science, KSU	
Memberships	- Sedimentological Society of Egypt - Geological Society of Egypt - Mineralogical Society of Egypt	
Research	- Petrology of sedimentary sequences (specially evaporites) - Sedimentological characteristics of old evaporite sequences with emphasis on their depositional and diagenetic histories - Sand dunes and their environmental impacts - Study of fluid inclusions in minerals and rocks to elucidate their depositional and diagenetic histories - Supervising several M.Sc. theses - Published several scientific papers	
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Name	Dr. Awni T. Batayneh	
Qualification	Ph.D. Geophysical Engineering, Jilin University, Changchun, China , 1996 (1416 H)	
Profession	Associate Professor	
Administrative tasks	- Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	- Environmental and Engineering Geophysical Society (EEGS) - International Association of Environmental Hydrology (IAEH) - Jordan Engineers Association (JEA) - Jordan Geologists Association (JGA) - Saudi Society for Geosciences (SSG)	
Research	- Geophysical investigation for the location of Prehistoric sites - Using the head-on resistivity method for shallow rock fracture investigations - Detection of a solution cavity adjacent to a highway in southwest Jordan using electrical resistivity methods - Gravity field and crustal structure of the northwestern Arabian plate in Jordan - Published several scientific papers	
Contact	E-mail: awni@ksu.edu.sa Address: P.O Box. 2455, Riyadh , 11451, Saudi Arabia Tel. : 966 1 4676198 - 966 1 4676212 Fax : 966 1 4673662 Department web site: http://geo.ksu.edu.sa	


Name	Dr. Mohamed S. Fnais	
Qualification	Ph.D. Geophysics (Earthquake Seismology), Saint Louis University, Saint Louis , Missouri , USA , 2004 (1424 H)	
Profession	Associate Professor	
Administrative tasks	- Advisor for the Vice-Deanship for international cooperation, KSU	
Memberships	- Seismological Society of America - American Geophysical Union - Saudi Society for Earth Sciences - Society of Geophysical Exploration	
Research	- Study of subsurface geophysical properties of Wadi Hanifa area, Saudi Arabia - Study of the structure of the crust and upper mantle of the Arabian Shield and Red Sea - Modeling the change of shear velocity in the crust and upper mantle of the Arabian Shield and Arabian Plate - Supervising several M.Sc. theses - Published several scientific papers	
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Name	Dr. Mohamed E. Al-Dabbagh	
Qualification	Ph.D. Geology (Sedimentology), University of Northern Carolina , USA , 1988 (1408 H)	
Profession	Assistant Professor	
Administrative tasks	<ul style="list-style-type: none">- Ex. Chairman of Geology and Geophysics Department, KSU- Head of the Alumni Affairs and Employment Committee in the Department of Geology and Geophysics, KSU	
Memberships	<ul style="list-style-type: none">- Saudi Society for Earth Sciences	
Research	<ul style="list-style-type: none">- Study of deposits and tectonics of the Red Sea- Supervising several M.Sc. theses- Published several scientific papers	
Contact	<p>E-mail: @ksu.edu.sa Address: P.O Box. 2455, Riyadh , 11451, Saudi Arabia Tel. : 966 1 4676198 - 966 1 4676212 Fax : 966 1 4673662 Department web site: http://geo.ksu.edu.sa</p>	


Name	Dr. Abdul Aziz A. Laboun	
Qualification	Ph.D. Geology (Petroleum Geology), King Abdul Aziz University, Saudi Arabia , 1982 (1402 H)	
Profession	Assistant Professor	
Administrative tasks	- Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	<ul style="list-style-type: none">- Saudi Society for Earth Sciences- Dhahran Society of Earth Sciences- American Association of Petroleum Geologists- Saudi Society for History- Saudi Society for Archeology	
Research	<ul style="list-style-type: none">- Study of Petroleum Geology of Saudi Arabia- Geoarcheological studies- Geomorphology of sand dunes- Supervising several M.Sc. theses- Published several scientific books in Arabic- Published several scientific papers	
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Qualification	Ph.D. Geology (Hydrogeology - management and Planning the water resources), University of Colorado, USA , 1992 (1412 H)	
Profession	Assistant Professor	
Administrative tasks	- Ex. Chairman of Geophysics Department, King Abdul Aziz University, Saudi Arabia - Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	- Saudi Society for Earth Sciences	
Research	- Management and Planning the water resources - Studies in Environment and pollution - Study of water composition and properties - Supervising several M.Sc. theses - Published several scientific papers	
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Name	Dr. Saad M. Al-Mogren	
Qualification	Ph.D. Geophysics (Gravity and magnetic), University of New Castle, United Kingdom , 2004 (1424 H)	
Profession	Assistant Professor	
Administrative tasks	<ul style="list-style-type: none">- Chairman of Geology and Geophysics Department, KSU- Supervisor of the Evaluation and Academic Accreditation, College of Science, KSU- Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	<ul style="list-style-type: none">- Saudi Society for Earth Sciences	
Research	<ul style="list-style-type: none">- Interpretation of gravity and magnetic data using 3-D modeling- Determining the Geod of Saudi Arabia- Observing the changes in the Absolute Gravity- Error corrections in the flight altitude during the Aeromagnetic Survey- Supervising several M.Sc. theses- Published several scientific papers	
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Name	Dr. Osama M. Kaoud Kassem	
Qualification	Ph.D. Geology (Structural Geology), University of Miens , Germany , 2005 (1425 H)	
Profession	Assistant Professor	
Administrative tasks	- Coordinator of Geology Program - Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	- Saudi Society for Earth Sciences - Geological Society of Egypt - Egyptian Society of Applied Petrophysics	
Research	- Study of history of microstructure deformation - Study of strain analysis in rocks - Study of plastic deformation - Published several scientific papers	
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Name	Dr. Habis F. Ghrefat	
Qualification	Ph.D. Environmental Science and Engineering, University of Texas at El Paso, USA, 2004 (1324 H)	
Profession	Assistant Professor	
Administrative tasks	- Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	- Saudi Society for Earth Sciences - Geological Society of America (GSA) - American Geophysical Union (AGU)	
Research	- Mapping Playa Evaporite Minerals, White Sands, New Mexico Using Landsat ETM+ - Gypsum grain size determination in the Dune Area of White Sands, N.M using AVIRIS imagery - Spectral Dimensionality Comparison between Multispectral Landsat 7 ETM+, ASTER, and EO-1 ALI, and Hyperspectral AVIRIS and Hyperion - Published several scientific papers	
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Qualification	Ph.D. Geology (Geochemistry and Petrology of igneous rocks), University of Manchester , United Kingdom , 1990 (1410 H)	
Profession	Assistant Professor	
Administrative tasks	- Member in some committees in the Department of Geology and Geophysics, KSU	
Memberships	- British Geological Society - Saudi Society for Earth Sciences - Saudi Chemical Society - American Society of Mineralogy	
Research	- Study of geochemistry and petrology of Granitoid rocks and its associated ore deposits - Geochemical prospecting of mineral ores - Published several scientific papers - Study of geochemistry and petrology of Granitoid rocks and its associated ore deposits - Geochemical prospecting of mineral ores - Published and prepared several scientific researches in Granitoid rocks and its minerals geochemistry, and ground water hydrology in K.S.A.. - Prepared several scientific researches in drilling deep water wells, and interpreted ground water parameter; those well; in some province; have been the water supply for water treatment plants all over the Kingdom. - Supervised and managed several mining project such as Bauxite, Zinc, and Copper ores within the Arabian Shield.	
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