مركز الاعتماد وضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER

The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

Course Name:
Geologic Data Analysis

تحليل البيانات الجيولوجية

1	Course title	Geologic Data Analysis نحليل البيانات الجيولوجية	
2	Course number	0305392	
3	Credit hours (theory, practical)	3 hours (2,1)	
	Contact hours (theory, practical)	3 hours (2,3)	
4	Prerequisites/corequisites	0301231	
5	Program title	Applied and Environmental Geology	
6	Program code		
7	Awarding institution	الجامعة الاردنيةThe University of Jordan	
8	Faculty	Science	
9	Department	Geology	
10	Level of course	Third – fourth year	
11	Year of study and semester (s)	2017/2018 first, second (mostly first)	
12	Final Qualification	BSc.	
13	Other department (s) involved in teaching the course	None	
14	Language of Instruction	English	
15	Date of production/revision	2017/2018	

16. Course Coordinator: Dr. Khitam Ahmad Alzughoul

Office numbers, office hours, phone numbers, and email addresses should be listed.
Office No.: G207 Office Hours: S, M, T, Th (11:00-12:00)
Phone No. : 22260
e- mail: k.alzghoul@ju.edu.jo

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.

18. Course Description:

As stated in the approved study plan.

This course is an introductory presentation of numerical analyses of geological data. The scientific geologist has a set of criteria for identifying Earth's materials and drawing a conclusion. The use the qualitative criteria and assessment is inevitably subjective, so problem should be stated and tested in terms of numbers. To know how to deal with the increasingly geologic information that comes from digital recording instruments, and to store data resulting form exploration in numerical form

1. 19. Course aims and outcomes:
2.

A- Aims:

1. To uunderstand the basic geologic data, their SOURCES AND classifications.
2. To understand the full geostatistical, mathematical and numerical derivatives and calculations
3. have a conceptual understanding of how methods work and how to apply them
4. the ability to follow procedures and make conclusions
5. To know how to use geostatistical software's such as Excel, JUMP, Surfer

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to …

1. Students can apply technical knowledge of computer applications and mathematics and physics to solving real-world problems in different disciplines of Earth and Environmental Sciences.
2. Students use the scientific method to define, critically analyze, and solve problems in earth and Environmental sciences.
3. Students can communicate scientific knowledge in both oral presentations and in writing

20. Topic Outline and Schedule:

References	Assessment	Outcomes	Instructor	Week	Content
Introduction	- Assignment -Quiz - Exam	**1–3**	Dr. Alzughoul	Week 1	**1- Introduction** • Why analyse geological data? • Objectives, Software Definitions
Chapter 1 p. (1-14)	- Assignment -Quiz - Exam	**1–3**	Dr. Khitam Alzughoul	Week 2	**2- Data Collection & Preparation** • Data Quality, Handling Data • Types of Geological Data, Types of Analysis • Populations & Samples– Definitions, Sampling
Chapter 2 p. 15- 146	- Assignment -Quiz - Exam	**1–3**	Dr. Khitam Alzughoul	Week 3 -6	**3- Statistics with one variable** • Graphical and Numerical Description - frequency of distribution & Histograms, properties, Parameters • Graphical Summaries: Exploratory Data Analysis • Probability

					• Random Variables • The Normal Distribution • Testing Hypotheses • Analysis of Variable
Chapter 3, p. 148- 164	- Assignment -Quiz - Exam	**1−3**	Dr. Khitam Alzughoul	Week 6-8	**4- Statistics with two variables** • Bivariate Scatter • The correlation Coefficient • Bivariate Regression
Ch 4 p. 180	- Assignment -Quiz - Exam	**1−3**	Dr. Khitam Alzughoul	Week 9	**5- Non Parametric Statistics** • Why to use non- parametric statics • Use of ranks, NP Correlations
			Dr. Khitam Alzughoul		**Mid- term exam -------- 2018**
Ch 5 p. 193- 212	- Assignment -Quiz - Exam	**1−3**	Dr. Khitam Alzughoul	Week 10	**6- Directional Data and Circular Statistics** • Definitions and Data Types • Statistics on Directional Data • Geometrical concepts, calculations, Tests • Statistics on Oriented Data
Ch 6 p. 213- 257	− Assignment -Quiz - Exam	**1−3**	Dr. Khitam Alzughoul	Week 11	**7- Data Through Time** • Markov Chains • Time Series Analysis
Chapter 7 p. 266- 281 Hand outs	Assignment -Quiz - Exam	**1−3**	Dr. Alzughoul	Week 11-12	**7- Geographyically distributed Data** • Distribution of Points • Graphical Display of Spatial Data
Chapter 8 p. 328	Assignment -Quiz - Exam	**1−3**	Dr. Alzughoul	Week 12 -end	**8 – Multivariate Methods** • Why use multivariate methods?, Choice of Method • Similarity Coefficients and Cluster Analysis
				TBD	**9- Final Examinations**

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

1. Power point presentations; Presentations of tables, images, Cartoons and videos
2. Problem solving and project oriented method
3. Class Discussions, group discussions, Team work Assignments
4. E learning,
5. Laboratory Applying Activities
6. Website visit Watching videos related to topics

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

1. delivering Assignments
2. Quizzes
3. Laboratory Reports
4. Exams
5. Seminars, solving problems through discussions

23. Course Policies:

A- **Attendance policies**:
Attendance is checked periodically. You are responsible for determining the content and extent of any class work presented during any period of absence. Absences in excess of 4 for the lecture, while Absence for the Lab for more than 1 time result in withdrawal from the class at my request. Make every effort to arrive on time to class.

All students are expected to attend all classes and should arrive on time. **Attendance** is essential to learning, be there. Students should maintain discipline and respect one another in both words and action. They are expected to come prepared and participate actively in class discussion. **Be on time**. Active participation is essential to learning.

According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams be given for accepted excuses.

**. Reading: Assigned portions of the text must be read, not merely scanned prior to coming to class. You are expected to learn and understand definitions of terms and concepts appearing in the reading assignments.

**NOTE: The lecture notes do not include: (1) solutions to the exercises and projects; (2) proofs to theories and equation derivations. These will be presented only during lectures. So, please do not rely on the notes for everything — class attendance and participation are key to doing well.

B- Absences from exams and handing in assignments on time:

* -Following the University rules in this regards: if the student provide a legitimate excuse, then another compensation exam will be given.

A quiz will be given during most lectures (unless an exam is scheduled). Each quiz will be 1-2 questions and based on the previous week's lecture. Quizzes cannot be made up. The lowest quiz grade will be dropped.

****Assignment and Laboratory Report: All reports and assignment should be turned on before due time. Any delay for any reason will result in having "0" . Copying of the report will yield a " zero" mark for the lab and will be considered as an act of cheating.

C- Health and safety procedures:

* Following the University rules in this regards

D- Honesty policy regarding cheating, plagiarism, misbehavior:

* If the cheating have been proven or if student cause any disturbance during the exam; then the legislations and violation approved by the University of Jordan will be followed.

اذا ثبت غش الطالب في الامتحان او ساهم في تعكير النظام الصفي فيتم تطبيق العقوبات المعمول بها في كلية العلوم و الجامعة الاردنية و حسب الأصول

E- Grading policy:

* **Midterm Exam** (30%), Assignments + Quizzes (05%), **Laboratory work** (25%)= (Laboratory Activities, reports + Practical (Lab) Exam) and **Final Exam** (40%)

Tests and grades: Final grades will be based on your performance in the assignment, repots, exams and the project. Make-up tests are strongly discouraged.

F- Available university services that support achievement in the course:

* The Library, Computer Center, and Hard rocks and Minerals Labs.

24. Required equipment:

1. The Library
2. Data Show
3. Internet and electronic services
4. Computers
5. Softwares

25. References:

A- Required book (s), assigned reading and audio-visuals:

- A. R. H. Swan & M. Sandilands. 1995, **Introduction to Geological Data Analysis,** Blackwell Science Ltd, USA
**Handout will be offered periodically during course work
- John C. Davis, 2002, Statistics and Data Analysis in Geology 3rd Edition, **John Wiley and sons, Inc. New York,** ISBN-13: 978-0471172758, ISBN-10: 0471172758

Other recommended books

Any book dealing with geological Data Analysis or Geostatistics

26. Additional information:

Name of Course Coordinator: Dr. Khitam Ahmad Alzughoul---Signature: ---------- Date: ----------

Head of curriculum committee/Department: ---------- Signature: ----------

Head of Department: ---------- Signature: ----------

Head of curriculum committee/Faculty: ---------- Signature: ----------

Dean: ---------- -Signature: ----------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File