

Academic Year 1442H (2020 – 2021)
Second Semester

PRINCIPLES OF GEOPHYSICS (GPH 201)

Lecture's Time: 09-10 am (#64461)

Lecture's Room: Online COVID19

Instructor: Dr. Mahmoud M. ELWAHEIDI

Office Hours: Sunday & Monday: 10:00 am -12:00 am

Tuesday: 10:00 am -12:00 am & 8:00 -9:00am

Wednesday: 08:00 -9:00 am

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I. COURSE OUTLINES		
Activity	No of Weeks	No. of hours
1. INTRODUCTION <ul style="list-style-type: none">• Definition• Classification of geophysical methods• Fields of application	1	2
2. FUNDAMENTAL CONSIDERATION <ul style="list-style-type: none">• Stress - Strain Relationship• Elastic Coefficients• Seismic Waves• Huygens and Fermat principles• Snell's Law in Refraction	2	4
3. SEISMIC REFRACTION METHOD <ul style="list-style-type: none">• Introduction• Two Horizontal Interfaces• Dipping Interfaces• Field Procedures• Interpretation	2	4

<p>4. SEISMIC REFLECTION METHOD</p> <ul style="list-style-type: none"> • A Single Subsurface Interface • Analysis of Arrival Times • Normal Move out • Determining of Velocity & Thickness • Dipping Interface • Field Procedures • Applications in Petroleum exploration 	2	4
<p>5. EARTHQUAKE SEISMOLOGY</p> <ul style="list-style-type: none"> • Definition and Historical review • Classification of Earthquakes • Earthquakes: Where and Why • Causes of Earthquakes • Earthquake Epicenter & Hypocenter • Magnitude & Intensity 	2	4
<p>6. ELECTRICAL METHOD</p> <ul style="list-style-type: none"> • Electrical properties of rocks • Apparent & True resistivity • Electrode configurations • Electrical soundings, Profiling & ERT • Applications 	2	4
<p>7. GRAVITY METHOD</p> <ul style="list-style-type: none"> • Fundamental principles • Measurements • Data reduction • Isostasy and crustal thickness • Interpretation & Applications 	2	4
<p>8. MAGNETIC METHOD</p> <ul style="list-style-type: none"> • Basic concepts • Description of the magnetic field • Source of magnetic anomalies • Interpretation & Applications 	2	4

II. GRADING SYSTEM

Assessment	Assessment task	Week due	%
1	Lab	1-12	20 %
2	Mid-term exam	To be determined in later time	30%
4	Attendance, Quizzes & Assignments	Continuous	10 %
5	Final exam	To be determined in later time	40 %

III. TEXT BOOKS- REFERENCES

- Lectures' notes available at: <https://lms.ksu.edu.sa/>
- Kearey P. and Brooks M., 2002. An introduction to geophysical exploration. Blacwell Science.
- J.M. Reynolds, 2011, An Introduction to Applied and Environmental Geophysics
- Lowrie, W., 1997. Fundamental of geophysics. Cambridge University Press.
- Telford, W., Geldart, L., and Sheriff, R., 1990. Applied geophysics, second edition. Cambridge University Press.
- <http://crack.seismo.unr.edu/ftp/pub/loaie/class/492-syll.html>

VI. IMPORTANT NOTES

- Class attendance is mandatory
- Assignments late delivery will not be accepted.
- Frequent visit to the Learning Management System (LMS) (<https://lms.ksu.edu.sa/>) site is required to keep yourself updated with course materials, activities and announcements.