King Saud University
College of Science
Geology and Geophysics
Department

جامعة الملك سعود
كلية العلوم
قسم الجيولوجيا والجيوفيزياء

Academic Year 1441H (2019 – 2020)

First Semester

PRINCIPLES OF GEOPHYSICS (GPH 201)

Lecture's Time: Sundays and Tuesday s **02-03 am** (29866)

Lecture's Room: 0140 04 G B 80/3

Instructor: Saleh Qaysi

Office Hours: Sundays, Tuesdays & Thursdays: 10:00 am -12:00 am
Mondays & Wednesdays: 09:00 am -11:00 am

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I. COURSE OUTLINES

Activity	No of Weeks	No. of hours
1. FUNDAMENTAL CONSIDERATION • Stress - Strain Relationship • Elastic Coefficients • Seismic Waves • Huygens and Fermat principles • Snell's Law in Refraction	**2**	**4**
2. SEISMIC REFRACTION METHOD • Introduction • Two Horizontal Interfaces • Dipping Interfaces • Field Procedures • Interpretation	**2**	**4**
3. SEISMIC REFLECTION METHOD • 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**
4. EARTHQUAKE SEISMOLOGY • Definition and Historical review • Classification of Earthquakes • Earthquakes: Where and Why • Causes of Earthquakes • Earthquake Epicenter & Hypocenter • Magnitude & Intensity	**2**	**4**

5. ELECTRICAL METHOD • Electrical properties of rocks • Apparent & True resistivity • Electrode configurations • Electrical soundings, Profiling & ERT • Applications	**2**	**4**
6. GRAVITY METHOD • Fundamental principles • Measurements • Data reduction • Isostasy and crustal thickness • Interpretation & Applications	**2**	**4**
7. MAGNETIC METHOD • Basic concepts • Description of the magnetic field • Source of magnetic anomalies • Interpretation & Applications	**2**	**4**

II. GRADING SYSTEM

Assessment	Assessment task	Week due	Proportion of Final Assessment
1	**Lab**		20 %
2	**1st Mid-term exam**	**Tuesday, 08/Safar/1441 (08 Oct., 2019)**	10%
3	**2nd Mid-term exam**	**Tuesday, 15/Rabi I/1441 (12 Nov, 2019)**	10%
4	**Attendance and participation in discussion**		10%
5	**Quizzes & Assignments & discussion**		10 %
6	**Final exam**		40 %

III. TEXT BOOKS- REFERENCES

- 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/louie/class/492-syll.html