

Academic Year 1441H (2019 – 2020)  
First Semester

## PRINCIPLES OF GEOPHYSICS (GPH 201)

Office No: **2B120**

Tel. No:

I. COURSE OUTLINES		
Activity	No of Weeks	No. of hours
<p>1. FUNDAMENTAL CONSIDERATION</p> <ul style="list-style-type: none"> <li>• Stress - Strain Relationship</li> <li>• Elastic Coefficients</li> <li>• Seismic Waves</li> <li>• Huygens and Fermat principles</li> <li>• Snell's Law in Refraction</li> </ul>	2	4
<p>2. SEISMIC REFRACTION METHOD</p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Two Horizontal Interfaces</li> <li>• Dipping Interfaces</li> <li>• Field Procedures</li> <li>• Interpretation</li> </ul>	2	4
<p>3. SEISMIC REFLECTION METHOD</p> <ul style="list-style-type: none"> <li>• A Single Subsurface Interface</li> <li>• Analysis of Arrival Times</li> <li>• Normal Move out</li> <li>• Determining of Velocity &amp; Thickness</li> <li>• Dipping Interface</li> <li>• Field Procedures</li> <li>• Applications in Petroleum exploration</li> </ul>	2	4
<p>4. EARTHQUAKE SEISMOLOGY</p> <ul style="list-style-type: none"> <li>• Definition and Historical review</li> <li>• Classification of Earthquakes</li> <li>• Earthquakes: Where and Why</li> <li>• Causes of Earthquakes</li> <li>• Earthquake Epicenter &amp; Hypocenter</li> <li>• Magnitude &amp; Intensity</li> </ul>	2	4

<b>5. ELECTRICAL METHOD</b> <ul style="list-style-type: none"> <li>• Electrical properties of rocks</li> <li>• Apparent &amp; True resistivity</li> <li>• Electrode configurations</li> <li>• Electrical soundings, Profiling &amp; ERT</li> <li>• Applications</li> </ul>		<b>2</b>	<b>4</b>
<b>6. GRAVITY METHOD</b> <ul style="list-style-type: none"> <li>• Fundamental principles</li> <li>• Measurements</li> <li>• Data reduction</li> <li>• Isostasy and crustal thickness</li> <li>• Interpretation &amp; Applications</li> </ul>		<b>2</b>	<b>4</b>
<b>7. MAGNETIC METHOD</b> <ul style="list-style-type: none"> <li>• Basic concepts</li> <li>• Description of the magnetic field</li> <li>• Source of magnetic anomalies</li> <li>• Interpretation &amp; Applications</li> </ul>		<b>2</b>	<b>4</b>
<b>II. GRADING SYSTEM</b>			
<b>Assessment</b>	<b>Assessment task</b>	<b>Week due</b>	<b>Proportion of Final Assessment</b>
1	<b>Lab</b>		20 %
2	<b>1<sup>st</sup> Mid-term exam</b>	<b>Tuesday, 08/Safar/1441 (08 Oct., 2019)</b>	10%
3	<b>2<sup>nd</sup> Mid-term exam</b>	<b>Tuesday, 15/Rabi I/1441 (12 Nov, 2019)</b>	10%
4	<b>Attendance, Quizzes &amp; Assignments</b>		20 %
5	<b>Final exam</b>		40 %
<b>III. TEXT BOOKS- REFERENCES</b>			
<ul style="list-style-type: none"> <li>• Lectures' notes available at: <a href="https://lms.ksu.edu.sa/">https://lms.ksu.edu.sa/</a></li> <li>• Kearey P. and Brooks M., 2002. An introduction to geophysical exploration. Blacwell Science.</li> <li>• J.M. Reynolds, 2011, An Introduction to Applied and Environmental Geophysics</li> <li>• Lowrie, W., 1997. Fundamental of geophysics. Cambridge University Press.</li> <li>• Telford, W., Geldart, L., and Sheriff, R., 1990. Applied geophysics, second edition. Cambridge University Press.</li> <li>• <a href="http://crack.seismo.unr.edu/ftp/pub/louie/class/492-syll.html">http://crack.seismo.unr.edu/ftp/pub/louie/class/492-syll.html</a></li> </ul>			
<b>VI. IMPORTANT NOTES</b>			
<ul style="list-style-type: none"> <li>• Class attendance is mandatory</li> <li>• Assignments late delivery will not be accepted.</li> <li>• Frequent visit to the Learning Management System (LMS) (<a href="https://lms.ksu.edu.sa/">https://lms.ksu.edu.sa/</a>) site is required to keep yourself updated with course materials, activities and announcements.</li> </ul>			