



**Faculty of Earth Sciences**



**Geophysics Department**



**The Geological Society**  
*Accredited degree courses*

### ***SEISMIC EXPLORATION***

<b>Course Name</b>	<b>Course ID</b>	<b>Prerequisites</b>
<b><i>SEISMIC EXPLORATION</i></b>	<b><i>EGP 321</i></b>	<b><i>EGP 211/PHYS 202/ MATH 202</i></b>

### **Time Table for Course Lectures**

#### **SEISMIC EXPLORATION (EGP 321)**

<b>Week</b>	<b>Lecture Topic</b>
1	Seismic Exploration Methods / Applications <sup>[1]</sup>
2	Seismic Waves / Propagation / Velocities <sup>[1]</sup>
3	Seismic Equipments <sup>[2]</sup>
4	<b>Test 1</b>
5	Seismic Refraction / Reflection Survey Layouts <sup>[3]</sup>
6	Refraction Travel Times (Horizontal/Dipping Interfaces) <sup>[4,5]</sup>
7	T-X Plots for Multilayers Medium <sup>[5]</sup>
8	<b>Test 2</b>
9	Refraction Inversion - 1 <sup>[5]</sup>
10	Refraction Inversion - 2 <sup>[5]</sup>
11	Refraction Inversion - 3 <sup>[5]</sup>
12	<b>Test 3</b>
13	Limitations of Refraction Seismics <sup>[5]</sup>
14	Boreholes Seismic Surveys / Examples <sup>[6]</sup>
15	Revision and Raised Questions
16	<b>Final Exam</b>

***References:***

[1] *Basic Exploration Geophysics*, by Robinson, E.S. and Coruh, C., 1998. John Wiley & Sons, NY, USA. p. 2-35

[2] *Basic Exploration Geophysics*, by Robinson, E.S. and Coruh, C., 1998. John Wiley & Sons, NY, USA. p. 117-138.

[3] *Basic Exploration Geophysics*, by Robinson, E.S. and Coruh, C., 1998. John Wiley & Sons, NY, USA. p. 139-160.

[4] *Basic Exploration Geophysics*, by Robinson, E.S. and Coruh, C., 1998. John Wiley & Sons, NY, USA. p. 39-57

[5] *Exploration Geophysics of the Shallow Subsurface*, by Burger, H.R., 1992. Prentice-Hall PTR, Englewood Cliffs, NJ. p. 57-91.

[6] *Applied Geophysics*, by Telford, W.M., Geldart, L.P., Sheriff, R.E., 1990. Cambridge University Press, 2, 770pp.

## SEISMIC EXPLORATION (EGP 321)

### Time Table for Lab. Work

Week	Test Name
1	Seismic Velocities & Elastic Properties of Rocks
2	T-X Plot Of Two Reversed Seismic Shots / Graph Properties
3	T-X Plot Of Two Reversed Seismic Shots / Velocity, Depth & Dip Angle Calculations
4	Field Seismic Data - Waves Identification / Refraction Time Picking
5	T-X Plot of Five Seismic Shots / Graph Properties / Calculations
6	Seismic Refraction Project-1 (Real Data) / Picking, Time Plotting, Calculations-I
7	Seismic Refraction Project-1 (Real Data) / Picking, Time Plotting, Calculations-II <sup>1</sup>
8	Seismic Refraction Project-1 (Real Data) / Picking, Time Plotting, Calculations-III (Inversion Techniques-A)
9	Seismic Refraction Project-1 (Real Data) / Picking, Time Plotting, Calculations-III (Inversion Techniques-B)
10	Refraction Times For Fault Identification / Calculations
11	Refraction Modeling By Ray-Tracing
12	Refraction Case Studies <sup>1</sup>
13	Borehole Surveys-Downhole / Crosshole Surveys (Design & Calculations)
14	General Revision And Raised Questions
15	<b>Final Exam</b>

[1] *Introduction to Geophysical Prospecting* by Dobrin, M.B. & Savit, C.H., **References:** 1988. McGraw Hill Pub. Co.

[2] *Applied Geophysics* by Telford, W.M., Geldart, L.P. and Sheriff, R.E., 1988. Cambridge University Press.