



**Faculty of Earth Sciences**



**Geophysics Department**



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

### ***EARTHQUAKE ENGINEERING***

| <b>Course Name</b>                   | <b>Course ID</b>      | <b>Prerequisite</b>   |
|--------------------------------------|-----------------------|-----------------------|
| <b><i>EARTHQUAKE ENGINEERING</i></b> | <b><i>EGP 372</i></b> | <b><i>EGP 211</i></b> |

#### **Course Description**

Magnitude and intensity of earthquake and mechanics of its occurrence. International seismic zones. Danger and seismic hazards. Groundwater motions and soils liquefaction during the ground shaking. Dynamics of the earthquake-resistant construction and their main characteristics.

#### **Course Objectives**

1. Review of seismic waves and basics of seismology.
2. Addressing some definitions like the earthquake magnitude, intensity, acceleration, and energy and earthquake location. Simple equations are given.
3. Explaining different types of earthquake hazards (soil liquefaction, landslides, etc.).
4. Integrating the earthquake parameters in constructing seismic zonation maps and seismic coding for buildings.
5. Defining the parameters that govern earthquake-resistant constructions.

#### **General References for the Course:** (Books/Journals...etc.)

Students in this course can read from:

1. *Earthquakes, 4th Edition*, by Bolt, B.A., 1999. W.H. Freeman & Company, NY, USA.
2. *Introduction to Seismology*, by Shearer. P.M., 1999. Cambridge University Press.

3. *Modern Global Seismology*, by Lay, T. and Wallace, T.C., 1995, Academic Press, San Diego.
4. *Seismology*, by Doyle, H., 1995. John Wiley & Sons, NY, Toronto.

#### **List of URLs for this Course**

- [www.dot.ca.gov/hq/esc/earthquake\\_engineering/](http://www.dot.ca.gov/hq/esc/earthquake_engineering/)
- <http://www.sciencecourseware.org/eec/Earthquake/Assessment/>

#### **Course Outcome**

1. Student can learn about different seismic waves, their radiation patterns and their paths from the source (earthquake) to stations.
2. Student can learn the relationships between geological structures and earthquake seismology.
3. Student can calculate the earthquake source parameters and location.
4. Student knows the seismic hazard/risk and its relation to constructions.
5. Student can realize the importance of earthquake coding to constructions.