Quadrant II – Transcript and Related Materials (Notes)

Programme : **Bachelor of Science (First Year)**

Subject : **Geology**

Paper Code : **GEC 101**

Paper Title : **Fundamentals of Mineral Science**

Unit : **1**

Module Name : **Internal Structure of the Earth-3**

Module No : **6**

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Notes:

Layers of Differing Physical Properties

- ***Lithosphere*** - about 100 km thick (up to 200 km thick beneath continents, thinner beneath oceans), very brittle, easily fractures at low temperature.
- The lithosphere is comprised of both crust and part of the upper mantle.
- The plates that we talk about in plate tectonics are made up of the lithosphere, and appear to float on the underlying asthenosphere.
- ***Asthenosphere*** - Lies below the Lithoshphere- solid rock, but soft and flows easily (ductile).
- The top of the asthenosphere is called the Low Velocity Zone (LVZ) because the velocities of both P- and S-waves are lower than the in the lithosphere above. But, not that neither P- nor S-wave velocities go to zero, so the LVZ is not completely liquid.
- ***Mesosphere*** - about 2500 km thick, solid rock, but still capable of flowing.
- ***Outer Core*** - 2250 km thick - liquid. We know this because S-wave velocities are zero in the outer core, this implies that the material is in a liquid state.
- ***Inner core*** - 1230 km radius, solid.

The Low Velocity Zone

- The existence of a low velocity channel or zone within the upper part of the mantle is thought to depend on the temperature of the material in relation to its melting point.
- The LVZ, which extends from about 65 to 220 km depth in the ocean basins.
- The low-velocity zone in the upper mantle is thus a kind of lubricated zone, making relative movement between the overlying Lithosphere and the interior possible.