



Dipartimento di Scienze e Tecnologie

ANNO ACCADEMICO 2017/2018

**CORSO di STUDIO in SCIENZE GEOLOGICHE
INSEGNAMENTO in PHYSICS OF THE EARTH**

DOCENTE Prof.ssa RAFFAELLA DE MATTEIS

Earth's age. Isotopes, radioactive decay, accumulation clocks. Major divisions of the Earth. Plate Tectonics: geophysical constraints.

Earth's gravity field: the law of universal gravitation, the earth's figure, gravitational potential and acceleration of the spheroidal Earth, normal gravity, the geoid, measurement of gravity, correction of gravity measurements (free-air, topographic, Bouguer plate correction) gravity anomalies, regional and residual anomalies, interpretation of gravity anomalies, Isostasy, gravity modeling, examples for Italian region.

Seismology and the internal structure of the Earth: elements of elasticity theory, seismic waves, earthquake seismology, earthquakes and plate tectonics, earthquake location, focal mechanism, earthquake size, earthquake frequency, seismic rays in a uniformly layered Earth, the ray parameter, inversions of travel-time vs distance curves, radial variations of seismic velocities, models of the Earth's internal structure, stress field, the seismicity in Italy.

Earth's magnetic field: separation of the magnetic fields of external and internal origin, axial dipolar model, temporal and spatial variations, the magnetization of the Earth's crust, interpretation of magnetic anomalies, origin of the magnetic field, paleomagnetic studies.

Heat within the Earth, sources of heat, heat transfer, heat flow across Earth's surface, tectonics and heat flow. Flusso geotermico: il calore all'interno della Terra, sorgenti di calore, trasferimento di calore.

Bibliografia consigliata:

- Lowrie W. - Fundamentals of Geophysics - Cambridge University Press, 1997.
- Gasparini, M.S.M. Mantovani - Fisica della Terra Solida - Liguori Editore, 1984.
- Zollo, A. Emolo - Terremoti e onde. Metodi e pratica della sismologia moderna. - Liguori Editore, 2011
- Fowler C.M.R. - The solid Earth - Cambridge University Press, 1990
- Lillie R.J. - Whole earth geophysics. Prentice Hall, 1999



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