Course N-01

1. Terminology: : Consists of the study of the choice and using terms that are part of the vocabularies solely of the specialty, which can be found in all areas of knowledge: computer science, grammar, linguistics, mathematics, philosophy, Medicine, music…etc.". And which can also come from everyday language and in the various dictionaries, which lexicographers are responsible for.

1.1. Glossary of terms relevant to the geology

abrasion – erosion caused by the rubbing or grinding of rocks or sediment particles against each other.

acid test (for calcite) – test for calcite in which a small drop of dilute hydrochloric acid (HCl) is placed on a rock or mineral to determine whether it reacts with the acid (fizzes or effervesces). Calcite will fizz.

albite – plagioclase feldspar that ranges from a pure sodium end member ($NaAlSi_3O_8$ or Ab 100%) to 90% sodium and 10% calcium (Ab 90% or An 10%). (see also plagioclase)

aluminosilicate –minerals with a combination of aluminum, silicon, and oxygen forming their anions.

amphibole – a group of aluminosilicate minerals with a framework structure and a variety of cations. See hornblende, tremolite, and actinolite for chemical formulas.

andesine – plagioclase feldspar that ranges in composition from Ab 30-50% or An 50-70% or 30-50% Na vs. 70-50% Ca. (see also plagioclase.) 2

anorthite – plagioclase feldspar that ranges from a pure calcium end member ($CaAl_2Si_2O_8$ or An 100%) to 90% calcium and 10% sodium (An 90% or Ab 10%). (see also plagioclase.)

apatite – phosphate mineral with the formula: $Ca_5(PO4)_3(F,Cl,OH)$. Apatite commonly occurs as microscopic slender crystals in igneous rocks.

bedding – layering produced by the deposition of sediment.

bedrock – solid rock of Earth's crust.

biotite – common mica group mineral that is black and has the chemical formula: $K(Mg,Fe)_3AlSi_3O_{10}(OH)_2$.

calcite – the most common carbonate mineral that is the primary constituent of limestone and marble and has the formula: $CaCO_3$.

carbonates – group of minerals with the anion CO_3^{2-}.

cement –chemical precipitates that glue particles together in the formation of sedimentary rocks.

abbreviations for chemical elements and subscript numbers showing their ratios.

chert – a non-clastic sedimentary rock composed of chemically or biologically precipitated hydrated quartz.

chlorite – green mica group mineral with the formula: $(Mg,Fe)_3(Si,Al)_4O_{10}(OH)_2 \cdot (Mg,Fe)_3(OH)_6$. Chlorite is formed during low grade regional metamorphism and by hydrothermal alteration and may fill veins.

clastic sedimentary rocks – sedimentary rocks formed by the deposition of particles eroded from other rocks.

clay – sedimentary particles with a diameter smaller than 0.002 mm or 2 microns.
cleavage – preferred breakage of a mineral on flat planes controlled by weaknesses in its crystalline structure.

coal - a non-clastic sedimentary rock made of decayed and de-volatilized plant material.

color – fundamental property of minerals determined by its appearance in the white light spectrum.

contact lines, contacts – the boundaries or lines separating different geologic units on a geologic map.

contact metamorphism – metamorphism of rocks due to heating next to a magma body.

continental drift – a theory proposed by Alfred Wegener that the current continents had once been together as larger continent and split apart from each other to move to their present positions.

crystalline structure – regularly repeated arrangement of atoms in the molecular structure of a mineral.

dike – a tabular igneous rock body formed by the intrusion of magma into a fracture or crack. The British spelling is “dyke”.

divergent plate boundary – a boundary between lithospheric plates where the plates are moving away from each other. This may occur as continents split apart at rift valleys or in the ocean basins at mid-ocean ridges.

dolomite – a carbonate mineral with the composition: $CaMg(CO_3)_2$. (see dolostone.)

Earth science (geology) – the science that studies Earth’s formation and history including modern processes of Earth’s interior, surface, and oceans and their formation and history.

earthquake – the sudden displacement of rocks on a fault where stress has built up over time and with failure on the fault elastic energy is released that cause shock waves to pass through the ground.

erosion – the removal of weathered material and surficial deposits at Earth’s surface by water, wind, glacier flow, or mass movement.

evaporites – non-clastic sedimentary rocks or minerals left by the evaporation of water in the ocean or a lake. Commonly this is salt (halite) and gypsum, and less commonly calcite and dolomite.
extinction – the disappearance of an organism from the fossil record or the dying out of an organism. .
fault - a fracture or fracture zone in rocks along which there is displacement of rocks on opposite sides.

fault zone – a zone within which displacement of two adjacent bodies of rock occurs.

feldspar – a group of aluminosilicate minerals that are the most common minerals at Earth's surface. They have sodium, calcium, and potassium as their cations. See plagioclase, microcline, and orthoclase for chemical formulas.

felsic rocks and minerals – light-colored igneous minerals and rocks, usually dominated by feldspar and quartz.

formation – in a geologic context it is the fundamental subdivision of rocks on geologic maps based on similar properties and age and traceability across the land surface.

fossils – features left by organisms including body parts or impressions of their bodies or tracks and trails.
fracture – any crack that forms in a rock or mineral.

Geographic Information System (GIS) – a computer mapping system that allows the placement of data on a map as well as the recording of data associated with points, lines, and polygons that map up the map data. See GIS.

geologic map – any map depicting or classifying any aspect of the geology of an area.

geologic time scale – the subdivision of geologic time according to named units.

geology – the study of Earth's processes, formation, and history.

geophysical – having to do with the physical properties of Earth.

gneiss - a metamorphic rock that displays banding formed by the segregation of non-micaceous minerals into layers because of the recrystallization and deformation.

GPS (Global Positioning System) device – a device that gives the location or coordinates of a place on Earth's surface based on signals from satellites. GPS systems are satellite networks that are used to triangulate the exact position or coordinates of a location on Earth's surface.

volcanic eruptions. As the plate moves across the hot spot a string of volcanoes is produced.
hydrothermal – having to do with hot water solutions.

igneous rocks – rocks formed from the cooling of magma or molten rock.

limestone – a non-clastic sedimentary rock dominantly made of calcite.

lithosphere – the outer part of Earth including the crust and upper most mantle that behaves as a rigid solid and is made of separate plates.

mantle – an interior layer of Earth beneath the crust down to a depth of 2900 km where it rests on the core. It is composed of iron and magnesium silicates and oxides and has a density of about 4.5 g/cc.

matrix – the fine particles that surround the largest particles in a poorly sorted conglomerate or coarse sandstone.

metamorphic rock – any rock that has had its mineralogy or texture altered by later changes in heat and pressure.

metamorphism – alteration of a rock's mineralogy or texture by later changes in temperature or pressure.

mineral – a naturally occurring, inorganic solid with a crystalline structure and a composition that can be written as a well-defined chemical formula. Each mineral has a unique set of properties.

Moho (short for Mohorovičić Discontinuity) – the boundary between the crust and the mantle below.

opaque – any material that will not transmit light.

periods – units of time that are subdivisions of eras.

permeability – the property of a material which is the ease with which water passes through the material.

petrographic (or polarizing) microscope – a microscope that takes advantage of polarized light to look at crystalline materials and is used by geologists to study thin sections of rocks.

petrologists – scientists that study the formation of rocks. Includes sedimentary, igneous, and metamorphic petrologists. Note: this has nothing to do with petroleum.

phosphate – a group of minerals with anions composed of phosphorus and oxygen.

plagioclase – a type of feldspar dominated by sodium and calcium anions and having a chemical formula ranging from: $NaAlSi_3O_8$ to $CaAl_2Si_2O_8$. Individual names are given to different compositional ranges of plagioclase according to the percentages of end members (Ab for albite: $NaAlSi_3O_8$ or An for anorthite: $CaAl_2Si_2O_8$) in this sequence.

pyrite – a common iron sulfide mineral, also informally called "fool's gold", with the chemical formula: Fe_2S.

pyroclastic rocks – volcanic rock formed from ejecta deposits.

quartz – a common, and very hard, silicate mineral that has the chemical formula: SiO_2. A major constituent of most felsic and sialic igneous rocks.
reverse fault – a dip-slip fault with displacement such that the footwall (above the fault surface) moves up the fault plane on the footwall (below the fault surface). (see normal fault and thrust fault.)

rock cycle – an idealized progression of rock formation that starts with magma, followed by igneous rock formation, weathering and erosion, sediment transport and deposition, sedimentary rock formation, and then metamorphism eventually leading to high temperature melting and magma formation.

sand – sedimentary particles that are 2.0 - 0.0625 mm in diameter.

salt – a non-clastic sedimentary rock made of sodium chloride (NaCl) or the mineral halite.

schist – a mica-rich metamorphic rock formed by the macroscopic growth of mica and the development of a wavy micaceous foliation or schistosity. A metamorphic rock displaying schistosity.

sediment – particles or grains of material eroded from existing rocks or derived from other materials. (see sedimentary rock.)

sedimentary rock – rocks formed by the accumulation of particles eroded from other rocks or organically or chemically accumulated or precipitated materials in surface or near surface environments.

sedimentary structures – the arrangements of particles, sorting characteristics, and shapes of beds and bedding features that are sometimes preserved in sedimentary rocks.

seismology – the study of mechanical waves and how they propagate through the Earth.

silicate – a group of minerals in which anions are composed of some combination of silicon and oxygen.

silt – sedimentary particles that are 0.0625 - 0.002 mm (or 62.5 - 2 microns) in diameter.

skarn – rocks produced by the contact metamorphism of carbonate rocks including limestone and dolomite. This rock is composed of calcitic or dolomitic marble, and numerous calcium/magnesium silicate minerals depending on the temperate and chemical reactions that take place in the presence of hydrothermal fluids.

soil – a layer at Earth's surface formed by the buildup of material left behind by the weathering of rocks and surficial deposits.

subduction zone - (see convergent plate boundary.)

sulfate – a group of minerals that has a combination of sulfur and oxygen (usually SO_4^{2-}) as its anion.

sulfide – a group of minerals that has just sulfur as its anion.

superposition – a fundamental principle that says that sedimentary layers are laid down one on top of the other with the unit at the bottom being the oldest and the unit at the top being the youngest. Sediment is always deposited on some other sediment or rock that is older.

texture – the size, shape, and arrangement of mineral grains in a rock

topographic map – map displaying contour lines that show the topography or shape of the land surface as well as other features such as water features (hydrography) and cultural features such as roads, railroads, and buildings.

translucent – a mineral that will transmit some light but will not transmit an image.

transparent – a mineral that transmits light as well as an image.

transport – the movement of sediment.

viscosity – the resistance of a fluid to flow.

https://sites.tufts.edu/fellsgeology/files/2021/08/GlossaryGeolIntro.pdf