

Course Contents:

Earth and Environment Definition of environment; origin of earth, lithosphere, hydrosphere, atmosphere, biosphere; Earth Structure, Plate Tectonics theory, geo-morphological features, Geological structures (folds, faults, discontinuity, dike); Engineering and Genetic classification of soils, Weathering and Soils; Rocks, rock cycle, Igneous Rocks, Sedimentary Rocks, Metamorphic Rocks, Rock Properties, Rock-water interaction; Natural disasters: Cyclone, Tornado, Volcanic Eruption, Earthquakes– Generation mechanism, different terminologies, earthquake monitoring and measurements, seismic region of the world, Tsunami, Land Slides; Sustainability and resilience for natural disasters; Hydrosphere; water cycle, surface and groundwater origin and its quality, oceans, ocean currents, ocean water quality; Atmosphere; components of atmosphere; earth's energy budget; air quality, winds, cloud formation, storms; Biosphere; essential components for life; energy, carbon, water and nutrients and their role in sustaining life; carbon and nutrients recycling; biomes and ecosystems; Natural Resource and Human Civilization; Natural Resources; natural resources for energy, food, shelter, and other human needs ; Human Civilization; link between human civilization, natural resources and environment; Infrastructure: characteristics of modern human civilization and the need for infrastructure; Environmental Impacts of Human Civilization Environmental impacts of population growth, intensive agriculture, land use changes, urbanization, industrialization, mining; Consequences of fossil fuel burning; global warming and climate change ; Loss of biodiversity, desertification, loss of soil fertility, reduction in water availability, land, air and water pollution; Sustainable Development; Concept of Sustainable Development: Brundtland Report; Modifications for sustainability; reuse and recycle, demand management, innovative supply side Engineering; Sustainable development in various sectors; energy, industry, agriculture, transportation, construction, water resources and land management; Institutional limitations in achieving sustainable development