LOGO DELLA STRUTTURA PRIMARIA

COURSE: **PHYSICAL GEOGRAPHY**			
ACADEMIC YEAR: **2016-2017**			
TYPE OF EDUCATIONAL ACTIVITY: **Basic**			
TEACHER: **Dr. Salvatore Ivo Giano**			
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Language: **Italian**			
ECTS: **7 CFU** (5 of lessons, 2 of pratice/laboratiories)	n. of hours: 40 of lessons and 24 of tutorials/practice)	Campus: Potenza Dept./School: Dept. of Science Program: Geological Sciences (L34)	Semester: course beginning on 03/10/2016 and ending on 15-31/01/2017

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The students will be acquired the basic concepts and terminology of physical geography to describe the physical landscape of the Earth system. They will recognize the natural landforms of the Earth and the main currently erosion, transport, and deposition processes acting on the Earth. Moreover, they will evaluate the transformation of the landscape induced by human activities. It is expected a qualitative and quantitative recognition of landforms by means of topographic maps analysis and aerial photogrammetry techniques

PRE-REQUIREMENTS

Sintetizzare in lingua inglese i contenuti riportati nella scheda in lingua in italiana.

A knowledge of physics arguments will be required.

SYLLABUS

Sintetizzare in lingua inglese i contenuti riportati nella scheda in lingua in italiana.

Field of interest and methods of the Physical Geography and outlines of the Earth system.

What is the Physical Geography. Aims and Methods of Physical Geography. The Earth's system component: lithosphere, atmosphere, hydrosphere, and biosphere. Generality of the earth system: open/closed system, matter, energy and mass balance.

Basic elements of Astronomical Geography and size and shape of the earth.

Composition of the universe, north and south astronomical pole, Nadir and Zenit, astronomical horizon, sun system and associated planets, movement of the plantes, the Keplero laws, the Gravitational law.

The experience of Eratostene, bending of the earth's surface, ellipsoid and geoid. Geographic coordinates. Earth's great and small circles, meridians and parallels, latitude and longitude. Rotation and revolution movements of the Earth, Coriolis forces, Ferrel law, perihelion, aphelion, earth axis inclination, solstice and equinox, apses's line, radiation and heating zones, astronomical zone, precession of equinox, eccentricity, obliquity

Representing the Earth surface.

Geographical coordinates and positioning. Earth's magnetic field, magnetic declination, wind rose, polar coordinates, solar radiation, analemma, latitude and longitude computation, time's measurement, use of the GPS. Graphical representation of the Earth. Topographic maps, map projection types, orthomorphic projection, perspective projection, cylindrical and conical projection, modified projection, Gauss projection, cylindrical transverse Mercator. Production of geographical maps. Absolute and relative point in the field, triangulation method, isolines, Global Positioning System (GPS), Geographical Information System (GIS), aerial photogrammetry, remote sensing, symbols on topographic maps, equidistance and contour lines, The topographic map of Italy, the Gauss-Boaga projection, the UTM projection, distance between two points on topographic map, slope of a hillside, construction of a topographic profile

Atmosphere and climate.

Atmospheric composition and zonation. Solar radiation and insolation, air temperature, atmospheric pressure,

pressure gradient force, wind and global scale circulation of the atmosphere, rainfall and hair humidity, air masses and frontal transitional zones. The Earth's climate. Climatic zonation, climate classification (temperature, rainfall, atmospheric circulation), Köppen climate classification system, A-Tropical Moist Climates, B-Dry Climates, C-Moist Mid-latitude Climates with Mild Winters, D-Moist Mid-Latitude Climates with Cold Winters, E-Polar Climates, H-Altitude Climate, climate of the Italian Region, Quaternary climate variations, climate variations from prehistoric age to Present day

***Hydrosphere**.*

Mass water distribution on the Earth. Oceans, ice caps and continental waters, the hydrologic cycle, hydrological balance, origin of tides, continental waters, lakes and their classification, Italian lakes, water balance in lakes, drainage networks, stream flow and stream discharge, origin and development of sheet washing/rills/gullies, drainage basin and its zone, thalweg area and watershed area, sediment transport, bed load and suspended load, length, gradient, velocity, discharge of the stream flows, rectilinear streams, braided streams, meandering streams, anastomosing streams, base level of erosion concept, normal and backward fluvial erosion, fluvial terrace types, alluvial and detrital fans, longitudinal profile of a river, graded stream concept, knickpoint formation, fluvial patterns, infiltration and soil water storage, porosity and permeability, hydraulic gradient, Darcy law, ground water and aquifer concept, flow and discharge in an aquifer, through flow of the water, classification of the springs, well of pumping.

***The Earth's internal system**.*

The Lithosphere and its internal structure. Physiography and topography of the Earth's terrestrial surface, first order landforms on the earth, continental masses and oceanic basin, hypsographic curve, second order landforms on the earth, continental shelf, continental slope, abyssal plain, mid-oceanic ridge, continental ridge, continental shield, orogenic chains. Endogenic and exogenic forces, coastal plains, plateau, basin and dome, fold belts, fault belts, crystalline and metamorphic landscapes, volcanoes landform, complex landforms.

Weathering and factors on the earth's surface modeling and landforms.

Chemical and physical weathering, frost and heat weathering, oxidation, hydrolysis, hydration, solution, landform of weathering, granular disintegration, exfoliation, crushing, regolith, colluvium and eluvium, detrital slopes and cones.

Landforms gravity-controlled. Creep, soil slip, gelifluction and solifluction, landslides, classification of the landslides by Varnes.

Landforms water-controlled. Earth pyramids, badlands and biancane, potholes, rills and gullies, gorges, fluvial valley evolution, the meander, vertical incision and lateral planation concepts, incised fluvial valleys, filled alluvial valleys, fluvial terraces, river mouth, delta and estuary, fluvial morphometry, stream ordering, bifurcation ratio, drainage density.

The Davisian's erosion cycle. Youth, maturity and old ages, local and regional base level of erosion, pediplain and monadnock, the Penck's cycle, the King's cycle, pediment and inselberg landforms, the Hack's dynamic equilibrium concept

Basic elements on volcanic landforms, shield volcanoes, pyroclastic volcanoes, calderas.

Karst landscapes and processes. Solution and precipitation of carbonates, surface karst landforms, karren, karst fields, sinkhole, doline, uvala, polje, hum, buried karst landforms, caves, speleothems.

Glacial landscapes. Glacial erosion and deposition, cirques and glacial valleys, glacial trough and fjords, moraines and tills, signs on Quaternary glaciation on the Earth.

Coastal landscapes. Waves and nearshore currents, wave length, breaking waves, refraction waves, wave-cut platform, sea cliff, wave-cut notch, beaches, beach ridges, coastal lagoons, sandy and rocky coasts.

Aeolian landscapes. Deflation and corrosion processes, hamada, serir, erg deserts, dune, dune types, loess deposit.

TEACHING METHODS

The Phisical Geography course is composed of 40 hours of Theoretical lessons and 24 hours of laboratory tutorials and field practice.

EVALUATION METHODS

The evaluation method is composed of two verifications: the first is a written examination that will be overcome in order to access to the second one represented by an oral examination. The final vote will be formed by the sum of the two examinations.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

A.N. Strahler – Geografia Fisica. Piccin editore, Bologna.
T.L. McKnight e D. Hess – Geografia Fisica, comprendere il paesaggio. Piccin editore, Bologna.
A. Mori – Le carte geografiche. Libreria goliardica, Pisa
W.M. Marsh e M.M. Kaufman – Physical Geography, great systems and global environments. Cambridge University Press, New York.
E. Lupia Palmieri e M. Parotto – Il globo terrestre e la sua evoluzione. Zanichelli editore, Bologna.
L. Aruta e P. Marescalchi – Cartografia, lettura delle carte. Dario Flaccovio editore, Palermo.

INTERACTION WITH STUDENTS

In the first lesson the aim of the course, the textbooks materials, and the evaluation method will be showed to the students. The availability of the teacher for tutorials is on Tuesday and Thursday from 15:00 p.m. to 17:00 pm., and also via e-mail.

EXAMINATION SESSIONS (FORECAST)[1]

10/02/2017, 17/03/2017, 19/05/2017, 16/06/2017, 14/07/2017, 29/09/2017, 20/10/2017, 24/11/2017, 15/12/2017

SEMINARS BY EXTERNAL EXPERTS YES □ NO □

FURTHER INFORMATION

[1] Subject to possible changes: check the web site of the Teacher or the Department/School for updates.