JOHN WESLEY THEOLOGICAL COLLEGE
COURSE THEMATICS

Corse: **ENVIRONMENTAL PHYSICS**	**Course type:** Lecture+Practical course	**Credits:** 4	**Course ID:** KTAK113a
Course responsible:	**Programme type:** full time	**Hours/Semester:** 60	**Assessment:** exam

Course objectives:

Study the physical background the phenomena and processes of the environment.

Competencies to be improved:

Knowledge: T1, T2, T7
Ability: K2, K3
Attitude: A2
Autonomy and responsibility: F2

Compalsory literature:

Presentations
Relevant parts of the following textbooks:
M. Dželalija: Environmental Physics. University of Split, Split, 2004.
http://djelatnici.unizd.hr/~mdzela/nastava/EnvironmentalPhysics.pdf
Á. Horváth (ed.) : Env ironmental phys ics methods, laboratory practices. Eötvös Loránd University, Budapest, 2002.
http://atomfizika.elte.hu/kornyfizlab/docs/Environmental_physics.pdf
Raymond A. Serway, Chris Vuille, Jerry S. Faughn: College Physics. Cengage Learning Academic Resource Center, Belmont, 2009.
http://profsite.um.ac.ir/~tavallaii/Meghdadi_A/bahar/Ph1/College%20Physics.pdf

Recommended literature:

Course content:

1. Radioactivity. Nuclear reactions: α, β, γ radiation, nuclear fusion, nuclear fission. Phenomenon and sources of natural radioactivity. Sources of artificial radioactivity. Nuclear reactions in the Sun. Radioactivity of environmental systems. **2. Gravity and the physics of the universe.** The law of general gravity. Earth's gravitational force, gravitational field strength. The gravitational field and its work. Laws of planetary motion, cosmic velocities. Basic astronomical concepts and phenomena. General characterization of the Solar System and the Milky Way. Cosmic radiation, redshift, Hubble's law. The big bang theory. **3. Magnetism.** Basic concepts: magnetic dipole moment, magnetization, magnetic induction. Magnetic properties of materials: remanent and induced magnetization, diaphragm and ferromagnetic materials. The Earth's magnetic field: geodynamic principle, inclination, declination, changes over time. Magnetic phenomena of the Earth's atmosphere. **4. Physical states and physics of fluids.** Physical states and their transitions. Evaporation, precipitation. Phase diagram of water. Physics of fluid flow. Continuity equation, Bernoulli's law. 5. **Electricity.** Electric conduction in nature. Electrical properties of natural elements. Electrical polarization. Natural potential and induced potential. Primary and secondary electromagnetic fields. 6. **Wave propagation principles.** Wave phenomena: interference, deflection, dispersion, standing wave. Wave laws at the boundary of two media: reflection, refraction, refraction. Propagation of elastic waves. Flexibility of bodies, Hooke's law. Voice, noise, acoustic waves.
7. **Electromagnetic wave propagation.** Light as an electromagnetic wave. The spectrum of the electromagnetic wave. The wave phenomenon of light. Laws of imaging, geometric optics.

Course requirements:

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Attendance at classses, keeping up with the course progress, submitting the expected homeworks **Grading scale**: >90 %: excellent, 81-90 %: good, 66-80 %:satisfactory, 51-65 %:pass

Course Programme:	**Semester:**	**Lecturers:**
WJLF ENVIRONMENTAL SCIENCE	2021_2021_1	Dr. István Kun