Course title in English	**RNA world - the hypothesis of the Origin of Life on Earth**
Course title in Polish	Świat RNA – Hipoteza Powstania Życia na Ziemi
Course code	
Type of course	Lecture
Level of course	PhD
Year of study	1-4
Semester/trimester	1/3/5/7
Number of hours/credits allocated	30/2
Name of lecturer	Piotr Mucha PhD, DSc, prof. assoc.,
Objective of the course (expected learning outcomes and competences to be acquired)	*Knowledge*: Student 1. defines the basic events from the calendar of the formation of the Universe and the Solar System and Earth 2. presents the chemical reaction paths of the prebiotic era 3. presents different definitions of life and understands their consequences 4. presents the basic assumptions of the "RNA world" 5. defines the catalytic properties of RNA and their role in the flow of genetic information 6. presents the evolution of life on Earth *Skills*: Student 1. uses physicochemical terminology to the extent necessary to present issues related to the formation of the Universe and Earth 2. provides methods for the synthesis of prebiotic compounds 3. can distinguish the "living" from the inanimate 4. can correlate environmental conditions with the possibility of life 5. can correlate the catalytic properties of RNA with the features of the living system *Social competence*: Student 1. understands the need for continuous education, 2. has the skills to critically evaluate and analyze information on the evolution of the universe and life-related issues contained in the mass media
Prerequisites	A. Formal requirements: organic chemistry and biochemistry (or macromolecule chemistry) or any subject in the field of genetics / molecular biology. B. Prerequisites: basic knowledge of organic chemistry and biochemistry
Course contents	Stages of the formation of the Universe, the Milky Way and the Solar System, characteristics of the Earth's

	original atmosphere, abiotic synthesis of nucleotides, amino acids and RNA and proteins, "chirality", RNA / DNA / PNA structure, life definitions, characteristics and relics of the "RNA world", catalytic RNA (ribozymes), the world of PNA, the world of DNA and proteins, the properties of the genetic code, the construction of a prokaryotic and eukaryotic cell, the oldest traces and evolution of life on Earth, a synthetic "living cell", the search for life in the Universe
Recommended reading	A. Literature required for the final passing of the course used during classes R. F. Gesteland, "The RNA World", Cold Spring Harbor Laboratory Press, 2005, M. Yarus, "Life from an RNA World: The Ancestor Within", Harvard Univ. Press, 2011 B. studied independently by the student Review publications recommended (provided) by the teacher B. Supplementary literature S. Hawking, "A Brief History of Time by Stephen Hawking", Bantam, 1998
Teaching methods	Lecture with multimedia presentation
Assessment methods	written test or problem questions
Language of instruction	Polish