

Course title: SPACE RADIO-DIAGNOSTIC TECHNIQUES

ECTS credit allocation (and other scores): 2

Semester: spring

Level of study: ISCED-7 - second-cycle programmes (EQF-7)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 30

Course coordinator/ Department and e-mail: Professor Andrzej Krankowski, Ph.D., Space Radio-Diagnostics Research Centre, kand@uwm.edu.pl

Type of classes: classes and lectures

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#### Substantive content

CLASSES: GPS receiver usage. GNSS TEC information retrieval. Radio wave propagation. Solar radio waves detection with LOFAR. Pulsar radio waves detection with LOFAR. Radio scintillations observation with LOFAR.

LECTURES: Physical basis of radio emissions. Radio propagation in different media. Natural radio emission in space. Radio wave detection techniques. Earth's atmosphere structure and its impact on signal propagation.

Learning purpose: Increase of knowledge of space radio research, including basics of radio astronomical observation techniques and bases of space radio sources. Increase of knowledge of radio propagation in different media. Increase of knowledge of Earth's cosmic environment.

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On completion of the study programme the graduate will gain:

Knowledge: Student has broad knowledge of geodesy, physical geodesy, geodynamics and geodetical astronomy. Student has systematic, theoretical general knowledge of field of studies key issues. Student has systematic, detailed theoretical knowledge of field of studies selected issues.

Skills: Student can obtain and use information within the fields of geodesy, physical geodesy, geodynamics and geodetical astronomy. Student can prepare scientific dissertation in Polish and short scientific report in foreign language considered basic for studied field of science, containing own research results.

Social Competencies: Student understands the needs and knows possibilities of further learning (post-graduate studies and courses) - improving professional, personal and social skills. Student understands the need of life-long studying; is able to inspire and organize other people learning process.

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Basic literature: 1) J. Szóstka, Fale i anteny, WKiŁ, 2000; 2) Z. Zieniutycz, Anteny. Podstawy polowe, WKiŁ, 2001, 3) K. Rohlfs, T. Wilson, Tools of radio astronomy, Springer, 2006

Supplementary literature:

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The allocated number of ECTS points consists of: 50

Contact hours with an academic teacher: 30

Student's independent work: 20