

(1.) Course Title: INFPHD640 Remote sensing methods (complex exam preparatory)	Credits: 6
Course Classification: Mandatory chosen	
Theoretical or Practical Nature of the Course, ' <i>training character</i> ' ¹³ : practice(credit%)	
Type of Class: practice and number of hours: 2/week in the given semester, (If the course is not (only) taught in Hungarian, then <i>the language: English</i>) Additional (specific) methods and characteristics² used in delivering the knowledge (if any): -	
Assessment Method (Exam / Midterm Grade / Other³): practical course mark Additional (specific) methods⁴ applied in knowledge assessment (if any): -	
Course Placement in Curriculum (Semester Number): -	
Prerequisites (if any): -	
Course Description: A concise yet informative description of the knowledge to be acquired.	
The exam covers the principles, methods, and techniques of remote sensing. Students are expected to demonstrate knowledge of imaging and non-imaging optical data acquisition workflows, with particular emphasis on multi- and hyperspectral measurements. The use of different active and passive platforms, including handheld, UAV, airborne, and underwater systems, will be addressed along with their respective application areas. The current state of science and technology will be presented from both domestic and international perspectives, including emerging trends and future developments. The PhD students are also required to understand recent scientific results, their cross-industrial applications, and perform comparative analyses where appropriate. Upon successful completion of the course, students should be able to select and apply appropriate remote sensing techniques and methods to support their own scientific research. • Fundamental concepts, systems, and methodological foundations of remote sensing • Overview of imaging and non-imaging data acquisition techniques • Theoretical and practical foundations of multispectral and hyperspectral measurement methods • Application possibilities of remote sensing platforms • Active and passive remote sensing procedures and instruments • The multidisciplinary role of remote sensing and other scientific fields • Current state, directions, and development trends in the field of remote sensing • Presentation of scientific results and cross-industrial applications • Critical evaluation of remote sensing data and methods • Selection and application of remote sensing technologies in research	

2-5 Most Important Required and Recommended Literature

List of required and recommended literature (notes, textbooks) with bibliographic data (author, title, publication details, (possibly pages), ISBN).

- Lillesand, T., Kiefer, R. W., & Chipman, J. (2015) Remote sensing and image interpretation. John Wiley & Sons. ISBN 978-1-118-34328-9
- Thenkabail, Prasad S., and John G. Lyon, eds. (2016) Hyperspectral remote sensing of vegetation. CRC press. ISBN 9781138066250
- Richards, John A., and John A. Richards. (2022) Remote sensing digital image analysis. Vol. 5. New York: Springer, ISBN-10. 3030823261

List of Prescribed Professional Competencies and Competency Elements

(knowledge, skills, etc., KKK Section 8) that the course significantly contributes to developing (highlight the most important ones).

a) Knowledge

- Has a research-level understanding of the general and specific characteristics, major directions, and precisely developed boundaries of the subject area within the discipline, as well as the agreed and debated interrelations.
- Creatively comprehends the interrelations, theories, and conceptual frameworks and terminologies of the given field of study.¹
- Possesses research methodology knowledge necessary for independent research in the given discipline/field.

b) Skills

- Capable of creative analysis of the field, synthesizing comprehensive and specific interrelations with a new perspective, and conducting appropriate evaluative and critical activities.
- Able to apply and further develop the specialized learning and problem-solving methods of the field.
- Can creatively elaborate on the novel, previously unknown practical implications of theoretical issues.
- Capable of planning and executing new projects, conducting research in the field, and developing new techniques and approaches.
- Able to identify unforeseen professional problems and uncover the detailed theoretical and practical background necessary for their resolution at a research level.
- Can construct and communicate new relations relevant to the field, as well as comprehensive interrelations significant for personal and communal existence.

¹**Section 108**, Article 37 of the National Curriculum Act (Nftv.) 37. lesson: a session (lecture, seminar, exercise, consultation) requiring the personal involvement of the instructor to fulfil the academic requirements specified in the curriculum, the duration of which is at least forty-five minutes and not more than sixty minutes.

² e.g. case studies, role play, thematic presentations, etc.

³ e.g. continuous debriefing, mid-year report

⁴ e.g. request for case studies, thematic papers, essays, business, organisational plans, etc.

c) Attitudes

- Represents and further develops the relations that contribute to the process of human self-creation based on the field's characteristics.
- Possesses an interest and learning ability that enable identifying and solving currently unpredictable research problems in the field.
- Demonstrates a firm professional commitment, a continuous dedication to exploring new approaches, and an acceptance of the necessity for persistent effort.

d) Autonomy and Responsibility

- Builds and initiates new knowledge areas with creative independence and proposes new practical solutions.
- Participates in formulating theoretical and practical questions with a leadership role and high-level cooperation.
- Engages as an equal discussion partner with professionals in the field.
- Takes responsibility for raising and addressing new ethical questions concerning theoretical and practical aspects of the profession.

Course responsible (name, position, academic degree): **Dr. András Jung, full professor, PhD**

Instructor(s) involved in teaching the course (if any) (name, position, academic degree):