

(1.) Course Title: INFPHD642 Output-oriented digital cartography (complex exam preparatory)	Credits: 6
Course Classification: Mandatory chosen	
Theoretical or Practical Nature of the Course, 'training character' ¹³ : 100% 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 the language: English) Additional (specific) methods and characteristics² used in delivering the knowledge (if any): -	
Assessment Method (Exam / Midterm Grade / Other³): exam 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 course will focus on the informatics background of digital cartography and GIS: the theory and practice of raster and vector data storage, the most used file formats in GIS and digital cartography. A key element of the course will be an overview of the types of software, and sometimes specific software, used to produce maps, whether paper maps or web-based map services. An important element of visualisation is an overview of colour representation, both in print reproduction and on computer screen. PhD students will also acquire an introductory level of pre-press skills related to print reproduction. The output orientation will also include a more in-depth knowledge of cartographic output devices, including different types of printers, plotters and the web environment: the specificities of screen display, global and national web map services, their most common standards and development trends.	
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).	
Compulsory	
Kraak, MJ–Ormeling, F.: Cartography, Visualization of Spatial Data, Fourth edition, CRC Group, 2021, 261 p., ISBN 9781138613959 Field, K.: Cartography, ESRI Press, 2018, 576 p., ISBN: 9781589484399 United Nations: Mapping for a Sustainable World, United Nations, 2020, DOI: https://doi.org/10.18356/9789216040468c001	
Recommended	
Del Lima, M.: Handbook of Cartography, Callisto Reference, 2015, 326 p., ISBN 1632393778 Cynthia Brewer: Designing Better Maps, 250 p., ESRI Press, 2015, ISBN: 9781589484405	
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	

- Possess the necessary research methodological skills for independent research in a given discipline/subject.
- Knowledge of the general principles, rules and traditions of information technology and GIS.
- Knowledge of the specific tools of the field of spatial computing, mastery of data management and analysis, understanding and effective application of cartographic representation in GIS environment;
- Knowledge and use of spatial data collection technologies, their geospatial aspects and key elements.

b) Skills

- Ability to design and implement new projects, conduct research in a given field, develop new techniques and approaches.
- The ability to select the most effective GIS tools and software for the task in hand, depending on the complexity of the task.
- Ability to process, evaluate, interpret and analyse data systematically using GIS and to support the drawing of conclusions from this data in GIS terms and to visualise them in an optimal way.
- With the acquired knowledge of spatial information and cartography, the PhD student is able to carry out planning, development and consultancy tasks in an efficient, user-oriented manner in the operation of GIS, decision support systems and expert systems.

c) Attitudes

- Have the interest and learning ability to keep abreast of the current state of the art in the field
- the identification and solution of unforeseen research problems in the field, which are currently not yet transparent.
- The acquisition of a geospatial approach will help to develop an appropriate attitude to professional cooperation with professionals working in related fields.

d) Autonomy and Responsibility

- The PhD student develops and initiates new research areas within spatial computing and initiates new practical solutions with creative autonomy.
- Ability to act as an equal and discussion partner with professionals in the field.
- With his/her knowledge and skills in GIS, he/she is able to work responsibly with professionals from other disciplines.

Course responsible (name, position, academic degree): Prof. László Zentai, DSc

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

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