

## **II CYCLE– Structural Design and Management in Civil Engineering**

### **profile: Construction Technology and Management**

1. Construction investment budget definition. Methodology assumptions for the estimated value of the investment (EVI/WKI) calculation
2. Classification of methods on cost estimation of design documentation
3. Characteristics of the indicator method on planned costs of design works in accordance with the relevant Regulation of the Minister
4. Characteristics of the basic method on cost estimation of design documentation in accordance with Principles of the Chamber of Construction Designing (IPB)
5. Types of cost estimates in construction projects,
6. Contractor's cost estimates in construction projects
7. Cash flow analysis in construction projects,
8. Monitoring of time and cost in construction projects,
9. Application of earned value method in construction projects,
10. Time-cost trade-offs in construction projects,
11. Organisational models of construction projects,
12. Phase of the construction investment process
13. Construction market research and analysis.
14. Business plan for construction company – scope and basic rules
15. Construction project procurement methods,
16. Types of contracts in construction,
17. Arrangements of pricing in construction projects,
18. Basic definitions related to renovation works. Goals (aims), types and scope of renovation works
19. Factors causing deterioration of foundations. Typical damage to foundations. Types and methods of strengthening of existing foundations
20. Factors causing damage to masonry elements. Reasons for strengthening masonry structures. Types and methods of repairing and strengthening of masonry structures
21. Demolition works planning (building surveying, structural surveying and planning works)
22. Classifications of demolition works,
23. Non-explosive methods of demolition works,
24. Explosive methods of demolition works,
25. Non-engineering methods of demolition (technology, equipment, applications),
26. Engineering methods of demolition (technology, machines and equipment, applications),
27. Typical sequence of top-down approach based demolition works.
28. BIM definition overview
29. Level of Developments in BIM process
30. Clash detection in the BIM model
31. Integrated Project Delivery - integrated management of a construction project
32. Documentation in the construction process based on BIM - EIR and BEP.
33. Construction process simulations based on the BIM model
34. Cost estimation based on the BIM model - advantages and disadvantages

35. Laser scanning in the construction process
36. Digitization of the construction process - implementation of construction works using modern digital technologies.
37. Identification, analysis and risk responses in construction
38. Features of project management software (MS Project or similar)