Bachelor Themes SFE – branch D
Thematic area: Steel and timber structures

Group 1: Part Steel

1. Advantages and disadvantages of steel structures
2. Application of steel in construction, history of steel structures
3. Steel, production process, properties, steel grades
4. Steel products suitable for construction, fabrication of steel structures
5. Corrosion, corrosion protection
6. Protection against fire
7. Welded joints of steel structures
8. Bolted connections of steel structures
9. Technical documentation for steel structures
10. General principle of structural design, present and future
11. Purpose of standards for the design of structures, partial safety factors (ultimate limit states method)
12. Action on structures
13. Load bearing resistance of structures
14. Tensile resistance
15. Compression resistance
16. Bending resistance
17. Stability, buckling resistance of compressed members
18. Lateral torsional buckling resistance
19. Welded joints design
20. Bolted connections design
21. Steel and concrete composite structures
22. Steel microstructure, selection of material for steel structures
23. Section classification
24. Class 4 cross-sections
25. Shear buckling
26. Frame Classification in terms of stability
27. Global analysis, imperfections of steel components and structures
28. Torsion resistance
29. Interaction N + M
30. Stresses in welds
31. Composite steel-concrete beams according to the theory of elasticity and plasticity
32. Serviceability limit state assessment of composite beams
33. Fatigue of steel structures
34. Thin-walled cold-formed steel structures
35. Beam to column simple connections
36. Beam to beam connections
37. Composite connections and connections to concrete structures
38. Column bases
39. Rigid moment connection
40. Purlins

41. Bracing in industrial halls
42. Bracing in multi-storey buildings
43. Crane runway beams
44. Shells, cylindrical vaults, domes
45. Membrane and suspended structures
46. Pneumatic and cable-stayed structures
47. Structural systems of tall buildings

Group 2: Part Timber

48. Physical and mechanical properties of timber and timber-based materials
49. Structural design of timber and timber-based materials
50. Limit state design
51. Design standards
52. Elements in tension
53. Elements in compression
54. Elements subjected to shear and torsion
55. Elements subjected to bending
56. Elements in interaction of compression and bending
57. Tapered and double-tapered beams
58. Curved beams
59. Deflection and vibration of timber beams
60. Connections and joints in timber structures
61. Dowel type fasteners
62. Metal plate fasteners
63. Main timber structural systems.
64. Design of timber structures exposed to fire
65. Protection of timber structures against fire
66. Protection of timber to biological deterioration
67. Timber structures for multi-storey buildings
68. Composite timber and concrete structures
69. Strengthening of timber structures
70. Production, protection, installation and maintenance of timber structures

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