



EXAMINATION SYNOPSIS

OF SUBJECT “TIMBER STRUCTURES AND STRUCTURAL COMPOSITES”

FOR THE STUDENTS IN *STRUCTURAL ENGINEERING*

Lecturer: Dr. Delyana BOYADZHIEVA, Associate Professor

1. Effective areas for the use of timber and plastic structures in the modern world (contemporary conditions). History of timber and plastic structures.
2. Durability of timber structures. Timber structures in aggressive environments. Organic damages. Fire resistance. Protection of timber structures
3. Structure of timber. Mechanical properties of structural timber and timber products. Grading. Wood based composite materials/products.
4. Mechanical properties of timber in function of moisture, temperature, duration of load and timber structure (natural defects)
5. Principles of limit state design
6. Design of members subjected to flexure
7. Design of members subjected to axial actions
8. Design of members subjected to combined axial and flexural actions
9. Joints in timber structures
10. Design of carpenter connections
11. Design of metal dowel type connections
12. Design of joints with connectors
13. Moment capacity of connections formed with metal dowel
14. Wood adhesives
15. Design of composite timber and wood-based sections - subjected to flexure
16. Mechanically jointed beams loaded in bending
17. Design of Built-Up Columns
18. Design of Glued Laminated Members
19. Design of GLULAM arches and frames
20. Planar timber structures, Timber trusses
21. Purlin and rafter structures (for roofs)
22. Spatial structures
23. Timber buildings
24. Lateral resistance of timber structures
25. Timber bridges
26. Composite timber-steel (steel-timber) elements and structures
27. Composite timber-concrete structures
28. Plastic structures –Materials, Structure and mechanical properties, joints
29. Tensile structures –Materials, Structure and mechanical properties
30. Tensile structures –Joints
31. Reinforcement of timber members – Strengthening of existing structures

Sofia

2019

Materials:

1. EN 1995-1-1 - Eurocode 5: Design of Timber Structures;
2. Blas H.J., STEP 1, STEP 2, Centrum Hout, The Netherlands;
3. HANDBOOK 1, HANDBOOK 2 -DESIGN OF TIMBER STRUCTURES ACCORDING TO EC 5;
4. Larsen H., V. Enjily, Practical design of timber structures to eurocode 5, Thomas Telford Limited, 2009;
5. Thelandersson Sven, Hans J. Larsen, Timber engineering, John Wiley & Sons Ltd, England, 2003;
6. Porteous J., Abdy Kermani, Structural timber design to eurocode 5, Blackwell Publishing, 2007;
7. PhD thesis, Dr. Vatyu Tanev;
8. PhD thesis, Dr. Delyana Boyadzhieva.