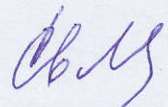


EXAMINATION SYNOPSIS
OF
STRENGTH OF MATERIALS

1. Subject of Strength of Materials. Basic hypotheses.
2. Internal forces. Determination of internal forces by the method of section.
3. Differential equations of internal forces.
4. Integration of the internal forces differential equations. Example.
5. Checks of the internal forces functions and diagrams.
6. Stress at a point. Theorems of the stresses equivalence. Principal stresses.
7. One-dimensional state of stress.
8. Two-dimensional state of stress.
9. Three-dimensional state of stress.
10. Strain at a point.
11. Hook's law in one dimension.
12. Generalized Hook's law.
13. Basic problem of Strength of materials.
14. Moments of inertia.
15. Tension/Compression. Experimental investigation.
16. Statically indeterminate constructions subjected to tension/compression.
17. Shear.
18. Torsion of beams of solid and hollow circular cross-section.
19. Special case of bending (bending combined with shear – plane case).
20. Bending combined with shear and tension.
21. General case of bending (double bending).
22. Deflection of beams – plane case.
23. Determination of the beam deflection and slope by Mohr's analogy method.
24. Influence of the shearing force on the beam deflection.
25. Deflection of beams – spatial case.
26. Statically indeterminate beams subjected to bending.
27. Deformation work.
28. Strain energy. Special cases.
29. Energy theorems: Castigliano's theorem, Menabrea's theorem, Mohr's theorem, Betty' theorem, Maxwell's theorem.
30. Integrals of Maxwell-Mohr.
31. Theories of failure.
32. Eccentrically loaded constructions.
33. Deformation of constructions subjected to eccentric load.
34. Buckling of columns – concepts and problems.
35. Cables. Cable of small sag and supports at the same altitude.

Lector: 

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