Spacecrafrt Engineering Master's Degree

- 1. The definition of a spacecraft.
- 2. Assessment of energy costs for orbit-to-orbit manoeuvres.
- 3. Main specifications of the spacecraft.
- 4. Propulsion system in the spacecraft structure.
- 5. Classification of spacecraft by application and purpose.
- 6. Truss-type spacecraft.
- 7. The structure of the main spacecraft systems.
- 8. Aerodynamic stabilization of the spacecraft.
- 9. Classification of spacecraft by their design features.
- 10. Magnetic stabilization of the spacecraft.
- 11. The structure of the main compartments of the spacecraft.
- 12. Spacecraft airtight container design.
- 13. General requirements for the spacecraft structure.
- 14. Spacecraft unpressurized pallet structure.
- 15. Flight control system of the spacecraft.
- 16. Schematic design of the spacecraft.
- 17. Basic stages of spacecraft design.
- 18. Spacecraft crew life-support system.
- 19. The peculiarities of remote sensing spacecraft and weather observation spacecraft.
- 20. Pneumatic / hydraulic system of the spacecraft.
- 21. Pre-schematic design of the spacecraft.
- 22. The structure of the space system.
- 23. The criteria for assessment of the designing process outcomes.
- 24. Ground tests of the spacecraft.
- 25. Engineering requirements to the spacecraft design.
- 26. Physical conditions of the space flight.
- 27. Features of the design of small and micro spacecraft.
- 28. Features of interplanetary spacecraft.
- 29. Materials used for spacecraft structure.
- 30. Preparation of the spacecraft for the launch.
- 31. Operational requirements for the spacecraft design.
- 32. The technical area of a cosmodrome.
- 33. Gravitational control of the spacecraft.
- 34. Features of interplanetary spacecraft.
- 35. Scope and trends of space development.
- 36. Characteristics of manned spacecraft.
- 37. Global space market.
- 38. Lagrange variational principle.
- 39. Internal force factors, differential relationship in torsion.
- 40. Characteristics of manned spacecraft.
- 41. Loads affecting the spacecraft.
- 42. Castigliano variational principle.
- 43. Thin-walled closed section beam torsion.
- 44. Features of the communications spacecraft.
- 45. Detailed design of the spacecraft.
- 46. Least work principle.
- 47. Thin-walled open section beam torsion.
- 48. Rayleigh-Ritz-Timoshenko method.
- 49. Safety factor.
- 50. Formulation of problem solving in stresses.
- 51. Thermal strains and stresses.
- 52. Finite element method.
- 53. Statically determinate frame structure calculation.
- 54. Straight rod tension.
- 55. Bubnov-Galerkin method.
- 56. Pumping and pressurized system for propellant components supply.
- 57. Thermal protection techniques for rocket and space equipment.

- 58. Classification of mathematical models used for the development and application of rocket and space equipment.
- 59. Structural features of liquid rocket engines.
- 60. The basic surface deviation and undulation.
- 61. Rocket propellant components. High-boiling and cryogenic components.
- 62. Their sizes. Maximum deviation. The definition of access and landing. Depicting access and landing in technical drawings.
- 63. Structure and placement of reinforcement in the propellant tanks of space-based rocket.
- 64. The main axonometric projection. Types and sections in mechanical-engineering technical drawings.