



**B.Sc. Programme – Forestry**

**FOR 616 Tractive machines**

Compulsory subject – in 3<sup>rd</sup> /winter/ semester for Bulgarian students

ECTS credits – **4.5** Ability to teach a foreign language – **English**

**Syllabus in brief**

***I. Lectures:***

- 1. Internal combustion engines** – spark ignition and compression ignition, working principles of two- and four-stroke engines, gasoline and diesel fuels, fuel mixture, engine performance parameters and characteristics.
- 2. Mechanisms and systems of internal combustion engines.** Engine components. Fuel systems. Lubrication system.
- 3. Cooling systems. Inlet, exhaust and starting system. Electrical system.**
- 4. Transmission of vehicles.** Function and classification. Clutch. Gearbox. Transfer box. Cardan shaft. Drive axles. Differentials. Final drives.
- 5. Wheel and track systems.** Tyres and tracks. Frames and suspension
- 6. Steering and brake systems of vehicles.**
- 5. Specialized forest vehicles.** Tractors: skidders and forwarders – purpose, structural features, equipment. Specialized timber and chip trucks – purpose, structural features, equipment.
- 7. Theory of ground-based vehicles.** Traction and slip. Tractive performance. Brake performance. Fuel efficiency. Longitudinal and lateral stability. Vehicle mobility.

***II. Exercises:***

- 1. Internal combustion engines components and mechanisms.**
- 2. Structure and components of fuel and lubrication system.**
- 3. Structure and components of cooling, inlet, exhaust, starting and electrical system.**
- 4. Structure and components of transmission of vehicles.**
- 5. Structure and components of wheeled and tracked systems.**
- 6. Structure and components of steering and brake systems of vehicles.**
- 7. Structure and components of tractor hitching mechanism, hydraulic system and power take-off.**
- 8. Structure and components of specialized forest vehicles.**
- 9. Calculation of tractive performance of forest wheeled vehicles.**

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