Title of module: **Automotive Drive Systems**

Lecturer: Prof. Dr.-Ing. Georg Weidner

Qualification aim: On the completion of this course the students should be able to give a quantitative contribution to the environmental discussion on motor vehicles. They will do calculations to the longitudinal dynamics and the demand for energy of cars. They can evaluate conventional and alternative drive systems concerning the demand for energy.

Content:

1. Rolling resistance and adhesion to road surface
2. Aerodynamic drag
3. Empirical determination of air- and rolling resistance
4. Climbing resistance
5. Acceleration and deceleration
6. Translatory and rotatory inertia
7. Demand for energy and power at several test cycles
8. Maps of combustion Engines
9. Tractive force/speed diagram
10. Calculation of fuel consumption
11. Efficiency maps of DC- and AC-motors
12. Batteries
13. Adaption of electric motors to vehicles
14. Calculation of driving range of electric cars
15. Layouts of hybrid drive systems
16. Calculation of consumption of hybrid drive Systems
17. Transmission systems

Teaching method:	lectures 2 x 90 min. per week, exercises included
Necessary knowledge:	fundamentals in physics (Newtonian mechanics)
Usability:	Mechanical Engineering (B.Eng.)
Preconditions for the granting of credits:	written examination: 120 min.
Credits:	5 ECTS-Credits
Frequency:	annually in summer semester
Work load:	150 hours (present time: 60h + self-study: 90h)
Duration of one unit:	90 min.
Supporting documents:	downloads (diagrams, exercises)
Recommended publications:	BOSCH: Automotive Handbook Naunheimer, Bertsche, Ryborz, Novak: Automotive Transmissions