MAK 444 AUTOMOTIVE ENGINEERING SPRING 2013 TERM PROJECTS

PROJECT 1 (2 GROUPS)
Make a detailed study about automotive suspension systems & suspension geometry.

You are responsible for the following:
- Reasons of requirement of a suspension system in a vehicle (*1st group*)
- Suspension system components (springs, damper, anti roll bar, etc.) (*1st group*)
- Suspension kinematics (all nomenclature must be included –camber, caster, toe, roll center, unsprung mass, etc.) (*1st group*)
- Suspension types ( Independent Suspension, Rigid Axle (dependent) Suspension, Semi infinite suspension and the most common types of these suspensions) (*2nd group*)

PROJECT 2
Make a detailed study about steering systems.

You are responsible for the following:
- Steering system components
- Steering methods (Ackerman steering, articulated steering, differential steering system, fifth wheel steering)
- Turning radius

PROJECT 3
Make a detailed study about wheels and tires.

You are responsible for the following:
- Rolling resistance
- Types of tires, pneumatic tires, components of pneumatic tires
- Tire codes
- Tire performance analysis (side forces, aligning torque, slip angle, tire pressure, etc. – effects of these parameters)
- Wheels
**PROJECT 4**
Make a detailed study about **braking systems**.
You are responsible for the following:
- Braking types
- Components of braking system
- Friction brakes (drum brakes and disc brakes)
- Retarders

**PROJECT 5**
Make a detailed study about **transmission systems and gearboxes**.
You are responsible for the following:
- Reasons of requirement of a suspension system in a vehicle
- Manual transmission (components, types and working principle)
- Automatic and semi automatic transmissions (components, types and working principle)
- Other types of Continuously variable transmission(CVT, Electric, hydrostatic transmissions)
- Advantages and disadvantages of all kind of transmissions

**PROJECT 6**
Make a detailed study about **clutches and torque converters**.
You are responsible for the following:
- Clutches (working principles, types, components)
- Torque converters (working principles)

**PROJECT 7**
Make a detailed study about **differential and drive shaft joints**.
You are responsible for the following:
- Differential(working principle, types)
- Kinematics of differential
- Drive shaft joints (cardan, double cardan, rzeppa, -working principles, advantages and disadvantages between each other)

**ALL GROUPS SHOULD PREPARE AT LEAST 10 QUESTIONS AND ANSWERS OF THESE QUESTIONS ABOUT THEIR SUBJECT.**