**Motorcycle Powertrain Development Workshop at the**

**Faculty of Engineering, UD**

The course is focusing on the construction of a motorcycle’s powertrain, analyzing its operation and redesigning some parts of it to develop a racing motorcycle. The program contains the basics of motorcycle constructions; designing and modeling different parts of the engine; workshop practice; rapid prototyping, additive manufacturing; material tests and diagnostics. At the end of the course the motorcycle engine will be assembled with the redesigned and produced parts and tested.

 

Week 1

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|  | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| 1 | Welcome at the Faculty of Engineering, UD | Power transmission of motorcycles | Power transmission of motorcycles | Dynamical Analysis of drivetrain elements | Concept Selection and Embodiment Design |
| 2 | Welcome at the Faculty of Engineering, UD | Power transmission of motorcycles | Power transmission of motorcycles | Dynamical Analysis of drivetrain elements | Concept Selection and Embodiment Design |
| 3 | Introduction to the key issues of the development of a racing motorcycle | Methodologies and Techniques for Reverse Engineering | CAD Modeling of powertrain parts | Engineering Design Methods | Concept Selection and Embodiment Design |
| 4 | Problem statement, Gathering requirements,  Success factors | Methodologies and Techniques for Reverse Engineering | CAD Modeling of powertrain parts | Engineering Design Methods | Concept Selection and Embodiment Design |
| 5 | Disassembly of the motorcycle Powertrain | Reverse Engineering of the powertrain | CAD Modeling of powertrain parts | Workshop, Brainstorming | Engineering Optimization Methods and Applications |
| 6 | Disassembly of the motorcycle Powertrain | Reverse Engineering of the powertrain | CAD Modeling of powertrain parts | Workshop, Brainstorming | Engineering Optimization Methods and Applications |

#### Week 2

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| --- | --- | --- | --- | --- | --- |
|  | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| 1 | Finite Element Analysis of the designed parts | Rapid Prototyping, Additive Manufacturing | Designing of manufacturing processes of vehicle parts | Machining the designed parts | Workshop, Vibration measurements |
| 2 | Finite Element Analysis of the designed parts | Rapid Prototyping, Additive Manufacturing | Designing of manufacturing processes of vehicle parts | Machining the designed parts | Workshop, Vibration measurements |
| 3 | Detail Design with Parametric CAD System | Designing of manufacturing processes of vehicle parts | Material testing of powertrain parts | Machining the designed parts | Workshop, Vibration measurements |
| 4 | Detail Design with Parametric CAD System | Designing of manufacturing processes of vehicle parts | Material testing of powertrain parts | Machining the designed parts | Workshop, Vibration measurements |
| 5 | Rapid Prototyping, Additive Manufacturing | Designing of manufacturing processes of vehicle parts | Material testing of powertrain parts | Condition Monitoring and Measurement Techniques | Assembly of the powertrain parts |
| 6 | Rapid Prototyping, Additive Manufacturing | Designing of manufacturing processes of vehicle parts | Material testing of powertrain parts | Condition Monitoring and Measurement Techniques | Testing the developed motorcycle powertrain |