

Module Name	Lightweight Components of Wind Turbines
Module Number	Eul-RES-E-LBWEA
Responsible Lecturer	Prof. Dr.-Ing. Maik Gude maik.gude@tu-dresden.de
Qualification Objectives	Students master the material-appropriate application of fiber-reinforced composites in lightweight structures and the dimensioning of basic lightweight structures and materials. They are capable of optimally adapting the structures of modern wind turbines to the loads and consistently implementing design principles for lightweight structures. Furthermore, they apply a high level of interdisciplinary knowledge in the fields of material and structural mechanics, design engineering, and manufacturing technology. This enables them to fully exploit the potential of lightweight construction for the design of wind turbines.
Contents	The module covers the fundamentals of lightweight construction for wind turbines. This includes the basics of fiber-reinforced composites, such as fibers, matrices, semi-finished products, and properties; the development of modern lightweight structures in fiber-reinforced hybrid construction for use in wind turbines; design principles for lightweight structures made of fiber-reinforced composites; basic and advanced calculation methods, such as mixing rules, classical laminate theory for anisotropic composite materials, and strength hypotheses; as well as an examination of selected manufacturing technologies and their impact on the property profile.
Teaching and Learning Forms	4 hours per week of lectures, 2 hours per week of exercises, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Engineering Mechanics, Design Engineering, and Manufacturing Engineering are required.
Usability	The module is an elective module from the elective area "Competence Deepening" according to § 6 paragraph 3 SO and § 33 paragraph 3 PO in the main study phase of the diploma program Regenerative Energy Systems.
Prerequisites for the Award of Credit Points	Credit points are awarded when the module examination is passed. The module examination consists of a written exam lasting 180 minutes.
Credit Points and Grades	7 credit points can be earned through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the Module	The module is offered every winter semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.