Course Unit Title	**MES504 / MES520 Renewable Energy** **MOE593 Special Topics: Renewable Energy** **MEE510 Sustainable Energy Reviews**
Programme of study	MSc in Energy Systems and the Built Environment MSc in Oil and Gas and Offshore Engineering
Lecturer	Dr.-Ing. Paris A. Fokaides
Type of course unit	Compulsory
ECTS	7
Year of study:	1
Semester(s) offered	Fall Semester 2012, Spring Semester 2015,2016, 2017, 2018, 2019, 2021 Fall Semester 2021, 2022
Course content	▪ Theory and practice of renewable energy technologies ▪ Renewable energy potential analysis ▪ Technical, environmental and economic considerations of renewable energy technologies applications ▪ Pre-engineering of renewable energy technologies applications
Course modules:	Module 1: Energy conversion principles in renewable energy sources ▪ Fundamentals of renewable energy applications ▪ Different options from renewable heat and power ▪ Classification of energy carriers according to degree of conversion ▪ Technical key figures of renewables Module 2: Solar energy utilization ▪ Solar thermal utilization principles ▪ Technical economic and environmental assessment of solar thermal technologies ▪ Solar thermal power production ▪ Solar driven electrochemical effects ▪ Photolvoltaics technical, economic and environmental assessment Module 3: Wind energy utilization ▪ Wind kinetic energy utilization principles ▪ Technical, environmental and economic aspects ▪ Different types of wind energy converters Module 4: Biomass and biofuels ▪ Biomass sources and biomass potential ▪ Thermochemical and biochemical biomass to biofuel conversion routes ▪ Biofuels utilization ▪ Biofuels environmental assessment and supply chain considerations Module 5: Geothermal energy utilization ▪ Geothermal utilization principles ▪ Technical, environmental and economic assessment aspects of geothermal applications ▪ Comparative assessment of different types of geothermal applications
Textbooks:	Kaltschmitt, M., Streicher, W., & Wiese, A. (Eds.). (2007). Renewable energy: technology, economics and environment. Springer Science & Business Media. 070 947 3
Instruction language	English
External reference	link