



COURSE TITLE: RES Systems Simulation

Number of contact hours: 30

Duration: 1 semester (fall / spring)

ECTS credits: 2

Programme description: The course aims to introduce students to the field of dynamic modeling and simulation of renewable energy systems (RES). The focus is on developing skills in creating and analyzing models of renewable energy installations using specialized software. Students will learn the principles of modeling, model validation, and performance analysis of systems under various operating conditions.

Students will learn how to determine the energy efficiency of renewable energy systems, analyze their reliability and stability, and assess the impact of various input parameters on system performance. This analytical skillset will be further enhanced through the study of system optimization, where students will explore methods for selecting optimal components and operating parameters, as well as analyzing operational scenarios for enhanced system efficiency.

The course concludes with practical projects, allowing students to apply their theoretical knowledge. They will develop models of real-world renewable energy installations using dedicated simulation software. These projects provide hands-on experience in modeling, simulating, and analyzing renewable energy systems.

Course type: project (30)

Literature:

1. TRNSYS 18 – online documentation and tutorials (Getting Started, Using the Simulation Studio, Standard Component Library Overview, Component Mathematical Reference, Multizone Building, Editing the Input File and creating TRNSED applications, Programmer's Guide, Weather Data)
2. POLYSUN ® SOFTWARE, User Manual, Vela Solaris AG, 2020

Assessment method: report from computer simulation

Lecturer: Piotr Cisek

Contact person: Piotr Cisek (e-mail: piotr.cisek@pk.edu.pl)