COURSE DESCRIPTION CARD – SYLLABUS

Course name

Elective module in the field: Information Technology and Communication Systems in Power Engineering – Data processing, visualization and exchange in the power engineering

Course

Field of study
Electric Power Engineering

Year/Semester
3/5

Area of study (specialization)
-

Profile of study
general academic

Level of study
first-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
dr inż. Andrzej Kwapisz

Faculty of Environmental Engineering and Energy

email:andrzej.kwapisz@put.poznan.pl

tel. 616652282

Responsible for the course/lecturer:

Prerequisites

Knowledge of mathematical analysis, circuit theory, basic signal processing and programming.

Can achieve the calculation due to the theory of circuits and verify their results, can operate computer software and network communication tools,

Is able to work in group.

Course objective

Knowledge of modern information technology used in the power industry. The use of numerical methods for the calculation of steady-state and transient in power and electrical systems. To familiarize students with the methods of data collection, transmission and storage of data relative to the grid and control systems, transmission systems and distribution of electricity. Get to know the laws and regulations concerning to the patents, intellectual property and personal data protection.

Course-related learning outcomes

Knowledge

1. Has knowledge in modeling power and electrical systems.

2. Has knowledge of the use of IT systems in power engineering.

Skills

1. Is able to carry out analysis and inference in the field of work of electrical and power systems based on available data.

2. Is able to create models of basic power system circuits and devices as well as calculation algorithms for these models.

Social competences

1. Has the skills to study independently, work in a group and acquire new knowledge, and understands the impact of IT technology on the work of an engineer.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture

Assessment of activity in class, assessment of homework, final test in writing at the end of the semester, colloquium includes test questions or problem tasks, written exam covering the subject of the subject assessed on a scale of 0 to 100%, the final grade lectures given by more than one lecturer based on weighted average, final grade for more than one component grade based on weighted average.

Laboratory

Verification of individual preparation for classes, including material from a single exercise or block of exercises, assessment of individual exercise reports made by the student, colloquium at the end of the semester, colloquium includes test questions or problem tasks, all grades on a scale of 0 to 100%, final grade based on the weighted average of all component ratings.

Programme content

Lecture

Control and supervision systems as a tool for monitoring the operation of the power system. Application of microprocessor technology, recording of events and disturbances, and processing of recorded measurement signals in power protection systems. Selected issues in the field of data exchange. Modeling of power system systems and components. Security in IT systems. Rules for preparing presentation of the results of engineering calculations in electronic and printed versions. Selected issues in the field of copyright (patents, database protection, software licensing methods). Support for teaching through extensive use of publicly available programs (open licenses). Presentation of available alternative sources that allow students to independently expand their knowledge and skills

Laboratory

Control and supervision systems, application of microprocessor technology, use of CAS software, modeling of selected power systems, verification of data from simulations, data transmission devices.

Teaching methods

Lecture

Multimedia and interactive presentation presenting important issues related to the subject, didactic discussion based on the literature on the subject, informative lecture, problem lecture, case study, work on source materials.

Laboratory

Implementation of exercises, use of publicly available information and software tools to support the didactic process, encouraging students to independently search for optimal solutions and problem solving.

Bibliography

Basic

1. Kacejko P., Inżynieria elektryczna i informatyczna w nowych technologiach elektroenergetycznych, 2010
2. Brozi A., Scilab w przykładach, NAKOM, 2007
3. Czemplik A., Scilab i Matlab - podstawowe zastosowania inżynierskie, Oficyna wydawnicza PWr, 2012
4. Gierycz P., SCILAB w obliczeniach inżynierskich, Oficyna wydawnicza PW, 2015
5. Krzyżanowski P., Obliczenia inżynierskie i naukowe, PWN, 2011
6. H. K. Høidalen, L. Prikler, ATPDRAW version 5.6 Users' Manual, 2009

Breakdown of average student's workload

	Hours	ECTS
Total workload	94	3
Classes requiring direct contact with the teacher	55	2
Student's own work (literature studies, preparation for laboratory classes, preparation of reports, preparation for tests)	39	1