STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Computer-aided design of power devices**		Code **1010314381010316894**
Field of study **Electrical Engineering**	Profile of study (general academic, practical) **general academic**	Year /Semester **4 / 8**
Elective path/specialty **High Voltage Engineering**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **part-time**	

No. of hours				No. of credits
Lecture: **-** Classes: **-** Laboratory: **-** Project/seminars: **18**				**2**

Status of the course in the study program (Basic, major, other) **other**	(university-wide, from another field) **university-wide**

Education areas and fields of science and art **technical sciences** **Technical sciences**	ECTS distribution (number and %**)** **2 100%** **2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Sudent knows the basics of electrical engineering, power engineering, basic numerical methods.
2	**Skills**	Student can independently solve simple tasks in the field of electrical engineering, power engineering, and use of the available computer programs.
3	**Social competencies**	Is aware of the work of the group.

Assumptions and objectives of the course:

Fact-finding of selected numerical methods and computer programs supporting the process of modeling of physical phenomena and design of electrical equipment.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Knowledge about design, construction and operations of electrical equipment - [K_W08+++]

2. Student has knowledge of the structure and operation of transformers and electrical machines - [K_W13++]

3. He has knowledge of the physical phenomena occurring in high-voltage insulation systems, systems to high voltage and protection rools - [K_W26++]

Skills:

1. Ability to formulate an algorithms, writing programming, and ability to use software tools in electrical engineering - [K_U04 + + +] - [K_U04+++]

2. Student can use the known methods, mathematical models and computer simulators to analyze and evaluate the electrical components and systems - [K_U10++]

3. Sudent can properly choose available programing environments, simulators and program tools to support computer aided development - [K_U13++]

Social competencies:

1. Understands the necessity and knows the possibility for learning throughout whole life (second-and third-degree and post-graduate) and raise the competence - [K_K01++]]

Assessment methods of study outcomes

Result of project.

Course description

Introduction to using of artificial neural networks simulator (ANN). Exercises of input the data and its description. Creating and teaching the ANN on simple math using the default parameters of the simulator. Testing the influence of ANN simulator parameters changing on teaching SSN results. Exercises on presentation of SSN computing results. Teaching of the neural network the recognition states of logical gates. The use of ANN to modelling of graphs describing the measurements results. The use of ANN to modelling of social phenomena. Designing of ANN to identify defects of the selected insulation system.

Update 2017: teaching SSN the text data analysis.

Basic bibliography:

1. Osowski S., Sieci neuronowe do przetwarzania informacji, Wydawnictwo OWPW, 2013

2. Kosiński R. A., Sztuczne sieci neuronowe Dynamika nieliniowa i chaos, WNT, 2014

3. Migdał Najman K. Najman K., Samouczące się sztuczne sieci neuronowe w grupowaniu i klasyfikacji danych.Teoria i zastosowanie w ekonomii., Wydawnictwo Uniwersytetu Gdańskiego, 2013

Additional bibliography:

1. Bernat J., Gielniak J., Morańda H., Program komputerowy wykorzystujący sztuczne sieci neuronowe do interpretacji wyników badań przy użyciu metody RVM w celu oceny zawilgocenia izolacji papierowej transformatorów, Przegląd Elektrotechniczny, 2008, Tom 84, Nr 10, ss. 5-7

Result of average student's workload

Activity	Time (working hours)
1. Preparing for lectures	12
2. Participation in lectures	30
3. Realisation of project	20
4. Consultation	2

Student's workload

Source of workload	hours	ECTS
Total workload	56	2
Contact hours	20	1
Practical activities	54	2