STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Statistics	**1011102211011100139**

Field of study	Profile of study (general academic, practical)	Year /Semester
Engineering Management - Full-time studies -	**(brak)**	**1 / 1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Production and Operations Management	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
Second-cycle studies	**full-time**

No. of hours	No. of credits
Lecture: **15** Classes: **15** Laboratory: **-** Project/seminars: **-**	**3**

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

Education areas and fields of science and art	ECTS distribution (number and %)

Responsible for subject / lecturer:

dr hab. Karol Andrzejczak
email: karol.andrzejczak@put.poznan.pl,
tel. +48(61) 665-2815
Wydział Elektryczny
ul. Piotrowo 3a, 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student knows basic knowledge of set theory, logic and mathematical analysis.
2	**Skills**	Student is able to efficiently draw function graphs, calculate integrals and derivatives
3	**Social competencies**	Student is aware of the need to deepen their knowledge

Assumptions and objectives of the course:

to acquire basic probabilistic and statistical methods and develop the ability to use these methods to solve practical engineering problems.

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

Knowledge:

1. Student knows with in depth methods of collecting data and extracting information hidden in engineering problems. - [[K2A_W11]]
2. Student has a basic knowledge of probability and mathematical statistics, useful to solve practical engineering problems. - [[K2A_W10]]

Skills:

1. Student is able to interpret the information from a sample and to draw conclusions. - [[K2A_U01], [K2A_U02]]
2. Can formulate their own opinions and obtain statistical data and the method of analysis. - [[K2A_U02]]

Social competencies:

1. Student is able to argue the necessity of continuous learning . - [[K2A_K03]]
2. Is aware of interdisciplinary knowledge and skills needed to solve complex engineering problems. - [[K2A_K06]]

Assessment methods of study outcomes

Forming rating:

a) auditorium exercises based on the assessment of the current progress of tasks implementation b) understanding of lectures based on answers to questions about the material discussed in previous lectures,

Summary rating:

a) exercises based on partial grades obtained for solving tasks on exercises or developing a cross-sectional set of issues,

b) in the field of lectures: final test covering the scope of the material presented in the lectures

Course description

The basic concepts of probability will be discussed i.e.: probability space, random variables, elements of descriptive statistics, distributions of statistics and their practical applications, methods of statistical inference - estimation, hypothesis verification and analysis of correlation and regression.

Teaching methods:

Lecture - informative lecture

Exercises - exercise method

Basic bibliography:

1. Jay L. Devore. Probability and Statistics for Engineering and the Sciences. Ninth or eighth Edition, 2012, 2015
2. Douglas C. Montgomery, G. C. Runger. Applied Statistics and probability for Engineers. Third or higher edition, 2003
3. Anthony Hayter. Probability and Statistics for Engineers and Scientists. Fourth edition

Additional bibliography:

1. Aczel A.D. Statystyka w zarządzaniu. Wyd. Naukowe PWN. 2000.
2. Andrzejczak K. Statystyka elementarna z wykorzystaniem systemu Statgraphics. Wyd. PP. 1997.
3. Bobrowski D., Mackowiak-Łybacka K. Wybrane metody wnioskowania statystycznego. Wyd. PP.
4. Górecki T. Podstawy statystyki z przykładami w R. Wyd. BTC, 2011.

Result of average student's workload

	Activity	Time (working hours)
1. 1.	Lectures participation	15
2. 4.	the study of literature and the development of cross-cutting project	20
3. 2.	Classes participation	15
4. 3.	Cunsultaion and e-consultation	6
5. 5.	preparing to test knowledge or individual project presentation	4
6. 6.	preparation for tutorials	15

Student's workload

Source of workload	hours	ECTS
Total workload	75	3
Contact hours	34	1
Practical activities	15	1