

## SUBJECT CARD

Attachment No. 1 to Regulation No 3/07/2020  
of 13 July 2020 *on the model subject card*  
at the Warsaw Management University

I. GENERAL BASIC INFORMATION ABOUT THE SUBJECT (MODULE)										
<b>SUBJECT NAME</b> <b>Statistical Inference</b>										
<b>Name of the organizational unit leading the course:</b>			Faculty of Management and Technical Sciences							
<b>Name of the field of study, level of education:</b>			Management, second cycle							
<b>Studying profile:</b>			general academic							
<b>Name of the specialisation:</b>			-							
<b>Type of learning module:</b>			primary							
<b>Year/Semester:</b>			Year I, semester 1							
<b>Person coordinating the subject:</b>			Artur Czech, PhD							
<b>Prerequisites (resulting from the succession of subjects):</b>			Knowledge, skills and competences acquired as a result of learning antecedent subjects (mathematics, statistics) at first-cycle studies							
II. FORMS OF CLASSES AND NUMBER OF HOURS										
	Lecture	Practical classes	Seminar	Laboratory	Workshop	Project	Seminar	Consultation	Exam/Credit	Total hours
Full-time studies	25	20								45
Part-time studies	15	15								30
III. METHODS OF TEACHING ACTIVITIES										
<b>Forms of classes</b>			<b>Didactic methods</b>							
<b>Lecture</b>			Lectures are enriched with multimedia presentations, discussions, work with literature, hypothetical-deductive thinking of listeners							
<b>Practical classes</b>			Solving tasks, group discussions							
IV. SUBJECT LEARNING OUTCOMES IN RELATION TO LEARNING OUTCOMES FOR THE FIELD OF STUDY AND AREAS										
<b>No.</b>	<b>Description of the learning outcomes in question</b>								<b>Directional effect reference</b>	
<b>Knowledge:</b>										
1	The student knows and understands in depth the methodology of conducting research work								ZO2_W05 P7S_WG	
2	The student knows and understands to an in-depth degree specialized applications of advanced statistical, econometric methods and IT tools for collecting, analyzing, simulating and presenting data in the organization as well as systems supporting decision-making processes in conditions of risk and uncertainty, group decisions, multifaceted decisions								ZO2_W08 P7S_WG	
<b>Abilities:</b>										
1	The student is able to choose the right analytical methods to solve the problem and analyze the problems of managing mathematical statistics methods								ZO2_U04 P7S_UW	
<b>Social competences:</b>										
1	The student is ready to recognize significant knowledge in solving cognitive and practical problems using specialized statistical methods and tools								ZO2_K01 P7S_KK	

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V. CURRICULAR CONTENT (LEARNING)				
No.	Lecture:	Reference to the learning outcomes in question		
1.	Elements of probability	ZO2_W05 ZO2_W08 ZO2_U04		
2.	Concept of a random variable			
3.	Selected discrete and continuous distributions (normal distributions, t-Student distribution, Chi-squared distribution).			
4.	Sample surveys			
5.	Interval estimation for mean, fraction and variance			
6.	Minimum sample size. Two-step Stein procedure. Determination of the minimum sample size for the mean value and fraction of highlighted elements			
7.	Testing statistical hypotheses (selected parametric significance and compatibility tests)			
No.	Practical classes/workshops:	Reference to the learning outcomes in question		
1	Probability theory	ZO2_W05 ZO2_W08 ZO2_U04 ZO2_K01		
2	Selected discrete and continuous distributions (normal distributions, t-Student distribution, Chi-squared distribution).			
3	Sample surveys			
4	Interval estimation for mean, fraction and variance			
5	Minimum sample size. Two-step Stein procedure. Determination of the minimum sample size for the mean value and fraction of highlighted elements			
6	Testing statistical hypotheses - selected parametric significance tests			
7	Testing statistical hypotheses - selected compatibility tests			
Learning outcomes	Verification method			
Knowledge:				
ZO2_W05 ZO2_W08	Written or oral exam, activity during the lecture Written colloquium or oral presentation, activity during exercises, group discussion	Lecture Practical classes		
Abilities:				
ZO2_U04	Written or oral exam, activity during the lecture Written colloquium or oral presentation, activity during exercises, group discussion	Lecture Practical classes		
Social competences:				
ZO2_K01	Written colloquium or oral presentation, activity during exercises, group discussion	Practical classes		
VII. CRITERIA FOR ASSESSING ACHIEVED LEARNING OUTCOMES				
Learning outcomes	Unsatisfactory assessment The student does not know and does not understand/cannot/is not	Grade range 3.0-3.5 The student knows and understands / can / is ready:	Grade range 4.0-4.5 The student knows and understands / can / is ready:	Very good rating The student knows and understands / can / is

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	ready:			ready:
For each of the learning outcomes identified for the knowledge, skills and competences module	The student obtains less than 50% of the max. number of points for a given effect	<p>The student gets from 50 to 59% of the max. number of points for a given effect on a grade of 3 and</p> <p>The student gets from 60 to 69% of the max. number of points for a given effect per grade 3.5</p>	<p>The student gets from 70 to 79% of the max. number of points for a given effect per grade 4, and</p> <p>The student obtains from 80 to 89% of the max. number of points for a given effect per rating 4.5</p>	The student obtains more than 89% of the max. number of points for a given effect

### VIII. STUDENT'S WORKLOAD – NUMBER OF HOURS AND BALANCE OF ECTS CREDITS

Type of activity ECTS	Student load	
	Full-time studies	Part-time studies
Participation in didactic classes (lectures, practical classes, tutorials, project, laboratories, workshops, seminars) – SUM of hours – from point II	45	30
Exam/Credit	1	1
Participation in the consultations	1	1
Project / Essay		
Independent preparation for didactic classes	10	20
Preparing to pass a didactic class	18	23
<b>Total student workload (25h = 1 ECTS) TOTAL hours/ECTS</b>	<b>3 ECTS/75 h</b>	<b>3 ECTS/75 h</b>
Student load in classes in direct contact with the teacher	45	30
Student load in practical classes		
Student load in practical vocational preparation classes		
Student load in research preparation classes		

### IX. LITERATURE AND OTHER DIDACTIC MATERIALS

#### Basic literature:

1. Statystyka [Statistics], Sobczyk Mieczysław, Wydawnictwo Naukowe PWN Publ, 2022
2. J. E. Hanke, A. G. Reitch, Understanding Business Statistics, IRWIN Publ.
3. W. W. Daniel, J. C. Terrell, Business Statistics, Basic Concepts and Methods, Houghton Mifflin Company.

#### Supplementary literature:

1. Luszniwicz, T. Słaby, Statystyka z pakietem komputerowym STATISTICA PL. Teoria i zastosowania [Statistics with STATISTICA PL software], C. H. Beck Publ., 2008 Warsaw.
2. J. Greń, Statystyka matematyczna [Mathematical statistics], PWN Publ, 1984, Warsaw.
3. Domański, D. Pekasiewicz, A. Baszczyńska, A. Witaszczyk, Testy statystyczne w procesie podejmowania decyzji [Statistical tests in decision-making proces], Wydawnictwo Uniwersytetu Łódzkiego Publ, 2014 Lodz.
4. Amir D. Aczel, J. Sounderpandin, Statystyka w zarządzaniu [Statistics in management], PWN Publ, 2018 Warsaw.
5. Młodak, Statystyka w pracach badawczych. Roztropność. Narzędzia. Etyka [Statistics in research papers. Prudence. Tools. Ethics], Kaliskie Towarzystwo Przyjaciół Nauk Publ, 2020, Kalisz.
6. M. Sobczyk, Statystyka matematyczna [Mathematical statistics], C.H. Beck Publ, 2010 Warsaw.
7. J. Józwiak, J. Podgórski, Statystyka od podstaw [Basic statistics], PWE Publ, 2012 Warsaw.

#### Other teaching materials: