



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Meteorology 2 [S1Lot2-PSPL>Meteo2]

### Course

Field of study

Aviation

Year/Semester

2/3

Area of study (specialization)

Aircraft Piloting

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

15

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

1,00

### Coordinators

Piotr Szewczak

### Lecturers

### Prerequisites

A student starting this subject should have basic knowledge of phenomena occurring in the environment, physical processes that shape weather, interpretation of weather forecasts presented in various forms. They should also have the ability to apply the scientific method to solve problems and be willing to cooperate within a team.

### Course objective

to familiarize the student with the processes and phenomena determining the weather, weather systems and phenomena hazardous to flight and disrupting the operation of navigation and communication devices.

### Course-related learning outcomes

Knowledge:

1. has extended and deepened knowledge of mathematics including algebra, analysis, theory of differential equations, probability, analytical geometry as well as physics including the basics of classical mechanics, optics, electricity and magnetism, solid state physics, thermodynamics, useful for formulating and solving complex technical tasks related to aeronautical engineering and modeling
2. has structured, theoretically based general knowledge in the field of technology and various means of air

transport, about the life cycle of means of transport, both hardware and software, and in particular about the key

processes occurring in them

3. has structured and theoretically based general knowledge in the field of key issues of technology and detailed

knowledge in the field of selected issues related to air transport, knows the basic techniques, methods and tools

used in the process of solving tasks related to air transport, mainly of an engineering nature

4. has structured, theoretically based general knowledge covering key issues in the field of technical thermodynamics, fluid mechanics, in particular aerodynamics

5. has structured, theoretically based knowledge in the field of engineering graphics and machine design: technical drawing, projection of objects, basic principles of engineering graphics, application of CAD

(Computer

Aided Design) computer graphic programs in machine design

6. has detailed knowledge related to selected issues in the field of construction of manned and unmanned aircraft, in the field of on-board equipment, control systems, communication and recording systems, automation

of individual systems, has basic knowledge of flight simulation training devices and simulation methods used to

solve air transport issues.

7. has extended knowledge in the field of strength of materials, including the theory of elasticity and plasticity,

stress hypotheses, methods of calculating beams, membranes, shafts, connections and other structural elements, as well as methods of testing the strength of materials and the state of deformation and stress in structures and also has basic knowledge in the main areas of technical mechanics: statics, kinematics and dynamics of a material point and a rigid body

8. has basic knowledge of metallic, non-metallic and composite materials used in machine construction, in particular their structure, properties, methods of production, heat and thermochemical treatment and the effect of

plastic processing on their strength as well as fuels, lubricants, technical gases, refrigerants, etc.

9. has the ability to self-educate using modern teaching tools, such as remote lectures, Internet websites and

databases, teaching programs, e-books

Skills:

1. is able to obtain information from various sources, including literature and databases, both in Polish and English, integrate it properly, interpret and critically evaluate it, draw conclusions, and comprehensively justify the opinions he/she formulates

2. is able to appropriately use information and communication techniques that are used at various stages of the implementation of aviation projects

3. is able to appropriately select materials for simple aircraft structures, indicate differences between fuels used in aviation

4. is able to communicate using various techniques in the professional environment and other environments using a formal record of the structure, technical drawing, concepts and definitions of the scope of the studied field of study

5. is able to solve tasks using basic knowledge of aerodynamics, flight mechanics and flow around bodies

6. is able to design means of transport with appropriate external requirements (e.g. regarding environmental

protection)

7. is able to analyze technical objects and solutions, is able to search in catalogs and on manufacturers' websites for ready-made components of machines and devices, including means and devices, assess their suitability for use in their own technical and organizational projects

8. is able to use the language of mathematics (differential and integral calculus) to describe simple engineering issues.

9. is able to organize, cooperate and work in a group, assuming different roles in it and is able to appropriately determine priorities for the implementation of a task defined by themselves or others

10. is able to plan and implement the process of their own permanent learning and knows the possibilities of further education (second and third degree studies, postgraduate studies, courses and exams conducted by universities, companies and professional organizations)

Social competences:

1. understands that in technology knowledge and skills very quickly become outdated
2. correctly identifies and resolves dilemmas related to the profession of an aviation and astronautics engineer

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: - assessment of knowledge and skills demonstrated in the written examination - 1.5 hours.

### Programme content

Lecture:

semester 5:

Atmospheric precipitation. Types of atmospheric precipitation. The process of precipitation formation. Air masses

and atmospheric fronts. Description, classification and source regions of air masses. Classification of air masses.

Boundaries between air masses. Atmospheric pressure systems. Highs, types, general properties, warm and cold

highs, ridges and saddles, disappearance. Non-frontal lows. Tropical storms.

### Course topics

Detailed discussion of atmospheric precipitation, types of precipitation and the processes of their formation. Discussion and classification of air masses and the boundaries between them. Discussion of atmospheric pressure systems, atmospheric properties, highs, lows and tropical storms.

### Teaching methods

Lecture: multimedia presentation, illustrated with examples given on the blackboard.

### Bibliography

Basic:

1. Domicz J., Szutowski L. Podręcznik pilota samolotowego, Technika Poznań 2001
2. Dunlop S., Pogoda - przewodnik ilustrowany, Świat Książki Warszawa 2003
3. Międzynarodowy atlas chmur, WMO 1956
4. Ostrowski M., Meteorologia dla lotnictwa sportowego, Aeroklub Polski Warszawa 2004
5. Petterssen S., Zarys meteorologii PWN Warszawa 1964
6. Roth G., Pogoda i klimat, Świat Książki Warszawa 2000
7. Schmidt M., Meteorologia WKiŁ Warszawa 1975
8. Schmidt M., Meteorologia dla każdego WKiŁ Warszawa 1972
9. Szewczak P., Meteorologia dla pilota samolotowego (PPL, CPL, ATPL, IR), Avia-test Poznań 2007
10. Słownik meteorologiczny pod red. Niedźwiedź T. PT Geofizyczne IMGW Warszawa 2003
11. Słownik pojęć geograficznych WEGŚ pod red. Kostrzewski A. Poznań 2001
12. Szczeciński Cz., Meteorologia na usługach lotnictwa WK Warszawa 1952
13. Światowa Organizacja Meteorologiczna, Podstawy meteorologii opr. B.J. Retallack IMGW 1991
14. Tamulewicz J., Pogoda i klimat Ziemi, WEGŚ tom V Poznań 1997
15. Tamulewicz J., Wody i klimat Ziemi, Pogoda i klimat Poznań 2001
16. Woś A. Meteorologia dla geografów PWN Warszawa 1996
17. Zwieriew A.S. Meteorologia synoptyczna, WKiŁ Warszawa 1965

Additional:

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### Breakdown of average student's workload

|  | Hours | ECTS |
|--|-------|------|
| Total workload   | 75    | 3,00 |
| Classes requiring direct contact with the teacher  | 30    | 1,00 |
| Student's own work (literature studies, preparation for laboratory classes/<br>tutorials, preparation for tests/exam, project preparation) | 45    | 2,00 |