



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of diagnostics of modes of transport

Course

Field of study

Aerospace Engineering

Area of study (specialization)

–

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

18

Laboratory classes

9

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

dr inż. Marta Galant

email: marta.galant@put.poznan.pl

tel. +4861 665 2252

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Knowledge: The student has a basic knowledge of the construction of means of transport and the principles of their operation. The student knows the construction of basic types of technical objects and knows the general principles of their operation. The student has a basic knowledge of the theory of probability and mathematical statistics. Has knowledge of the techniques of measuring mechanical quantities and modeling.

Skills: The student is able to analyze and synthesize information, draw conclusions, formulate and justify opinions. The student is able to apply the basic models of probability theory and mathematical statistics.



The student is able to solve specific problems occurring in technical systems. He is fluent in a suite of office computer programs.

Social competences The student is aware of the importance of action in the facility's life cycle. The student understands that the further from the construction phase of technical facilities their high unreliability can be noticed, the more expensive it is. He realizes that the costs of repairing technical objects usually constitute a small part of the losses caused by their damage. The student can collaborate in a group and set priorities that are important in solving the tasks set for him.

Course objective

1. The aim of the course is to learn the theoretical problems related to technical diagnostics of means of transport

Course-related learning outcomes

Knowledge

1. has extended knowledge necessary to understand the profiled subjects as well as specialist knowledge about construction, operation, air traffic management, safety systems, economic, social and environmental impact in the field of aviation and space

2. has basic knowledge in the field of technical diagnostics of means of transport and methods and methods of solving issues related to the assessment of their technical condition and forecasting, knows: conditions for diagnosing technical objects, the essence of technical diagnostics applied to means of air transport, tasks and objectives of technical diagnostics

Skills

1. has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books

Social competences

1. understands the need for lifelong learning; can inspire and organize the learning process of other people

2. is ready to critically evaluate the knowledge and content received, recognize the importance of knowledge in solving cognitive and practical problems, and consult experts in the event of difficulties in solving the problem on its own

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Assessment of knowledge and skills on a written or oral exam based on the explanation of selected issues

Laboratory: assessment of practical skills

Programme content

1. The concept of the term diagnostics, diagnostics as a measurement method, conditions for diagnosing technical objects.

2. The essence of technical diagnostics, tasks and goals of technical diagnostics. The concept of entropy in diagnostics, entropy properties, relative entropy.

3. The phases of the object's existence, diagnostics in the various phases of the object's existence.



4. Diagnostics in the vehicle operation system, diagnostics in the use and maintenance subsystem. Diagnostic system.

5. Analysis of the object of diagnosis, diagnostic models (determined and undetermined), a set of features of the condition of the object, a set of output parameters (working and accompanying).

6. The structure of the object and the diagnostic signal, the concept of the structure, parameters of the structure describing the state of the object. Conditions to be met by the output parameter to be considered a diagnostic parameter.

7. Diagnostic parameters and their division. Technical symptoms.

8. The concept of the limit value and the permissible symptoms, methods of estimating limit values. 28. Classification of technical conditions of the object, two, three and four-state classification. Classification of diagnostic state parameters, general and detailed parameters.

9. Diagnostic methods, information synthesis method, information analysis method. Vehicle diagnosis methods, instrumental and non-instrumented methods. The scope of technical diagnostics activities, diagnosing the current state, supervising the state of the object, generating existing (past) states, forecasting future states. Diagnostic experiments, passive experiment, active experiment, active-passive experiment, passive-reliability experiment. Vehicle diagnostic susceptibility. Effectiveness of using diagnostics in vehicle operation. Methodology of diagnostic tests.

Teaching methods

Informative (conventional) lecture (providing information in a structured way) - may be of a course (introductory) or monographic (specialist) character

Laboratories

Bibliography

Basic

1. Cempel C., Tomaszewski F., Diagnostyka Maszyn. Zasady ogólne, przykłady zastosowań. Instytut Technologii Eksploatacji, Radom 1992.
2. Żółtowski B., Podstawy diagnostyki maszyn. Wydawnictwo Uczelniane Akademii Techniczno-Rolniczej, Bydgoszcz 1996

Additional



Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for tutorials, preparation for tests) ¹	50	2,0

¹ delete or add other activities as appropriate