COURSE DESCRIPTION CARD - SYLLABUS

Course name
Data analysis

Course

Field of study
Aerospace Engineering

Year/Semester
III/6

Area of study (specialization)
Aircraft engines and airframes

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
english

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars
30

Number of credit points

5

Lecturers

Responsible for the course/lecturer:
Dr inż Jedrzej Mosiężny

Jedrzej.mosiezny@put.poznan.pl

Responsible for the course/lecturer:

Prerequisites

Has basic knowledge on construction of aircraft, flight dynamics and aerodynamics.Has the capability of performing basic of performing basic algebraic and differential computations

Course objective

The goal of the study is to project knowledge and skills in area of aircraft design

Course-related learning outcomes

Knowledge

1. Has grounded knowledge in areas of engineerign graphics, machine design, shape and dimensional tolerances [KIL_W03]

2. Has grounded knowledge in terms of CFD data acquisition, optimization, quantitive and qualitative analysis of data, data visualization

3. Has extended knowledge in aera of applied mathematics for data analysis and creating mathematical models and their implementation to software.

Skills

1. Is capable of self learning with use of contemporary, digital learning methods.

2. Is capable of acquiring information from literature, internet and other sources. Is capable of integrating gathered knowledge and drawing conclusions.

3. Is capable of assesing the use and results of use of specialistic software

Social competences

1. Understands the necessity of conforming to the professional ethics

2. Understands the necessity of critical assessment of acquired knowledge and the necessity of perpetual learning

3. Understands the role of technical university graduate

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: 90 minute assignment in the last lecture. Test consists of 10 closed, single choice tasks (estimated time per task - 2 minutes) and 10 short opne calculation tasks (estimated time per task - 5 minutes) relevant to tasks presented on the lecture. Correct answer for closed tasks is worth 1 point. Open tasks are given 0-2 points with 0.5 point grading. Fully accomplished task cosists of a schematic (if needed), equations, calculations and unit calculations. Tasks are independent, answer from previous task is not required to following task. Passing the test requires 50% of points.

Project: Passing the project is based on minimum 5, maximum 7 project assignments relevant to the lectures. A project task is based on a elaborate calculations completed with specialistic software or self written scripts. Estimated time for completing a task - 13 days. Tasks shall be submitted via univerisites e-mail before given deadline. Tasks are graded from 0 - 10 points. Grading criteria are dependent on the task and comminicated during assignment. Task submitted after a deadline and/or by and to a non-univerisity e-mail are graded with 0 points. Tasks completed with use of references without pointing the reference sources (plagiarism, copycat works) are graded with 0 points. Criteria for passing a single assignment: obtaining 50% of points. Criteria for passing the class: obtaining 50% of total available point from all assignments and passing minimum of 70% of assignments.

Programme content

1. Data analysis workflow

2. Basics of python 3.x workflow

3. Basics of statistics and probabilistics, testing of statistical hypotheses

4. Experimental data analysis

5. Numerical data analysis

6. Python libraries overview

7. Multidimensional dataset visualization

Teaching methods

Live coding based lecture, project classes in computer laboratory with practical examples of calculations presented on lecture

Bibliography

Basic

1. Joel Gruss. Data Science from Scratch

2. Jake VanderPlas. Python Data Science Handbook

3. Peter C. Bruce, Andrew. Practical Statistics for Data Science

Additional

Python 3.x manual

Breakdown of average student's workload

	Hours	ECTS
Total workload	126	5,0
Classes requiring direct contact with the teacher	76	3,0
Practical Activities [1]	50	2

[1] delete or add other activities as appropriate