SZKOŁA GŁÓWNA GOSPODARSTWA WIEJSKIEGO

# Dust collection system for wood industry

Educational subject description sheet

## Basic information

| | |
|---|---|
| **Field of study**<br>Wood Technology<br>**Speciality**<br>-<br>**Organizational unit**<br>Faculty of Wood Technology<br>**Study level**<br>first cycle (engineering degree)<br>**Study form**<br>full-time studies<br>**Education profile**<br>General academic | **Didactic cycle**<br>2024/25<br>**Subject code**<br>TDRTDS_D.320.05407.24<br>**Lecture languages**<br>english<br>**Mandatory**<br>Elective subjects<br>**Block**<br>Major subjects<br>**Disciplines**<br>Forest science |

| | |
|---|---|
| **Coordinator** | Radosław Auriga |
| **Teacher** | Radosław Auriga |

| | | |
|---|---|---|
| **Period**<br>Semester 6 | **Examination**<br>Pass with grade<br><br>**Activities and hours**<br>Laboratory exercises: 15 | **Number of ECTS points**<br>1 |

## Goals

| Code | Goal |
|---|---|
| C1 | Aim of this course is to familiarize students with knowledge of dedust systems and devices used in wood industry |

## Subject's learning outcomes

| Code | Outcomes in terms of | Effects | Examination methods |
|---|---|---|---|
| **Knowledge – Student knows and understands:** | | | |
| W1 | student has a general knowledge of dedust systems used in various branches of the wood industry | TD_K3_W03 | Written credit, Project |
| W2 | student has basic knowledge about life cycle of dedust systems and machines | TD_K3_W04_inz | Written credit |
| **Skills – Student can:** | | | |
| U1 | design a simple dedust installation | TD_K3_U05_inz | Written credit, Project |
| U2 | perform a critical analysis of the functionality of existind dust removal systems | TD_K3_U06_inz | Project |
| **Social competences – Student is ready to:** | | | |
| K1 | critically evaluate the designed solutions | TD_K3_K01 | Project |

## Study content

| No. | Course content | Subject's learning outcomes | Activities |
|---|---|---|---|
| 1. | Pneumatic conveyors. Parameters of the pneumatic dust removal installation. Energy consumption of the dust removal process. Elements of the construction of a pneumatic dedust installation. Calculation of flow resistance of individual elements and entire installations. Fans - division, structure, purpose, selection. Dust collectors - general division. Settlement chambers - construction, purpose, principle of operation, examples of applications. Cyclones - division and purpose. Filter dedusting. Methods of regeneration of filter partitions. Division of dry filter dust collectors. Cylindrical filters, cyclofilters and cylindrical-chamber filters - structure, principle of operation, purpose. Silos and tanks of wood particles - construction and purpose. Emptying methods - scrapers. Fire protection and extinguishing systems that protect and reduce the effects of explosions in pipelines, filters and silos. | W1, W2, U1, U2, K1 | Laboratory exercises |

## Course advanced

| Activities | Methods of conducting classes |
|---|---|
| Laboratory exercises | Lecture, Discussion, Presentation |

| Activities | Examination method | Percentage |
|---|---|---|
| Laboratory exercises | Project | 50% |
| Laboratory exercises | Written credit | 50% |

| Activities | Credit conditions |
|---|---|
| Laboratory exercises | project of dust removal instalation |

## Literature

**Obligatory**

1. Wood-based panels - an introduction for specialists. London 2010. Brunel University Press.

## Calculation of ECTS points

| Activity form | Activity hours* |
|---|---|
| Laboratory exercises | 15 |
| Self-study on the content covered in class | 5 |
| Preparing the project | 10 |
| | |
| **Student workload** | **Hours**<br>30 |
| **Number of ECTS points** | **ECTS**<br>1 |

* hour means 45 minutes

## Effects

| Code | Content |
|---|---|
| TD_K3_K01 | Absolwent jest gotów do krytycznej oceny posiadanej wiedzy i odbieranych treści |
| TD_K3_U05_inz | Absolwent potrafi projektować, zgodnie z zadaną specyfikacją, oraz wykonywać typowe dla kierunku studiów proste urządzenia, obiekty, systemy lub realizować procesy, używając odpowiednio dobranych metod, technik, narzędzi i materiałów |
| TD_K3_U06_inz | Absolwent potrafi dokonać krytycznej analizy sposobu funkcjonowania i ocenić istniejące rozwiązania techniczne, w szczególności urządzenia, systemy i procesy w zakresie technologii drewna, z uwzględnieniem aspektów systemowych i pozatechnicznych, w tym aspektów etycznych |
| TD_K3_W03 | Absolwent zna i rozumie zagadnienia z zakresu technologii, narzędzi i materiałów stosowanych przy rozwiązywaniu zadań inżynierskich z zakresu szeroko pojętego drzewnictwa |
| TD_K3_W04_inz | Absolwent zna i rozumie podstawowe zagadnienia dotyczące procesów zachodzących w cyklu życia urządzeń, obiektów i systemów technicznych stosowanych w przemyśle drzewnym |