# POZNAN UNIVERSITY OF TECHNOLOGY



EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

## **COURSE DESCRIPTION CARD - SYLLABUS**

Course name Metal structures II [N1Bud1>KMET2]

| Course   |                         |                                   |            |
|--|-------------------------|-----------------------------------|------------|
| Field of study<br>Civil Engineering  |                         | Year/Semester<br>4/7              |            |
| Area of study (specialization)   |                         | Profile of study general academic |            |
| Level of study<br>first-cycle  |                         | Course offered in<br>Polish       |            |
| Form of study<br>part-time   |                         | Requirements compulsory           |            |
| Number of hours  |                         |                                   |            |
| Lecture<br>20  | Laboratory classe<br>20 | es (                              | Other<br>D |
| Tutorials<br>10  | Projects/seminars<br>0  | 5                                 |            |
| Number of credit points<br>4,00  |                         |                                   |            |
| Coordinators<br>dr inż. Marcin Chybiński<br>marcin.chybinski@put.poznan.pl |                         | Lecturers                         |            |

#### **Prerequisites**

Studnet knows the basic issues of steel production technologies used in the construction industry and their strength and mechanical properties. Recognizes and characterizes types of welded and bolted connections and explains calculation procedures. Skillfully applies basic formulas in the field of structural mechanics and material strength. He can adopt appropriate design and technological solutions in the field of anti-corrosion and fire protection. Can propose a design solution for a connection using an appropriate calculation procedure. Can work independently and cooperate in a group.

### Course objective

Introducing the basic methods of designing metal structure elements and familiarizing with the methods of dimensioning metal structure elements such as beams, columns, trusses.

#### **Course-related learning outcomes**

Knowledge:

1. Know European standards (EN) and technical conditions of constructing building facilities.

2. Knows detailed rules of constructing and dimensioning elements and metal connections.

Skills:

1. Can prepare statements of strengths influencing the building units.

2. Are able to design selected elements and simple metal.

Social competences:

1. Take responsibility for the accuracy and reliability of work results and their interpretation.

2. Can realise that it is necessary to improve professional and personal competence, understand the need and opportunities of continuous learning (Master and PhD studies, post-diploma studies, trainings).

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Passing the lecture - written exam. Auditorium exercises - written test. Design exercises - project execution and its verbal defense.

Grading scale:

5.0 - the student obtained over 90% of the points in the exam, test and project defense,

4.5 - the student obtained from 80% to 90% of the points in the exam, test and project defense,

4.0 - the student obtained from 70% to 80% of the points in the exam, test and project defense,

3.5 - the student obtained from 60% to 70% of the points in the exam, test and project defense,

3.0 - the student obtained from 50% to 60% of the points in the exam, test and project defense,

2.0 - the student obtained less than 50% of the points in the exam, test and project defense.

### Programme content

Lecture

- hall casing elements,
- static solutions of hall cross systems,
- loads on hall structures according to PN EN 1991,
- load combinations according to PN-EN 19990,
- dimensioning of bending, compression and tension elements
- determination of the critical load capacities in compression and bending,
- shaping trusses,

- shaping hall bracings,

Design

Steel roof design (bracings, girder).

### **Course topics**

Lecture

- hall casing elements,
- static solutions of hall cross systems,
- loads on hall structures according to PN EN 1991,
- load combinations according to PN-EN 19990,
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Design

Steel roof design (bracings, girder).

## **Teaching methods**

Lectures illustrated with slides and films - problem lecture / seminar lecture / lecture with multimedia presentation. Design exercises - steel roof design (bracings, girder).

## Bibliography

Basic

1. Poradnik projektanta konstrukcji metalowych, Bogucki , Arkady , Warszawa , 1982

2. Konstrukcje metalowe cz. I i II, Łubiński, Żółtowski , Arkady , Warszawa , 1992

3. Tablice do projektowania konstrukcji metalowych, Bogucki W., Żyburtowicz M, Arkady , Warszawa , 1996

Additional

- 1. PN-EN 1990 Eurokod: Podstawy projektowania konstrukcji
- 2. PN-EN 1991 Eurokod 1: Oddziaływania na konstrukcje
- 3. PN-EN 1993 Eurokod 3: Projektowanie konstrukcji stalowych

#### Breakdown of average student's workload

|  | Hours | ECTS |
|--|-------|------|
| Total workload   | 100   | 4,00 |
| Classes requiring direct contact with the teacher  | 50    | 2,00 |
| Student's own work (literature studies, preparation for laboratory classes/<br>tutorials, preparation for tests/exam, project preparation) | 50    | 2,00 |