

I. Tantárgyleírás**1. Alapadatok***1.1 Tantárgy neve***STEEL AND COMPOSITE STRUCTURES***1.2 Azonosító (tantárgykód)***BMEEOHSAS47***1.3 Tantárgy jellege*

Kontaktórás tanegység

1.4 Óraszámok

Típus	Óraszám / (nap)
Előadás (elmélet)	3

1.5 Tanulmányi teljesítményértékelés (minőségi értékelés) típusa

Félévközi érdemjegy

1.6 Kreditszám

4

1.7 Tárgyfelelős

név	Dr. Kovács Nauzika
beosztás	Egyetemi docens
email	kovacs.nauzika@emk.bme.hu

1.8 Tantárgyat gondozó oktatási szervezeti egység

Hidak és Szerkezetek Tanszék

1.9 A tantárgy weblapja<https://epito.bme.hu/BMEEOHSAS47><https://edu.epito.bme.hu/course/view.php?id=4577>*1.10 Az oktatás nyelve*

magyar és angol

1.11 Tantárgy típusa

Kötelező az építőmérnöki (BSc) szakon

1.12 Előkövetelmények

Strong prerequisites:

- Steel Structures (BMEEOHSAT42)
- Reinforced Concrete Structures (BMEEOHSAT43)

1.13 Tantárgyleírás érvényessége

2020. február 5.

2. Céltűzések és tanulási eredmények*2.1 Céltűzések*

The aim of the Subject is to teach the structural speciality, layout and design of plated girders, including the followings: effect of internal forces and moments interaction on the cross-sectional resistance and stability phenomenon; the configuration and design of simple connections.

The further aim is to teach the configuration, behaviour and the basis of the elastic and plastic design methods of composite girders.

2.2 Tanulási eredmények

A tantárgy sikeres teljesítése után a hallgató

A. Tudás

1. knows the general terminology of the steel and composite structures,
2. knows the design methods of welded plate girders,
3. knows the cross-sectional and stability phenomenon interaction of steel structures,
4. knows the configuration of simple steel structural joints,
5. knows the configuration of composite girders,
6. knows the elastic design method of composite girders,
7. knows the plastic design method of composite girders,
8. knows the elastic and plastic design methods of shear connections.

B. Képesség

1. able to design of steel plate girders,
2. able to design of steel columns under eccentric compression,
3. able to design the simple joints of steel structures,
4. able to determine the elastic and plastic resistance of composite beam cross-section,
5. able to do design the shear connections by elastic and plastic methods.

C. Attitűd

1. opened to gain new knowledge, increase their knowledge by continuous learning,
2. opened to used IT devices,
3. pursue to accurate and error-free solutions

D. Önállóság és felelősség

1. design the steel and composite beams individually based on given source materials,
2. apply systematic thinking

2.3 Oktatási módszertan

The theoretical background of the design of the steel and composite structures are explained on the lectures and numerical examples are solved on the exercise classes. Homework examples should be solved individually by the Student and check the correct results online with the aim to be prepared for the mid-term exams.

2.4 Részletes tárgyprogram

Week	Topics of lectures and/or exercise classes
1.	Local plate buckling: class 4 sections, shear buckling.
2.	Welded plate girders: configuration, design concepts.
3.	Beam-columns: cross-section classification, cross-sectional resistances.
4.	Beam-columns: stability behaviour and design.
5.	Simple connection: beam splices and column bases.
6.	Simple connection: pinned column base connection.
7.	Simple connection: beam-to-beam connections.
8.	Concept of composite construction, structural layout and behaviour.

9.	Design of composite structures: basis.
10.	Composite beams: elastic calculation for short and long term loadings.
11.	Composite beams: cross-section classification.
12.	Composite beams: cross-sectional resistances
13.	Configuration of shear connectors and design by elastic and plastic method.
14.	Steel and composite structures: examples.

A félév közbeni munkaszüneti napok miatt a program csak tájékoztató jellegű, a pontos időpontokat a tárgy honlapján elérhető "Részletes féléves ütemterv" tartalmazza.

2.5 Tanulástámogató anyagok

Online materials

1. ESDEP Course WG.10. Composite structures
2. Slides of Lectures.
3. Solved examples.
4. Sample for midterm exams

2.6 Egyéb tudnivalók

Attendance to lectures and exercise classes is compulsory. The signature and credits of the subject will be refused to students attending less than 70% of the classes.

2.7 Konzultációs lehetőségek

The instructors are available for consultation during their office hours, as advertised on the department website. Special appointments can be requested via e-mail:

kovacs.nauzika@emk.bme.hu or seres.noemi@emk.bme.hu

Jelen TAD az alábbi félévre érvényes:

II. Tárgykövetelmények

3. A tanulmányi teljesítmény ellenőrzése és értékelése

3.1 Általános szabályok

The assessment of the learning outcomes specified in clause 2.2. above and the evaluation of student performance occurs via midterm tests and homework assignments.

3.2 Teljesítményértékelési módszerek

Evaluation form	Abbreviation	Assessed learning outcomes
1. midterm test	MT1	A.1-A.2; B.1
2. midterm test	MT2	A.3-A.4; B.2-B.3
3. midterm test	MT3	A.5-A.8; B.4-B.5
1-3. homework	HW1	A.1-A.4; B.1-B.5; C.1-C.3; D.1-D.2
attendance and activity (optional; positive only)	A	A.1-A.8; B.1-B.5

A szorgalmi időszakban tartott értékelések pontos idejét, a házi feladatok ki- és beadási határidejét a "Részletes féléves ütemterv" tartalmazza, mely elérhető a tárgy honlapján.

3.3 Teljesítményértékelések részaránya a minősítésben

Abbreviation	Score
MT1	33%
MT2	33%
MT3	34%
Sum	100%
HW bonus	10%
Sum + bonus	110%

Midterm exams:

- All midterm exams have theoretical (test) and practical (examples) parts.
- **Successful completion of all three midterm exams—both theoretical (test) and practical (example) parts—with a score of at least 30% is a necessary but not sufficient condition for passing the course; see point 3.5.**

Home works:

- Home works are optional.
- The aim of the home works are the preparation for the practical part of the midterms. They are parametric practical examples, unique for each students.
- Max. 10 bonus points are gained by Home works.

3.4 Az aláírás megszerzésének feltétele, az aláírás érvényessége

Signature is not gained in this Subject.

3.5 Érdemjegy megállapítása

The course performance evaluation system includes 3 mandatory midterm exams and several smaller, optional calculation-based homework assignments.

The midterms consist of a theoretical (test) and a practical (example) parts. To pass the course, students must achieve at least 30% of the points in both parts of all three midterms (test: 4 points, example: 6 points). Any midterm with a score below 30% is considered failed and **must be retaken**. A score of 30% or higher is considered successful.

Attention! A minimum of 50 points must be earned from the midterms to achieve a passing grade. If all

midterms are passed with only the minimum 30%, the total score will still fall short of the passing threshold!

Achievable max. points:	Abbreviation	Max points
	MT1	33 point (theory:13 point + practice: 20 point)
	MT2	33 point (theory:13 point + practice: 20 point)
	MT3	34 point (theory:14 point + practice: 20 point)
	Sum	100 points
	HW bonus	10 points
	Sum + bonus:	110 point

The grade of the semester based on the gained points:	Grade	Points (P)
	excellent (5)	$85 \leq P$
	good (4)	$75 \leq P < 85$
	satisfactory (3)	$65 \leq P < 75$
	passed (2)	$50 \leq P < 65$
	failed (1)	$P < 50$

3.6 Javítás és pótlás

1. Each midterm exam (ZH) can be retaken **once**, according to the schedule.
2. A failed midterm (<30%) can be improved during the retake opportunity.
3. A passed midterm ($\geq 30\%$) can be improved during the retake opportunity.
4. The better result between the original and the retake will be considered.
5. Homework assignments are -, —, and are intended to support preparation for the midterms.
6. With optional homework, a maximum of — can be earned, which will be added **to midterm scores that are—**.

3.7 A tantárgy elvégzéséhez szükséges tanulmányi munka

Activity	Hours/semester
contact hours	$14 \times 3 = 42$
preparation for the courses	$7 \times 2 = 14$
preparation for the midterm tests	$2 \times 14 = 28$
homework	18
home studying of the written material	18
Sum	120

3.8 A tárgykövetelmények érvényessége

2025. szeptember 5.

Jelen TAD az alábbi félévre érvényes: