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# VISUALIZATION IN ENGINEERING GEOMETRY

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# Outline

Problems and new ways in DG training

Introduction of our two web sites

Movie on the content

Intentions and students' feedback

Future plans

# Advantages of virtual learning environments

The plan was to create a virtual learning environment for the subject Descriptive Geometry for architects or engineering students.

- Major part of students is not able to understand mathematical texts.
- To help in individual learning.
- For correspondent students - LLL.
- Digital world is more alluring.

# Techniacal data of our web sites

Two projects, supported by Social Renewal Operational Programme (TÁMOP).

Coursebook I. (http://www.asz.ymmf.hu/geometria/)
16 problem sheets (pdf) for the 14 weeks of the semester;
23 videos (avi) that can be used online or offline – cca. 340 min. (1 325 908k)

Coursebook II.(http://www.asz.ymmf.hu/geometria2/)
14 problem sheets (pdf) for the 14 weeks of the semester;
19 videos (avi) that can be used online or offline – cca. 293 min. (1 085 649k)

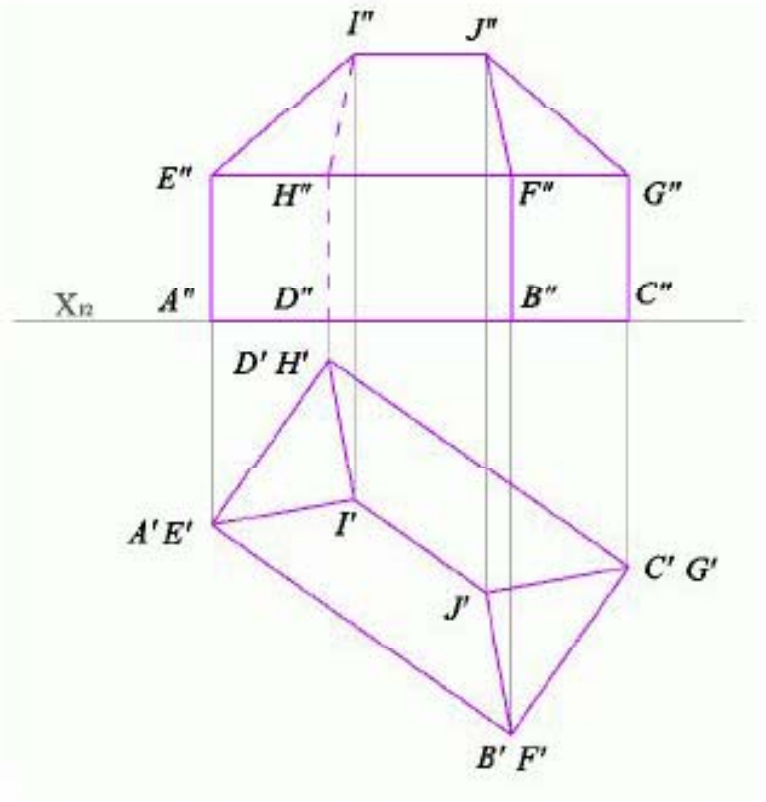
# The structure of a coursebook

| Témakör | Feladatleírás | Videó |
|---|---|---|
| 1. Térelemek megjelenítése Monge-féle ábrázolásban | 1.pdf | 1.avi |
| 2. Egyenesek kölcsönös helyzetének vizsgálata | 2.pdf | 2.avi |
| 3. Egyenesek és síkok illeszkedésének vizsgálata | 3.pdf | 3.avi |
| 4. Síkok metszésének vizsgálata | 4.pdf | 4.avi |
| 5. Új képsík bevezetése | 5.pdf | 5.1.avi |
| | | 5.2.avi |
| | | 5.3.avi |
| | | 5.4.avi |
| | | 5.5.avi |
| | | 5.6.avi |
| 6. Adott térelemre illeszkedő másik térelem szerkesztése | 6.pdf | 6.avi |
| 7. Egyenes és sík döféspontja | 7.pdf | 7.avi |
| 8. Láthatóság eldöntése | 8.pdf | 8.a,b.avi |

# Sample problem

5. Új képsík bevezetése — távolságok, szögek

Az ábrán látható egy épület sematikus vázlata Monge-rendszerben.




Feladat: külön ábrákon szerkessze meg a következőket!

5.1. a *JG* szaruél hosszát!
5.2. az *EFJI* és a *GHIJ* tetősíkok hajlásszögét!
5.3. az *EFJI* és a *JFG* tetősíkok (mint félsíkok) hajlásszögét!
5.4. a *C* pont távolságát az *AIF* síktól!
5.5. az *FJ* szaruél és a függőleges *FB* él szögét!
5.6. az *AIF* háromszög valódi méretét!

# Movie (selection)

# Intentions

Explains Monge, axonometric, perspective projection and elavations by spatial experience.

No terminus technicus – everyday words are used in videos.

Practical problems.

Exploits the oppurtunities of CAD systems – not merely digital ruler and compasses.

# Students' feedback

They all new that such aiding material exists.

Approx. 10% do not use it, the others do, but not in every week.

They find the videos understandable, but modestly interesting.

In students' opinion the videos are practical and illustrative and they are useful in making homeworks and in preparation for exams.

# Students' feedback - advanteges

Can be seen everywhen and everywhere.
The videos help to understand the confused in class drawings.
Can be stopped and repeated.
Easier to understand than books or coursebooks.
Illustrative and detailed.
One can learn the basic processes easily.

# Students' feedback - disadvanteges

Not complete – some type of problems are missing.
Too monotone.
Sometimes too fast.
If something is not clear, then there is nobody to ask.
The problems are simpler than those at exams.

# Future plans

These digital contents could easily be used in other languages – only the sound should be changed!

Implementation for mobile devices.

Make it more complete with new chapters.

# References


http://www.asz.ymmf.hu/geometria/

http://www.asz.ymmf.hu/geometria2/

Bölcskei A., Katona J.: Efforts in Descriptive Geometry Education and Their Result, International Scientific Conference moNGeometrija (2012, Novi Sad), Proceedings, 381-389.


THANK YOU FOR YOUR KIND ATTENTION!