

PLANETOLOGY VIDEO LECTURES FOR REMOTE LEARNING DURING THE COVID-19 PANDEMIC.

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Introduction: Regular university classes moved online during the first wave of Covid-19 pandemic, in the middle of the spring semester of 2020 when a national lockdown was imposed. The following semester had been planned to be entirely online. Students were not allowed to enter the buildings of the university during this time but the staff was. This gave us the opportunity prepare a complete series of lectures for this semester. The series represent a cross section of classes for students in Astronomy at ELTE University. Although the pandemic cut regular interaction with students, the recorded lectures provide an unprecedented opportunity to reach larger audience via social media and also serves as a long-term documentation of the teaching activity.

Digital Platforms and Formats:

We used Instructure's Canvas Learning Management System (LMS) as the main teaching platform where syllabus, video lectures, readings and tests were available. We furthermore used MS Teams for weekly live video and asynchronous chat interaction, and we posted the video lectures on Alphabet's YouTube. The course consists of 16 video files with a total playing time of 17 hours. We had three different types of video lectures, depending on the lecturer's choice:

Video lectures

1) Video lectures pre-recorded in the empty classroom at the university each week. We intensively used the classroom blackboard, microscope, overhead projector, various printed materials, and rock samples. The class with all instructional materials was recorded live in one hour-long take with a single high-resolution web camera (Fig.1).



Fig. 1. Lecture on NASA lunar sample thin section set.

Video lectures with rotating planetary globe

2) Video lectures using a rotating globe as virtual background (Figs 2-3). We used SplimediaLab's XSplit Broadcaster to record the lecturer with a virtual background using its VCam plugin that removes the background without the need of greenbox technology. We used our topographic and albedo maps of Mars [1] and the Moon [2, 3] that we created earlier as skins in Alphabet's Google Earth Pro. These base maps were changed to Google's CTX Mosaic when we talked about smaller features. These lectures were recorded in the office or at home.



Fig. 2. Lecture with rotating Mars, and high resolution MRO images.



Fig. 3. Lecture with rotating Moon and LRO and images.

Slide shows with lectures

3a) Slide Show with audio comments, or rather, audio lecture illustrated with a static slide show (Fig. 4). The audio was edited first and slides prepared for the class were synchronized later with audio and the two

merged in Adobe Premiere. The audio was recorded at home.



Fig. 4. Comparing planetary precipitations on Earth and Mars slide show (köd is fog, dér is hoarfrost.)

3b) Similar slide show but produced in MS Power Point format with audio comments clickable on the each slide indicated with a loudspeaker icon (Fig. 5).

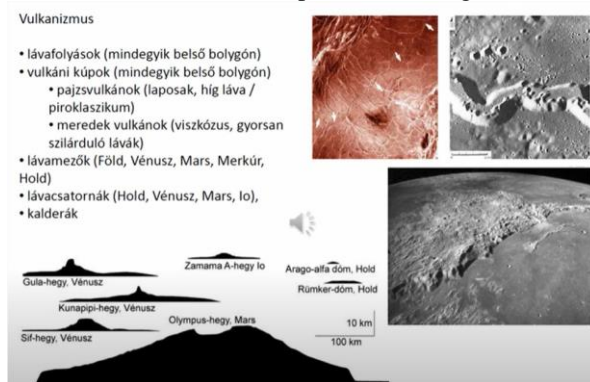


Fig. 5. Volcanic landforms slide.

Content of the Planetology Lecture Series: The Structure of the course

- Stratigraphy of planetary bodies
- Earth type planets
- Outer Solar System
- Impacts
- NASA Lunar Rock Samples
- Small Bodies
- Meteorites, small body evolution
- Building a model spacecraft
- Volatiles in the Solar System
- Geography of Mars
- Surface of the Moon
- Evolution of the Solar System
- Surface evolution of planets and moons

Student responses and future streamlining of teaching methods:

The local community University Radio EPER made a survey about the student's opinions on the remote classes. According to the responses, the most positive effect of the changes was that lectures and learning materials became available for download, that "made learning easy" [4]. However, student interaction was not enforced during the semester. We focused on producing the video lectures, and not on student interaction. In other online lectures we experienced that some students made detailed notes of the videos that were later shared in the group and many of the responses in the final tests were similar. Therefore, the next phase of building this online course will be the development of tools of regular interaction with and among the students. In these tasks students collect points for their weekly responses to assignments created in the LMS.

The video lectures "Planetológia 2020" are available at <https://bit.ly/2Xw1VRe> on Youtube.

Additional homework possibilities were found in the form of a series: Concise Atlas of the Solar System [5], [6]: at <http://www.federatio.org/tkte.html>

Acknowledgments:

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References:

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