Digital Teaching in MSCSP

Best Practice Examples

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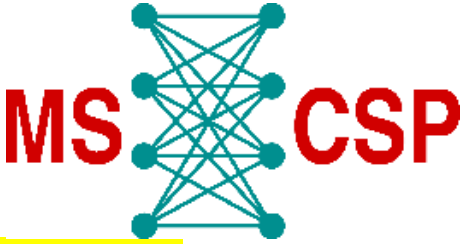

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Outline

- Digital teaching in MSCSP
- Communication Networks – Best practices
- Media Technology – Best practices
- Lab tour
- Summary and conclusions

Digital teaching in MSCSP

- Lectures
  - ⇒ Hybrid (mostly)
  - ⇒ Inverted classroom
  - ⇒ Asynchronous (video lectures)
- Exams and Quizzes
  - ⇒ Video surveillance of written exams
  - ⇒ Digital exams and quizzes through Webex
  - ⇒ H5P apps (Webex or exported as standalone) for teaching
- Project presentations with VR
  - ⇒ As part of the communication Networks course
- Lab tour using 3D-Vista

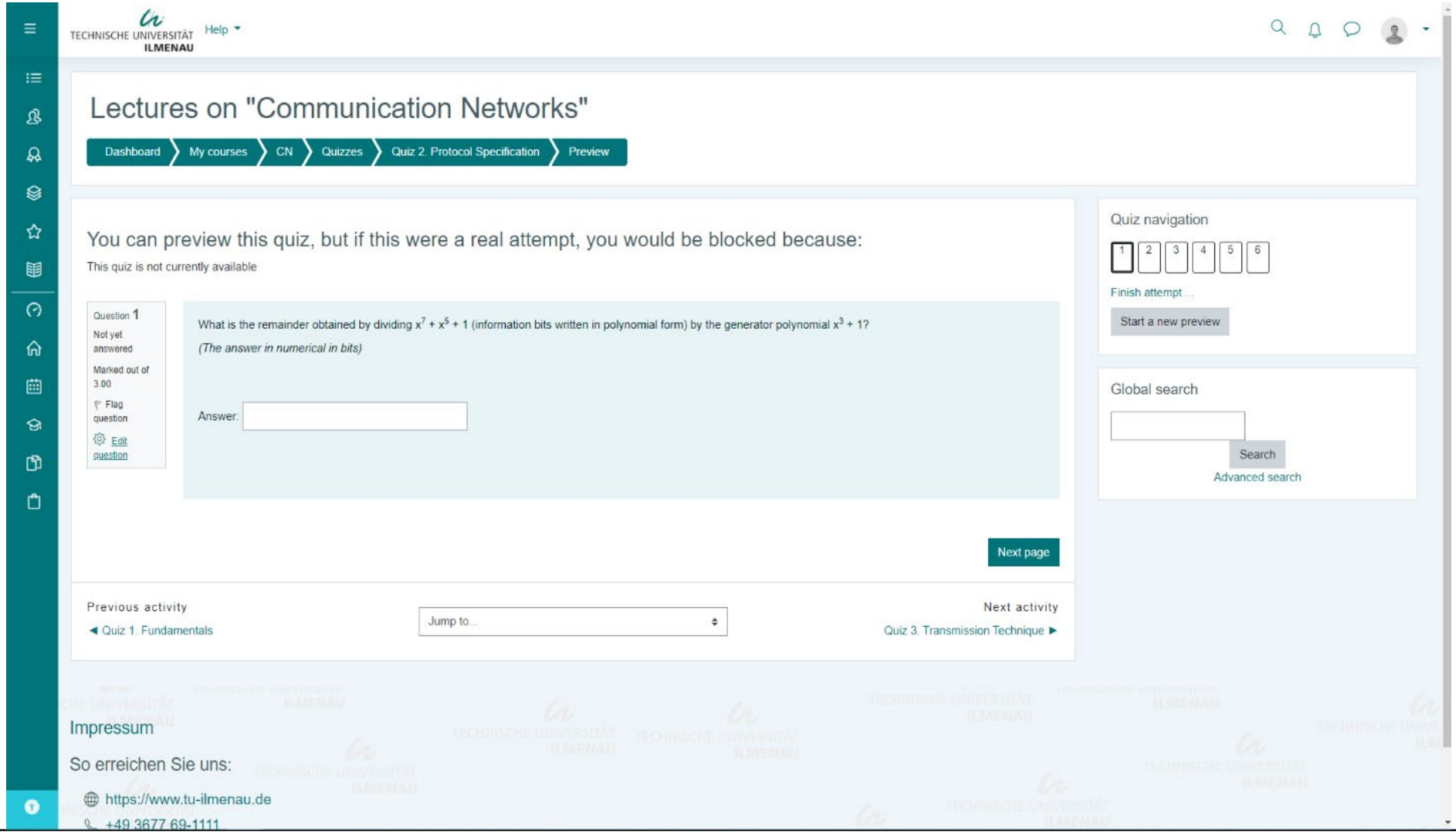
Communication Networks

- Hybrid lectures
- Excellent use of Moodle and H5P for quizzes, home works, and take-home bonus exams

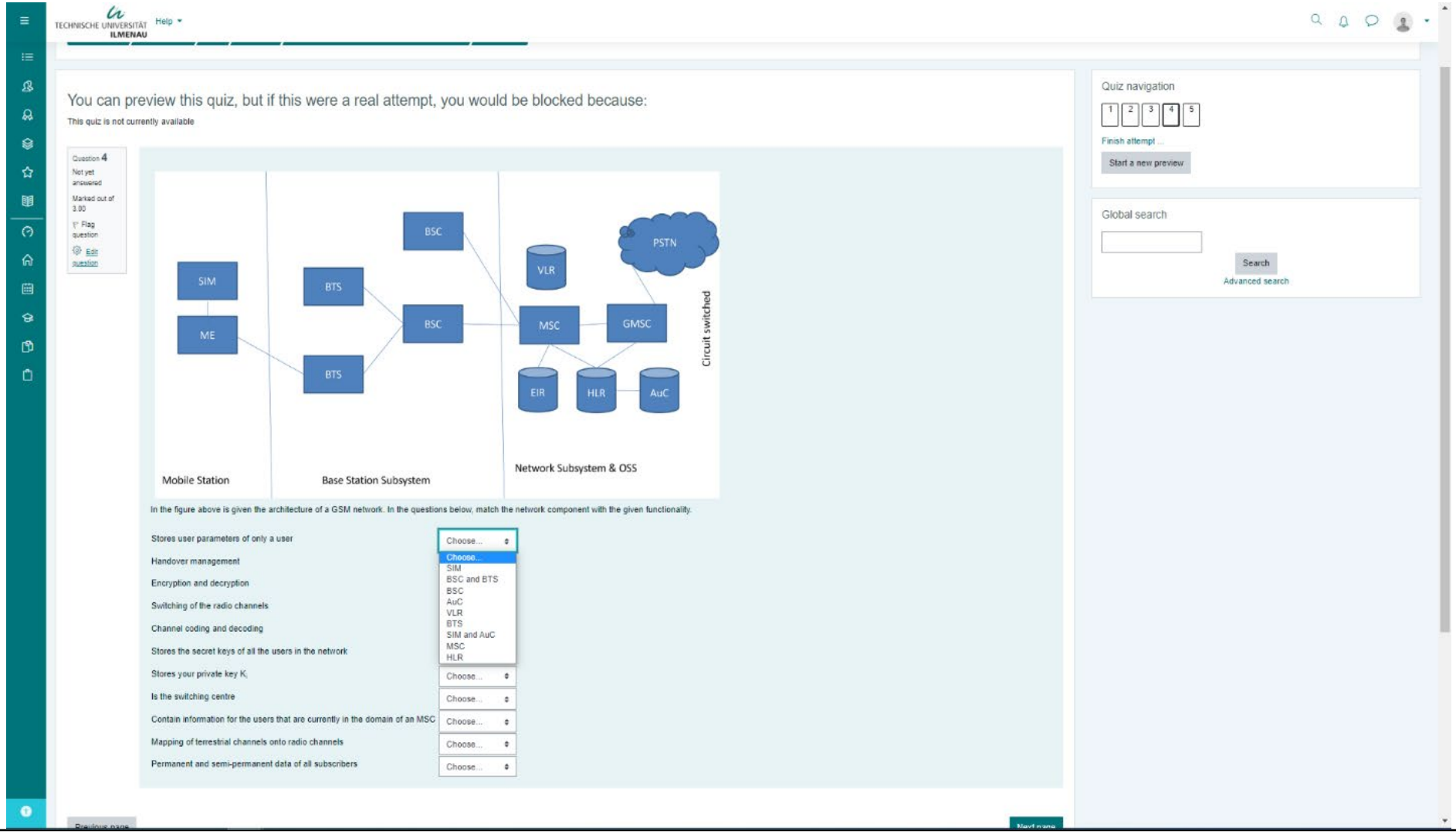
Quizzes using Moodle

- There is a degree of freedom in choosing different types of questions, such as, multiple choices, adding images, fill in the text, numerical answer, and many more.
- The quiz is made available for only a limited time (e.g., one week) and the students must submit their answers within some time (e.g., one hour) after they start the trial.
- The results for all the quizzes are available in Moodle. They can be weighed and manipulated otherwise to calculate the final grade.

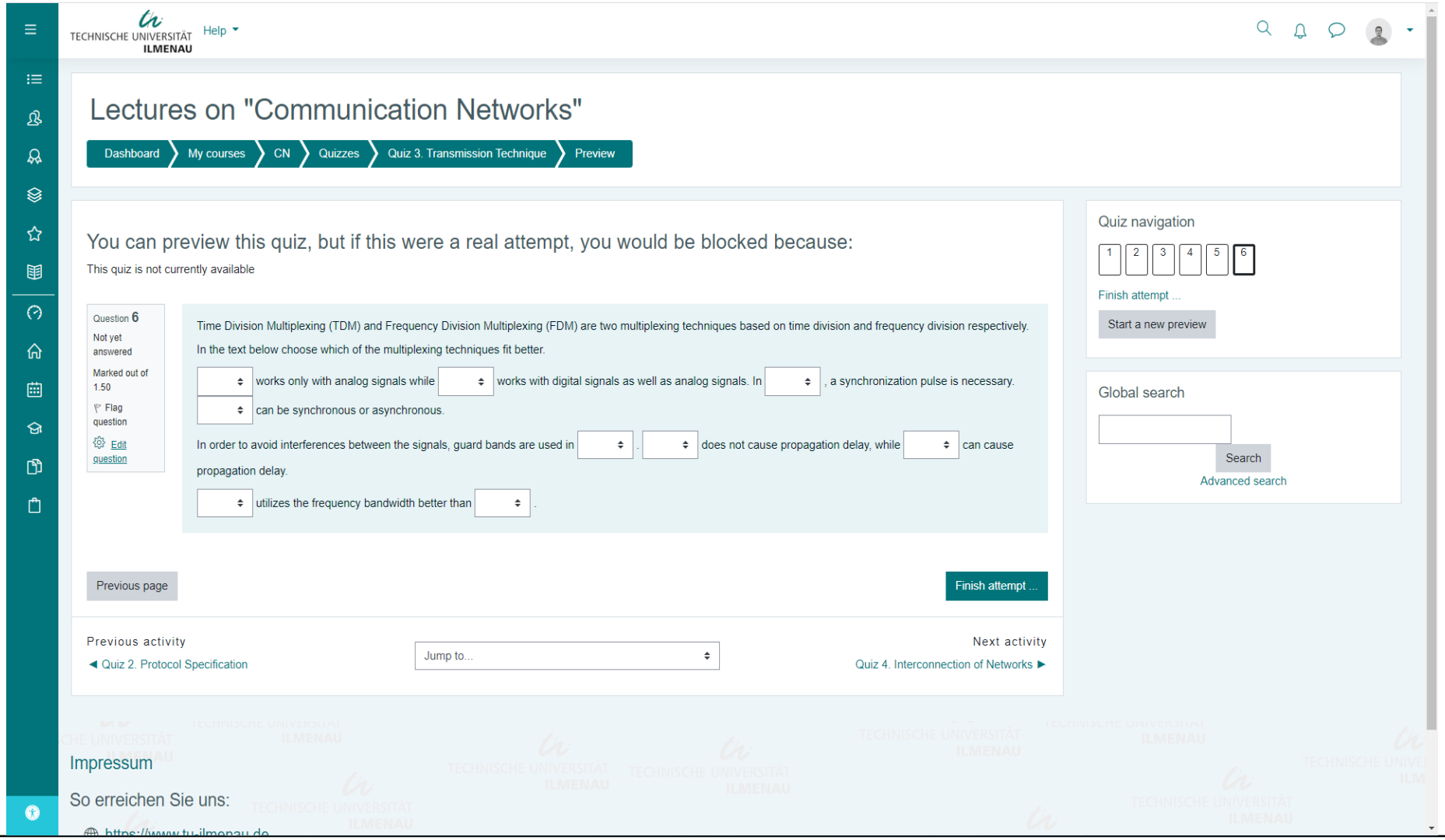
Example Quiz



Example Quiz



Example Quiz

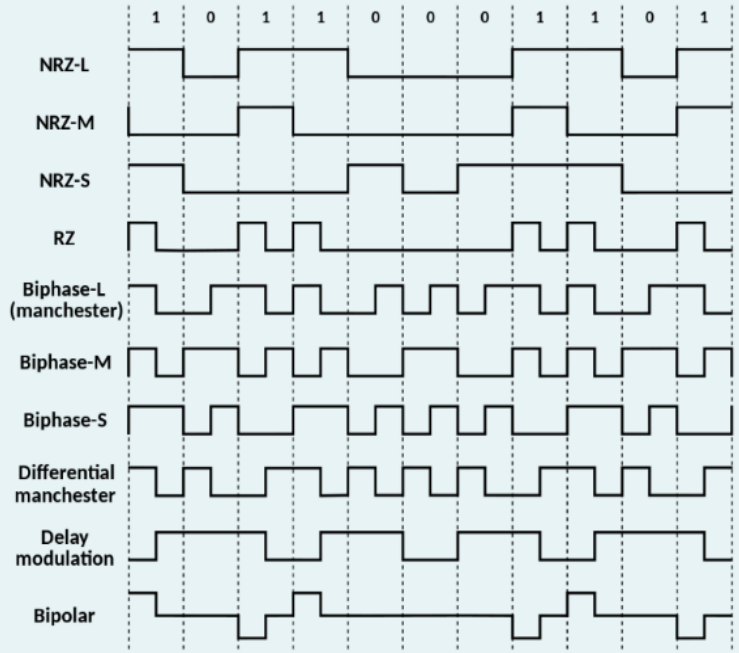


Example Quiz

TECHNISCHE UNIVERSITÄT ILMENAU Help

Question 4
Not yet answered
Marked out of 2.00
Flag question
Edit question

In the figure below are shown the waveforms for several line codes. A positive feature of a line code is if it's DC-free or DC-balanced. In the options given below choose the codes that you think are DC-free.



- NRZ-L (Non Return to Zero - Level)
- NRZ-M (Non Return to Zero - Mark)
- NRZ-S (Non Return to Zero - Space)
- RZ (Return to Zero)
- Biphase-L (Manchester)
- Biphase-M
- Biphase-S
- Differential Manchester
- Delay Modulation (Miller Code)
- Bipolar (AMI-Alternate Mark Inversion)

Start a new preview

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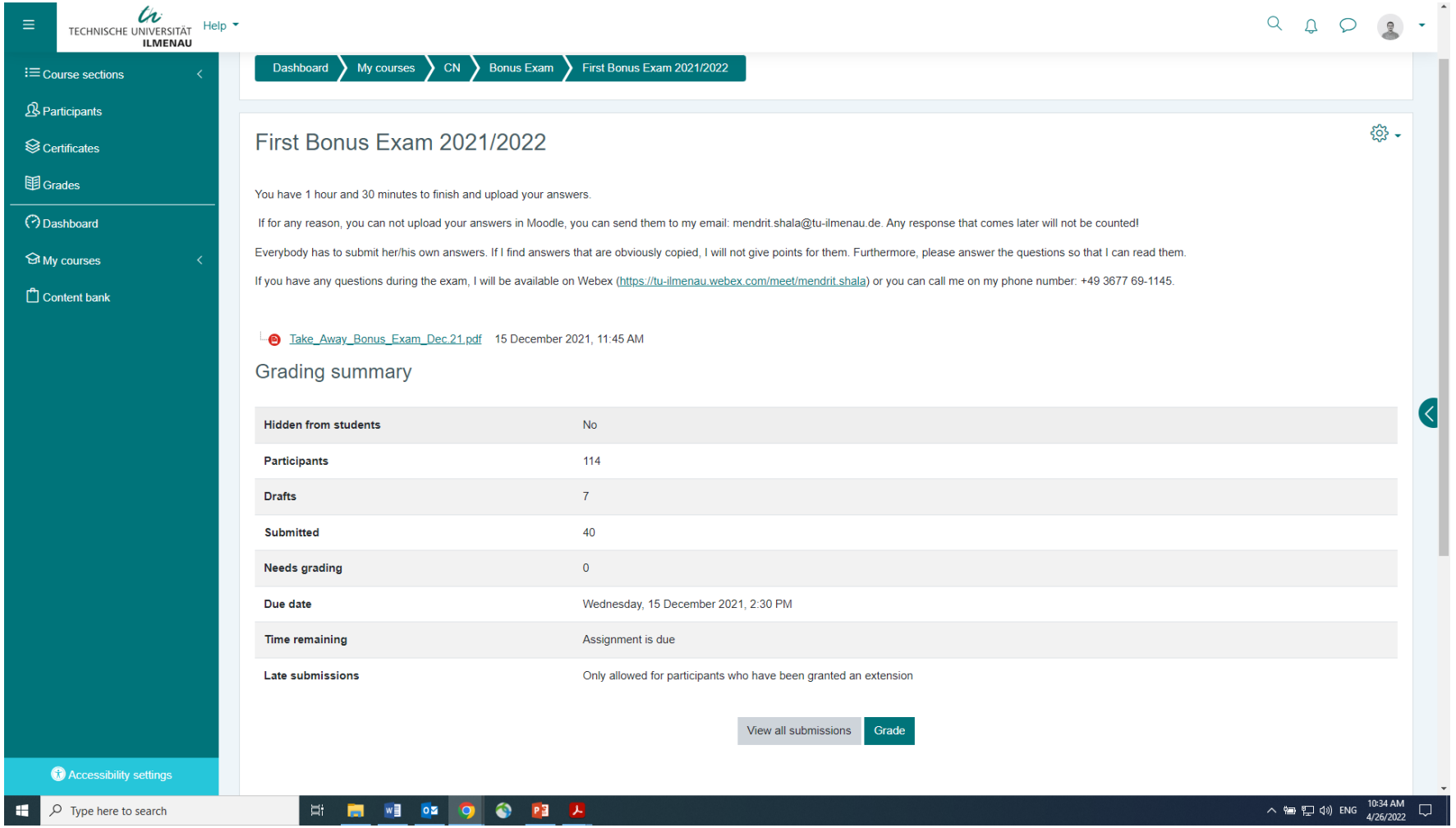
Take-Home bonus exams

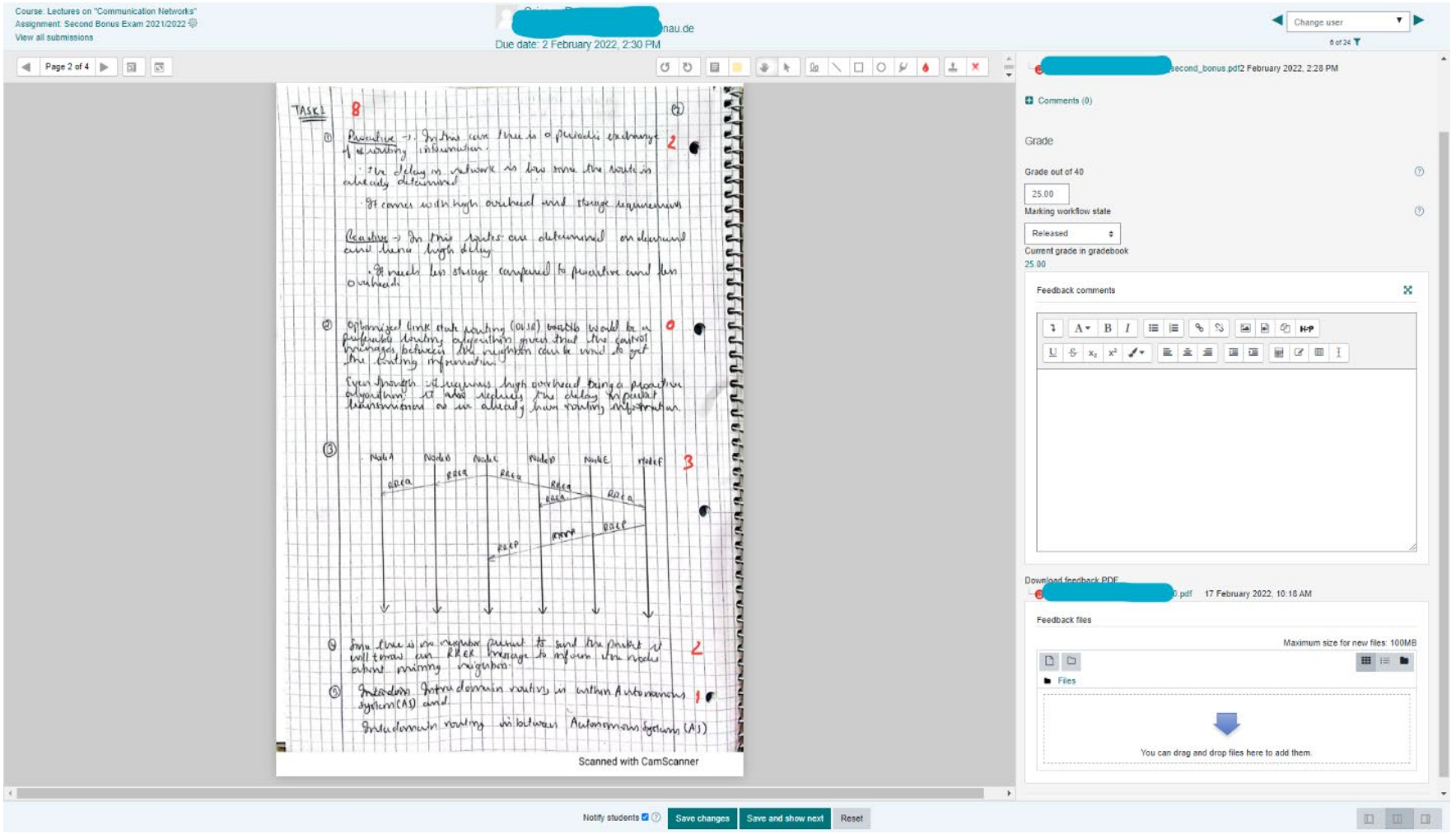
- The exam is made available to students in pdf format.
- They can download it and then upload their answers in a variety of formats.
- The exams are graded directly on Moodle platform and students can be notified right away about their results.
- Comments and other files can be added to the review. Also, students can directly see their graded exam sheet to see their performance in each question.

Take-Home bonus exams



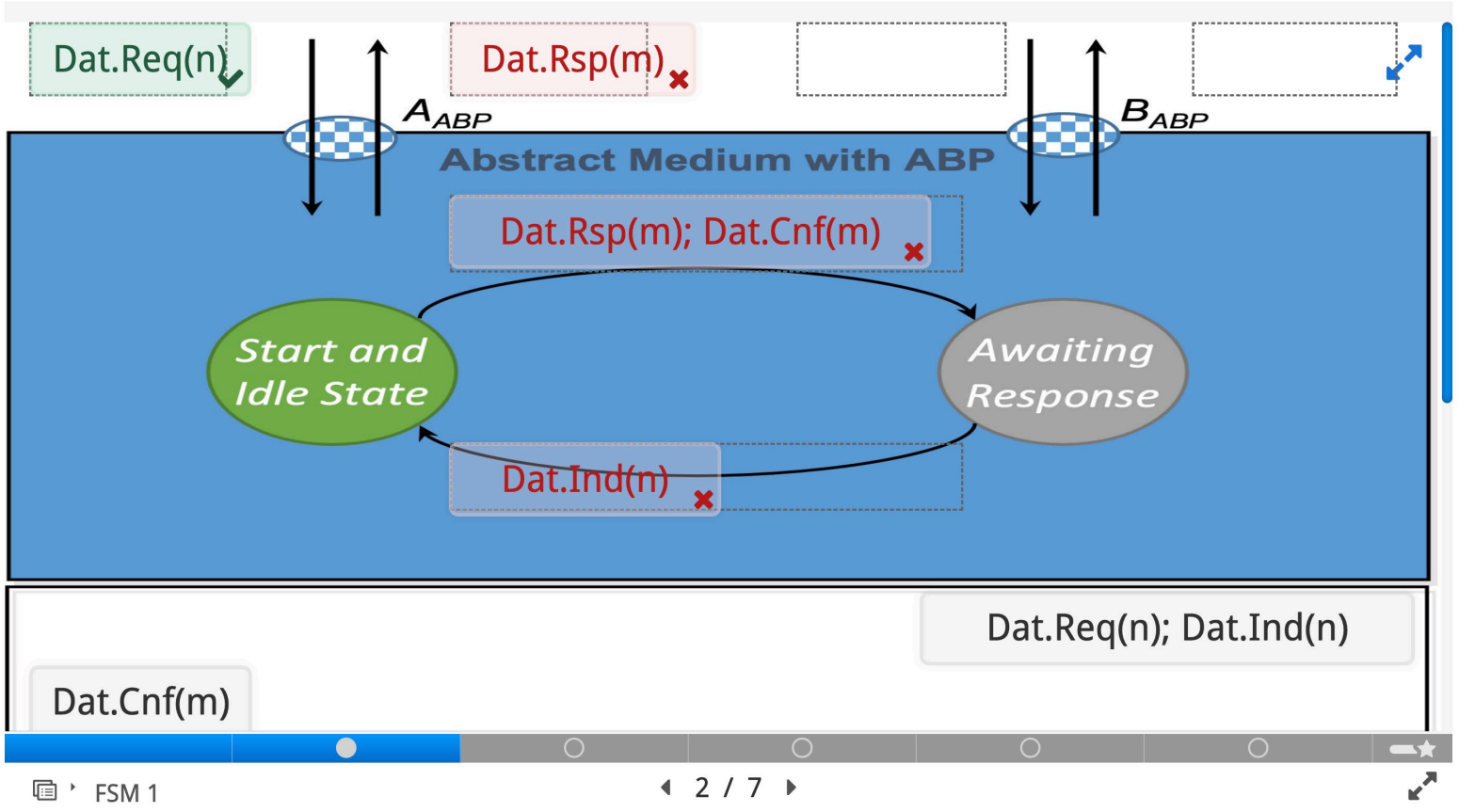
Take-Home bonus exams

Take-Home bonus exams



H5P app for homework

- Stand-alone app (can be opened in a browser) or in Moodle
- Students can interact and “play” with the state machines



H5P app for homework

- The mistakes are pointed out

Feedback

Dat.Cnf(m) + ~~**Dat.Rsp(m)**~~	Incorrect. The Correct Answer is Dat.Cnf(m)
Dat.Req(n); Dat.Ind(n) + ~~**Dat.Rsp(m); Dat.Cnf(m)**~~	Incorrect. The Correct Answer is Dat.Req(n); Dat.Ind(n)
Dat.Rsp(m); Dat.Cnf(m) + ~~**Dat.Ind(n)**~~	Incorrect. The Correct Answer is Dat.Rsp(m); Dat.Cnf(m)

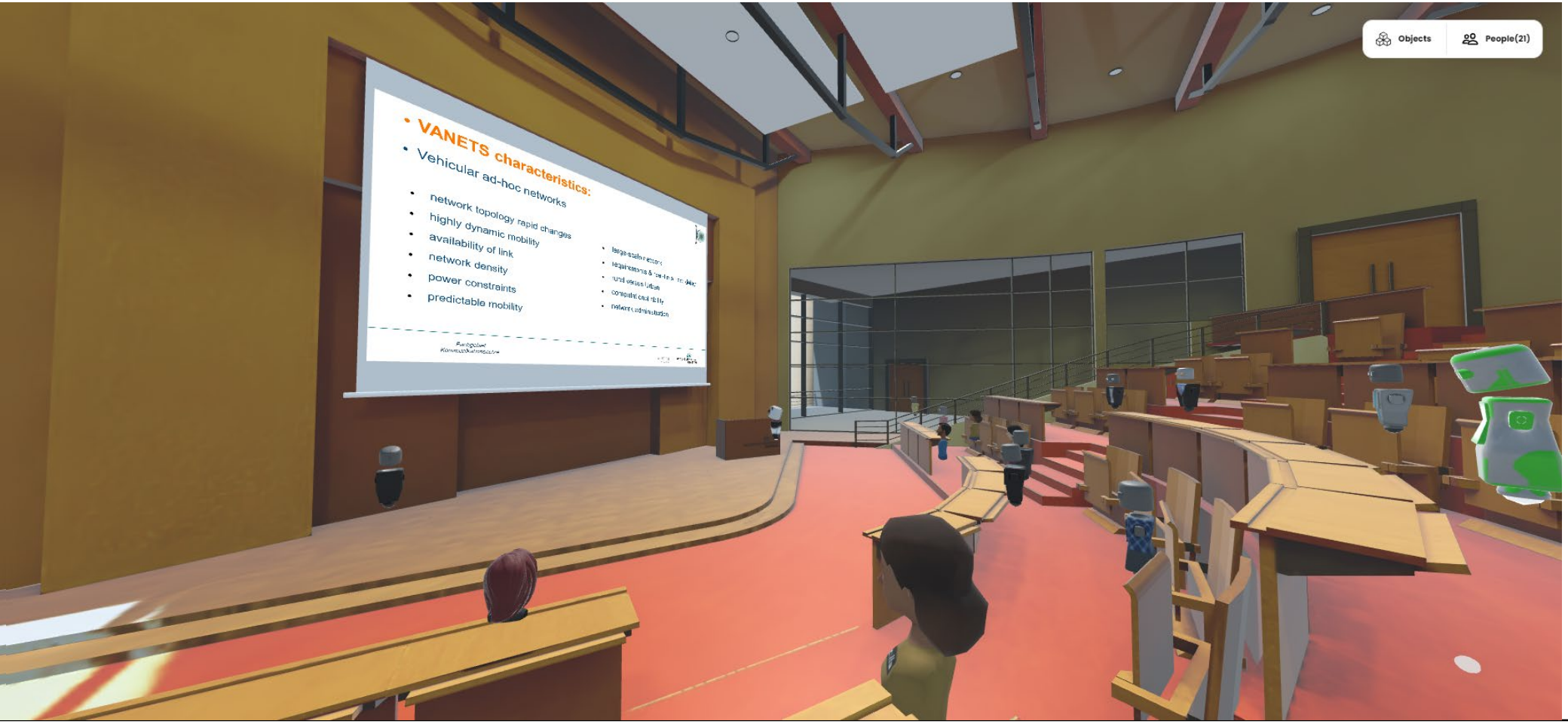
1/6 Retry

FSM 1 2 / 7

Group presentation using VR

- Students had fun and were also able to “socialize” with their peers

Group presentation using VR



Digital Teaching in Media Technology

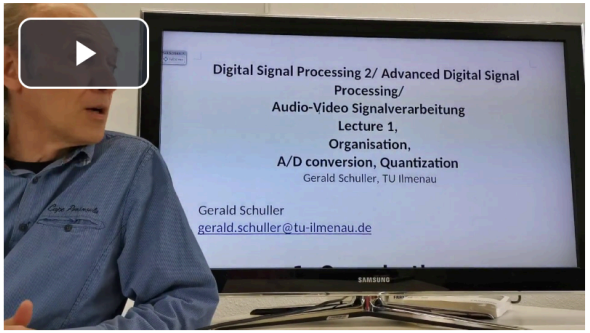
- Lectures
  - Lectures' videos, materials and corresponding Python files are available on Moodle
  - Questions & Answers sessions are held at the lectures' timing in a hybrid mode
- Seminars
  - Teacher uses "nbgrader" system to release assignment
  - Students fetch the assignment
  - Students solve and submit the assignment
  - Teacher releases a feedback, then students fetch it in an HTML format.
- Quizzes and Final Exam
  - Quizzes and final exam are held through Moodle.
  - Quizzes and the final exam use random numbers in each assignment, so every student solves their own version of them.

Digital Teaching in Media Technology
Lecture Videos & Materials

Lecture 1 slides, Introduction, Quantization

Introduction, Uniform Quantization,

Video to the lecture slides 1:



Also watch our Jupyter notebook tutorial in Jupyter Notebook, including the Python examples:

https://github.com/TUIlmenauAMS/ADSP_Tutorials

If you click on button "Launch with Google Colab", it opens in the browser and you can even let the Python examples run there, by clicking on the "run" button ("run all" or play button in the indivudual cells).

Part 1 is e.g.:

https://colab.research.google.com/github/GuitarsAI/ADSP_Tutorials/blob/master/ADSP_01_Quantization.ipynb

Updated 2022-10-23

Short Python Intro

Python examples. Lecture 1, Quantization, Real Time Plot

Here you find the Python example scripts sound.py, pyrecplay_quantization.py, and pyrecplotanimation.py

Python Jupyter Notebook Files for Lecture 1

Here are files for the Python Jupyter Notebook, where you can see the slides in your browser, and where you can execute and even modify the python examples of the lecture inside your browser!

Digital Teaching in Media Technology
Python Examples

AVS / ADSP / DSP II

Dashboard › My courses › AVS/ADSP/DSPII › Part 1. Quantization › Python examples. Lecture 1, Quantization, Real Time Plot

Python examples. Lecture 1, Quantization, Real Time Plot

Here you find the Python example scripts sound.py, pyrecplay_quantization.py, and pyrecplotanimation.py

- pyrecplay_quantizationblock.py
- pyrecplotanimation.py
- sound.py

Download folder

Previous activity
◀ Short Python Intro

Jump to...

Next activity
Python Jupyter Notebook Files for Lecture 1 ▶

Digital Teaching in Media Technology
Jupyter Notebook Example

AVS / ADSP / DSP II

Dashboard › My courses › AVS/ADSP/DSPII › Part 1. Quantization › Jupyter Notebook Files for Lecture 2

Jupyter Notebook Files for Lecture 2

updated 2018-10-09

ADSP-Img-Lecture2

ADSP-Lecture2.ipynb

Download folder

Previous activity

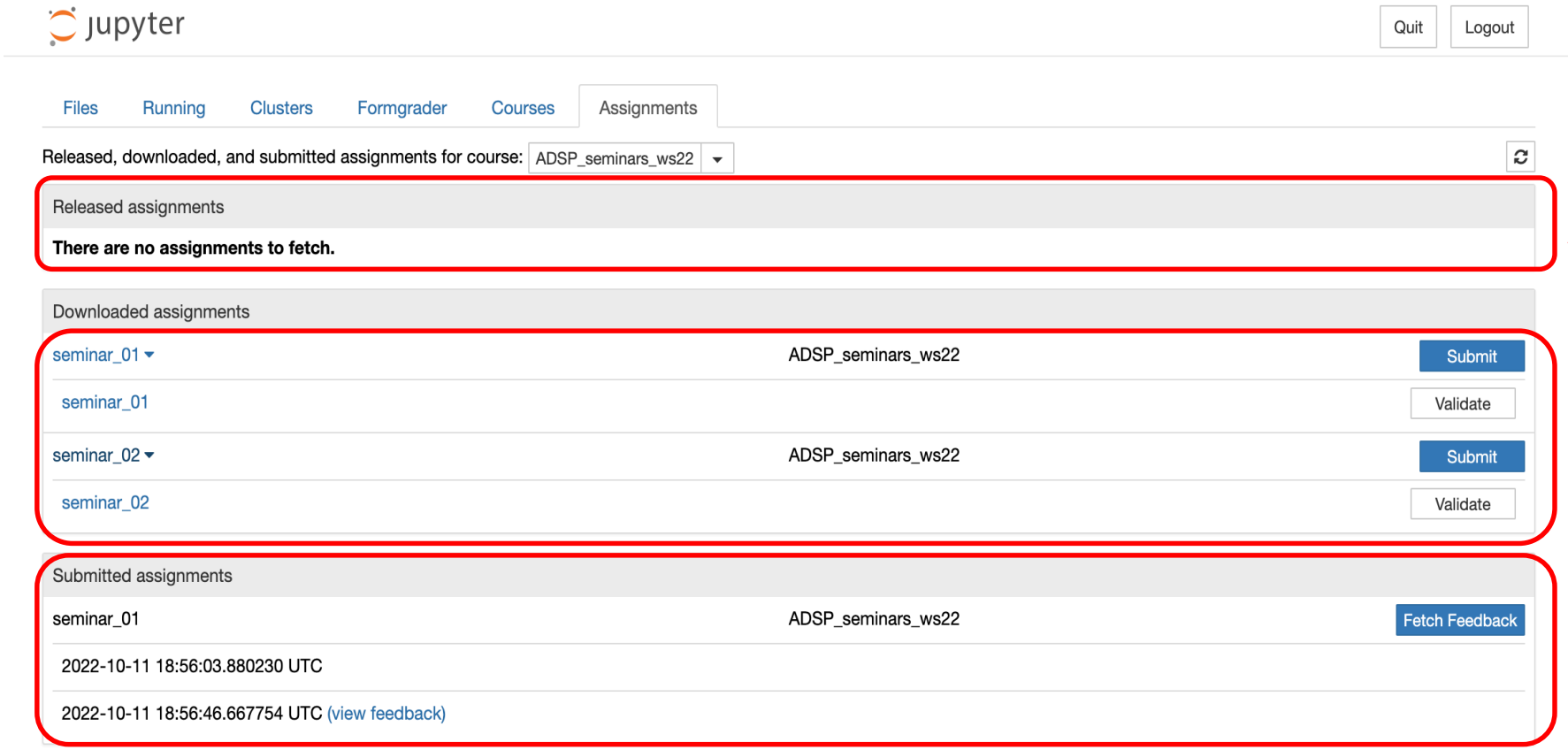
◀ Google Colab Jupyter Tutorial on Quantization 02

Jump to...

Next activity

Quiz 2. Non-uniform quantization ▶

Digital Teaching in Media Technology Seminars

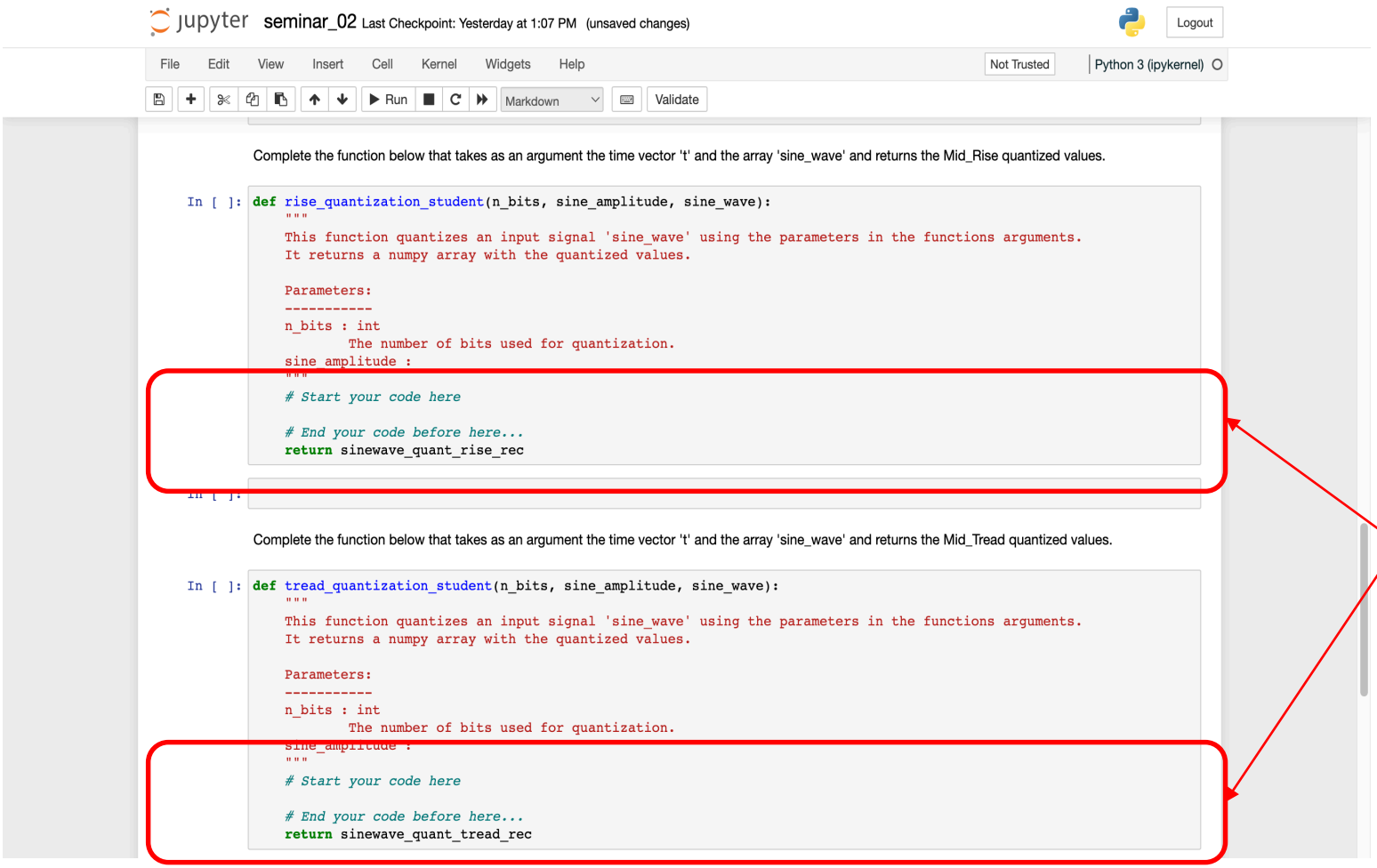


Fetching Assignments

Solving and submitting downloaded assignment

Fetching and viewing feedback

Digital Teaching in Media Technology Seminars



Students write down the appropriate code in different Jupyter Notebook cells

Digital Teaching in Media Technology
Quizzes and Final Exam

- There is a degree of freedom in choosing **different types of questions**, such as, multiple choices, fill in the text, numerical answer, and many more.
- The **quizzes** are made available for only a **limited time** (e.g. one week) and the student receives the **grade immediately**. The results for all the quizzes are available on Moodle
- The **final exam** is held online through **Moodle** on an exact date for a limited time period.
- Eventually, the grading takes into consideration the different difficulties across different years and creates a competition: **the top 10%** (mean + 1.5* stddev, over a time span which ensures good statistics) **get a 1.0**, the **bottom 10%** (mean -1.5*stddev) **get a 4.0 or a fail**.

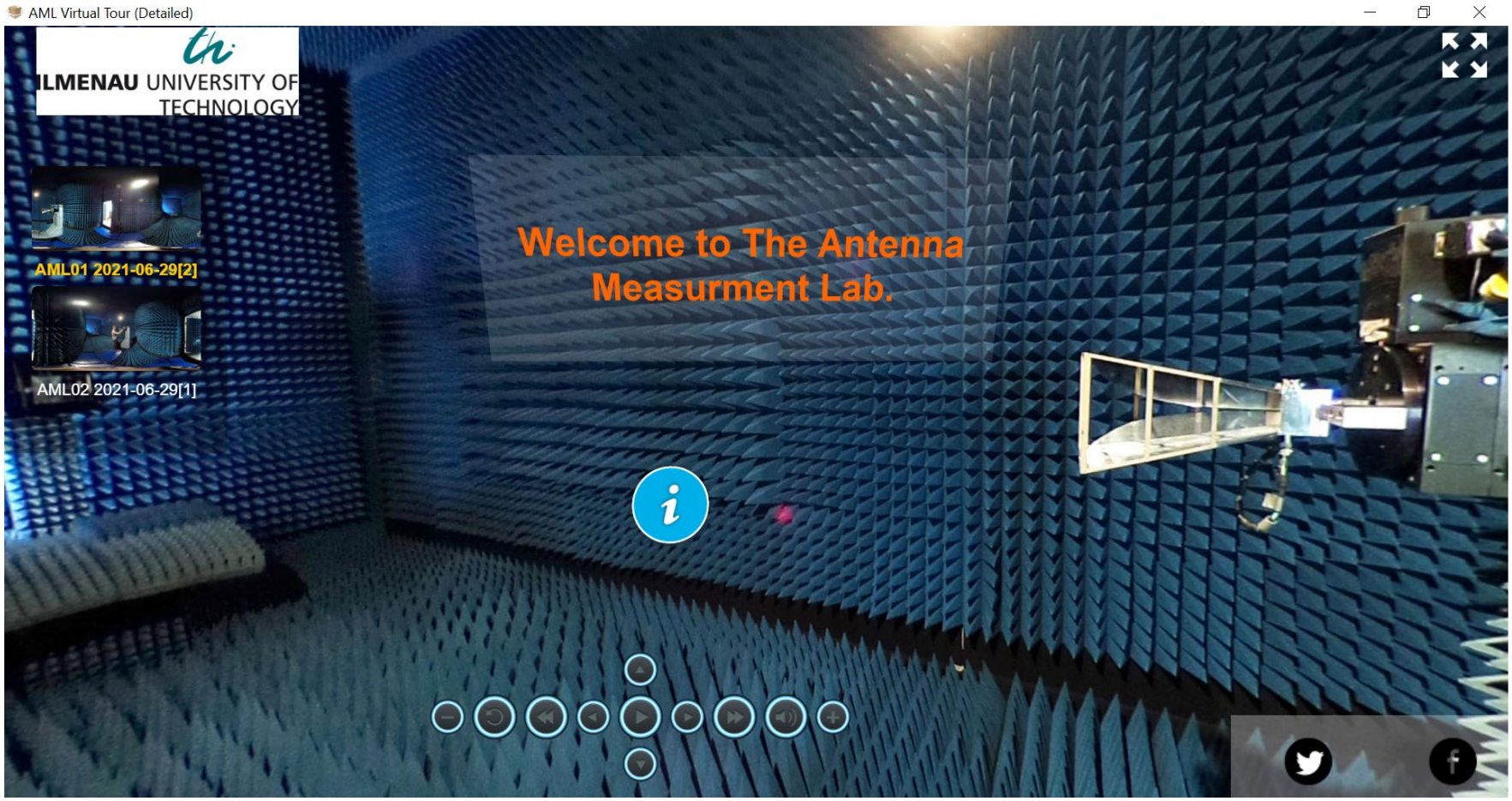
Lab tour

- Multimedia tools to help students with lab work

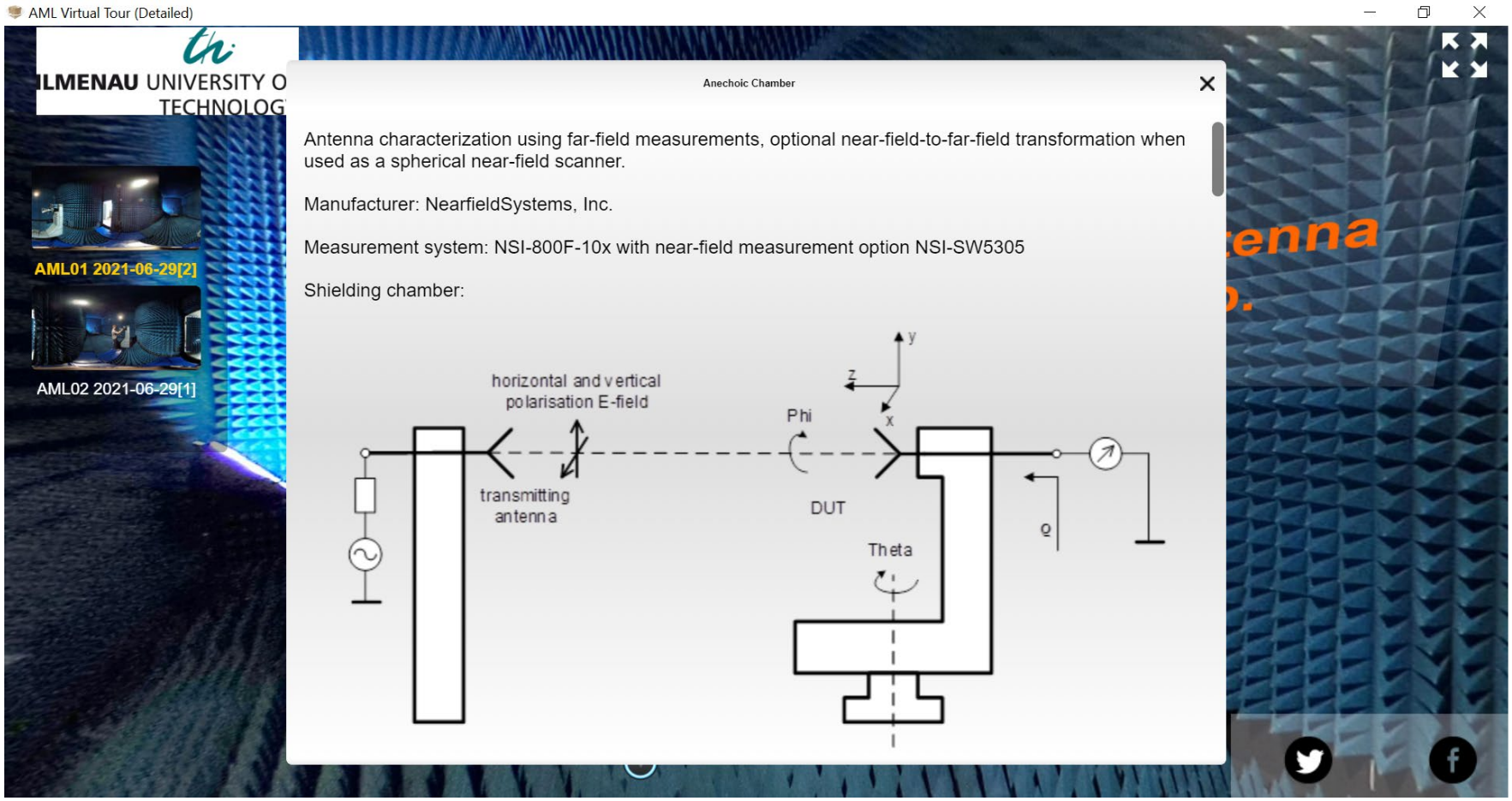
  ⇒ Pictures of equipment (antennas etc.) were taken and the slides were updated with them so the hybrid students would get a better look at what the lecturer was demonstrating

  ⇒ A prototype Lab tour for the HMT lab was prepared using the 3-D vista software

Lab tour


AML Virtual Tour (Detailed)
ILMENAU UNIVERSITY OF TECHNOLOGY
AML01 2021-06-29[2]
AML02 2021-06-29[1]
Welcome to The Antenna Measurment Lab.

Lab tour


AML Virtual Tour (Detailed)
ILMENAU UNIVERSITY O
TECHNOLOG
AML01 2021-06-29[2]
AML02 2021-06-29[1]
Anechoic Chamber
Antenna characterization using far-field measurements, optional near-field-to-far-field transformation when used as a spherical near-field scanner.
Manufacturer: NearfieldSystems, Inc.
Measurement system: NSI-800F-10x with near-field measurement option NSI-SW5305
Shielding chamber:
horizontal and vertical polarisation E-field
transmitting antenna
Phi
DUT
Theta
y
z
x
φ

Summary and conclusions

- A variety of excellent methods were employed, mainly by two departments for their courses
- The result was a higher standard of pedagogy and a greatly enhanced feeling of inclusion for the online students
- While the online students were satisfied and appreciative of the didactic methods, the lecturers would often hope for a higher level of participation from the online students, and the grades of the online students were slightly below average as well

Thank you for your attention