

Online Lecture Manual

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- This manual explains the delivery of online lectures using Zoom on a PC (except for 5.2①(iii)).
- The recommended basic operations are described in sections 1 to 5.1, 6 and 7.
- Instructors can make hand drawings on the screen and share them in real time with the students (both classroom and online participants) using any of these three setups: (1) iPad & Apple Pencil; (2) document camera; or (3) “LCD tablet and a stylus pen. We explain the use of these devices in section 5.2.

1. What you need

- Your own PC with a camera.
- Zoom installed on your PC.

2. Scheduling your lecture on Zoom and notifying your students

- Click on the Zoom icon on your desktop and sign into your Zoom account. The box shown in Figure 1 will appear.

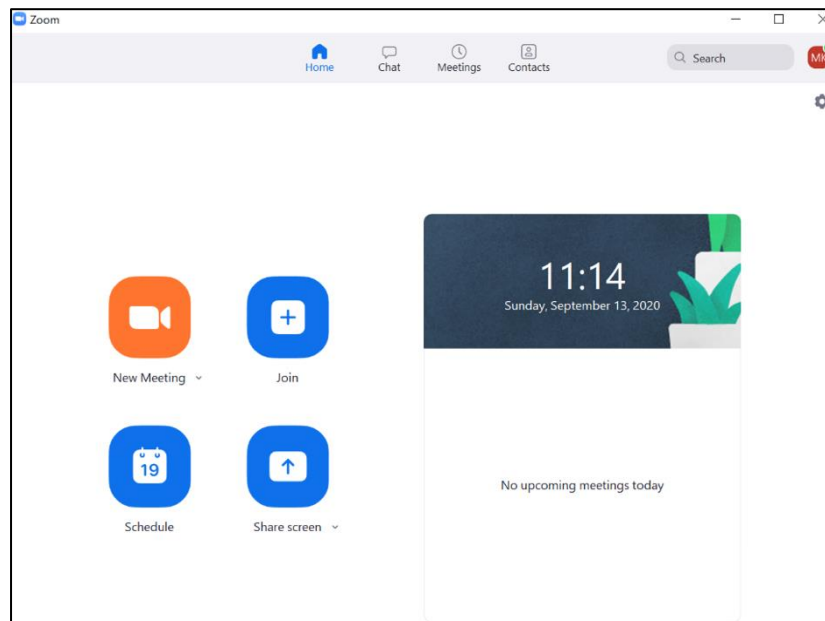


Figure 1

- Click on “Schedule” as shown in Figure 1 to open the scheduler window (Figure 2).
- Select your meeting settings. **Choose “Recurring meeting” if you are scheduling a lecture with multiple meetings.**

Figure 2

- If you wish to control which students can attend the lecture, set a password and send it only to students who have registered for your lecture.
- Once you are done with scheduling, click on the “Schedule” button at the bottom. This will display a box with date, time, URL, ID, and passcode for the meeting. Copy all that information and paste it into an email to notify your students.
- For further details on scheduling a meeting, please visit <https://support.zoom.us/hc/en-us/articles/201362413-Scheduling-meetings>

3. Launching Zoom and signing into your own Zoom account on your PC

- Click on the Zoom icon on your desktop and sign into your Zoom account.
- Click on “Meetings” as shown at the top of Figure 1. Your scheduled meetings will be shown in the “Upcoming” tab. Click on the meeting you wish to start, and click on “Start” in the right-side panel to start the meeting (lecture).

4. Recording your lecture in Zoom

- At the beginning of the lecture, press “Recording” at the bottom of the Zoom screen. Choose “Save to Cloud” (this way, when you end the lecture, Zoom will automatically start to create a recorded file in the Zoom cloud. See Figure 3.) It takes quite a while for that process to be completed. Zoom will send an email to the host’s email address when it is completed.

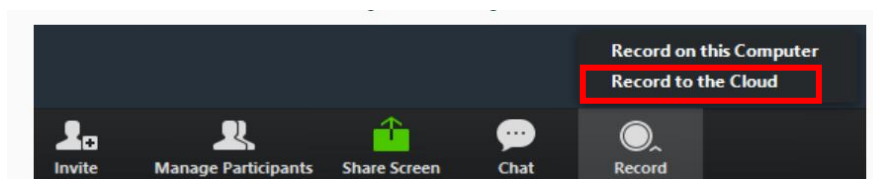



Figure 3

- You can also set Zoom (when you launch it) to start cloud recording automatically. To enable automatic recording, sign into the Zoom web portal, click “Account settings”, click on the “Recording” tab and select “Automatic Recording.”
Tip: You can also access the Zoom web portal by clicking on  icon shown in the upper right hand corner of Figure 1 and clicking on “View More Settings” at the bottom.
- For further details, please see the following URL:
<https://support.zoom.us/hc/en-us/articles/203741855-Cloud-recording>

5. Sharing lecture materials (electronic files) and handwriting in Zoom

5.1 Sharing only electronic files of lecture materials (e.g., PowerPoints, PDFs)

- Click on “Share Screen” at the bottom of the Zoom screen and select the materials that you wish to share (Figure 4).

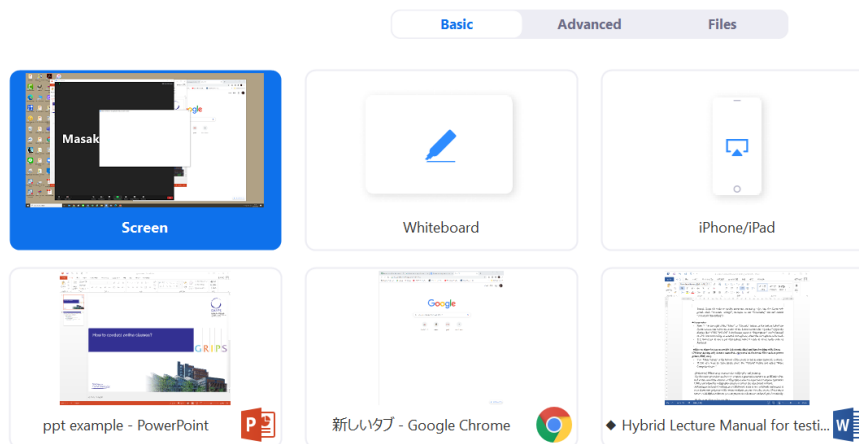


Figure 4

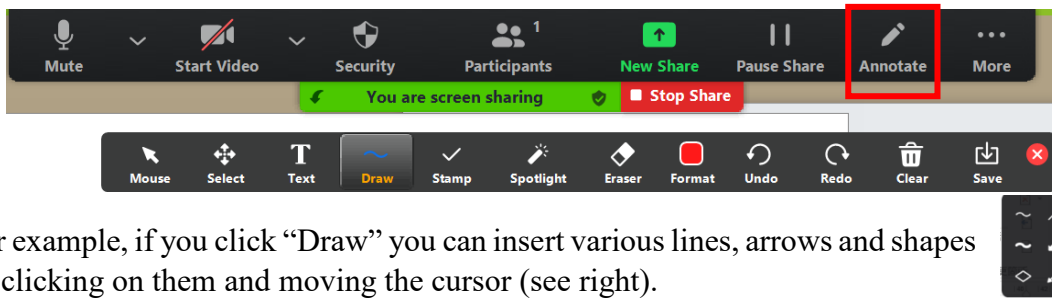
- If you wish to share only one file (e.g. PowerPoint or PDF), then choose that particular file. However, if you have several files to share (e.g. a PDF file, then a ppt file, then a text file), it is easier to choose to share your entire desktop screen, indicated as “Screen” in Figure 4 above. If you share your entire desktop, you can easily click and choose the particular file you want to share. On the other hand, if you share one file at a time, every time you want to share a different file, you have to click “New Share” and go back to the interface shown in Figure 4 and choose the material you wish to share next.
- Since sharing “Screen” will share the entire desktop, it's best (before the lecture) to delete any photos or icons on your desktop that you don't wish the students to see.
- If you also want to share audio, press the “Advanced” button shown in Figure 4 and select “Share.”
- Zoom automatically adjusts the video quality according to the bandwidth of the remote participant, so asking the students to turn off their microphones and video may increase the quality of the audio/video received by the students.

<Reference>

Annotating on a shared screen

- Using Zoom's Annotate function, you can draw lines and shapes, and enter text directly on the screen you are sharing.

- After sharing your screen, click “Annotate” on the Zoom screen. You will then see the annotation tool bar shown below.



- For example, if you click “Draw” you can insert various lines, arrows and shapes by clicking on them and moving the cursor (see right).
- If you click on “Text”, you can insert text using your keyboard. However, it is difficult to create complex figures or equations with this tool. For those purposes, please refer to “When sharing lecture materials AND handwriting” in section 5.2 below.
- Before you move to the next page/slide, you need to click on “Clear” and erase your annotations.

<Reference> Using PowerPoint files

- Running your presentation in a resizable window makes it easier to switch from PowerPoint to other applications. In order to do that, click on “Slide Show” and choose “Set Up Slide Show” and select “Browsed by an individual (window)” and select OK to close.

5.2 When sharing lecture materials AND handwriting

- The basics of sharing lecture materials are presented in 5.1 above. However, if you wish to work through technical problems or demonstrate derivations, it is helpful to make hand drawings on the screen in real time and share them with the students.
Below, we explain three ways of doing hand drawing (note: each needs additional equipment):
 - ① using an iPad (with support for Apple Pencil) and Apple Pencil;
 - ② using a document camera;
 - ③ using an LCD tablet and a stylus pen.
- There are three methods for ①. Since these require some getting used to, we encourage you to practice beforehand.


① Using an iPad and Apple Pencil

(i) Launching Zoom from your iPad

- You will need an iPad and Apple Pencil.
- Apple Pencil can write directly on the iPad’s screen, and the writing can be shared with remote students. However, when you launch Zoom from an iPad, you cannot see the students’ faces. (To see the students’ faces during the lecture, please use method (ii) or (iii) below).
- On your iPad, launch Zoom from your account. For directions for recording, follow section 4. **Recording your lecture in Zoom.** Click on “Share Screen” at the bottom of the Zoom screen and select the materials you wish to share.
- When preparing your materials for sharing, it may be helpful for you to leave a number of blank spaces where you can insert comments/equations during the lecture using Apple Pencil. You can also choose Zoom’s whiteboard, as shown in Figure 4, but with the whiteboard, you cannot share the lecture materials while you are sharing your handwriting. In order to be able to switch from the whiteboard to your lecture material, you need to click “New Share” and go back to the

interface shown in Figure 4 and choose the lecture material for showing.

- If your lecture material is a PDF file, then you can save the file in Apple's iBooks software, which is pre-installed in iPads; during the lecture you can open the file in iBooks, where you can add handwriting.

Tip: an easy way to transfer a PDF file from any PC to your iPad is to email the PDF file to the email account that you use in your iPad. On your iPad, open the attached PDF file, click on  in the upper right hand corner of the screen, and choose “Open in iBooks”). You can also use software such as PDF Expert or Notability (both available for a fee).

- If your lecture material is in a PowerPoint file, you can open the file with PowerPoint for iOS on iPad, and make handwritten annotations on the screen during the slide show. However, in order to use the eraser or change the color or thickness of your annotations, or edit, you need to sign in to your Microsoft account. To sign in to your Microsoft account, open PowerPoint and choose “Settings”, “Account”, and enter your mail address and password.

Note: you cannot make handwriting annotations in PowerPoint files saved in older versions of PowerPoint, i.e. 1997–2003.

- Handwritten annotations with Apple Pencil on iPad display very clearly for students participating remotely.

(ii) Launching Zoom from your PC and sharing your iPad’s screen

- You will need your PC, iPad, and Apple Pencil.
- If you launch Zoom from your PC and connect your iPad to it via “Screen mirroring,” you can share your iPad screen and its handwritten annotations with the students, as described in (i), and at the same time you can see the students’ faces on your PC screen. Moreover, launching from the PC will give you better control of the Zoom meeting.
- Launch Zoom from your own account on your PC. (For the procedure for recording, follow section 4. **Recording your lecture in Zoom.**)
- Open the lecture materials that you wish to share on your iPad. Make sure that your iPad is connected to the same Wi-Fi network as your PC.
- On your PC, click on “Share Screen” at the bottom of the Zoom screen, and choose “iPhone/iPad” as shown in Figure 5 below.

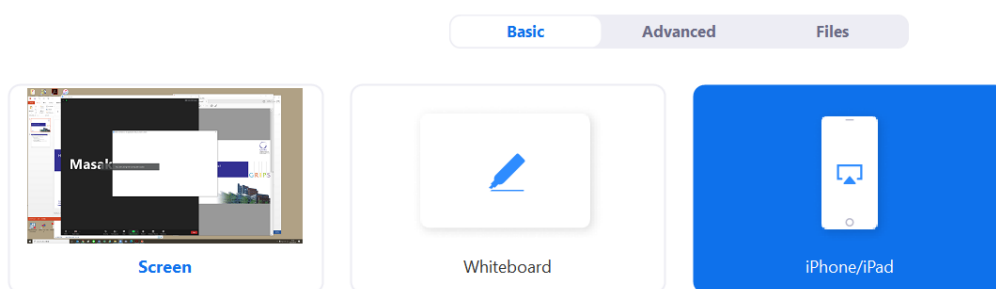


Figure 5

- If you are sharing your iPad for the first time, you will be prompted to download a plug-in. Install the plug-in in your PC and follow the on-screen instructions for connecting your iPad.
- On your iPad, swipe down from upper right hand corner of the screen to access the control center. Tap “Screen Mirroring” and choose “Zoom-your computer” to start sharing your iPad screen.

- All procedures thereafter will be the same as those in (i). Whatever you write on your iPad screen will be shared with the students. The iPad screen that you are sharing will appear on your PC monitor in a green border.
- In order to stop sharing, click on “Stop Share” in the Zoom interface on your PC.

(iii) Launching Zoom from your PC and sharing PC AND iPad screens

- You will need your PC, iPad and Apple Pencil.
- With the method (ii) above, only the iPad screen can be shared. However, if you mirror your iPad screen on your PC screen first, and then share your PC screen on Zoom, you can share with your students both the documents on your PC and your handwriting on your iPad screen (see Figure 6-2 below). That method is more powerful; for instance, you could share a PowerPoint document stored in your PC (which doesn't need complex handwritten annotation), and share your handwritten comments about the PowerPoint on your iPad screen.

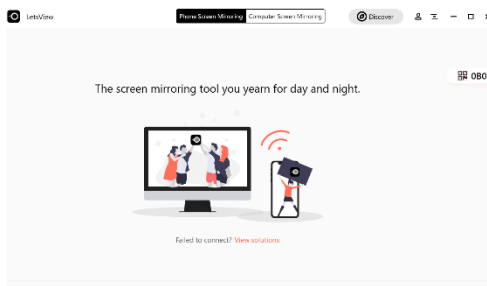


Figure 6-1

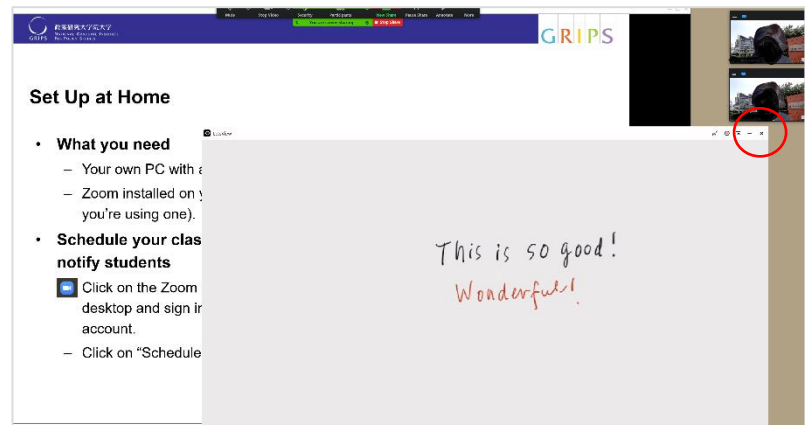


Figure 6-2

- To mirror your iPad screen on your PC, you need to install a screen mirroring application on your PC. There are several available; LetsView is a freeware which works fine (<https://letsview.com/windows>).
- Just before your class, open the lecture materials in your PC that you wish to share, and also open the materials in your iPad that you wish to share. If you wish to use your iPad as a whiteboard, you could, for example, create a blank PDF file and send it to your iPad as explained in (i) above.
- Then, start LetsView; a window like the one in Figure 6-1 will appear. Once LetsView is open, swipe down from the upper right hand corner of your iPad screen to access the control center; tap “Screen Mirroring” and choose your computer name to start sharing your iPad screen. As noted in (ii) above, make sure that your iPad is connected to the same Wi-Fi network as your PC.
- Once your iPad screen is mirrored on your PC screen, launch Zoom and start screen sharing as shown in Figure 4. For the procedure for recording, follow section 4. **Recording your lecture in Zoom.**
- In order to stop mirroring, click on “X” in the top right corner of your mirrored iPad screen (circled in red in Figure 6-2), and do the same for LetsView in Figure 6-1. When you see the “Do you want to exit?” prompt, click “yes.”

- If your PC name doesn't appear in the control center, try closing LetsView and re-starting.
- The above method lets you share your handwritten comments even more clearly than you could with the document camera (as outlined in ② below). However, it seems that the size of the mirrored iPad screen as it appears on the PC is fixed, so it is important to check that the mirrored screen is big enough for the students to see comfortably. You could enter full-screen mode to make it bigger, but if you need to switch between a document on your PC and your iPad screen, it would be more convenient not to use full screen.
- In mirroring with Mac, this problem doesn't arise. First, connect your iPad to a Mac computer using a Lightning (or USB-C) cable. Then, launch Quick Time Player, choose *File > New Movie Recording > Record*. Tap the "v" mark and choose your Mac computer name to start mirroring. The iPad screen mirrored on your Mac is resizable.

② Using a document camera

- You will need your PC, a document camera, and a cable for connecting your PC to the document camera, (Probably that cable came with your document camera.)
- A document camera can show the students any materials you have (e.g., including memo, lecture notes and books) and share them. In particular, you can write text on paper and the document camera will show it to the students participating online on their screen. You can also see the students' faces on your PC screen during the lecture.
- Connect a document camera (probably USB) to your PC, and adjust the document camera so that it captures the paper or other material on which you intend to write.
- On your PC desktop, prepare lecture materials such as PDF and PowerPoint files. In addition, you can start the "Camera" application that comes pre-installed in Windows (or comes with your document camera) to confirm that what the document camera is capturing (e.g. a piece of paper on the desk) is shown on the desktop.
- If you cannot select a document camera in the "Camera" application, pressing the camera selection button (front or rear camera) in the application might solve the problem.
- In your PC, launch Zoom from your own account. (For instructions for recording and audio, follow section 4. **Recording your lecture in Zoom**).
- Click on the "Share Screen" button in Zoom and share your PC desktop (as in Figure 4) so that you show the PowerPoint and the document camera at the same time. (Make sure you are not sharing only the document camera, or only the PowerPoint document.)
- If your lecture materials are in PowerPoint, running the presentation in a resizable window (not full screen) makes it easier to switch from PowerPoint to the document camera screen. In order to do that, click on "Slide Show," choose "Set Up Slide Show," select "Browsed by an individual (window)" and select "OK" to close.
- During the lecture, you can switch freely between the two screens (i.e. lecture material and document camera screen) on your desktop by clicking on the material that you want to bring to the front (see the example in Figure 7).

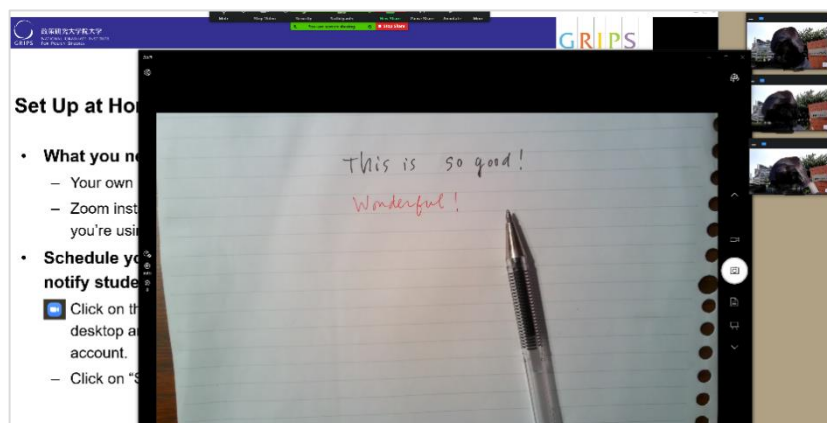


Figure 7

- You can also print your lecture materials, and write on them during the lecture, showing the process via the document camera. If that is all you wish to do, you can select “Advanced” in the panel that appears after clicking on “Share Screen”, and select “Content from 2nd Camera” as in Figure 8 below; then, only the document camera screen will be shared.

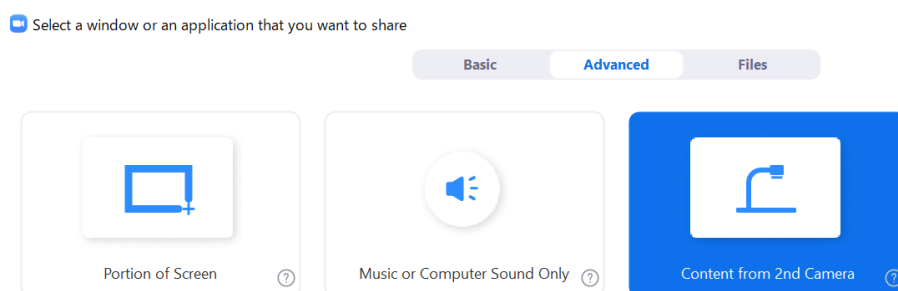


Figure 8

- If you use a camera with high resolution, such as Elmo MX-P2 (16x digital zoom at 4K resolution, with built-in microphone with HDMI, RGB and USB 3 connection, only 1.2 lbs in weight, and easy to carry), you can project handwritten material very clearly.
- Pens with darker colors are better (especially if you have a low resolution document camera).

③ Using an LCD tablet and a stylus pen

- You will need your PC, LCD tablet with its stylus pen, and a cable for connecting your PC to your tablet.
- You can write on the tablet’s screen directly with its stylus pen, and share your writing with remote students. The method is very similar to method ①(ii) for iPad, but since tablets tend to have larger screens (typically 16–22 inches) and have a feel closer to that of writing on paper, an LCD tablet is a good choice if you plan to share many figures and equations written by hand.
- Please keep in mind that even a 16-inch tablet is quite large and can be difficult to carry around. Also, you need to make sure that your PC has the necessary port for connecting to the tablet. For example, even if your tablet can be connected to your PC’s USB-C port, if your PC’s USB-

- C port doesn't support video-out connectivity, you won't be able to share handwritten material.
- Connect your PC to your tablet (usually, you need to install the tablet's driver in your PC beforehand). For instance, Wacom Cintiq tablets require both HDMI and USB-A for connecting to the PC.
- In your PC, launch Zoom from your account. For instructions for recording, follow sections 4. **Recording your lecture in Zoom.** Click on "Share Screen" at the bottom of the Zoom screen and select the materials you wish to share.
- In order to synchronize the tablet screen with the content shown on on your PC screen, right click on the desktop and choose "Display settings". Expand the drop-down menu next to "Multiple displays," select to duplicate these displays, or press "Windows key"+"P" and select "duplicate".
- Then you can control Zoom via the tablet screen.
- Handwritten annotations made on LCD tablets will display very clearly for students participating remotely (e.g. Wacom Cintiq).

6. Discussion

- When the number of students in the lecture is not too large, the instructor can start discussions with all the students' microphone unmuted. The instructor can also use the "Breakout Room" function in Zoom to divide students into multiple groups to allow small group discussions.
- In order to be able to use the "Breakout Room" function in Zoom, sign into the Zoom web portal, click "Account settings," navigate to the "Meeting" tab, scroll down and enable "Breakout room." If you also check "Allow host to assign participants to breakout rooms when scheduling," you can assign individuals to groups when you schedule the meeting (lecture). To do so, you need the email addresses of all the students.
- You can also automatically assign students to a set number of groups during the lecture. To do that, click on "Breakout Rooms" at the bottom of the Zoom screen, choose "Automatically" and the number of groups, and click "Create Rooms."
- During the breakout session, the host (instructor) can join or leave any group at any time, by clicking on "Join."
- Participants in breakout rooms can ask the host (instructor) for help by clicking on the "Ask for Help" icon, which will notify the instructor of the request.
- During the breakout session, regardless of where the instructor is participating, only the main room will be recorded.
- Please refer to the following URL for further details on breakout rooms.
<https://support.zoom.us/hc/en-us/articles/206476313-Managing-Breakout-Rooms>

7. Distribution of recordings (using Zoom cloud)

- Log in to your Zoom web portal and select "Recordings" from the left menu. A list of recordings will be displayed (if the conversion is not yet complete, it will say "recording processing...").
- Select the recording you wish to distribute and click on the "Share" button on the right.
- Turn on "Share this record." Check "Only authenticated users can see." In order to restrict the viewers to the students, make sure that the domain indicated is that of the university.
- Turn off "Viewers can download," to block the students from downloading the lecture videos.
- Copy the link to the recording and send it to the students via e-mail.