Online education in the Global South
Tips and tools

TU Delft

Disclaimer

This manual has been created from many resources openly available through different platforms, the sources of which are mentioned on the slides. The information, which belongs to the original author(s), has in some cases been (slightly) altered for the purpose of this document. The content of this manual focuses on the basics of transitioning to online education and the most useful tools which are freely available worldwide. It was made with the intention of motivating and inspiring educators who have to transition to online education. Most of the advice assumes that both the educator and the student have access to the Internet. This manual is by no means an exhaustive list of tips and tools. If the reader wishes to read more information about a certain topic, they can use the source links at the bottom of the slides, or the references at the end of the manual.

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Purpose of this document

As mentioned in the disclaimer, this document was made with the intention of motivating and inspiring educators who have to transition to online education quickly and effectively. This document was originally made in response to the Covid-19 pandemic which forced a lot of universities worldwide to shut their doors and start to educate online with little resources. The tips and tools given in this document may be deemed useful for other purposes as well, however. For example, online examination can save an educator a lot time, and the creative ways of teaching and didactic skills mentioned can also be used in the offline classroom. Furthermore, creative and innovative online class activities and online learning could replace traditional lectures in the future.

Besides the education components, there is also some information on professional development (professional online courses etc.). During and after the pandemic, educators and other professionals may find the time, interest or need to follow online courses to, for example, learn a new skill.

Most of the tips and tools provided can only be used when both the educator and the students have access to the Internet. It is recognized that this is not the case in all countries. However, even for those countries, the manual may still contain useful information on didactic skills and professional development.

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Manual contents

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Objectives and advantages of e-learning:

- You reach more people, thereby increasing your impact
- Students can learn at their own pace when following an online course
- It is cost-effective
- Teaching online reduces travel costs and time
- Curricula is updated more regularly
- Quality control (when lectures are shared)
- Through online education, lifelong learning supported (i.e. outside of school)
- The sharing of materials is supported
- Green!

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Caution: cyber security and privacy

In this document, references are made to different tools and software. You must always be cautious when downloading new software however, for it could pose risks to your privacy and/or your computer.

- Check the **privacy policy** of a new software. Pay special attention to:
  - What and whose personal data does the company/product collect
  - How is this data processed
- Be careful what **permissions** you give when browsing online or using new software
- Check the **security policy** of your employer before downloading a new software from the internet.

Terminology

- **E-learning:**   a learning system that we can obtain through the internet (i.e. online education)
- **MOOC**:   Massive Open Online Course
- **Webinar**:   a seminar conducted over the Internet
- **Didactics**:   a theory and practical application of teaching and learning
- **Open-source**:   Original source code is made freely available and may be redistributed and modified.

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Online classes and lecturing

Accept, reprioritize and keep it simple

Acceptance
- No one is expecting you to directly replicate your course!
- The key is ensuring that <u>students don't fall too far behind</u>
- In most cases, we will need to <u>let a few things go</u>, and that's okay

Reprioritize
- You can't convert everything online
- Condense your theory: focus on the key theory
- Prioritize the 1 or 2 <u>core theoretical concept/s</u> that students have to know for your course

Keep production simple
- Focus on the 'what', then on the 'how'
- Keep the 'how' simple

Source: https://drive.google.com/file/d/1VfUNvicfRpmmX9OlmPNx4JxsG8juohwq/view

Online teaching and learning etiquette

When you teach online, see it as if you are teaching in front of a normal class. You and your students should both:

- Dress appropriately
- Ensure your background is neutral and non-distracting
- Be careful with humor and sarcasm
- When using written communication, be aware of strong language, all caps, and exclamation points. Double-check your spelling.
- Do not post or share (even privately) inappropriate material.

This way you create a professional and productive learning atmosphere.

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Simple production: examples

Quickest approach:

- Select a reading/article or video and send it to your students
- Start a discussion or make a short quiz about this reading

If you have a little more time:

Lecture using existing slides
1. Use your existing PowerPoint slides
2. Download a video recording/ screen capture software (info on tools will follow)
3. Record yourself giving the lecture using your existing slides (either live, or send to students as an MP4 file)
4. Allow students to ask questions via an email thread, Google Docs etc.

Lecture without existing slides
1. Watch some online lectures on YouTube, EdX or other sites. See what works for you
2. Continue with making a script for your lecture - our quick tips are [here](#)
3. Decide whether you want to use PowerPoint slides, tips can be found [here](#)
4. Follow steps 2-4 from 'Lecture using existing slides'

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Digital didactics

- It is important that at first you do not focus on the technical aspects, but on how you can **get your message across** most effectively
  - i.e. students will not retain information from just a 90min online lecture
- You want to **keep the attention** of your students and **activate** them
- Once you have your didactical plan, you can choose a media that suits you best, instead of the other way around
- It is important to **reflect** on your digital didactics. How are your students experiencing your new way of teaching? It is effective?
  - This can be done by:
    - Asking your students at the end of the live lecture
    - Setting up a survey through free survey software such as Survey Monkey or Google Forms

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Digital didactics

Example: online debate

A good way to activate students to think more deeply about the content may be to organize a debate.

Preparation: You will need to choose a problem or statement that allows for an affirmative and a negative team. Subsequently, you need to make two (or more) teams of students, each of which needs time to prepare their debate arguments. You then need to organize (i.e. set time, invite students, choose media) the debate and do some preparations on moderating.

Technology:
1. You need to explain the topic/problem/statement. The problem can be elaborated on through a, which you make yourself, you take from YouTube or perhaps you can choose a controversial Ted Talk topic. video
2. Inform your students on their position regarding the statement.
3. Students can use conferencing tools such as Skype, Zoom or Google Meet to discuss with one another and use a platform to collect all their ideas such as Google Drive , Dropbox
4. Organize the debate through a conferencing software that allows big groups, i.e. Zoom or Google Meet

Fun alternative: Twitter debate
- Ask all your students to make Twitter accounts
- Choose a unique debate #hashtag which they can use in their debate.
- They can post their arguments, including the chosen #hashtag, making them visible on the #hashtag page
- Other students can comment on these arguments with their rebuttals
- This allows students to debate for a longer period of time, take more time to respond, and allows others from outside the class to bring in new perspectives by using the same hashtag!

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Digital didactics: options

	Readily available	Asynchronous	Synchronous
Not interactive	• (Online) readings • Video clips, how-to videos • Podcasts • Frequently asked questions • Old lectures/webinars	• Announcements • Sharing newly made online lecture material	• Live streamed lecture
Interactive	• Existing games or models	• Blogs • Vlogs • Discussion groups • Email • Opportunities for questions	• Chat • Virtual class • Video conference • Conference call

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Decide what really needs synchronous communication (students and instructors are gathered at the same time) and what does not

Try to keep online lectures to no more than 20 minutes – or break them into short self-standing chunks with activities for students

Moving classes online: getting started

Provide clear instructions to guide students what to do, and when.

Decide how you will communicate with your students.

Select only 1 or 2 interactive tools and master them.

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Moving classes online: 4 easy tips

1. Split up your lecture in a series of activities
2. Reuse content or even an old lecture
    *   Besides your own content, you can find teaching content on different University OpenCourseWare websites, for example: [TU Delft OCW](#)
3. Replace (part of your lecture) by recording your own video.
    *   Keep lectures short and lively
    *   Multiple short videos is better than one long one
4. Replace (part of your lecture) with a short live video conference / webinar
    *   If you don't have time to prepare anything before your next lecture, use a live conferencing software for discussions/ questions

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Online class activities: examples

- Watch a video on YouTube
- Listen to a podcast;
- Read an article
- Student presentations
- Make an (interactive) quiz
- Do an assignment with interactive tools
- Discuss / ask questions / give feedback on a discussion board online.
- Organize a debate
- Chatroom discussions

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Large student groups (>35)

When lecturing for large groups, there are some other things to consider:

- Appoint a **moderator** in your lecture/presentation
  - The moderator (can be a colleague or student) collects any questions and voices them to you. They can mute all students and only unmute them when they are asking a question during the allotted time
- Set **ground rules** for students:
  - Do not activate your microphone unasked
  - Do not use your webcam
  - Be very explicit on how and when you can take questions and answer them (i.e. in the chat, or by virtually raising a hand)
- Consider using **break-out sessions**
  - These are sessions where students are dispersed into smaller groups for discussion or working on a question
- Use the **polling** option
  - This allows you to collect opinions or to test whether students understood what you have just explained.

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TU Delft Online Learning Hub

- The goal of the Online Learning HUB is to support and facilitate TU Delft faculty to teach and develop online courses with teachers as active and reflective participants.
- It is useful for everyone involved in online course development

4 phases:

Plan	Produce	Run	Evaluate
Define learning objectives, learning activities, resources and assessment	Create learning activities, reuse and develop educational resources (text, quizzes, video)	Run your course using community management and e-moderation techniques	Improve your course for the next re-run using surveys and learning analytics

Link: https://onlinelearninghub.tudelft.nl/

Tools per activity

Recorded "Traditional" lectures

If you wish to make an online lecture of your material, you can use:

- OBS Studio: open source (free) software for both recording and Live Streaming (Interactive Lectures)
- Quicktime (available on Mac by default)
- Camtasia: paid software with Education Pricing for €182.60 (there is a free trial for 30 days which puts a watermark over the output video)
- Screencast-o-matic and Snagit are tools to record your screen while you teach
- VideoScribe: Paid whiteboard video animation software that allows users to create highly dynamic and interactive animation videos on a virtual whiteboard interface (there is a free trial for 7 days which puts a watermark over the output video)

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Tools per activity (cont.)

<u>Interactive lectures</u>

If you want to host a live online lecture where students can actively interact with you and ask questions:

- Twitch: live streaming platform for large groups
- Jitsi (self hosted), Skype for Business and Zoom work for smaller groups of students

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Tools per activity (cont.)

<u>Student Presentations</u>

For student presentations, the following tools work well:

- Skype (although it requires you to "befriend" everyone in the class
- Zoom (free version has a 40 minute limit)
- Google Meet

These tools provide the possibility for all except the speaker to have muted microphones and for one participant to share the screen.

![TU Delft logo]

Source: https://lindsayannlearning.com/7-free-online-discussion-tools/

Tools per activity (cont.)

<u>Discussions</u>

Besides the previously mentioned tools, you can also set up voice/video chat with students using Talky.io and the Queue.

Discussions can also be organized in written form using a platform:
- Poll Everywhere: allowing polls and discussions
- Today's Meet: Online chatroom that can be moderated by a teacher
- Nearpod: Interactive PowerPoint
- Padlet: Like an online graffiti wall
- Or consider using a Facebook group, Twitter, or Google Docs

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Tools: overview

- **Live Streaming**: Twitch, OBS, YouTube Livestream
- **Uploading Videos**: Yukon, YouTube
- **Online Conferencing**: Talky.io, Zoom, Skype for Business, Discord, , WebEx, Google Meet
- **Teams**: Mattermost, Discord, WebEx, MS Teams
- **Discussions**: Poll Everywhere, Today's Meet, Nearpod, Padlet, Facebook Group

Service	Live	Audience size	Price*
Youtube	Yes	Unlimited (lecture size)	Free
Yukon server	No	Unlimited	Free
Twitch.tv	Yes	Unlimited (lecture size)	Free
Zoom	Yes	Conference size	Multiple plans
Skype for business	Yes	Conference size	Part of MS Office 365
Jitsi	Yes	Conference size	Free
Talky.io	Yes	Project group size	Free
Discord	Yes	Conference size	Free
WebEx	Yes	Conference size	Multiple plans

* You should always check the general terms and conditions when signing up for a service or making an account for a software in relation to **privacy** matters and **data protection**.

Quick guide: Google Meet

If you wish to organize a simple meeting without recording
- Go to: https://apps.google.com/meet/
- Check that your microphone and sound are working and that the relevant plug-ins are installed
- Click 'Video Call'
- Invite people of whom you know the Google account or share the link with them via email/social media or another form of communication
- Start the discussion!

You can also create a permanent link to a certain hangout, so that all participants can get back to the session with the same link. This can be done by creating a Hangout event in Google Calendar.

Excellent tips and FAQ can be found here: https://support.google.com/hangouts/

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Quick guide: YouTube Live*

formerly 'Google Hangouts on Air'

1. Check Sound and Microphone on your device
2. Open the platform you use to announce the hangout (Brightspace, edX,...), Powerpoint and [YouTube Live](#)
3. In Youtube Live, log in with your Google Account, click on your account profile picture and click 'Creator Studio'
4. Click 'Live Streaming', then click 'Events'
5. Make a new live event with the time set to 'Now'. Make sure to use the 'Quick' setting
6. Click 'Go Live Now!'
7. You are now in the Hangout. Click 'Invite people' at the top. Copy the link you get and publish it on the community. Now your students can start to join.
8. Wait a bit until all your students have arrived, ask them for permission to record the session and click 'Start Broadcasting' on the bottom. Wait a few second before starting.
9. You are now broadcasting with your students in the Hangout.
   - If you want to share your screen to show a PowerPoint or make a drawing, click the green 'Screenshare' button on the left in the hangout. Make sure to stop screensharing if you don't need it anymore.
10. When you have discussed enough and said goodbye to you students, stop broadcasting, but **do not close the window!**
11. Click 'Links' in the bottom right corner, and copy and save the links to your session. Share that link with the students and/or other parties. Now you can close the window.

Online assignments

Online assignments

- In an online assignment and tests you have less control over the students' use of resources and interaction
  - Students can use the internet, study books, notes and each other
- The assignment should ideally be designed in such a way that the students have to **apply the information** that they have available to them.
  - Imagine them completing the task in the real world of work (within their future jobs), where they can consult resources to complete some or other task.
- Assignments are often used to address higher order knowledge skills: **deeper understanding**, **applying, analyzing, evaluating, designing**
- Time given to submit the assignment should match the learning objectives, and the activities needed to complete them
  - These activities could include, for example, group discussions
- If time is limited and strict, collaboration between students and plagiarism are less appealing.
  - Time pressure requires active knowledge and skills, and does not allow students to learn on the job.

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Source: https://brightspace-support.tudelft.nl/individual-and-group-assignments/

Online assignments: deliverables

Many assignments can be done online in different forms. Some examples are given below:

- Written documents:
  - Research paper, case study, fact sheet, article, report, proposal
- Designs:
  - Schemes, drawings, fact sheets, model outcomes) shared on for example Brightspace Discussion Board.
- Presentations
  - PowerPoint over conferencing software, poster presentation, PowerPointslides with voice-over, slide book with notes, video, animation, etc.
- Portfolio and reflective logs
- Discussion forums
- Quizzes or small tests on content (see next chapter for examination software

Tips for keeping assignments clear, fair and assessable

- Make sure you test only learning objectives applicable to this assignment. You can use consistency check table for this.

- Check **feasibility**.
  - The workload should be reasonable for your students
  - grading burden should be manageable for you and your colleagues

- Use **assignment description** that includes the following information:
  - Name assignments accurately. It will help students to focus on the purpose of the assignment.
  - Clear instructions
  - Clear point allocation and word/page limits.
  - Specify intended audience and purpose of the assignment.
  - Provide rubrics with clear descriptors.
  - List resources, how to get help, and how feedback will be provided.
  - Indicate what the final product should be, and how it should be submitted.
  - Give the submission date and mention the consequences for missing it.

- Be clear about what is and what is not **permitted.**

- If relevant, provide clear **rules for retake** (how to improve, revise or new assignment) and **grading**.
  - Consider whether it is fair to grade similarly, when retakers received feedback on their product and could improve.

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Online examinations

Online examinations: quick tips

- In remote exams, the <u>risk of fraud</u> is higher than for on-campus exams.

- Therefore, you need to change multiple choice questions, true-false questions and other closed-ended questions to **open-ended questions**.

- Your exam should become an open-book exam.
  - This implies that you cannot use questions that require learning-by-heart, but more questions on <u>understanding</u>

- You can choose to organize an **oral online examination**, or a **written online examination**

Suitable for oral examination:
- Presentation & language skills
- Case-studies analyses
- Knowledge & understanding testing

Unsuitable for oral examination:
- Computations
- Scientific analyses
- Online analytical problem solving

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The assessment should cover <u>the learning objectives</u>, and nothing more

Example: if an assessment is changed into an oral exam, the verbal capacities or language use of the student should not influence the grade, unless it is part of the learning objectives

Oral online examinations

Which type of oral exam fits my course?

See next slide

	Standalone remote Oral	Remote oral + Take-home assignment	Remote oral + Time limited assignment	Remote oral + Digital exam
Max no. students	< 30	< 60	< 60	< 60
Coverage learning objectives (typical)	100%	85% in assignment, 15% in oral exam	85% in assignment, 15% in oral exam	85% in digital exam, 15% in oral exam
Recommended length remote oral	Max 1 hour	Max 30 min	Max 15 min	Max 15 min
Necessary staff preparation	High: Need to develop sufficiently large question bank, sample exam and answers, exam script	Medium-high: Need to develop sufficiently large question bank, sample exam and answers, exam script	Assignment: medium Need to develop sample exam and answers, exam script	Medium-very high: Need to develop digital exam and have a system t
Marking time	Low	Low-high (depending on assignment	Medium	Low-medium
Software and software experience needed	Need to operate conference software*	Need to operate conference software and be able to send out assignments	Need to operate conference software and be able to send out assignments	Need to operate conference software and a software that allows quizzing/testing*

Digital examinations software

Online exam parameters

- Schedule/timer
- Exam result processing
- Negative marking
- Capture candidate photo
- Subjects/topics
- Difficulty level
- Exam type (subjective/objective)
- Question navigation

How does it work?
1. Install exam software and add a short description
2. Add images, audios, and videos to make the exam look livelier
3. Ensure that the explanation of the answers is displayed after completing the exam.
4. Schedule the start date and end date for the participants to access the exam.
5. Set the time limit for the exam attendees to attempt the entire examination
6. Put the test online
7. Share the exam link with the participants
8. View the progress of the participants after the exam completes.
9. Check out the statistics per user or get the overall view of the performance of the group

Digital examination software

Exam software	Deployment	Device supported	Unique features
TCExam	Open API	Web-Based	Enables the trainers and educators to schedule, author, deliver and report on the online quizzes, tests, and examinations. It is a web-based system that is platform-independent and language-independent.
Kaldin	Cloud-hosted, open API	Windows, Mac, Web-Based	Kaldin creates, schedules, and evaluates exams efficiently. It offers a relaxed and straightforward interface to the clients with a hassle-free test process. It is a fully customizable application that can be modified as per user's requirements.
Moodle	Cloud-hosted, open API	Windows, Mac, Web-Based	Provides collaborative tools and activities for group learning, offers an all-in-one calendar to keep track of your events, provides a file management system, has a simple text editor.
Papershala	Cloud-hosted, open API	Windows, Mac, Web-Based	Trustworthy software for coaching institutes allowing instant results after exams. It has a simple and easy to use interface.
TAO	Cloud-hosted, open API, On-premise	Windows, Mac, Web-Based	TAO delivers maximum interoperability, flexibility, and security to the users. It is a standard-compliant, open-source assessment system that works as per client-specific functionality.
R-Exams	Open API	Web-Based	R-Exams is an open source package of online exams that comes with very nice exercise templates
PESofts	Cloud-hosted	Windows, Mac, Android, Web-Based	A leading online test conducting software system that offers responsive and reliable support

Source: https://www.goodfirms.co/blog/best-free-open-source-exam-software-solutions

Online examination: large numbers of students

If you have a **very large class**, grading exams can take up a lot of time. You could think of alternative testing:

- Peer-reviewed assignments
- If there is only one correct answer, choose a digital exam software with an **automatic grading option.** Be sure to always double check the grading, however.
- Try **combining** multiple choice question (but make them difficult and assume that students will consult their resources!) with a couple of open-ended question.
- Consider using '**student assistants**' (that have already passed the class in a previous stage) to help grade the exams.
- For mathematical or engineering subjects, you can use TCExam, which allows **mathematical symbols** to be used in both the questions and the typing of answers.

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Structure of open exam questions

When constructing exam questions, use the following 3-part structure:

1. **Context (optional)**
   - Make sure the context is relevant for the question. If not, remove it.
   - If the question can be answered without using the context, then change/remove the context OR change the question. Unless a learning objective is to filter out irrelevant information, of course.

2. **Question (assignment)** *– see next page*

3. **Directions for answering**
   - Use imperative sentences ("List three characteristics of X" rather than "What are the characteristics of X").
   - Specify what you expect in the answer (e.g. "List the three characteristics of X").
   - Avoid "anything goes" formulations such as "What do you think…"

Source: https://brightspace-support.tudelft.nl/drawing-up-open-exam-questions-for-remote-exams/

How to write exam questions

- Your exam questions should be challenging, interesting, fair and, if possible, fun!
- Exam questions should reflect the learning objectives of the course.
- Identify the action verbs in your learning objectives, and then make sure that your questions cover the same cognitive level (level of difficulty, e.g. remembering vs analysis).
- Make sure you are testing what you promised students would learn. Let them know which course learning objective(s) is/are covered in the exam.
- The learning objectives will also determine the type of exam
- Write clear instructions; if there's any ambiguity in what they need to do, students will struggle.
- Ask a colleague to proofread your questions.
- Simplicity is best! Don't write complex sentences, or use idiomatic language that students may find difficult to understand.
- To test a deeper level of understanding and insight, ask the students to justify their answers.
- Ask your students what kind of questions they would expect to see in the exam.

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Checklist for exam questions

This way students can budget their time to be most impactful for them. They should not spend a lot of time on a question that will not earn them a lot of points.

Information for students on the exam

- ✓ During the test/assignment, are the points to be earned by each question or subquestion announced?
- ✓ Before taking the test/assignment, do students know what will be on the test both in structure and in content?
- ✓ Before taking the test/assignment, did your students get the opportunity to practice the types of questions with which you will be testing?
- ✓ After getting the grade and feedback, does the student get information on how her grade has been calculated, and on how he or she can improve her performance?

Question quality

- ✓ Is the answer model in line with what the test questions ask?
- ✓ Is the question unambiguous and is it clear what is being asked?
- ✓ Is the tested knowledge or skill necessary to answer the question?
- ✓ Do not try to cover more than one learning objective in the same sub question

Lay-out / language of the exam

- ✓ Is the layout clear?
- ✓ Are the figures clear?
- ✓ Are there any spelling errors or typos?
- ✓ Have double negatives been avoided? Is the question concisely formulated?
- ✓ Any copy-paste errors?

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Source: https://brightspace-support.tudelft.nl/drawing-up-open-exam-questions-for-remote-exams/

Research

Academic research at home

The current situation (Covid-19 Pandemic) affects all researchers, although some research projects are more affected than others. Some research activities can continue from home. If you anticipate that your project will become delayed because of the pandemic, it is important to:

- Notify your research department
- Check the guidelines of your funding organization

Tips:

- Check in with your program officer and discuss impacts on your research. It is important to think creatively about how to sustain your research over at least the next three to five months.
- Plan a weekly conference call with your research team and superiors
  - This allows you to update them on your situation and discuss how to proceed, exchange tips etc.
- Modify your research and analysis if needed
  - Try to switch to remote data collection and storage instead of face-to-face interaction and lab data. If you do modify your research, make sure you get approval from your superiors.
- Protect your human participants and animal subjects, if applicable
- Do the things that you never have time for
  - i.e. take a course, write a proposal, or finish your research article

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Working from home: mental health

When working from home, it is important to stay mentally and physically healthy.

These tips can help:

- Schedule your working hours
- Create a morning routine
- Establish a dedicated working space within your home
- Plan your day: review to-do list, make prioritized planning
- Take regular breaks to do something completely different
- Prioritize social interactions: i.e. with colleagues, friends, family over the phone
- Remember to exercise and get fresh air
- Mark the end of your working day
- Do not be too hard on yourself when you have an unproductive day

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Want to publish a scientific article?

Consider open access!

Open access means the free availability of research and scholarly outputs on the public internet . It is explained in more detail in this YouTube video

Need inspiration?

Open Access Publishers:
Springer: Open Access Journals and Open Access Books
Elsevier: Open Access Journals
Wiley: Open Journals

Links to Open Access Directories
Directory of Open Access Journals can be found here
Directory of Open Access Books can be found here
ScienceOpen.com is a platform for scientific communication

Improve your skills
There are many courses and blogs available on doing research, academic writing, publishing, structuring your article etc.
- For EdX writing courses, click here
- Or look at the 90 Free Online Courses to Improve Your Writing Skills
- See also the course recommendations in the next chapter on professional development

And here is a Webinar on conducting qualitative fieldwork during COVID 19'

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Professional development

Online courses for professionals

- There are many opportunities for academic professionals to keep developing themselves
  - This could be learning a new useful skill (such as learning a programming language), getting more knowledge on a specific topic within your own field or learning something from a completely different expertise etc.
- You can follow many courses online at your own pace, that are either free or inexpensive
- The offer of courses is updated regularly, so keep checking the resources!

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Tools and resources

Where to find these courses:

- EdX
  - Massive open online course (MOOC) provider, hosts online university-level courses in a wide range of disciplines to a worldwide student body
- Coursera
  - Massive open online course (MOOC) provider, collaborating with both Universities and businesses
- Open courseware is provided at many top universities, for example:
  - TU Delft
  - Yale University
  - Harvard
  - MIT

Other websites (non-exhaustive list) that provide similar services:
https://www.futurelearn.com/
http://www.openculture.com/freeonlinecourses
https://www.udemy.com/
https://alison.com/
https://academicearth.org/

Course recommendations: academic skills

Free online courses on academic skills for educators and researchers:

Course title	Organizer	Course description	Link
Open Science: Sharing Your Research with the World	TU Delft, through EdX	Explore ways to apply Open Science principles to academic work - including your own. Learn how to share your research effectively and responsibly, building greater visibility and impact.	Link
Research Methods: An Engineering Approach	Wits University, through EdX	Learn how to successfully design your research and understand the underlying principles of postgraduate research from an engineering perspective.	Link
LaTeX for Students, Engineers, and Scientists	IIT Bombay, through EdX	Explore a new way of writing and typesetting articles, books, papers, etc. using a document preparation system called LaTeX.	Link
Qualitative Research Methods: Conversational Interviewing	MIT, through EdX	A short course that will teach you how to prepare for and conduct conversational interviews, that will produce rich qualitative data.	Link
EmSAT English Preparation - Level 1 and 2	UAEU, through EdX	This comprehension and production course focuses on the pre-intermediate level and develops the learner's reading, listening and study skills.	Level 1 Level 2
Scientific Methods and Research	Ural Federal University through EdX	Learn how to conduct research based on scientific methodology and analyze scientific articles and conduct experiments.	Link
Introduction to Data Analysis using Excel	Microsoft, through EdX	Learn the basics of Excel, one of the most popular data analysis tools, to help visualize and gain insights from your data.	Link
Academic Writing Made Easy	TUM, through EdX	This course takes you through the basics of academic writing: from structuring and organizing an academic text to avoiding common pitfalls that can negatively affect your credibility.	Link
English Grammar and Style	UQ, through EdX	Learn key concepts and strategies in grammar and style to help enhance your writing.	Link

More free, self-paced courses for academic skills can be found at EdX en Coursera

Course recommendations: programming

When it comes to programming, you may want to look into **Python**. Python is an interpreted, high-level, general-purpose programming language. A global community of programmers develops and maintains CPython, an **open source** reference implementation.

The Python Standard Library can be found here

Course title	Organizer	Link
Introduction to Python: Absolute Beginner	Microsoft through EdX	Link
Introduction to Python: Fundamentals	Microsoft through EdX	Link
Using Python for Research	Harvard University through EdX	Link
Python for Exploratory Computing	Mark Bakker, TU Delft	Link
Python for Everybody	University of Michigan through Coursera	Link
Analytics in Python	Columbia University	Link
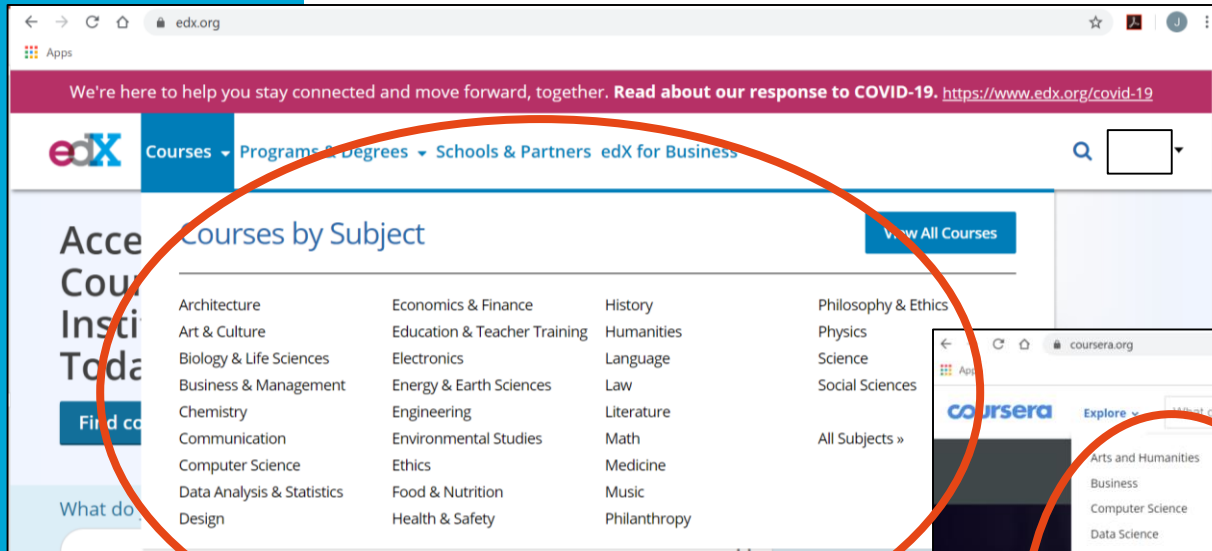
More free, self-paced Python courses can be found at:
https://www.edx.org/course?search_query=python
https://www.coursera.org/search?query=python&index=prod_all_products_term_optimization

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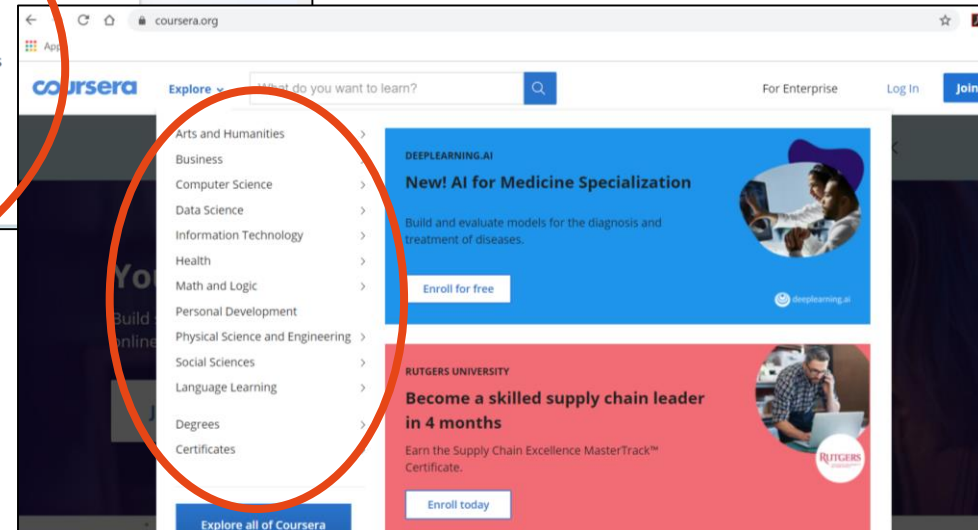
Course recommendations: content

Endless possibilities…

TU Delft EdX courses

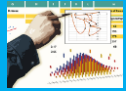|											
Photovoltaic Technologies	Photovoltaic Energy Conversion	Sustainable Energy	Leadership for Engineers	Framing	Responsible Innovation	Urban Sewage Water	Water & Climate	Sustainable Urban Development	The Value of Business Models	Wind Energy	Sustainable Urban Freight Transport
Photovoltaic in Microgrids	Photovoltaic Systems	Introduction to Solar Energy	Cyber Security Economics	Topology of Condensed Matter	Pre-University Calculus	Drinking Water Treatment	Aeronautical Engineering	Business Model Metrics & Tools	How to Design a Business Model	Dutch Urbanism	Big Data Strategies
Quantum Cryptography	Data Analysis to the MAX()	Advanced Transport Phenomena	Credit Risk Management	Observation Theory	Building with Nature	Open Government	Nuclear Energy	Business Model Implementation	Business Model Testing	Programmeren voor kinderen	Mathematical Modelling
Quantum Internet & computers	Data Analysis: Dashboard	Big Data Strategies	Delft Design Approach	Image | Ability	Functional Programming	Next Generation of Infrastructure	Healthy Aging in 6 Steps	Entrepreneurship for Engineers	Railway Systems Engineering	Programmeren voor leerkrachten	Rethink the City
Geoscience	Management of Engineering Projects	Sustainble Building Adaption	Design Practice in Business	Solving Complex Problems	Basic Transport Phenomena	Circular Economy	Entrepreneurship for Global Challenges	Engineering Design for a Circular Economy	Globally Distributed Software Engineering	Co-Creating Sustainable Cities	Forensic Engineering
Mastering Complexity	Funding of Projects Succesfully	Mind of the Universe	Design in Healthcare	Industrial Biotechnology	Design through physical & digital models	Electric Cars: Introduction	Electric Cars: Technology	Electric Cars: Business	Electric Cars: Policy	ROS: Robot Operating System	
Effective Decision Making	Influence Stakeholders	Communicate Effectively	Sustainable Packaging in a Circular Economy	Automated Software Testing	Adv. Automated Software Testing	Waste management and critical raw materials	Building Blocks of a Quantum Computer 1	Building Blocks of a Quantum Computer 2	Open Science: Sharing Your Research		

Useful links and further reading

- TU Delft remote teaching and learning tips: https://brightspace-support.tudelft.nl/remote-teaching-learning/
- MIT remote teaching and learning tips: http://teachremote.mit.edu/
- Harvard remote teaching and learning tips: https://teachremotely.harvard.edu/
- Blogs and advice websites:
    - https://www.chronicle.com/article/Going-Online-in-a-Hurry-What/248207
    - https://www.insidehighered.com/views/2020/03/10/prepare-move-online-continuity-planning-coronavirus-and-beyond-opinion
    - https://www.chronicle.com/interactives/advice-online-teaching?cid=rclink
    - http://www.moseswrites.org/onlineeducation.html
    - https://alicekeeler.com/
    - http://www.e-learn.nl/2020/03/13/ambiguous-times-for-online-education
- Worldwide trends on twitter by looking up hashtags such as:
    - #ConnectUniversities
    - #Elearning
    - #OCW

Reference links

https://brightspace-support.tudelft.nl/drawing-up-open-exam-questions-for-remote-exams/

https://brightspace-support.tudelft.nl/individual-and-group-assignments/

https://brightspace-support.tudelft.nl/remote-assessment/#available-remote-assessment-types

https://brightspace-support.tudelft.nl/remote-assessment-oral-exams/

https://brightspace-support.tudelft.nl/remote-teaching-learning/

https://lindsayannlearning.com/7-free-online-discussion-tools/

https://www.apa.org/news/apa/2020/03/conducting-research-covid-19

https://www.goodfirms.co/blog/best-free-open-source-exam-software-solutions

https://www.rug.nl/education/online-teaching/tools/blackboard-collaborate_-starten-met-online-college-geven-#4

https://youlearn.ou.nl/web/hulp-bij-online-onderwijs/digitale-didactiek

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