On the "New Options for Education after COVID-19:
Implementation of Online Teaching and Learning (from AY 2022)"

June 22, 2021
Decision at the Office of Education and International Cooperation Meeting

In AY 2020, Tokyo Tech offered university education online as a temporary and special measure in response to the COVID-19 pandemic, which seems likely to continue into AY 2021. Although the arrival of the post-pandemic era, when COVID-19 could be treated like seasonal flu, is not yet foreseeable, we should expect major changes in higher education to occur in or after AY 2022.

Teaching and learning activities at Tokyo Tech from AY 2022 should interlace with and develop the thoughts, perspectives, and measures experienced during the pandemic. Hence, there is an urgent need to develop a system, i.e., policies and guidelines, that can be enacted in AY 2022 enabling us to set up new teaching and learning methods and strategies as the post-corona situation requires. Needless to say, different scenarios are possible. Circumstances may mandate the start of the new methods and strategies to be from AY 2023. Or, the pandemic may not end and new guidelines may have to be implemented gradually in stages. Nevertheless, it would stand to reason to set up a basic policy concerning new forms of education for Tokyo Tech from AY 2022 onwards, aptly adapting to changing conditions.

We should take note that the Ministry of Education, Culture, Sports, Science and Technology (MEXT) has decided to extend the period of special measures pertaining to the Standards for the Establishment of Universities (大学設置基準), and continue lifting the restriction setting the maximum number of course credits earned from online instruction at 60 credits for bachelor's degrees ("Handling of remote teaching and learning at universities and colleges (大学等における遠隔授業の取扱いについて)" dated April 2, 2021 and "Use of online methods at education institutions (教育現場におけるオンライン教育の活用)" dated March 29, 2021). In addition, MEXT is planning to review the Standards for the Establishment of Universities in AY 2021, and provide definitions for remote teaching and learning via online education methods expected to start in AY 2022.

Meanwhile, at Tokyo Tech, the Office of Education and International Cooperation established the "Guidelines on Online Instruction (trial)" in AY 2019 (announcement on December 12, 2019), and formulated rules for a trial regarding course credits granted for on-demand learning using videos. Based on the Guidelines, further discussion will be required to plan for new education options developed during the pandemic such as remote lectures using Zoom, providing a learning environment fit for online education.

Face-to-face instruction has been the essential and fundamental form of education at Tokyo Tech since before the COVID-19 pandemic, and it will remain so post pandemic.

While this remains fundamental, we are now at a stage where incorporation of online options based on our experience during the pandemic is in order, so that we may accommodate the various learning styles of our students.

For this purpose, we shall present the basic policy for the implementation of new methods of teaching addressing regular students of Tokyo Tech, fit for the post-corona age as detailed separately. Further, based on this policy, we shall determine separately guidelines for the implementation of online education programs (especially of online courses).

"After COVID-19" refers to the time when social distancing is no longer required, and students can participate in on-campus activities as they did before the pandemic.

New Options for Education after COVID-19:

Implementation of Online Teaching and Learning (from AY 2022)

1. Definition of methods of online instruction

There are three types of university education to consider: in-class learning, laboratory learning, and activities outside of regular coursework. "Online instruction" is primarily related to the first of these and may be described as "a mode of instruction where mandatory face-to-face classroom hours prescribed by the course are fully or partially replaced by online learning activities both during and outside the regularly scheduled class times."

It includes livestream and on-demand options (fully online), and HyFlex and blended options (a combination of face-to-face and online).

The two main types are "Livestream" via Zoom and other media, and "On-demand" using video and audio recordings ("Recordings"). The eclectic form comprised of both types is called "Livestream plus On-demand."

There are two types of instruction that use both face-to-face ("Face-to-Face") and online instruction methods.

1) The "HyFlex" format uses both the Face-to-Face and Livestream methods simultaneously by livestreaming the Face-to-Face class.

2) The "Blended" type, which, while based on the Face-to-Face method, utilizes the following types of online instruction: Livestream, On-demand, and HyFlex.

   At Tokyo Tech,

   a. those that use the Face-to-Face and On-demand methods alternately are called "Online Alternating" type, while

   b. those that use both methods in a single class are called "Half-and-Half."

Those courses that use On-demand teaching material for preparation and review purposes outside the regularly scheduled class times, such as the "flipped classroom" method, do not fall under the scope of online education.

Class formats available during the regularly scheduled class times

Class format		Attendance of students	Delivery of instruction
Face-to-Face		In-person (Students and instructors are present in the same room.)	In-person
Online	Livestream (synchronous)	Online	Online
	On-demand (asynchronous)		
	Livestream + On-demand		

HyFlex (Face-to-Face and livestreamed instruction occurring simultaneously)	Face-to-Face + Livestream	In-person or online (Students can choose either option.)	In-person
Blended (Face-to-Face and online instruction occurring alternately/supplementarily)	Face-to-Face + Livestream Face-to-Face + On-demand ・Alternately (e.g., Face-to-Face class sessions and On-demand class sessions take place by turns.) ・Half-and-Half (e.g., The first half of a class session is online, and the second half is Face-to-Face.) Other combinations possible	In-person and online	In-person and online

Note: HyFlex format includes simultaneous transmission of remote classes using Polycom and other remote lecture systems.

As comparable forms of online education can be developed for outside the classroom, "Online education" hereinafter shall encompass all forms of education listed above used not only in the classroom (inclusive of preparation and review) but also in the context of learning activities at the laboratory and those of outside of regular coursework.

2. Basic approach in education adopting online instruction
New options for education including online instruction methods will be evaluated from the following two perspectives:
- Key points for planning online education
  The proportion of online instruction to be introduced shall depend on goals such as quality assurance of education.
- Key points for implementing new options for education
  Basic approach for implementation of new options to be decided

1) Key points for planning online education
    A. Teaching and learning takes place face-to-face in principle, since in-person interactions in classrooms and on campus are fundamental for education at Tokyo Tech.
    B. Online education will be encouraged in either of the following situations, where it can expand students' learning options and support their different learning styles.
        a. Students can learn online as effectively as, or more effectively than, they do face-to-face.
        b. Students can benefit by participating in online activities such as online study abroad programs, online internships, and international collaborative education programs available online, regardless of time and/or physical location. Students will have valuable learning opportunities that they cannot otherwise access when restricted by the necessity for face-to-face settings.

However, online learning activities must be planned so that certain requirements for educational quality assurance are met.

C. With the advancement of online education, more careful planning will be necessary to incorporate online and face-to-face teaching/learning with minimal disruption and interference. Also, we will need to address issues stemming from a lack of in-person meetings between faculty and students.

D. Tokyo Tech will send a strong message to teaching staff, encouraging them to promote online activities (see B above), and to express support in their challenge of devising and trying new teaching methods.

2) Key points for implementing new options for education

A. Education entities, such as implementation committees for liberal arts and basic science courses, and Schools and departments in charge of major courses and laboratory-based education, are responsible for quality assurance of online education. They must determine clear processes and metrics for quality assurance, especially regarding regular class sessions delivered online.

B. The ratio of online to face-to-face instruction used by each education entity will be determined at the Institute-wide level, if necessary.

C. "Good Practice" for online education should be disseminated at symposia, workshops, etc. and shared among Schools or across Tokyo Tech.

D. Tokyo Tech will adopt a "Bring Your Own Device (BYOD)" approach.

E. Tokyo Tech will promote digital transformation (DX) on campus and improve its online learning/teaching environment, which will allow for simultaneous livestreaming of face-to-face instruction, learning management systems, and other online activities.

F. It is essential to build a system of recording and archiving lectures, course materials, etc. for students to utilize deepen their understanding.

Other

· This document is not subject to updates. However, partial revisions may be admitted if grave changes in circumstances so warrant.

· The contents of this document are applicable to education taking place in the classroom (inclusive of preparation and review thereof), at laboratories, and outside of regular coursework.

· As network setup and procurement of classroom space require time, forms of education implemented will be subject to constraints involving such circumstances

Factors to Consider in the Adoption of Online Instruction

1. Essentials of "learning" and "teaching"

Factors to be considered in the selection of pedagogical activity

1) Methods

A. Consolidation of knowledge (lectures, seminars, etc.)

B. Training activities using the seminar format

C. Group work and PBL projects

D. Experiments and/or other methods of acquiring practical skills

E. Research (experimental or theoretical)

F. Combination of the above

2) Settings

- the classroom (including preparation for and review of class sessions)

- the laboratory

- outside of regular coursework

3) Locations

On campus (Ookayama, Suzukakedai, and Tamachi) or off-campus sites

4) Circumstances involving the student

Number of course enrollees, characteristics and circumstances of individual students (e.g., motivation, sociability, preference for study at home, study abroad, continuing education, difficulty in physical access to campus)

5) Areas and fields of education

Major subjects, liberal arts and social sciences, languages, career development, research, etc.

6) Degree levels

Bachelor's, master's, and doctoral levels

(Course numbers range from 100 to 600 by degree level.)

2. Advantages and disadvantages by class format

Advantages and disadvantages by class format

	Advantages	Disadvantages	Suitable cases
Face-to-Face	• Shared lively experiences and mutual communication (Allows quick responses; flexible pacing; and when effective, use of ad libs, jokes, digressions, etc.) • Learning effectiveness through direct faculty–student and student–student interaction before, during, and after class sessions • Individual attention paid to students • Can describe concepts from a wider perspective using a large screen • Copying from the board helps students to retain what is taught by instructors • Chances for students to meet prospective supervisors	• Limited by time and place • Some students may be left behind during the class • Courses taught in different groups may be less uniform in teaching method and content depending on instructors • Students cannot repeat topics after class • Students may be distracted from listening to instructors while copying from the board	
Livestream	• Not limited by place (more students will be on time for class.) • Falls in between face-to-face and on-demand formats • Some students may prefer to ask questions anonymously • Can reach a large number of students at a time (scalability) • Enables recording of lectures (available for students to repeat topics) • Can use online tools such as Google Forms and polling to gauge student understanding or collect information • Allows remote guest speakers to be invited • Students can closely watch presentation materials (usually displayed on classroom boards/screens)	• Unable to observe students' reactions • Prone to technical issues (a secure network connection and adequate rooms are required) • Some students may rather watch lecture videos on their own time rather than attend scheduled livestreamed classes • Difficult to respond to students quickly in the class • Difficult to organize lively, large-group discussion	• Knowledge-intensive education (very suitable) • Core courses and courses attended by motivated students
On-demand	• Not limited by time or place (students can take two courses that originally had a class time conflict) • Can reach a large number of students at a time (scalability) • Students can re-watch and repeat topics • Enables building of better teaching materials (uniformity in teaching) • Students can closely watch presentation materials (usually displayed on classroom boards/screens)	• Should Tokyo Tech play the role of a correspondence university? • Unable to observe students' reactions (tends to become one-way communication from instructors to students) • Needs quizzes and assignments for every session to assess students' understanding • Students more focused on studying for exams	• Knowledge-intensive education taken by a large number of participants, very suitable especially when teaching basic knowledge • Seminars, workshops, etc., discussing a specific topic • Seminars, workshops, etc., aiming to disseminate top-level knowledge (e.g., seminars for adult learners) (very suitable)
HyFlex (Face-to-Face + Livestream)	• Can select either face-to-face or livestream based on individual situations (students studying abroad, adult learners in remote areas, etc.) • Can respond quickly to students' reactions • Allows remote guest speakers to be invited	• Staying focused may be more difficult for students attending online • Instructors need to pay attention to both face-to-face and online venues • TAs' support and HyFlex equipment are essential	• Courses taught in multiple venues on different campuses • Courses offered under university bilateral or international exchange programs

Blended (Face-to-Face + Livestream)	• Allows breakout sessions	• Careful scheduling needed to allow students enough time to move between face-to-face and online classes, and to fully take advantage of the online format	• Courses involving livestreamed sessions by guest speakers (technical equipment must be pre-installed on campus) • Courses conducted in cooperation with other universities (face-to-face instruction at each university and students' final presentations livestreamed to multiple venues)
Blended (Face-to-Face + On-demand) Alternating between Face-to-Face and Online	• Possible to take advantage of both face-to-face and on-demand formats • Combination of on-demand format for encouraging learners' progress at their own pace and face-to-face approach for facilitating classes, involving exercises, advanced subjects, or Q and A sessions, can make instruction plan more effective • Well-designed instruction plan can enhance and improve teaching	• Careful scheduling needed to allow students enough time to move between face-to-face and online classes, and to fully take advantage of the on-demand format • Needs to urge students to watch video lectures before attending a face-to-face session	• Dialogic teaching and courses involving exercises (very suitable) • Courses involving experiments and teaching experiment skills (very suitable) • When teaching a large number of attendees through on-demand option and offering follow-up instructions to a small number of attendees in person
Blended (Face-to-Face + On-demand) Half-and-Half*	• Possible to take advantage of both face-to-face and on-demand formats • Instructors may use the on-demand format to close students' learning gaps, i.e., teaching fundamentals through on-demand option in the first part of the class session and then moving to face-to-face instruction in the last 50 minutes Also, they can spend one class period making up a cancelled session • Does not require students to stay focused for 100-minute-long periods	• Careful scheduling needed to allow students enough time to move between face-to-face and online classes, and to fully take advantage of the on-demand format • Takes up more of the instructors' time • Needs to urge students to watch video lectures before attending a face-to-face session	

* E.g., A 100-minute class session consisting of the On-demand format for the first 50 minutes and the Face-to-Face format for the last 50 minutes