Imperial College London

Royal College of Art
Postgraduate Art & Design

Imperial-RCA Design for Global Challenges Winter School

30th January to 10th February 2023

Learn from Imperial & RCA academics live online! This exciting multidisciplinary programme will develop your design thinking to change the way you see the world!

About Imperial College London

Consistently rated amongst the world's best universities (6th in World, QS World University Rankings 2023), Imperial College London is a science-based institution with an international reputation for excellence in teaching and research. Imperial attracts over 20,000 students and 8,000 staff of the highest international quality from over 136 different countries.

Since its foundation in 1907, Imperial's contributions to society have included the discovery of penicillin, the development of holography and the foundations of fibre optics. This commitment to the application of research for the benefit of all continues today, with current areas of focus including interdisciplinary collaborations to improve global health, tackle climate change, develop sustainable sources of energy, address security challenges, develop data management and analysis technologies for supporting data driven research, and tackling problems at molecular scale.

Located in the heart of London, Imperial has the greatest concentration of high-impact research of any major UK university, according to the 2021 Research Excellence Framework (REF) results. Innovative research at the College explores the interface between science, medicine, engineering and business to deliver practical solutions to a broad spectrum of societal and economic issues. We address these challenges on three levels, which are interdependent (core disciplines, multidisciplinary research and global challenges). Many of our academics are engaged with all three and our academic staff includes some of the world's most renowned scientists, medics and engineers whose contributions to their field have been recognised internationally.

Imperial's Centre for Continuing Professional Development had extensive experience in developing and running a range of online winter schools for undergraduate students. We draw on Imperial's education pedagogy of online learning in designing and delivering the winter school to provide an engaging learning experience for students. Various interactive applications are used to support live teaching and online group projects are designed to assess students' learning outcomes.

About Royal College of Art (RCA)

The RCA started life in 1837 as the Government School of Design. In 1967 the RCA was granted a Royal Charter which enshrines its purpose as being 'to advance learning, knowledge and professional competence [in art and design'... through teaching, research and collaboration with industry and commerce.' To this day, it remains the world's most influential wholly postgraduate university institution of art and design, offering MA, MPhil and PhD degrees. Our graduates have led many global businesses (including IDEO, Kia Motors, Jaguar Land Rover, Burberry, Dyson and Apple).

The RCA is ranked as having the 'highest number of student spin-outs with university ownership in recent years in the UK' (PACEC report for HEFCE, 2015) and InnovationRCA was recently awarded the UK Business Angels Association award for UK University Accelerator of the Year. The RCA is renowned for teaching and incubating real-world innovation and has been named as the world's leading university for Art and Design for the past 6 years by QS Rankings.

Leading companies choose to work with the RCA on custom executive education programmes that address their strategic goals, unique challenges and identified opportunities. Courses have been delivered in Dubai, Hong Kong, Singapore, China, Japan and Mexico. Organisations that have benefited

from RCA innovation expertise include Sony, Ford, NHS, BAA plc, Fujitsu, Kuwait Foundation for the Advancement of Sciences, GSK, Panasonic, Samsung, JP Morgan, Huawei, Majid al Futtaim and Cern.

Our practical innovation workshops and methodologies have been incorporated into those offered by other institutions. These include London Business School, Imperial College London, Judge Business School, Fudan University, National University of Singapore, Shanghai University and the University of Cambridge.

Programme Overview

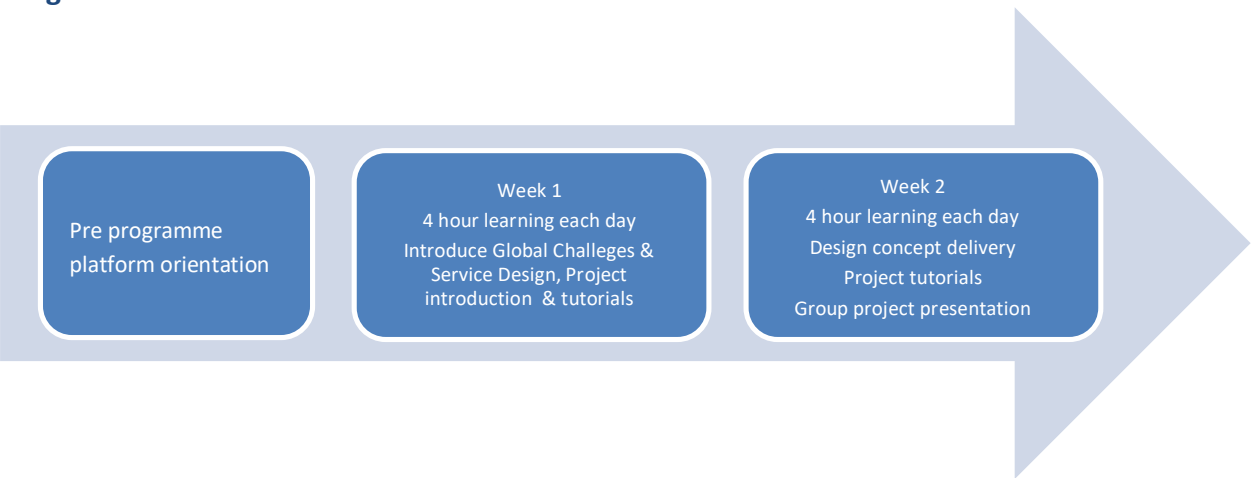
Jointly delivered by Imperial College London and the Royal College of Art, the Design for Global Challenges Online Winter School is a two-week multidisciplinary programme designed for undergraduate students currently studying at a university in China with an interest in learning how to tackle world challenges through service design.

The aim of the programme is to enable students to explore some of the current global challenges in climate change, global health, cyber security and propose an innovative idea to design a service that could tackle one of the areas.

In addition to the global challenges, students will gain an insight into data science, hear latest advances in robotics and meet some of our graduate entrepreneurs who are driving progress by launching their design innovations into the commercial world.

Students will develop personal and professional skills through interactive workshops in design thinking, team-building and presentation and experience team based learning through a service design group project.

Programme Structure



Week 1: In the first week, students will be introduced to design thinking and form a team by exploring their social relations and roles through a leadership and team building workshop. As students familiarise themselves with one another, they will analyse and evaluate some of the global challenges in climate change, health and cyber-security and the impact it has on society and companies. Students will be introduced to service design and encouraged to identify one area of a global challenge that

needs tackling and propose an innovative idea to design a service that could either control or reduce the global challenge. They will also engage in fun social activities to get to know each other and gain an insight into the British Culture.

Week 2: During this week, students will apply their creativity and design ideas to develop their service. They will also explore how advances in robotics and data science technology are transforming the future. They will hear from successful design entrepreneurs sharing their work. The effective communication workshop will support them with their presentation skills in preparation for their final day. At the end of the week students present their service design to a panel. This is an opportunity to put all their learnings from throughout the course into practice.

Apply learning through Group Project

The group project not only provides an opportunity for students to learn teamwork, it is designed for students to apply their learning throughout the winter school and to assess their learning outcomes. Students will be allocated in small groups at the start to identify one area of a global challenge that needs tackling and propose an innovative idea to design a service that could either control or reduce the global challenge. Students will be encouraged to think creatively and innovatively to develop ideas which will be challenged by tutors who will provide guidance, tools and support them in developing their service. Each group will present their ideas to a panel on the final day and the best project team will be awarded a prize and a letter of recognition. All students will receive a project assessment score.

Learning outcomes

On completion of the winter school, students will be able to:

- Analyse and evaluate the impact of climate change on society and the environment.
- Analyse and evaluate the impact of major global diseases and the changing future of healthcare policies and innovations.
- Analyse and evaluate the challenges of the internet and new frontiers in cyberspace/digital media security that companies face.
- Understand how advances in robotics and data science technology are transforming the future.
- Apply service design tools and develop a service to tackle a global challenge.
- Understand how businesses differentiate and compete in global markets, and to define and build business models to establish competitive advantage.
- Develop and practise valuable professional skills in team building, leadership and presentation.
- Develop and employ team building skills to work as a team towards a group design project.
- Find out what it is like to study in the UK and get an insight into the British culture through social activities.

Teaching methods

RCA - Learning by doing

We use a 'learning-by-doing' practice-based model that draws upon the ethos of the RCA studio context, an immersive, imaginative space where cross-disciplinarity and creativity push the boundaries of innovation. The RCA introduces the creative and critical skills that are essential to all academic and industry researchers in the 21st century. Participants return to their organisations as ambassadors with the confidence to influence and lead cultural change. We find challenge-based practical projects, small teams and prototyping encourages interaction and breaks down barriers.

RCA - People-Centred, Interdisciplinary Approach

The RCA takes a human-centred approach to innovation, informed by our specialisms in art, design and humanities, but also by our well-established track record of successful collaborations with social science, science, engineering, technology and medicine. A common thread throughout all workshops is a commitment to inclusivity, ethics and integrity. Many of the underpinning people-centred methodologies are informed by longstanding research from The Helen Hamlyn Centre for Design. The HHCD approach to research and innovation centres on inclusivity, interdisciplinarity and co-creation, with specialist expertise in ageing, diversity, healthcare, societal problems and global issues.

RCA - Online networks and teaching

The programme would be anchored in a dedicated virtual learning environment enabling participants to access knowledge before, during and after the programme concludes. It will act as the hub for the exchange of participant content and ideas, peer to peer interaction and cohort building, peer review panel learning and online mentoring.

Since March 2020 the RCA has used a combination of Moodle, Zoom and Mural for all postgraduate teaching and executive workshops. We have held international webinars for up to 700 guests from 60 countries and have facilitated interactive break out rooms for 6 to 10 people. This experience has led us to develop specific tools and techniques for engagement and cohort building online.

The winter school will be delivered online via Zoom platform with up to 4 hours of learning per day.
In addition:

- Web based exercises and quizzes will be provided for formative feedback.
- Group projects are designed for assessing the learning outcomes.
- Case study methodology and collective online discussions are used to strengthen the conceptual, analytical and problem-solving skills of the students in real situations.

Teaching Faculty

The winter school will be taught by a team of renowned Imperial and RCA academics leading in their area of education and research.

Certificates

On successful completion of the winter school, all students will receive an Imperial College London and Royal College of Art Digital Certificate and a project mark in the form of transcript.

Who should attend and entry requirements?

The winter school is designed for students studying an undergraduate degree in any subject discipline at a well-recognised university in China.

- Applicants should normally demonstrate good overall university performance in their current year of study.
- Applicants must be at least 18 years old before the start of the winter school.
- Applicants should have a good command of English, and if it is not their first language, they will need to satisfy the College requirement as follows:
    - *A minimum score of IELTS (Academic Test) 6.5 overall (with no less than 6.0 in any element) or equivalent.*
    - *TOEFL (iBT) 92 overall (minimum 20 in all elements)*
    - *CET- 4 (China) minimum score of 550*
    - *CET- 6 (China) minimum score of 520*

Cost

The cost of winter school is £2150.

***Scholarship Application**
Please note you are also eligible to apply for the scholarship and get a tuition fee deduction. A scholarship of up to £600 will be provided by *Global University Online*.

To apply, please complete an online application form and upload your personal statement (within 500 words) and CV/resume. For more details, please visit:
http://www.globaluniversityonline.org/hqdx.php/scholarship/detail/22.html?lang=en

The deadline of scholarship application is 23:59 30th November (UK time).

Provisional Programme outline (subject to change)

Imperial-RCA DESIGN FOR GLOBAL CHALLENGES ONLINE SUMMER SCHOOL
30 January to 10 February 2023

Pre-sessionals		
UK Time	**China Time**	
Saturday	**28-Jan**	
07:00	15:00	Orientation
08:00	16:00	Cross-cultural Communication
Sunday	**29-Jan**	
07:00	15:00	Academic Writing
08:00	16:00	Workshop
Week 1		
Monday	**30-Jan**	
08:00	16:00	Welcome & Introduction to Imperial College London
08:15	16:15	Welcome & Introduction to RCA
08:30	16:30	Programme overview and ice-breaker
08:50	16:50	Group Photo with Prof.Peter Childs
09:00	17:00	Creativity & Ideas Generation
10:15	18:15	Break
10:30	18:30	Building Effective Team & Leadership
12:00	20:00	End of session
Tuesday	**31-Jan**	
08:00	16:00	GC1: New Frontiers in Global Health
09:15	17:15	GC2: Innovations in Climate Change
10:30	18:30	Break
10:45	18:45	GC3: Challenges of the Internet
12:00	20:00	End of session
Wednesday	**01-Feb**	
08:00	16:00	D1: Service Design and its Impact
		Lecture: Introduction to Service Design and its Impact
09:00	17:00	Service Design Project Workshop
09:30	17:30	Break
09:45	17:45	Introduction to online tools: run through and exercises
10:15	18:15	Team work on global challenges
11:00	19:00	Show and Tell: 2-3 teams selected to present ideas
11:15	19:15	Social activity 1 - Creative drawing session
12:15	20:15	End of session
Thursday	**02-Feb**	
08:00	16:00	D2: Service Design - Discovery Phase
		Lecture: Who are we designing for?
09:00	17:00	Exercise: Developing Personas
09:30	17:30	Exercise: Mapping the journey your persona takes Identify the pain points & opportunities
10:15	18:15	Break
10:30	18:30	Exercise: Mapping stakeholders
11:00	19:00	Show and Tell: 2-3 teams selected to present ideas
11:15	19:15	Self-study: Students work on group project
12:15	20:15	End of session
Friday	**03-Feb**	
08:00	16:00	GC4: Innovation in Robotics - reshaping the future
09:00	17:00	Break
09:15	17:15	Business Model Innovation
11:15	19:15	Self-study: Students work on group project
12:15	20:15	End of session
Saturday 04-Feb & Sunday 05-Feb		
No lectures on weekends - free time for students		

Week 2		
Monday	**06-Feb**	
08:00	16:00	D3: Definition and Design
		Welcome back and recap on last week: discovery phase and introducing the definition and design
		* translating research into HMW statements
		* Ideation and visualisation
08:45	16:45	"How Might We....." Define the problems to solve & opportunities to be grasped
09:15	17:15	Lecture: Creativity - how to generate ideas
10:00	18:00	Break
10:15	18:15	Exercise: design development
10:45	18:45	Lecture: Visualising Concepts and story-telling
11:15	19:15	Exercise: design your go to journey
12:15	20:15	End of session
Tuesday	**07-Feb**	
08:00	16:00	GC5: The future of data science and its application
09:30	17:30	Break
09:45	17:45	Effective Communication for Presentation
11:15	19:15	Self-study: Students work on group project
12:15	20:15	End of session
Wednesday	**08-Feb**	
08:00	16:00	D4: Concept Delivery
		Lecture: From Concept to Proposition
08:45	16:45	Exercise: Map the system for your go to journey and Prototyping your proposition
09:45	17:45	Break
10:00	18:00	Graduate RCA - Project Presentation - Group Q&A
10:30	18:30	Presentation - finalise your new service design presentation
11:15	19:15	Social activity 2
12:15	20:15	End of session
Thursday	**09-Feb**	
08:00	16:00	D5: Future Challenges in Service Design
		Lecture: Using Service Design to tackle global grand challenges
08:30	16:30	Q&A with Dr. Nick de Leon
09:00	17:00	Project tutorials
10:00	18:00	Break
10:15	18:15	Opportunities for international Students at Imperial
10:45	18:45	Opportunities for international Students at RCA
11:15	19:15	Self-study: Students work on group project
12:15	20:15	End of session
Friday	**10-Feb**	
		FINAL TEAM PRESENTATION & PANEL FEEDBACK (10 minutes + 5 minutes Q&A per group)
07:50	15:15	Welcome: introduce panel and judging criteria, questions
08:00	16:00	Group 1
08:15	16:15	Group 2
08:30	16:30	Group 3
08:45	16:45	Break
09:00	17:00	Group 4
09:15	17:15	Group 5
09:30	17:30	Group 6
09:45	17:45	End of presentation
		Judging panel convene to decide on winning team
		Students to complete online evaluation form
10:15	18:15	Judging panel reconvene to provide feedback and announce the winning team
		Final remarks
10:45	18:45	End of summer school

Design for Global Challenges Online Winter School session descriptions:

Creativity and Ideas Generation

This session helps students "to think outside the box" to generate ideas. The techniques presented and tried during the session are particularly useful for people who do not believe they have time to think differently due to the pressures of daily life. The session will take students through a pragmatic 6 stage problem solving process. Students will apply the process from problem definition through to implementation.

- Discover
- Define
- Design
- Develop
- Deliver
- Diffuse/Distribute

Introduction to Service Innovation & Design Thinking and its Impact

Our RCA interactive workshops are designed to address specific challenges through the use of practical tools such as design thinking and people-centred service innovation, with reference to real-world projects, experiences and case studies.

At the end of the workshop process the students will have worked in groups to develop a proposal in response to the challenge.

Learning aims:

- Empathy, clarity, creativity, networking, self-reflection, integrity, confidence, agility, positivity, equality and diversity, influence, collaboration, communication and inclusion.
- Eethnography, data visualisation, ethics, principles, sustainability, critical thinking, problem identification, analysis evaluation, innovation, public and impact.

Project Introduction & briefing

Students will be allocated in groups of 5 to identify one area of a global challenge that needs tackling and propose an innovative idea to design a service that could either control or reduce the global challenge. This is a tried and tested format at the RCA and each year the MA students take part in the college wide "Grand Challenge" 2021 and Cern.

New Frontiers in Global Health

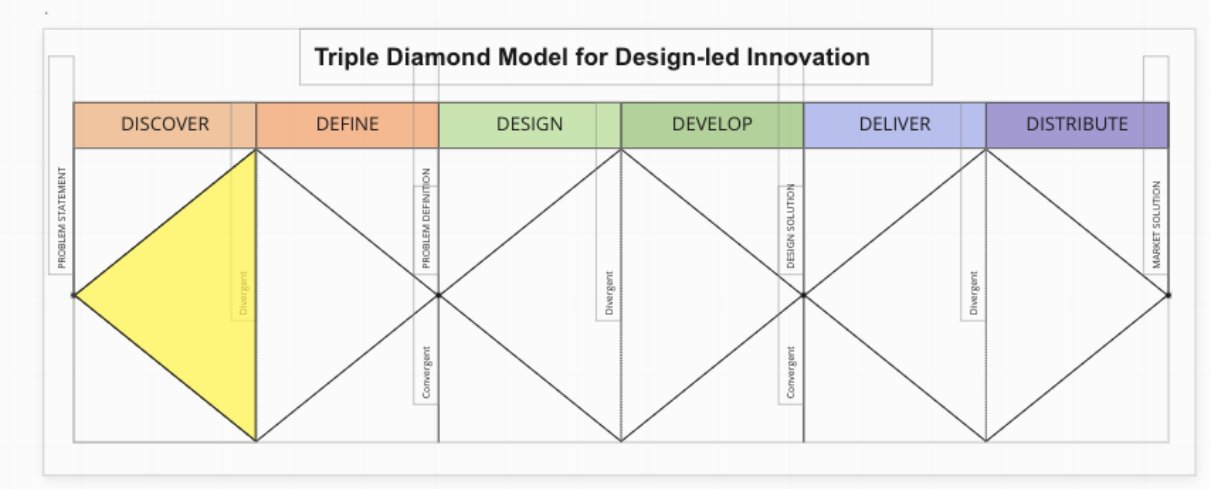
The aim of this session is to provide students with an understanding of current challenges in Global Health and what are the latest innovations to meet these challenges.
This session will cover:

- What is Global Health?
- Problems and Challenges
- Solutions with case studies examples
- Current innovations in Global Health

Building Effective Team and Leadership

Through the medium of practical exercises and guided review, students will explore ways in which team performance can be enhanced. The session will give participants the opportunity to participate in a range of tasks designed to highlight common ways in which team performance can come unstuck and the behaviours that can mitigate against this.

Discovery



In the discovery phase of the Design Thinking process, we encourage divergent thinking, the purpose is to organise a broad range of information and gather insights.

- identify and break down the problem statement
- what are the main factors that have contributed to the problem?
- what other sectors/markets/geographies have addressed this problem
- what are the key contextual issues/drivers that might suggest a way forward

Innovations in Climate Change

Climate Change is one of the biggest challenges to development today. While climate change poses a number of risks to vulnerable communities and businesses around the world, many opportunities are unfolding for private companies to implement actions towards reducing risks to their business operations, as well as investing in adaptation action in vulnerable regions in a sustainable and profitable manner. The session will give students an understanding of what Climate Change is, its impact and the challenges businesses and academia face as they find innovations to tackle these problems.

Challenges of the Internet

The Internet is a global system of interconnected computer networks that use the standard Internet protocol suite to serve several billion users worldwide. Whether for business or leisure, use of the internet is becoming part of our daily lives. To understand what impact this can have, the session will cover:

- An introduction/overview of the internet and its power
- Current challenges of the internet and problems faced by companies.
- What businesses are doing to overcome these challenges?
- Current innovations in managing Internet Challenges (academic and business)

Innovation in Robotics - reshaping the future

This session provides an insight into machine learning, robotics and AI. Students will learn the latest real-world application and innovation in the area and see how robotics can reshape the future and transform the world in different sectors.

The Future of Data Science and its Application

Modern science typically involves big data, taking advantage of high-throughput data capture and high-performance computing capabilities. Data science is therefore an essential element of all modern interdisciplinary scientific activities. It acts as the glue to facilitating collaborative scientific discovery and involving the whole life cycle of data, from acquisition and exploration to analysis and communication of the results. Data science is not only concerned with the tools and methods to obtain, manage and analyse data, it is also about extracting value from data and translating it from asset to insight. This session aims to showcase data science and its applications to address data-driven scientific grand challenges.

Business Model Innovation

The aim of the session is to facilitate students' understanding of how businesses differentiate and compete in global markets. Students learn to define and build business models to establish competitive advantage. The session to include:

- Explain the difference between market-pull and technology-push
- Recognize different types of innovations
- Introduce the business model canvas and systematically understand, design & differentiate new business models

- Differentiate between product & business model innovation

Effective Communication for Presentation

This workshop will take students on a journey through fundamental principles of communication and presentation. Through exercises, plenary and interaction, students will learn more about their strengths and natural abilities, and how to perform at a higher level. The session will allow students to work experientially within a group setting and will give participants exercises, ideas, tips and practises for inclusion in their presentations on the last day.

Definition

Using convergent thinking, the aims is to interrogate and refine the problem to arrive at a design brief that makes sense of the possibilities.

- what are the most relevant pointers from the Discover phase
- which elements matter most and which are most feasible?
- how do these elements fit together, and what is the convergent path on which they might sit?
- how might and actionable creative design brief be developed and articulated?

Design

The design phase is about creating ideas. Through using divergent thinking, the aim here is to generate a range of different creative ideas to address the challenge.

- what are the most relevant and resonant creative design responses to the brief?
- how can these concepts be described visually in model or sketch form?
- look at other sectors or countries for ideas to cross-pollinate.

Concept Delivery

Finalise the design solution describing its key characteristics, benefits and beneficiaries. Present the ideas to the group. Suggest several routes to implementation.

- what shape should the final proposal take
- what are its key features and attributes?
- describe a range of delivery mechanisms to make this happen
- how do you communicate the essence of the proposal to an audience?

Distribution and Diffusion

Use convergent thinking to bring the proposal to a wider audience, what are the elements required to scale up the solution and create impact?

- what is the preferred route to implementation?
- who are the key players needed to make the project real?
- how will you promote and market this innovation to a wider audience?
- how will you test the solution and incorporate feedback to further improve the solution?

Future Challenges in Service Design

Services represent around 80 per cent of the economy. Service design applies human-centred design principles to make services that are more sustainable and desirable for changing consumer priorities. It delivers better experiences, successful innovation and business value. It can be applied to global challenges in all sectors ranging from retail, banking to transportation, health, and education etc. In this session, students will discuss some of the challenges in service design as a key enabler to humanize the world and to create a better future for all of us.

Project tutorial sessions

The teams will work in small groups and the workshop facilitators will be available to visit and comment on the projects in the rooms to give feedback.

Opportunities for International Students

This session provides an opportunity for international students to find out more about studying in the UK and at Imperial and RCA. They will find out about student life and facilities on campus, programmes available, the application process and scholarships.

Online Social Activities

These social sessions will offer students an opportunity to gain an insight into British Culture and get to know each other through interactive activities.

Group Presentations

Students in groups will apply their learning and present their design ideas to a panel and the best project team will be awarded a prize and a letter of recognition. All students will receive a project assessment score.

Comments from 2022 winter cohort:

- *This course gave me an amazing experience to dive deep into some of the global challenges and make imaginative ideas became true. It was quite engaging even if it was online. Collaborating online with people from different background really activate my creativity.*
- *I never thought i can learn this much during a 2 week course.*
- *Participating in this course has been very rewarding. As a design student, the school's courses are relatively scattered, and I have learned design-related knowledge, but I am rarely able to systematically learn and apply design thinking. Through this design thinking course, the whole process of design has been reorganized, and design thinking has been effectively used.*
- *Get to know the global challenges and make every second in your life count by tackling them. the final design project, which can be said to kill two birds with one stone. It not only produced a plan, but also exercised the ability of design thinking.*
- *A really useful course which makes me fall in love with service design.*
- *The course offered an opportunity to learn the scientific, efficient and systematic design process of Royal College of Arts, together with Imperial's great business insights.*
- *This course really helps us to learn more about innovation thinking and teamwork, that's really helpful for our future work, if you interest in design, just join it!*
- *Very nice course and the best teachers! I've really learned a lot through this course, Thanks!*
- *I think this course is very meaningful and adds to the fun while learning the skills.*
- *I gained a lot from this winter camp. Several lovely professors gave very useful lectures and the cooperation of the group. They are all unforgettable experiences for me, and also provide help for my next study.*
- *One of the best features of the course is collaborating with different people from different background. We shared our different perspective and everyone can learn a lot from the process.*
- *Great combination of inspiring design courses and workshops to develop our ideas.*
- *Very grateful to Imperial and RCA for offering such a course, it is my honour to participate in it. An unforgettable experience!*
- *It was a great experience for me to be able to interact with teachers from Imperial College and RCA at the same time.*
- *It helps me get to know how real world challenges are tackling and discover new challenges under the guidance of teachers.*

Photo above: Class of 2022 winter school

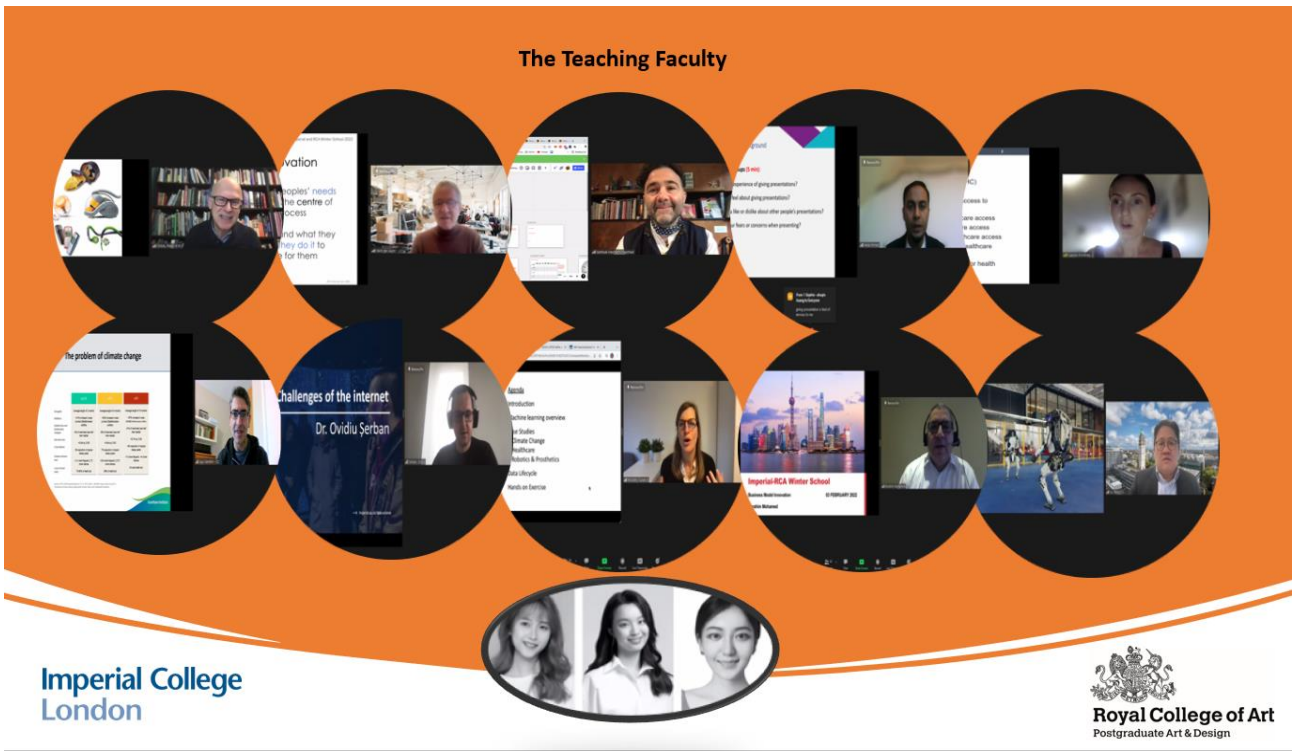


Photo above: The Teaching Faculty