MASTERS OF TALL BUILDINGS AND VERTICAL URBANISM
(M.TBVU)
A NEW URBAN FUTURE

The Illinois Institute of Technology (IIT) and the Council on Tall Buildings and Urban Habitat (CTBUH) are pleased to announce the Masters of Tall Buildings and Vertical Urbanism (MTBVU), the world’s first multi-disciplinary advanced degree focused specifically on the building type that more than any other, in an age of rapid urbanization, holds the key to sustainable existence for humanity on this planet – the high rise. This new, design- and research-based program brings together students and professionals from architecture, real estate, engineering, urban design, construction management, finance, and other backgrounds in a unique learning environment built to foster interdisciplinary research and experience. Students will work with a remarkable roster of industry leaders to discover innovative approaches to vertical density and city-making.

“Future generations must design responsive, high-density cities that support both human and environmental health.”

HIS EXCELLENCY, MOHAMED ALI ALABBAR
Founder and Chairman, Emaar Properties, Dubai

ADVISORY AND TEACHING PANEL MEMBER; SEE PAGE 10

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DEAN’S STATEMENT

With more than a million people projected to move into cities every week for the next 25 years – and in the face of major climate change – there is perhaps no greater challenge for humanity than creating humane, equitable, exciting, healthy urban centers. And there is no single building type more important to, or emblematic of, modern cities than skyscrapers. Moreover, there is no school of architecture with a stronger pedigree in tall buildings than Illinois Institute of Technology (IIT). After all, skyscrapers were invented in Chicago, just blocks from our campus. Many structural, formal, and organizational innovations in tall building design began as projects here at IIT. Our renowned faculty and advisory council enable our students to engage directly with the most influential experts in the field. Our fabrication center, one of the largest in the country, offers hands-on, at-scale project development. And you will study in Crown Hall, one of the most important works of modern architecture in the world (and the only purpose-built architecture school designed by Mies van der Rohe). This is a chance to develop expertise in a subject that is vital to our common future, and to do that in a setting that is unparalleled. Join us!

PROGRAM DIRECTOR’S STATEMENT

In order to ensure that cities are places where people can thrive, we must do more than simply increase density. This program looks to position its graduates at the nexus of how future cities develop. We need to integrate tall buildings more thoughtfully into both our urban and social fabrics. To accomplish this, we need to create a new cohort of professionals trained specifically to engage in the sustainable design, construction, operation, and management of tall buildings in the context of a comprehensive understanding of cities – a sustainable, vertical urbanism. Our new Masters program brings together the great strengths and diversity of Illinois Institute of Technology and the global Council on Tall Buildings and Urban Habitat – an unparalleled combination of academic and professional resources. CTBUH has a unique, 50+ year history of research, documentation, and advocacy; the only organization of its type in the world. Our 2 million+ members include virtually every world leader in the realm of tall buildings, from architects and engineers to developers, financiers, and public servants. Together, we offer students an opportunity that is simply not available elsewhere. As a graduate of this program, you will enter the field with a unique set of knowledge, skills, and connections, prepared to create positive, sustainable outcomes for future societies.
PROGRAM HIGHLIGHTS

HELP DETERMINE THE FUTURE OF HUMANITY ON THIS PLANET
This program seeks to explore nothing less than the most sustainable solutions for an urban future, in the increasing global emergencies of climate change, health and wellness; population growth; and mass urbanization. See how the constituent courses contribute to this on page 6.

WORK IN A MULTIDISCIPLINARY SETTING
The program brings together students and early-career professionals of myriad backgrounds, to work with experts of all disciplines in multi-perspective collaboration, to determine the most viable and sustainable way forward for cities (see page 10).

CAREER OPPORTUNITIES
Many of the renowned firms supporting this program offer a paid one-year internship, pending an application process, after successful graduation (see page 12), or you can pursue a PhD or career in research (see page 18).

EXPERIENCE THE LEARNING LABS OF CHICAGO & IIT
Chicago – and IIT – were the first crucibles for the skyscraper, and continue to be driving forces for the evolution of cities. Study in, and experience, the high-rise learning laboratories that are Chicago and the home of Mies van der Rohe: IIT (see page 14).

FUNDING AND TRAVEL OPPORTUNITIES
Sponsored programs through CTBUH – as well as potential paid internships – support research, international travel, and other opportunities (see page 16).

BEYOND THE TROPHY BUILDING
The program focuses beyond the tall building as a singular icon, to considering the three-dimensional vertical city as a whole (see past studio outputs on pages 20–27).

Led by Tengku Dato’ Ab Aziz Tengku Mahmud, CEO of PNB, students toured the construction site of Merdeka 118, the second tallest building in the world, as part of the MTBVU international trip to Singapore and Kuala Lumpur, partially funded by scholarships.
Please note: Both pathways below can be undertaken in two semesters, two semesters plus a summer, or spread over two years for those continuing to work in industry.

### PROGRAM PATHWAYS

<table>
<thead>
<tr>
<th>TWO PATHWAYS</th>
<th>SEMESTER 1: FALL</th>
<th>CREDITS</th>
<th>SEMESTER 2: SPRING</th>
<th>CREDITS</th>
<th>SEMESTER 3: SUMMER</th>
<th>CREDITS</th>
<th>TOTAL CREDITS</th>
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<tbody>
<tr>
<td><strong>1: M.TBVU DESIGN PATHWAY</strong>&lt;br&gt;The core of the design pathway is the design studio in each semester. The first semester project is often set overseas (see more on page 16).</td>
<td>ARCH 545 Tall Building Design Studio I</td>
<td>6</td>
<td>ARCH 546 Tall Building Design Studio II</td>
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<td></td>
<td>ARCH 570 Seminar: Talking Tall I</td>
<td>3</td>
<td>ARCH 571 Seminar: Talking Tall II</td>
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<td></td>
<td>ARCH 572 Tall Building Technologies I</td>
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<td>ARCH 573 Tall Building Technologies II</td>
<td>3</td>
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<td>Approved Elective</td>
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<td><strong>2: M.TBVU RESEARCH PATHWAY</strong>&lt;br&gt;Students on the research pathway increasingly focus on a research output as the course progresses, rather than design studio.</td>
<td>ARCH 601 Research Methodologies</td>
<td>3</td>
<td>ARCH 546 Tall Building Design Studio II</td>
<td>6</td>
<td>ARCH 592 Masters Project (Research)</td>
<td>6</td>
<td><strong>30</strong></td>
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<td>ARCH 570 Seminar: Talking Tall I</td>
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<td>ARCH 571 Seminar: Talking Tall II</td>
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<td><strong>TOTAL CREDITS:</strong></td>
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PROGRAM COURSE DESCRIPTIONS

ARCH 545: TALL BUILDING DESIGN STUDIO I
(6 credits, Semester One)
ARCH 546: TALL BUILDING DESIGN STUDIO II
(6 credits, Semester Two)

The Tall Building Design Studio is the core of the MTBVU design pathway. Students work collaboratively in small groups (typically 2–4 students), or individually, on a real-world design problem and site of some complexity, either on an urban scale or a single tall building. All students undertake ARCH 546 Tall Building Design Studio II in semester two, irrespective of whether on the MTBVU design or research pathways. A major international trip is undertaken in semester two, with a travel stipend offered to help support the building/site visits and cultural experience. The trip allows students to explore real-world examples related to the studio project and gives valuable insights into architectural innovations and various design strategies (Note: All students in the program, irrespective of design or research pathway, can join this international trip – see more on page 16). The studio typically meets with tutors on that subject, with weekly tutorials. The final outputs are shown on pages 20–27 of this brochure.

ARCH 570: TALKING TALL I
(3 credits, Semester One)
ARCH 571: TALKING TALL II
(3 credits, Semester Two)

The Talking Tall course is focused on the “softer” side of tall buildings and cities, and investigates the physical, environmental, and social sustainability implications of urban density and tall buildings at human, architectural, and urban scales. This course provides students with in-depth knowledge and resources to investigate high density in the context of existing and future cities. Sub-topics include design principles; technologies; appropriateness to context; energy consumption; life-cycle considerations; natural ventilation; vertical greenery; façades; new typologies; zoning and planning; analysis of vertical urbanism vs. suburban sprawl; transportation and infrastructure implications; quality of life for residents in tall urban environments; and other subjects. All of this is undertaken with a view to a discourse on what should constitute a holistic vision of “sustainable vertical urbanism.”

ARCH 570 Talking Tall I is delivered by the program director, Dr. Antony Wood. The course is convened as a seminar course, with three distinct aspects each week; (i) a presentation on a particular subject; (ii) a reading related to that subject; (iii) a comprehensive discussion around that subject. It is examined through two exams, constituting 50% of the final grade each, at mid-term and end of semester.

In semester two, ARCH 571 Talking Tall II is intended for a smaller group of students who develop a focused research topic of personal relevance, working together with an expert tutor on that subject, with weekly tutorials. The final outputs are a presentation to peers, and a 4000-word paper, the best of which are published in the CTBUH Journal, and disseminated internationally.

ARCH 572: TALL BUILDING TECHNOLOGIES I
(3 credits, Semester One)
ARCH 573: TALL BUILDING TECHNOLOGIES II
(3 credits, Semester Two)

This lecture/seminar course provides students with an understanding of the technologies that enable tall buildings and dense future cities, especially cutting-edge and emerging technologies. The technologies examined embrace both the building and urban (infrastructure) scales. Sub-topics include; artificial intelligence (AI); building automation control systems; building information modeling (BIM); building maintenance; construction; energy conservation and generation; environmental engineering; environmental protection; façade engineering and systems; fire and life safety engineering; geo-technical / foundations; MEP engineering; project and property management; renovation & retrofit; security; seismic engineering; structural engineering; sustainability; transportation; urban infrastructure; vertical transportation; and wind engineering. ARCH 572 Tall Building Technologies I is delivered through weekly lectures, typically given by a high-profile subject expert from the field of practice, together with further research and discussion.

In semester two, ARCH 573 Tall Building Technologies II is focused on a specific topic (e.g., innovative façade systems) at a more detailed level. Students are tasked to incorporate the learning from this subject into their studio project, or a hypothetical tall building if the studio project is not relevant. In addition to designing the façade system, the course utilizes simulation software to discuss the integration of environmental analysis into the design scheme. The course is delivered by presentations on particular subjects and desk crits, on the weekly progress of each project.

ARCH 601: RESEARCH METHODOLOGIES
(3 credits, Semester One)

This course – undertaken with other research-focused students in the College of Architecture at IT – provides a foundation for advanced students in the diversity of research paradigms in architecture. The first component is an introduction to the philosophy of knowledge with an emphasis on architecture. The second component entails a critical review and evaluation of diverse research methodologies in current doctoral architectural research. It is intended to provide substantial information on research methodologies not covered in undergraduate and graduate education. In this course students write a series of papers that critically review the course readings and discussions.

ARCH 592: MASTERS PROJECT
(6 Credits, Yearlong or Summer)

The Masters Project involves the synthesis of architectural study into an independent project. The Project most commonly embraces either the design of a tall building, or in-depth research about a specific aspect of tall buildings or cities. Students work one-on-one with a supervisor and outputs might include traditional forms such as a design project or written thesis, but also non-traditional forms such as a website, video, or exhibition. The area of focus for the Masters project is often an extension of a previous study undertaken through other classes.
ADVISORY AND TEACHING PANEL

The high-profile, multidisciplinary Advisory and Teaching Panel meets once per year to review outputs and the direction of the course. In addition, each member—who is appointed for a three-year term initially—is committed to a significant involvement in the course during their appointment. That involvement might embrace tutorials and studio reviews; presentations to the group; hosting office visits; and other initiatives.

Companies designated with an asterisk (*) have also committed to supporting a paid internship following graduation from the program, pending an application process.

His Excellency, Mohamed Ali Alabbar
Founder and Chairman, Emaar Properties*, Dubai
Global entrepreneur and head of most renowned Middle Eastern property developer, owner of Burj Khalifa, Dubai.

Melissa Burton
Director, Arup*, Toronto
Leader of planning, advisory, technology services, and an Arup Fellow, with a background in wind engineering and a focus on environmental and urban realm impacts.

Jeanne Gang
Founder, Studio Gang*, Chicago
Chicago-based architect known for several seminal tall buildings such as Aqua and Vista Towers, Chicago.

Oussama Kabbani
Advisor to His Excellency, CEO, Royal Commission for Riyadh City, Saudi Arabia
Urban Development specialist, Harvard graduate, former chief planner for Beirut, and current advisor on the urban expansions of Riyadh.

James Von Klemperer
President, Kohn Pedersen Fox*, New York City
Leader of one of the world’s most famous architectural practices for tall buildings, designers of Shanghai World Financial Center, Shanghai, among others.

Viviana Muscettola
Director, Zaha Hadid Architects*, London
Italian architect and director at ZHA, working on numerous high rise projects globally.

Gregg Pasquarelli
Founding Principal, SheP, New York City
Architect for world’s ‘most slender’ tall building, 111 West 57th Street, as well as American Copper, both in New York City, and other notable high-rises.

Moshe Safdie
Founder, Safdie Architects*, Boston
Architect, urban planner, and theorist rethinking connected vertical urbanism with projects such as Marina Bay Sands, Singapore.

Saskia Sassen
Professor, Columbia University, New York City
Sociologist and foremost thinker on globalization and future cities. Coined the term “global city.”

Sarah Srensen
Director, Statoil*, Stavanger
Expectant mother, world-renowned Norwegian architect and Chair of the CTBUH Urban Design Committee.

Benjamin Romano
Founding Partner, BLP Architects*, Mexico City
Prominent Latin American architect, former developer and educator; previous Harvard expert-in-residence; designer of Mexico’s seminal Torre Reforma.

Martha Schwartz
Founding Principal, Martha Schwartz Partners*, New York City
One of the world’s foremost landscape architects, and professor at Harvard University.

Charles Tapar
Executive Director, Property and Asset Management APAC, JLL*, Mumbai
Head of the overseas arm of the world’s largest construction firm, with projects in over 40 countries.

ShaoFeng Wang
CEO, International Operations, China State Construction Group, Beijing
Head of the overseas arm of the world’s largest construction firm, with projects in over 40 countries.

James Parakh
Program Manager of Urban Design, City of Toronto Planning Division, Toronto
Award-winning architect and Chair of the CTBUH Urban Design Committee.

BENJAMIN ROMANO
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MUN SUMM WONG
Partners*, New York City
Prominent Latin American architect, former developer and educator; previous Harvard expert-in-residence; designer of Mexico’s seminal Torre Reforma.

MARTHA SCHWARTZ
Founding Principal, Martha Schwartz Partners*, New York City
One of the world’s foremost landscape architects, and professor at Harvard University.

CHARU THAPAR
Partner, MS Architects*, New Delhi
Leading Indian architect, urbanist, with 40 years of experience designing environmental high-rise buildings today.

CAROL WILLIS
Founding Director and Curator, The Skyscraper Museum, New York City
Architectural historian and author of seminal texts such as “Form Follows Finance: Skyscraper and Skylines in N.Y. & Chicago.”

Mike Wells
Co-Founder, Biodiversity by Design, London
Ecologist and socio-ecologist, with 40 years experience in ecological science.

Jeanne Gang
Founder, Studio Gang*, Chicago
Chicago-based architect known for several seminal tall buildings such as Aqua and Vista Towers, Chicago.

William Baker
Consulting Partner, Skidmore Owings and Merill*, Chicago
Structural engineer for the world’s tallest building, the Burj Khalifa, and many other notable projects.

Albert Chan
Director Of Development Planning And Design, Shu On Land*, Shanghai
Leads the master planning, sustainability efforts and design of large mixed-use developments in China, including the world-renowned Xintiandi in Shanghai.

Nathalie de Vries
Founding Partner, MVRDV*, Rotterdam
Architectural historian and theorist rethinking architectural practices and technic rethinking connected vertical urbanism with projects such as Marina Bay Sands, Singapore.

Werner Sobek
Ingenieure*, Stuttgart
Famous engineer of numerous high-rise buildings, as well as creator of the Institute of Lightweight Structures, Stuttgart.

Jeanne Gang
Founder, Studio Gang*, Chicago
Chicago-based architect known for several seminal tall buildings such as Aqua and Vista Towers, Chicago.

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Saskia Sassen
Professor, Columbia University, New York City
Sociologist and foremost thinker on globalization and future cities. Coined the term “global city.”

Charles Tapar
Executive Director, Property and Asset Management APAC, JLL*, Mumbai
Responsible for the asset management of over 240 million square feet of office space in the Asia Pacific region.

ShaoFeng Wang
CEO, International Operations, China State Construction Group, Beijing
Head of the overseas arm of the world’s largest construction firm, with projects in over 40 countries.

James Parakh
Program Manager of Urban Design, City of Toronto Planning Division, Toronto
Award-winning architect and Chair of the CTBUH Urban Design Committee.

Benjamin Romano
Founding Partner, BLP Architects*, Mexico City
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Responsible for the asset management of over 240 million square feet of office space in the Asia Pacific region.
Alumni Reflections

"Coming from Thailand, it was my dream to work at KPF after graduation from IIT.”
PIM SUNSANEEVITHAYAKUL
Architectural Designer, KPF
New York City

"After my PhD on Urban vs. Suburban Sustainability at IIT in 2015, I worked for CTBUH and am now Director of the Master of Urban Design Program at Thomas Jefferson University, Philadelphia.”
DR. PENG DU
Director of Master of Urban Design Program, Thomas Jefferson University

"After the IIT-CTBUH Tall Building Program, I was assisted with a placement in the Gensler Shanghai Office, where I have been since 2018, now an associate.”
JARED DAVIS
Designer, Gensler, Shanghai

"I continued one of the themes from the tall building course into a PhD study, and now also have a teaching position at IIT.”
ZAHIDA KHAN
Adjunct Professor and PhD Candidate, IIT

INTERNSHIP OPPORTUNITIES

The companies listed here have committed to supporting a paid internship following graduation from the program, pending an application process.

ARUP

KPF

MVRDV

Safdie Architects

SOM

Tishman Speyer

WOHA

Zaha Hadid Architects

STATEMENT ON STEM

The MTBVU program is officially approved as a STEM (science, technology, engineering, and mathematics) designated field of study in Architectural and Building Sciences/Technology within the U.S. Department of Homeland Security’s STEM designated fields list. International students who have earned degrees in STEM fields in the US, may apply for a 24 month extension of their post completion Optional Practical Training (OPT) employment for a total of 36 months, a significant benefit for international students who wish to stay and work in the US, post-graduation.
ABOUT IIT
The Illinois Institute of Technology is a venerable, research-driven technological university located in Chicago. With more than 5000 students (from nearly every country in the world), 1000 faculty and staff, and a history of breakthrough developments (the cell phone was invented here, as was design-thinking), IIT has been an important center for education and research in the Midwest for more than 100 years.

IIT’s campus, designed by renowned architect Ludwig Mies van der Rohe, is located just south of Chicago’s vibrant and architecturally rich downtown. Our proximate and collaborative relationship with the nation’s third-largest city provides both inspiration and a fertile testing ground for research and practice, as students learn from, and work, in a global metropolis. As such, many of IIT Architecture’s students and faculty have left their mark on Chicago in the high-rise realm, including Bruce Graham and Fazlur Khan’s Sears (now Willis) Tower and the John Hancock Building (now 875 North Michigan Avenue), among many others.

To learn more about IIT, visit IIT.edu.

ABOUT CTBUH
The Council on Tall Buildings and Urban Habitat (CTBUH), founded in 1969 and with offices in Chicago, Shanghai and Venice, is the world’s leading non-profit organization for all those interested in the future of cities.

We explore how increased urban density and vertical growth can support more sustainable and healthy cities, especially in the face of mass urbanization and the increasing effects of climate change. The relationship between policy, infrastructure, buildings, people, space, and place is key.

Students taking the M.TBVU program will benefit from CTBUH initiatives directly, including opportunities for internships, sponsored research, design, conference, and travel programs (see more on this on page 16). In addition, students will gain unparalleled access to the CTBUH global network of multi-disciplinary professionals. Key office visits, building tours, industry internships and future career opportunities will be an integral part of the program. For a glance at some of the high-profile CTBUH members who are part of the M.TBVU Advisory and Teaching Panel, see page 10.

To learn more about the Council, visit CTBUH.org.

WILLIAM BAKER
Consulting Partner, Skidmore Owings and Merrill, Chicago ADVISORY AND TEACHING PANEL MEMBER; SEE PAGE 10

“The supertall building was invented in the basement of IIT’s Crown Hall, through the work of Fazlur Khan, David Sharpe, and others.”

CTBUH Members by Profession
- 24% Architecture/Urban/Interiors
- 26% Owner/Developer/Occupier
- 25% Engineering (all types)
- 9% Construction/Project Management
- 4% Association/Government/University
- 9% Materiales/System Supplier
- 1% Other

CTBUH Members by Region
- 38% North America
- 27% Asia
- 17% Europe
- 9% Middle East
- 7% Australia
- 1% Africa
- 1% Central/South America
- 1% Middle East
- 1% Other

“The CTBUH organizational member network embraces over 2 million individuals, working in 10,000+ offices, in more than 100 countries around the world.”

SUPPORT OPPORTUNITIES THROUGH IIT
IIT offers a full program of student support, ranging from financial aid to health care to teaching opportunities. Nearly all IIT students are eligible for aid through the university (Federally supported programs are limited to US citizens). The College also offers a range of scholarships, internships, and work opportunities. As graduate students, participants in the program are also eligible to apply for teaching assistantships in the University, as well as the College of Architecture. For more information on all these programs, please see IIT.edu.

Support Opportunities Through IIT

© Arturo Duarte Jr

CTBUH President and Director of the MTBVU, Dr. Antony Wood addresses the audience at the CTBUH 2023 International Conference in Singapore.
UNIQUE SUPPORT OPPORTUNITIES THROUGH CTBUH

In addition to internship and career opportunities, students in this degree program can benefit from the following specific academic programs convened by the CTBUH:

INTERNATIONAL TRAVEL PROGRAM
Every student in the program will have the opportunity to join an overseas study visit in semester one, receiving a travel stipend (usually around US$1,000) to help offset expenses. The destination for this study visit is usually driven by two, typically aligned, influences: (i) the location of the CTBUH Annual Conference, and (ii) the location of the site that serves as a vehicle for the Tall Building Design Studio (ARCH 545).

INTERNATIONAL STUDENT DESIGN COMPETITION
The CTBUH Student Tall Building Design Competition champions site-specific urban responses to global issues, while giving top students the chance to showcase their work. Finalists are selected to present their proposals to a jury of experts at the CTBUH International Conference, where an overall winner is selected. Winning students receive cash prizes, as well as complimentary conference registration and travel/accommodation costs.

CONFERENCE ATTENDANCE
The Council holds two major international conferences per year: its Tall & Urban Innovation Awards Conference in the spring (held in Chicago), and its Annual Conference held in a high-rise city somewhere around the world each fall. All students in the program receive complimentary registration at both conferences (typically around US$1,500). Locations of CTBUH conferences in the past ten years include Abu Dhabi, Dubai; Hong Kong; London; Mumbai; New York City; Seoul; Shanghai; Shenzhen; and Sydney.

STUDENT RESEARCH COMPETITION
The goal of the annual Student Research Competition is to assist talented students, working in groups under the guidance of a professor, to focus on a relevant research question, and create an engaging output as a response. The competition typically culminates with an award of US$10,000–$20,000, recognized on stage at the CTBUH International Conference, and promoted through CTBUH channels and platforms. The project often also leads to a publication or other substantial output.
PHD AND RESEARCH OPPORTUNITIES

The program is an excellent feeder into three different types of career: professional practice, further advanced study at the PhD level, or even a career in research. There are opportunities for internships at CTBUH during the program itself, as well as the possibility of appointment as a research assistant after graduation. The following studies are examples of industry and federally-funded research projects at CTBUH in the past few years.

**Future Timber City: An Awareness and Educational Program for Future, Sustainable, Dense Cities**
- Project Completion: July 2022
- Project Duration: 2 years
- Funding Sponsor: USDA Forest Service and Binational Softwood Lumber Council
- Provides a framework for better understanding the character and dimensions of a future mass timber city.

**Robotics in Tall Building Construction**
- Project Completion: November 2020
- Project Duration: 2 years
- Funding Sponsor: Schneider
- Identified the incentives for, and obstacles to, the adoption of robotics in the construction industry.

**Skybridges: Bringing the Horizontal into the Vertical Realm**
- Project Completion: August 2020
- Project Duration: 2 years
- Funding Sponsor: TK Elevator GmbH
- Succinctly captured the state-of-the-art in skybridge design, as well as puts forward a set of principles for future development.

**A Study of the Sustainability Implications of Differing Urban + Suburban Locations in Chicago**
- Project Completion: February 2016
- Project Duration: 2 years
- Funding Sponsor: CTBUH and Illinois Institute of Technology
- A comprehensive real-data study on all factors that contribute to “sustainability” in an urban vs. suburban context.

**The Space Within: Skyspaces in Tall Buildings**
- Project Completion: November 2018
- Project Duration: 2 years
- Funding Sponsor: CTBUH Urban Habitat Committee
- Identified and addressed the missing technical requirements for green living technologies (for roofs and façades) in existing international standards.

**Robotics in Tall Building Construction**
- Project Completion: November 2020
- Project Duration: 2 years
- Funding Sponsor: Schneider
- Identified the incentives for, and obstacles to, the adoption of robotics in the construction industry.

**The Space Between: Urban Places, Public Spaces & Tall Buildings**
- Project Completion: October 2017
- Project Duration: 2 years
- Funding Sponsor: CTBUH
- Investigated the importance of publicly accessible spaces surrounding tall buildings, and how they impact the quality of life for those that live, work, and visit tall building neighborhoods.

**A Comprehensive Study on Tall Building Damping Technologies**
- Project Completion: October 2017
- Project Duration: 2 years
- Funding Sponsor: Bouygues Batiment International
- Produced a comprehensive study of the damping technologies available for tall buildings, describing their function and relationship to other building components.

**A Study of the Sustainability Implications of Differing Urban + Suburban Locations in Chicago**
- Project Completion: February 2016
- Project Duration: 2 years
- Funding Sponsor: CTBUH and Illinois Institute of Technology
- A comprehensive real-data study on all factors that contribute to “sustainability” in an urban vs. suburban context.

**Life Cycle of Tall Building Structural Systems**
- Project Completion: January 2015
- Project Duration: 2 years
- Funding Sponsor: ArcelorMittal
- Established a definitive comparison of the life-cycle carbon implications of steel, concrete, and composite structural systems in tall buildings.

**Green Walls in High-Rise Buildings**
- Project Completion: October 2014
- Project Duration: 1 year
- Funding Sponsor: Arup
- Set out recommendations for selecting, implementing, and maintaining green walls in high-rise buildings.

**A Comprehensive Study on Tall Building Damping Technologies**
- Project Completion: October 2017
- Project Duration: 2 years
- Funding Sponsor: Bouygues Batiment International
- Produced a comprehensive study of the damping technologies available for tall buildings, describing their function and relationship to other building components.

**A Study on the Design Possibilities Enabled by Ropeless, Non-Vertical Elevators**
- Project Completion: September 2018
- Project Duration: 2 years
- Funding Sponsor: TK Elevator GmbH
- Investigated how technological innovation in elevators, specifically ropeless non-vertical cabins, could impact the design outcomes of tall buildings and cities.

**A Comprehensive Study on Tall Building Damping Technologies**
- Project Completion: October 2017
- Project Duration: 2 years
- Funding Sponsor: Bouygues Batiment International
- Produced a comprehensive study of the damping technologies available for tall buildings, describing their function and relationship to other building components.
RECENT MTBVU STUDIOS AND PAST IIT-CTBUH HIGH-RISE STUDIOS

The following is a selection of recent/past projects by Illinois Institute of Technology (IIT) students. This work – focused on tall buildings and vertical urbanism – showcases an emphasis on connected urbanism, rather than on a single tall building.

NOVA PRO FORMA

Various Cities, United States

In fall 2023, the world-renowned architecture firm Skidmore, Owings & Merrill (SOM) ran this MTBVU studio. Under the guidance of three senior colleagues at SOM: Scott Duncan, Design Partner; Jorge Rovira, Associate Principal; and Jason Fisher, Associate Principal, the Nova Pro Forma design studio tasked students to reimagine the tall building as the embodiment of emerging and entirely new uses that speak to novel modes of working and the ecological imperatives we confront today. Students chose from six “alternatives,” developing both an architecture and a nova pro forma, based on the following business cases for tall structures: 1) Carbon Capture; 2) Energy Generation; 3) Energy Storage; 4) Food Production; 5) Server Farming; 6) Medicine; and 7) An amalgam of all the six cases to support multifamily housing.

The viability of the traditional tall building typology is currently being called into question by multiple factors. The two primary functions housed within the vast majority of towers – commercial office and multi-family residential – have each seen radical transformations triggered by the COVID pandemic, resulting in less demand for office space due to remote work practices, and the attendant downward pressure on living in the urban core, recognizing that many types of work can be done from the suburbs or even from more dispersed locations. A heightened awareness about the importance of energy efficiency and other forms of environmental sustainability has also caused many to question those aspects of the tall building as a type.

An often overlooked aspect of tall building design is the pro forma – Latin for “as a matter of form” and the financial model that informs the number of floors, gross floor area, cost dynamics and revenue stream – that is so fundamental to its reason for being. Without the pro forma, there is no tall building. In light of the aforementioned pressures, the future of the tall building as a typology is reliant on a reimagining of the pro forma – a nova pro forma.

Above: “Five Jumps to Chicago” project by Davis Housman

Above: “Unmanned Building for Man” project by Jusang Lee

Above: “The Living Carbon Effect” project by Allison Drooger
FUTURE TIMBER CITY
Del Norte County, CA, United States

The year is 2070 and, after six decades of attempting to adapt cities to cope with “natural” disasters of increasing frequency and severity in the face of accelerating climate change, humanity has come to accept a simple truth: that the continued viability of our cities is now governed by the inherent sustainability of their location, rather than the increasingly desperate attempt to superimpose more resilient infrastructure on existing urban centers, which typified urban development in the first half of the 21st century. Current cities have largely become soulless and undemocratic; vertical but homogenized physically and culturally; and reel from one climate-change-induced disaster to another.

At the onset of 2070, then, our continued survival on this planet relies on the creation and inhabitation of new, ultra-dense, “megacities” (each with upwards of 100 million people), that limit the impact on the land and maximize their sustainable symbiosis with both location and resources. As we stand on the cusp of the world’s largest forced urban migration, with 9.7 billion people scheduled to move into these new megacities over the next 50 years, the United Nations has established a task force (of which you are a part!), whose mission it is to consider the most appropriate locations for these megacities, and what they might become in physical, urban, social, political, economic, infrastructural and human terms. The very survival of humanity on this planet is dependent on the outcome.

The above scenario was the basis for this collaborative design studio undertaken by IIT College of Architecture with assistance from the CTBUH, in the Masters of Tall Buildings and Vertical Urbanism (MTBVU) program. Students were tasked to design a future city of 10 million inhabitants, built out of timber to the greatest extent possible, as a response to contemporary and future pressures of climate change, rapid population growth and massive urbanization. In semester one, students began with research projects to explore the key viable solutions for the future city in 2070 and beyond (e.g., specific city location; urban densities and organizing principles; urban functions and sizing; forests and trees; energy generation and storage; food production; water; waste; urban transportation systems; and use of mass timber) and integrated the research findings into their design scheme. They continued progressing the design scheme during semester two, developing the urban vision in more detail, and advancing the design of a cluster of tall buildings within the vision to a more detailed level. This phase took into consideration technical aspects of the studio project, on which the students worked in parallel with external experts from CTBUH member companies, in a MTBVU course entitled “Tall Building Technologies”, as part of the curriculum.

Above: “Mycelium Myriad” project by Katarzyna Wodtisz and William Manzanilla
Above: “Timber City” project by Malhar Kate, Nathaniel Stanislaw, and Patrick O’gara
Above: “Towards 2070: Vertical Adaptation” project by Jiwon Park and Divya Sureban
TOWARDS ZERO-CARBON CITIES
Shenzhen, China

The United Nations forecasts that 70 percent of the world’s projected nine billion population will be urbanized by the year 2050, creating one million new urban inhabitants per week for the next several decades. At the same time, the planet is rapidly experiencing climate change, and every indication is that there is an urgent need to slow the rate of planetary warming within less than a decade to avert catastrophic consequences, especially with respect to coastal cities. This year-long studio conducted research in order to develop a typology of possible sustainable vertical cities that integrate the maximum number of relevant sustainable design strategies and technologies, not only in terms of carbon, but also in terms of internal environment, building community, and the impact of the building on the physical, social and cultural realms. In the fall semester, students focused on the urban scale, in the context of the Qianhai area of Shenzhen, China – which they visited. They researched and designed a zero-carbon city, which was expected to run entirely on renewable energy. In the spring semester, the students focused on a zero-carbon cluster of skyscrapers – specifically developing the design within the urban design developed in the previous semester. The final designs took into consideration the cultural, climatic, and physical aspects of the location, and focused on net-zero carbon technologies and systems within the design proposals.

2 Global Warming of 1.5°C. Summary for policymakers. Intergovernmental Panel on Climate Change, 2018.
SUSTAINABLE VERTICAL URBANISM: TOWARDS 2050
Global Studio

In this year-long studio, students were presented with the following scenario: The year is 2050 and, after five decades of attempting to adapt cities to cope with “natural” disasters of increasing frequency and severity in the face of accelerating climate change, humanity has come to accept a simple truth: that many existing cities—especially coastal cities—are no longer viable into the future. The United Nations has thus established a task force to address the needs of our cities. Students were asked to determine the most sustainable global locations for new cities, and determine how these cities can maximize environmental and cultural symbiosis with both terrain and climate.

In the fall semester, students conducted research in order to determine where these new cities would be best located, relative to: current population densities; the impact of climate change; and the inherent sustainability opportunities of climate and resources locally. Student groups developed the outline strategies for cities in radically different terrains and climates: the hot Saharan desert of north Africa; the mountainous Himalayas; a deforested region of the Amazon; the increasingly flooded Ganges delta of Bangladesh; the grasslands of south Sudan; the melting Arctic; and the middle of the South China Sea.

In the spring semester, students developed their strategic urban designs into the detailed design of a cluster of buildings. Students determined the size, height, function, accommodation, and responsibilities of the building(s), according to their strategic urban plan and a consideration of urban life in the future.

“The Desert City” by Kristen Barrett, Olumurewa Oguntade, and Ernesto Zuniga Jr, Algeria, was influenced by the traditional desert oasis, but elevated to a datum of 500–1,000 meters, harvesting water from high-level cloud and fog.

“The Grasslands City” by Arlene Hayes and Tra Nguyen, Sudan, studied and replicated both form and environmental strategies from African termite mounds.

“The Mountain City” by Jared Davis and Drew Armetta, Himalayas, took its design inspiration from the rock formations of southern China, extending the city into mountainous vertical form.
ADMISSION REQUIREMENTS

The Masters of Tall Buildings and Vertical Urbanism (M.TBVU) program is open to all applicants with a bachelor’s degree and a strong interest in this field. The following items are required to apply for the program:

- Application letter, explaining your interest and background in this field.
- Official transcripts
- Two letters of recommendation
- Portfolio

INTERNATIONAL STUDENTS

International applicants must meet all of the general requirements listed above as well as the following additional requirements.

- English proficiency exam (TOEFL/IELTS) scores
- Financial affidavit of support form (FAS)
- Copy of passport identity page
- School transfer form (international transfer applicants only)

WANT TO KNOW MORE?

For detailed information on deadlines and admission requirements, please visit:

arch.iit.edu/study/mtbvu

For more info, contact Program Director Dr. Antony Wood at: awood@ctbuh.org