【Tamkang Clement and Carrie Chair】Prof. Yukio Tamura Uses Tamura Model to Inspire Students to Understand Phenomena from a Spiritual Perspective

Campus focus

Invited by the Department of Civil Engineering, Professor Yukio Tamura, an Honorary Professor at Tokyo Polytechnic University in Japan, delivered a Tamkang Clement and Carrie Chair Lecture on November 14 at 10:10 a.m. in the Chang Yeo Lan International Hall of the Hsu Shou-Chlien International Conference Center. His speech, titled "Mathematical Models for Understanding Phenomena: Physical View and Mind View," explored the development process of mathematical models for vortex-induced vibration phenomena of cylinders based on his own observations and reflections. Prof. Tamura encouraged the students in attendance to grasp the essence and mechanisms of phenomena and to appreciate the true charm of research.

"Please count how many times the letter F appears in this passage." As Prof. Tamura began the countdown, an English sentence appeared on the slide. All the students and faculty present carefully counted the letter F on the projection screen. When the countdown ended, everyone was surprised to find that their answers were different. He started his talk with this question to illustrate the idea: "Observation captures facts or phenomena from a physical perspective, but ultimately, they should be transformed into a mental perspective to understand the phenomena."

In this lecture, Prof. Tamura discussed a mathematical model based on a wake oscillator, using the Tamura Model for vortex-induced oscillations of a circular cylinder as an example. Drawing on the research process from his doctoral dissertation, he explained how he attempted to describe vibrational phenomena using mathematical models developed by various scholars. However, he found that these models could not fully explain the experimental results. He systematically explored Birkhoff's wake oscillator (1953), Funakawa's early wake model (1969), Nakamura's 2DOF flutter model (1970), the Hartlen-Currie model (1970), the Iwan-Blevins model (1974), and

Tamura's own linear wake oscillator model with variable length (1979). Prof. Tamura illustrated how, through repeated observation and reflection on multiple studies, he developed a mathematical model that integrated the effects of vortex-induced vibrations and the galloping of prismatic cylinders. This comprehensive model, known as the Tamura-Shimada model (1987), was also introduced alongside some of its recent advancements.
Prof. Tamura emphasized the necessity of striving to understand phenomena and encouraged students to uncover the indirect messages hidden between the lines when reading textbooks (Read between the lines). He explained that doing so allows one to gain more than others. He outlined the process of transforming raw data into information, then into knowledge through analysis, and ultimately integrating it into personal experience and Intelligence. One can better grasp every observational element by leveraging AI (Analysis and Integration), ultimately achieving Quality Sublimation. He stated, "Knowledge is an island surrounded by a vast ocean. No matter how far we advance, we will always remain on the shore of the unknown world." The experience of deep thinking or dedicating oneself to understanding something will yield even greater rewards.
The final slide of the presentation featured the famous Japanese painting The Thirty-Six Views of Mount Fuji. Pointing to the boat caught beneath the towering wave, he asked the faculty and students in attendance, "How can you achieve your goals?" His answer: "By having a far-reaching vision and working diligently on the boat."
Another Tamkang Clement and Carrie Chair invited by the Department of Civil Engineering, Professor Ahsan Kareem spoke at the end of the lecture. In addition to praising Prof. Tamura's insights, he shared his own views on modeling. Prof. Kareem suggested that while traditional methods of building models based on physical principles are undoubtedly valuable, machine learning and AI are also viable options for model development in the current era. Prof. Tamura agreed with this perspective.
On the morning of November 13, at 10:30 and 11:00, Prof. Tamura and Prof. Kareem, accompanied by the Dean of the Colleges of Engineering, Artificial Innovative Intelligence, and Precision Healthcare, Professor Tzung-Hang

Lee Chair of the Department of Civil Engineering, Prof. Yung-Shan Hong Director of the Wind Engineering Research Center, Prof. Jen-Mu Wang and Professor Cheng-Hsin Chang, visited President Huan-Chao Keh and Chairperson Flora Chia-I Chang. President Keh and Chairperson Chang respectively presented Prof. Tamura and Prof. Kareem with Panda trophies and vases imprinted with calligraphy by Masters Chi-Mao Li and a painting by Master Ben-Hang Chang, featuring Tamkang campus scenery and the school anthem as commemorative gifts.

President Keh warmly welcomed the two Tamkang Clement and Carrie Chair professors and began by discussing the topics covered in their lectures. The speakers emphasized the importance of information literacy for university students today. President Keh shared Tamkang University's journey in promoting the concept of AI+SDGs=∞, explaining how both AI and sustainable development goals can be integrated across disciplines to enhance students' learning outcomes. He also highlighted that Tamkang University currently offers mandatory courses for freshmen in general education, including "AI and Programming Language" and "Exploring Sustainability", to help students build a strong foundation for interdisciplinary learning and boost their competitiveness. Chairperson Chang not only explained the origins of the Tamkang Clement and Carie Chair series, initiated by the university's founders, Dr. Clement C.P. Chang and his wife but also invited the speakers to view the construction progress of the Tamkang Bridge across the Tamsui River from the office. She shared updates on the project and suggested that the speakers plan trips to experience its scenic beauty when visiting Taiwan again.


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How to Reach Your Goal?
We are on the boat!
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Can you guess images on flat mirrors ?
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