53
May 2022
Bimonthly Newsletter

Taipei Tech Post

National Taipei University of Technology

New Railway Inspectors Begin Training in Taipei

Article courtesy *Taipei Times*
(Content by Cheng Wei-Chi and Liu Tzu-Hsuan / Staff reporter, with staff writer)

The first two railway track inspectors recruited last year by the Ministry of Transportation and Communications began their seven-week training yesterday (March 8th).

The inspectors are to be responsible for overseeing the safety of the operation of railway tracks upon completion of their training.

Following the example of the airline industry, the bureau created 42 vacancies for the position, which are still open to applications, to improve railway supervision, Railway Bureau Deputy Director-General Yang Cheng-Chun said.

A ceremony was held yesterday (March 8th) morning at National Taipei University of Technology to mark the beginning of the training and a milestone in railway supervision.

The bureau has commissioned the university to provide the training, including organizing courses, inviting lecturers, arranging venues and preparing teaching materials, it said.

The training is divided into three seven-week stages, the first of which was to run from yesterday to April 26, followed by a second stage at the end of June and a third stage at the end of October, the bureau said.

The main focus of the training includes operating procedures and equipment examination, which would be taught in three stages with lessons and on-the-job training, it said.

The training comprises of common courses and specialty courses in transportation, construction, rolling stock and electricity, as well as on-the-job training in each specialty to broaden the knowledge and skills of railway inspectors at the bureau and its affiliated agencies, it added.

The training is to be attended by the railway track inspectors and employees working in the relevant business units, the bureau said.

Experts from the Taiwan Transportation Safety Board, the Institute of Transportation, the Civil Aeronautics Administration, Sinotech Engineering Consultants Inc, CECI Engineering Consultants, Inc, National Taiwan University, National Taipei University of Technology and National Cheng Kung University would provide the training, it said.

The trainees have to complete the required training and pass a test at each stage before a certificate is awarded, the bureau said, adding that salaries for the railway track inspectors would be between NT$50,000 and NT$80,000 per month.

“EVAN 2”

Medical App Project of Taipei Tech and NTU Hospital, Wins 2022 iF Design Award

EVAN 2, a professional anesthesia assessment app developed by Taipei Tech in collaboration with National Taiwan University Hospital (NTUH), was awarded the 2022 iF Design Award. It is Taiwan’s first iF Design Award that sees the collaboration between a university and a hospital, and the first iF Design Award for NTUH.

Anesthesiologists must accurately assess a patient's condition in order to develop a customized program that provides the best anesthesia care to surgical patients. NTUH’s current information system provide anesthesiologists various examinations and medical records, but the system’s interface has significant room for improvements in order to increase the safety of the 40,000 patients undergoing anesthesia each year at NTUH. In addition, anesthesiologists require a mobile app in order to meet the demands of a clinical setting.

To answer this demand, Zheng Meng-Cong (Director of Taipei Tech Design Psychology Lab) and Shih Po-Yuan and Hsiao-Liang Zheng (NTUH anesthesiologists) worked with NTUH Information Technology and Philips Taiwan Ltd. to devise an iPad-based anesthesia assessment app named EVAN (EValuation of ANesthesiologists). EVAN integrates three major areas of anesthesia—pre-anesthesia evaluation, post-anesthesia check, and PCA (patient-controlled analgesia) evaluation.

The team put the first iteration of EVAN to a user study and, based on the feedback, made the improved EVAN 2, which is the version that won the 2022 iF Design Award. In addition to improving the original functionality, EVAN 2 can also help anesthesiologists monitor patients' vital signs during surgery, thus enhancing anesthesia safety and efficiency. During the post-development period, Shih even enrolled in Taipei Tech’s design master's program and joined Zheng’s Design Psychology Lab in designing EVAN 2.

EVAN 2 can help anesthesiologists monitor patients' vital signs during surgery, thus enhancing anesthesia safety and efficiency.

According to Shih, the number of anesthesia abnormalities such as seizure, emergency treatment, and difficulty of intubation has been reduced by nearly one-half since the launch of EVAN 2 at NTUH. The completion rate of pre-anesthesia evaluation has also increased from 96.25% to 99.85%. Shih believes the effectiveness of communication between healthcare professionals, designers and programmers is the key to the success of EVAN 2. Many anesthesiologists have commented that their work efficiency has improved.

The team has been working on EVAN 2 since 2018. Through working closely with NTUH anesthesiologists and repeated experimental adjustments, the app was finally completed last year. “I believe that this successful result will open more doors for cross-disciplinary cooperation between the fields of design and medical care in the future” said Zheng.

The Premier of Taiwan, Su Tseng-Chang (second left), Wang (second right), and the members of Wang's research team pose for a photo at the ceremony

Taipei Tech President Wang Receives the 2022 National Award for Distinguished Contributions to Industry-Academic Cooperation

On March 21st, Wang Sea-Fue, Taipei Tech President and Chair Professor of the Department of Materials and Mineral Resources Engineering, received the Ministry of Education 2022 National Award for Distinguished Contributions to Industry-Academic Cooperation.

Wang has long been devoted to the research and development of electronic ceramic and solid oxide fuel cells (SOFC), and he has advised many graduate program theses in this research field. Wang's work has appeared in more than three hundred SCI journals and resulted in seventy-eight domestic and international patents. He has also served as the head of the EMO Materials and Nanotechnology Center, a research institute based in Taipei Tech that collaborates with hundreds of industry partners every year.

Wang found his research interest when he studied at National Taipei Institute of Technology, the predecessor of Taipei Tech. After graduating from the Mining and Metallurgical Engineering Department (later renamed to Department of Materials and Mineral Resources Engineering), he went on to study in the U.S. He obtained his M.Sc. degree from South Dakota School of Mines and Technology and his PhD in materials science and engineering from Pennsylvania State University (Penn State).

Penn State is renowned for its close tie with the industry sector. When studying at Penn State, Wang knew that his research subject should be based on its industrial value. Right after graduation, he started working as a senior research and development engineer at Vishay Intertechnoloy, one of the largest manufacturers of passive electronic components in the U.S.

Looking back, Wang noted that the six-year period that he spent on his PhD was not easy. He decided to switch his research subject from metal to ceramics after the first three years because the data he collected was not good enough. He needed to start from scratch, and it was a very humbling lesson. "It was a difficult time, but I had learned so much along the way. Perseverance is the essential quality that got me through the process," said Wang.

As an educator, Wang has advised nearly two hundred graduate students so far, and he has always stressed the importance of independent thinking to his students. "I always encourage my students to try things that are a bit beyond their abilities because that is how they make great progress," said Wang.

2022 Design Graduation Exhibition: Sustainable Coexistence

This year's Golden Pin Design Awards, Taiwan's largest annual design awards, considered nearly five thousand entries from design schools all over, and fifteen entries from Taipei Tech design students were selected as finalists in various categories. Seven Taipei Tech projects were selected as finalists in the category Best of the Year, and three entered the final round of the Recycled Design category. Ten Taipei Tech projects made it into the final round of the Young Pin Design Award, an award specifically for design students. The final results will be announced on June 1.

According to Taipei Tech President Wang Sea-fue, in this year's industrial design graduation exhibition, the fifty-two graduating students demonstrated designs under the theme "Change Together." Some students entered their designs in this year's Golden Pin Design Award and were selected as finalists. Wang said that the "Change Together" theme is a response to the United Nations' sustainable development goal (SDG) and also to social changes due to the pandemic. Through these designs, students hope to create a better life and become a force for good in society.

"The Oyster Bench" by students Xie Yiqing and Hong Xiangting is a homage to one of Taiwan's favorite foods—oyster omelet. However, the booming coastal oyster farming industry also brings nearly 160,000 tons of discarded oyster shells every year. Xie and Hong recycled these shells by grinding them into powder, mixing the powder in cement, and making public benches. This project has been selected for the final round of the Young Ping Design Award.

To assist firefighters in putting out fire, Li Yuanjie and Zhang Yanqi came up with the idea of a high-temperature resistant drone called "Life-line" that is made of glass fiber. In their design, the drone can help carry fire hose into a fire scene to minimize the need for firefighters to personally face dangerous situations. Equipped with a thermal imaging camera, Life-line can also quickly find the source of fire and put it out. The design is especially suitable for the narrow alleys found in cities in Taiwan.

Rehabilitation after a stroke is crucial, but it is difficult to have someone with the patient at all times. Shi Yaocheng, Zheng Lixin, and Li Yizhen came up with "WHEEHAB" that is designed not only to provide rehabilitation activities, but also to automatically provide assistance when the patient is too weak to continue. The students also built gamification into WHEEHAB to motivate the user, and the rehabilitation records can be sent to a physician for evaluation.

"Change Together" is exhibited in the Taipei Tech Art and Culture Center starting from April 29. The exhibition is also hosted interactively online and can be found through the link *https://www.behance.net/taipeitech107design*. The designs will then be showcased in the 2022 Yodex from June 1 to June 4.

The Oyster Bench, made by recycled oyster shells, has been selected for the final round of the Young Ping Design Award

Life-line is a high-temperature resistant drone designed to assist firefighters in putting out fire

WHEEHAB is designed not only to provide rehabilitation activities, but also to automatically provide assistance when the patient is too weak to continue

Taipei Tech Continues Strong Performance in 2022 QS World University Rankings

Quacquarelli Symonds (QS) recently announced their results of the 2022 QS World University Rankings by Subject. In the broad subject categories, Taipei Tech has made a remarkable improvement in Engineering & Technology, raising its world ranking from last year's position of 144 to 108 this year.

Taipei Tech has also performed strongly in other subjects in this year's QS ranking:

Chemical Engineering (63), Materials Science (71), Architecture / Built Environment (51–100), Electrical & Electronic Engineering (101), Mechanical, Aeronautical & Manufacturing (106), Computer Science & Information Systems (201–250), Business & Management Studies (201–250), Environmental Sciences (251–300), and Physics & Astronomy (551–600).

Taipei Tech continually strives to maintain and strengthen its programs, giving students opportunity to apply their training to solve real-world problems. President Wang Sea-fue points out that Taipei Tech has been dedicated to education and industry-academia collaboration for years. The funding of Taipei Tech's industry-academia cooperation projects reached five hundred million NTD last year. Taipei Tech has also established the Frontier Institute of Research for Science and Technology (FIRST). The main mission of FIRST is to align Taipei Tech's resources in the research and development of energy, artificial intelligence, and semiconductors. The institute also serves as a network platform where Taipei Tech can deepen collaboration relationships with industry partners such as Delta Electronics, Acer, AUO, ELAN Microelectronics, Chicony, Sunbird, and more. Taipei Tech has also worked closely with TSMC and launched the Semiconductor Industry Program, through which hundreds of students have secured job positions at TSMC in the past three years.

As for architecture's strong showing in the QS Rankings, it is worth noting that Taipei Tech Department of Architecture is the oldest higher education architecture department in Taiwan. Many Taipei Tech architecture graduates have become world-renowned architects, including Morin Kaku (architect of Japan's first skyscraper Kasumigaseki Building) and Hou Shi-chiuan (chairman of Hanshin Department Store). In recent years, the Department of Architecture has been engaging in the development of green buildings and senior-friendly environmental design, keeping pace both with climate change and aging population issues.

New AI Graduate Program to Train Cross-Disciplinary Engineers

Taipei Tech will launch the Artificial Intelligence Technology Master's Program in Fall 2022. The program will focus on applications of artificial intelligence in healthcare, manufacturing, and Big Data. The capacity of the program is thirty-three students, and the applicants this year include undergraduate students majoring in transportation management, chemical and material engineering, digital design, foreign languages, and education.

Yang Shih-hsuan, Vice President of Taipei Tech, noted that smart technologies and Internet-enabled devices will play an important part in our daily life in the future. Programming and computational thinking will therefore be required skills for the future workforce. In addition, members of the workforce will also need cross-domain problem-solving skills in order to find solutions that AI technologies cannot solve. These skills include communicating with colleagues from different professional backgrounds and approaching problems from a variety of perspectives.

Hwang Yuh-shyan, Dean of the College of Electrical Engineering and Computer Science, pointed out that this new AI program will have faculty members from the College of Electrical Engineering and Computer Science and the College of Mechanical and Electrical Engineering, who will teach AI-related courses offered in their respective colleges. These courses cover introductory artificial intelligence, machine learning, deep learning, image processing, speech recognition, Big Data analysis, cloud computing, edge computing, and various cross-disciplinary applications. These courses are organized into three themes—healthcare, manufacturing, and Big Data—which allow students to study in depth. Students will also choose one of the themes for their individual research.

Hwang further indicated that, for this new AI program, Taipei Tech will be working closely with industry partners to plan the curriculum through the newly-established Frontier Institute of Research for Science and Technology (FIRST. Students will also be able to use an NT$20-million computing platform, donated by partners, to conduct experiments and run simulations. These industry partners include AU Optronics Corporation (AUO), ELAN Microelectronics, Acer Computer, and the Taiwan AI Academy. AUO and ELAN have also set up scholarships specifically for students of the new AI program.

After graduation, students can work in related industries both domestically and internationally, including robotics, self-driving cars, software and hardware integration, semiconductors, IC design. Graduates will also be sought after in cross-disciplinary industries such as financial technology, digital arts, online education, and more.

Taipei Tech has been actively cultivating talents for the semi-conductor industry by offering programs in collaboration with TSMC

Interdisciplinary Micro Programs Strengthen Career Readiness

In light of the rapid technology development and the need for multiple-domain knowledge in the workplace, Taipei Tech has been offering twenty-eight micro programs that are designed to help students broaden their horizons. These programs cover topics including semi-conductor, artificial intelligence, biomedical technology, green energy, and smart sensor technology, all of which are Taiwan's strategic development areas.

Yang Shih-hsuan, Taipei Tech Vice President and Provost, mentioned that Taipei Tech has been promoting micro programs since as early as 2016. The data shows that, by 2021, there have been more than four thousand students who have taken a micro program. With positive feedback from students, the university is now considering making micro programs a graduation requirement for freshman students entering in Fall 2023.

For students who are interested in semi-conductors, Taipei Tech is offering three new courses this semester: "Fundamentals of Semiconductor Equipment," "Fundamentals of Semiconductor Equipment Components," and "Advanced Semiconductor Equipment and Key Components." These courses are available to students who take either the "Semi-conductor Equipment" or the "Semi-conductor Manufacturing" micro program, and students will be able to tour TSMC's Central Taiwan Science Park facility in Taichung.

The inter-university collaboration between Taipei Tech and Taipei Medical University offers the "Biomedical Assistive Technology" micro program. Through this program, students are introduced to assistive technology. Medical and electrical engineering and the concept of design thinking are integrated into the curriculum to help students develop medical products. For example, students in the "Innovative Design of Smart Assistive Devices" course are encouraged to explore issues and develop innovative assistive devices. Students have thus far proposed designs for an all-purpose wheelchair, an Internet-enabled VR bicycle, and an oral muscle training game design.

In addition, three colleges of Taipei Tech have collaborated to offer the "Smart Sensor Technology" micro program: College of Mechanical & Electrical Engineering, the College of Electrical Engineering and Computer Science, and the College of Engineering. Students of this micro program also have the opportunity to take part in the school USR project, in which they work on upgrading fishery technology using IoT (Internet of Things) and smart technologies.

pmp THE BEST SOLUTION

TAIPEI TECH

Publisher
Sea-Fue Wang

Executive Editors
Chien-Wen Wu
Morris Fan

Editors
Yi-Wen Cheng
Vivi Chen
Jessie Lin
Siao-JIng Chen

English Copy Editors
Vivi Chen
Sharin Schroeder