仿生學 STEM 教育工作坊-向大自然取經的新興科學 從蜂鳥到新幹線

Workshop on Biomimicry for Nature-Inspired Innovation: From a Kingfisher to a Shinkansen

108 年 5 月 15 日(星期三) 上午 10 點至下午 4 點半

國立臺灣師範大學公館校區科教大樓六樓 601 會議室 (臺北市文山區汀州路四段 88 號)

工作坊簡介

本工作坊由臺師大科教中心主辦，為科技部新南向計畫合作之推廣活動，本次邀請計畫之合作對象泰國農業大學(Kasetsart University)三位年輕學者來臺分享仿生學 STEM 課程，以期達到跨國課程分享交流之目的。

This workshop aims to introduce teacher participants the concept of biomimicry, the science behinds it and how to incorporate it into engineering design process to optimize design and create a nature-inspired innovation. First, the participants will engage in a classic, natural experiment simulation, *the Fittest Beak Type* to understand theory of evolution by natural selection and appreciate biological adaptation that can inspire product design and development to solve many human's modern-day problems. Second, they will look deep into a function of given biological structures and systems and list potential nature-inspired innovations. The participants, third, in a student's hat, will design and develop a tool or a procedure to solve a surprisingly complex challenge, *Cleaning Sun Glasses Straw*. In team, they do background research; specify requirements, constraints, and a context; brainstorm, evaluate and choose a solution; develop and test a prototype; improve the prototype in multiple iterations to get an optimal design. They are pushed to search for biological structures and constraints in living things, examine the functions that the organism can do and emulate it into their design and retest it. Forth, the participants, with a teacher's hat, reflect on their biomimicry-integrated engineering design process and the nature of technology. Fifth, they are presented Biomimicry Design Spiral (BDP), a six-step model of the application of biomimicry for product design and development and teaching engineering design process proposed by Biomimicry Institute. Last, this workshop ends with the assessment of expected learning outcomes for design-based learning and integrated-STEM pedagogy including but not limited to informed design competencies, nature of technology, engineering values and habits of mind.

講者

泰國農業大學教育學院 Pongprapan Pongsophon 副教授、Chatree Faikamta 副教授，及 Jeerawan Ketsing 助理教授。

議程表

Time	Event	Speaker
0930-1000	報到	
1000-1015	活動簡介、講者介紹	Prof. Chun-Yen Chang
1015-1200	仿生學(Biomimicry) STEM 中學課程□ 設計分享與實作 1	Prof. Pongprapan Pongsophon
1200-1300	午餐	
1300-1430	仿生學(Biomimicry) STEM 中學課程□ 設計分享與實作 2	Prof. Chatree Faikamta
1430-1445	休息	
1445-1615	仿生學(Biomimicry) STEM 中學課程□ 設計分享與實作 3	Prof. Jeerawan Ketsing
1615-1630	綜合討論 (Q&A)	

※本工作坊為英語演講，現場無提供同步翻譯，請見諒。