SISP 1314 Engineering Design of Solar Car

Course Description
The main objective of the course is to encourage students to develop their own project idea and/or extend their knowledge and skills to design engineering related product, i.e. solar car. Various fundamental knowledge, including configuration of the solar car, battery and its performance, motor and its application, fundamental of design and manufacturing in mechanical system, as well as solar panel and thin film will be covered. Students will be given an opportunity to design and build a solar car in small scale through laboratory sessions. They will work in teams, preferably with teammates across different schools to identify the needs for their proposed idea, thereby developing their problem-solving, communication, interpersonal and project management skills via this entire experiential learning approach.

Topics
1. Introduction to Solar Car, team formation
2. Design: Understand How Designers Use Inspiration from Nature
   Discussion 1: Conceptual design of the Solar Car
3. Technical knowledge on Battery and Motor
   Discussion 2: Innovative Idea of Solar Car
4. Technical knowledge on Solar panel and Thin Film
   Discussion 3: Building Process of Solar Car
5. Build 1: Build the Model Solar Car
6. Build 2: Finalize the Model Solar Car and Demonstration

Grading Scheme
- Project (50%)
- Presentation (30%)
- Course Participation (20%)

[Topics and grading schemes are subject to change as deemed appropriate. Students will receive information and guidelines in class on how they will be assessed for the course.]

Instructor
Prof Robin MA
Prof Ma obtained his Ph.D. in the School of Materials Science and Engineering at the University of New South Wales (UNSW). He is an Electron Microscopist, having carried out nearly 8 years of research work in the world class electron microscope centers in both Sydney (Electron Microscope Unit at UNSW) and Melbourne (Bio21 Institute). He also worked as an Engineer at the AJAX Engineering Fasteners (Melbourne) for 12 months. He has considerable research experience, particularly in focused ion beam (FIB) related research as well as in using both transmission electron microscopy (TEM) and scanning electron microscopy (SEM). His primary area of expertise is in the relationship between microstructure and properties of materials, including metals and ceramics. His current research interest focuses on the shape memory alloy (SMA) related research, including the processing of SMA, and the investigation on its mechanical properties. Before joining the HKUST, he was a Teaching Fellow in the Department of Mechanical Engineering at the Hong Kong Polytechnic University.