The Hong Kong University of Science and Technology

UG Course Syllabus Template (Simplified version uploading to SENG website)

Community Service Project: STEAM Project for the community

ENGG2900H

2 Credits (graded Pass or Fail)

Pre-requisites: Nil

Name: Prof. Tim WOO

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Office Hours: By email appointments

Course Description

This Project Course (ENGG2900H) provides HKUST undergraduate students with ample opportunities for personal growth, not only in essential 21st-century competencies—such as Creativity, Critical Thinking, Collaboration, and Communication—but also in acquiring a diverse array of practical skills pertinent to project management through the execution of their STEAM projects. Throughout the course, students will assume the role of Workshop Developers, where they will craft their teaching materials and construct prototypes for instruction. Ultimately, they will serve as Tutors or Assistants, imparting their acquired engineering knowledge and technological expertise to primary and secondary school students. This experience will serve as excellent preparation for aspiring engineers, equipping them to mentor the next generation of professionals in the field. The course will commence in the Summer Semester and extend into the Fall Semester; during the Summer Term, the majority of theoretical concepts will be taught, while community service initiatives will be implemented in the Fall semester.

Topics

- Project Management Basics
- STEAM (Science, Technology, Engineering, Art, and Mathematics) Education
- Relationship between the 21st-century skills and STEM education
- The Basics of STEAM elements – hardware and software
- Design of the workshop and the serious and fun games for education
- Outreach services for servicing the community

Assessments:

Assessment Task	Contribution to Overall Course grade (%)
Idea Presentation	10%
Project Proposal	10%
Project Deliverables	20%
Community Service	20%
Closing Project Presentation	20%
Reflective Report	20%

Required Texts and Materials

- McBride, M. (2016). Project management basics. Apress.
- Felder, R. M., & Brent, R. (2024). Teaching and learning STEM: A practical guide. John Wiley & Sons.
- Hynes, M., Portsmore, M., Dare, E., Milto, E., Rogers, C., Hammer, D., & Carberry, A. (2011). Infusing engineering design into high school STEM courses.
- C. Sik-Lanyi and J. Ara, “Serious and Fun Games: Introduction to the Special Thematic Session,” in Computers Helping People with Special Needs, Cham: Springer International Publishing, 2022, pp. 67–72.
- Widya, R. Rifandi, and Y. Laila Rahmi, “STEM education to fulfil the 21st century demand: a literature review,” Journal of physics. Conference series, vol. 1317, no. 1, pp. 012208-, 2019, doi: 10.1088/1742-6596/1317/1/012208.

[Optional] Additional Resources

[List any additional resources, such as online platforms, library resources, etc.]