THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department of Civil & Environmental Engineering

UG Course Syllabus

Course : **CIVL 4460 Process Design of Environmental Engineering Facilities**
Units : **[3-0-3:3]**
Instructor : **Dr. G.H. Chen Rm. 3577 Tel: 2358-8752**

*** Course Description ***

This course emphasizes on the practical design of various elements of water and wastewater treatment systems, including aeration, coagulation & flocculation, sedimentation, filtration, screening, pumping, disinfection, sludge handling & disposal. Standard activated sludge process and a conventional water treatment process will be used to illustrate actual plant design.

*** Course Outline ***

Overall View

- Introduction of water treatment
- Introduction of wastewater treatment

Design Preparation

- Determination of design flow and constituent loading
- Flow and Material balance

Design of Unit Operation & Process

- Bar screening
- Grit chamber
- Sedimentation
- Coagulation & flocculation

Design of Biological Treatment Process

- Secondary treatment process
- Nutrient removal process
- Sludge bulking control

- o Biological filter

Design of Post-treatment Process

- o Sludge thickening & dewatering
- o Sludge digestion
- o Effluent disinfection (optional)

*** Reference Texts ***

Water Treatment Plant Design, American Society of Civil Engineers and American Water Association, McGraw-Hill, 2nd Edition, 1990.

Wastewater Engineering, Treatment, Disposal and Reuse, Metcalf & Eddy, Inc., McGraw-Hill, 3rd Edition, 1991.

Biological Process Design for Wastewater Treatment, Benefield & Randall, Ibis Publishing, Charlottesville, Virginia, 1985.

*** Mark Allocation ***

i)	Site Visit Reports (2)	50% of final mark
ii)	Design Projects	50% of final mark