

國立臺北大學自然資源與環境管理研究所  
105 學年度第一學期 『環境工程科學概論』

課程講義(11)：水處理技術概要  
Introduction to Water Treatment Technologies

Recommended Readings	<a href="#">「離岸風力」能解決臺灣 2025 非核家園？丹麥大廠選彰化開發四座風場</a> <a href="#">PUB NEWater (Singapore)</a>
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● INTRODUCTION

- Public Water Supply, Sewage Systems, Industrial Wastewater, Water Reuse
- Tap Water vs. Drinking Water => 自來水、飲用水
  - ⇒ Infrastructure vs. Environmental Protection => Public Utility
  - ⇒ 社區自設公共給水設備、簡易自來水
- Drinking Water Quality 飲用水水質 vs. Tap Water Quality Standard
  - ⇒ [飲用水水質標準](#)
  - ⇒ [自來水水質標準](#)
  - ⇒ 大高雄地區自來水後續改善工程計畫、翡翠水庫原水專管
- Water Bill => [自來水費](#) => [水價調整專區](#)
- 水源保護區回饋
- Waste Water Treatment and Sewage Systems
  - ⇒ 民生污水處理
  - ⇒ 工業廢水處理=>工業區污水處理廠
- 中水道系統、雨水收集利用、民生污水回收再利用
  - ⇒ [建築物生活污水回收再利用建議事項](#)

● WATER SUPPLY ENGINEERING

- 自來水工程、給水工程、上水道工程
  - ⇒ 集水工程 Collection Works
  - ⇒ 輸水工程 Transmission Works
  - ⇒ 抽水工程 Pumping Works
  - ⇒ 淨水工程 Purification Works
  - ⇒ 配水工程 Distribution Works

● WATER TREATMENT ENGINEERING (PURIFICATION WORKS)

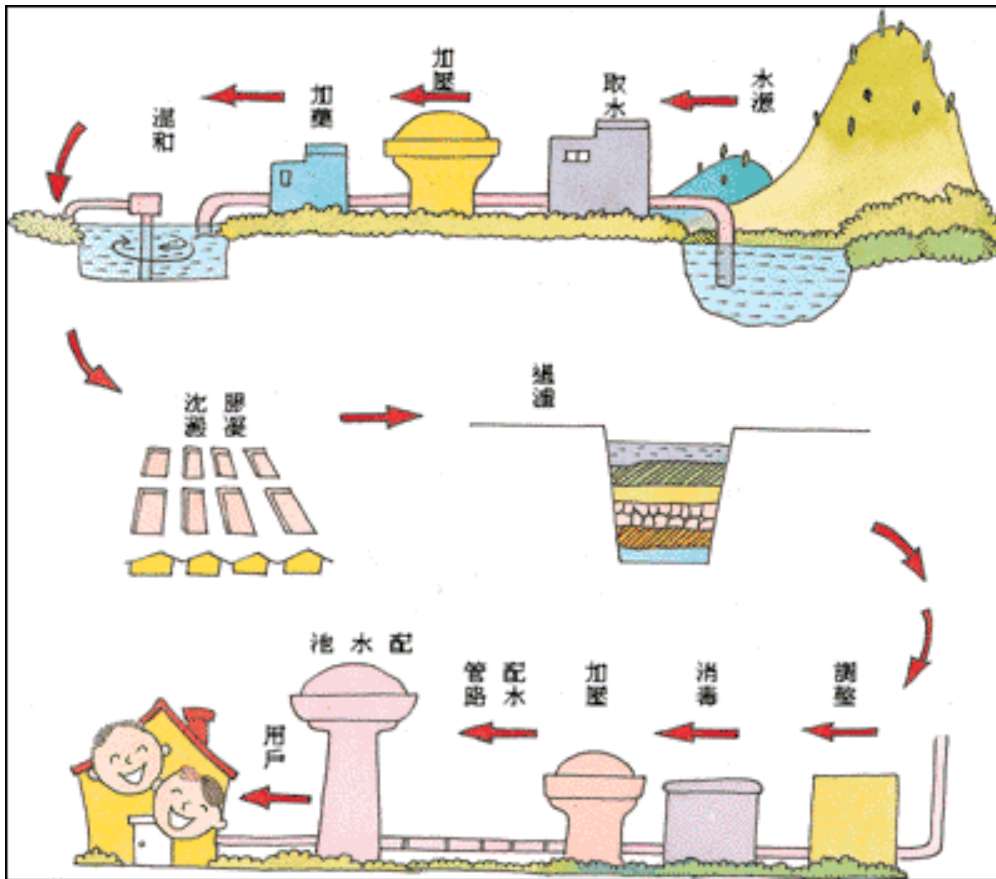
- Water Treatment Units
  - ⇒ Gas Transfer; Ion Transfer; Solid Transfer
  - ⇒ Solute Stabilization => Desalination
  - ⇒ Sanitation, Hygiene and Aesthetical Considerations (Potability)
- Water Treatment Components (Steps)
  - ⇒ Gridding and Screening
  - ⇒ Coagulation (混凝) and Flocculation (膠凝) => PAC

⇒ Sedimentation ⇒ Primary and Secondary (even Tertiary sedimentation)

⇒ Filtration and Disinfection ⇒ THM (Tri-Halogen Methane)

□ Advanced Water Treatment: Potability and other Aesthetical Considerations

⇒ Ion Exchange; Reverse Osmosis (RO); Ultra-filtration: Membrane; UV & O<sub>3</sub>



自來水到我家：取水、導水、淨水、送(配)水

(<http://www.water.gov.tw/ct.aspx?xItem=7343&ctNode=776&mp=1>)

## ● SEWAGE ENGINEERING AND WASTEWATER TREATMENT ENGINEERING

□ Sewage Systems or Sewers: Sanitary Wastewater and Stormwater Runoff

⇒ Combined vs. Separate Sewage Systems

⇒ Pipelines vs. Channels: Pipe Flow vs. Open Channel (Open Surface) Flow

□ Classification of Wastewater Treatment Plants

⇒ Primary Treatment 一級處理

⇒ Secondary (Biological) Treatment 二級 (生物) 處理

⇒ Tertiary (Advanced) Treatment 三級 (高級) 處理

□ Sludge Treatment

⇒ Anaerobic Digestion; Dewatering and Drying ⇒ Water Content; Disposal

⇒ Sludge and Biomass: Integrated Wastewater Treatment Plant

□ Effluent Standards and Emerging Pollutants ⇒ Water Pollution Fee