



Wenchao Xue (Ph.D.)

I. Biographical Data

A. Name: Wenchao Xue

B. Education

Ph.D. (2013) Urban Engineering, The University of Tokyo, Japan

M.E. (2010) Environmental Engineering, Tsinghua University, China

B.E. (2008) Water Supply and Sewage System Engineering, Tsinghua University, China

Areas of specialization:

- Environmental membrane and electrochemical technologies
- Resources/energy productive wastewater treatment
- Monitoring and elimination of environmental emerging contaminants
- Sustainable watershed environmental management

C. Positions held

Assistant Professor

Apr 2018 - Present

Asian Institute of Technology, Thailand

- Teaching postgraduate level courses in Environmental Engineering and Management (EEM) Field of Study (FoS); Supervising Master and Doctoral students as a Chair or Co-Chair/Committee Member; Conducting sponsored research and outreach activities; Undertaking professional networking and outreach

Researcher

Aug 2017 – Mar 2018

Asian Institute of Technology, Thailand

- Conducted research project on “Biogeochemical changes and adaptation mechanisms in response to anthropogenic impacts in watersheds”; Supervising Master students as a Committee Member.

Foreign Lecturer

Chulalongkorn University, Thailand

Oct 2016 – Mar 2017

- Developed and delivered an International postgraduate course on “Environmental Membrane Technology”; Co-advised Master degree students.

Postdoctoral Fellow**Chulalongkorn University, Thailand****Oct 2015 – Sep 2016**

- Conducted research projects on “Development of Appropriate Urban Water Reuse Technology for Mitigation of Water Scarcity Problem” and “Development of a Novel Catalytic Forward Osmosis Membrane for Industrial Wastewater Reuse”; Co-advised Master degree students; Co-taught International postgraduate courses on “Theory and Design of Advanced Wastewater Treatment Processes” and “Theory and Design of Advanced Water Treatment Processes”

Environmental Consultant and Engineer**Nov 2013 – Sep 2015****Environment Resources Management (Japan) Ltd, Japan**

- Conducted a number of contaminated site and groundwater remediation projects such as “In-situ thermal remediation of a volatile organic compounds contaminated site in Nagoya, Japan”, and “Detailed delineation of petroleum soil contamination using modeling approach in Urawa city, Japan”.

Visiting Scholar**Oct 2012 – Dec 2012****RWTH Aachen University, Germany**

- Conducted student exchange research on “Urban Water within a Changing Globe”.

D. Special honors and awards

- Kurita Water and Environmental Foundation-AIT Research Grant, Jun 2016.
- UNEP Fellowship to participate in the UN Winter School on Sustainable Consumption and Production, Jan 2016.
- Postdoctoral Fellowship granted by Ratchadaphiseksomphot Endowment Fund through Chulalongkorn University, Oct 2015 – Sep 2016.
- Japanese Government Scholarship for Ph.D. study, Oct 2010 – Sep 2013.
- Best Thesis Award, Water Environment Presentation Award of The Asahi Kasei Water Environment Preservation Foundation, Jun 2010.
- Best Student Paper, Beijing-Tianjin-Tangshan Membrane Technology Seminar, Sep 2009.
- Academic scholarships from Tsinghua University, Oct 2006 – Oct 2007.

II. Pedagogy**A. Experience as a teacher**

1. Courses taught at postgraduate program of Environmental Engineering and Management (EEM), AIT

- *ED78.08: Environmental Quality Management*

This course enhances the understanding on how the natural environmental systems operate, how anthropogenic influence affects the environment and what are the different methods and principles used in management of environment.

- *ED78.17: Advanced Processes for Wastewater Treatment, Reuse and Recycling*

Advanced wastewater treatment processes are essential to remove variety of pollutants from domestic and industrial wastewaters. This course equips the students with principles, design and operation of various advanced processes for treatment, reuse and recycle of wastewater.

- *ED78.23: Hazardous Waste Technology and Management*

This course exposes the students with the properties of hazardous chemicals, their spread in the environment and risk associated with it. Furthermore, students also learn about hazardous waste minimization and various technologies employed for hazardous waste treatment and disposal, including remediation of hazardous waste contaminated sites. Students also are exposed to various methods used in hazardous waste management and regulatory aspects.

- *ED78.35: Wastewater Treatment*

Domestic as well as industrial wastewater need to be treated properly to their discharge into environment in order to maintain surface water quality. The main objective of this course is to provide theoretical knowledge and practical application of various processes employed in wastewater treatment, and how to design these treatment processes. The course also familiarizes the students with the operation and maintenance methods as well as the troubleshooting techniques used in the various wastewater treatment processes.

B. Courses taught (April 2018 – May 2019) at AIT

Semester	Courses	Credit hour	Student enrollment	Instructor	Average grade
August 2018	ED78.23: Hazardous Waste Technology and Management	2(2-0)	14	Wenchao Xue	3.18
	ED78.35: Wastewater Treatment	3(3-0)	18	Wenchao Xue	3.29
January 2019	ED78.08: Environmental Quality Management	3(3-0)	20	Wenchao Xue (30 hrs) Ekbordin Winijkul (15 hrs)	3.25
	ED78.17: Advanced Processes for Wastewater Treatment, Reuse and Recycling	2(2-0)	8	Wenchao Xue	3.44
August 2019	ED78.23: Hazardous Waste Technology and Management	2(2-0)	7	Wenchao Xue	3.36
	ED78.35: Wastewater Treatment	3(3-0)	23	Wenchao Xue	3.22
January 2020	ED78.08: Environmental Quality Management	3(3-0)	31	Wenchao Xue (30 hrs) Ekbordin Winijkul (15 hrs)	3.34
	ED78.23: Hazardous Waste	2(2-0)	12	Wenchao	3.25

2020	Technology and Management		Xue
August 2020	ED78.08: Environmental Quality Management	3(3-0)	Wenchao Xue (30 hrs)
			Ekbordin Winijkul (15 hrs)
	ED78.35: Wastewater Treatment	3(3-0)	Wenchao Xue

III. Student Research Supervision

A. Summary of student research supervision at AIT (April 2018 –)

STUDENTS	COMPLETED		IN-PROGRESS	
	Chair of the Committee	Co-Chair of the Committee	Chair of the Committee	Co-Chair of the Committee
Doctoral	0	0	2	0
Master's	11	0	9	0

B. Supervised Master's Thesis

No.	Student's name	Degree	Thesis title	Graduation year
1	May Zaw	M.Eng.	Sea Salt Bittern Driven Forward Osmosis For Nutrient Enrichment and Recovery from Black Water	May 2019
2	Natchaya Namngam	M.Sc.	Assessment of the Spatiality and Intensity of Anthropogenic Impact on Sediment and Topsoil Metals in Lower Chao Phraya River Watershed	May 2019
3	Husna Lhaetee	M.Sc.	Effect of Anthropogenic Land Use Pattern on Nutrient Distribution in River Surface Sediment and Catchment Topsoil: A Study of Lower Chao Phraya Watershed	May 2019
4	Daniela M.R. Dobles	M.Sc.	Evaluation of Green Infrastructure's Benefits and Co-benefits for Runoff volume and Pollutant Reduction	July 2019
5	Gidion T. Chahe	M.Sc.	Assessment of Dynamic Flood Risk due to Climate Change and Storm Surges	May 2019
6	Aye Mon Aung	M.Sc.	Spatial Distribution and Risk Assessment of Heavy Metals in Surface Sediments and Top Soils of Upper Chao Phraya Watershed	May 2020
7	Nutkritta Udomkittayachai	M.Eng.	Electroconductive Moving Bed Membrane Bioreactor for Enhanced Nutrient Removal in Domestic Wastewater	May 2020
8	Dhitiya Pakdeesom	M.Sc.	Nutrient Loading in River Sediment Cores and Potential Impact Factors in Upper Chao Phraya Watershed, Thailand	May 2020
9	Sahawat Yumunthama	M.Eng.	Integrating Wastewater Treatment with Electricity Generation Through the Synergy between Forward Osmosis And Microbial Fuel Cell Technology	May 2020
10	Piyarattana Homyok	M.Sc.	Spatial and Temporal Distribution of Heavy Metals in Sediment Cores from Upper Chao Phraya Watershed	May 2020
11	Tianjian Liu		Reclamation of Secondary Municipal Effluent and Contaminated Surface Water for Refinery Cooling	Dec 2020

IV. Research

A. Publications

1.A Summary of journal articles published

Refereed International Journals	Refereed Regional Journals	Refereed National Journals
17	0	0

In Progress		
Refereed International Journals	Refereed Regional Journals	Refereed National Journals
2	0	0

1.B Articles in Refereed **International Journals**

- 1) S. Meng, R. Wang, K. Zhang, X. Meng, **W. Xue**, H. Liu, D. Liang, Q. Zhao, Y. Liu (2021). Transparent exopolymer particles (TEP)-associated protobiofilm: A neglected contributor to biofouling during membrane filtration, *Frontiers of Environmental Science and Engineering*, in press. Publisher: Springer, [Impact Factor: 4.053]
- 2) T.A. Kurniawan, R. Avtar, D. Singh, **W. Xue**, M.H.D. Othman, G.H. Hwang, T. Setiadi, I. Iswanto, A.O. Kern, M. Bintang (2021). Reforming MSWM in Sukunan (Yogyakarta, Indonesia): A Case-Study of Applying a Zero-Waste Approach based on Circular Economy Model, *Journal of Cleaner Production*, in press. Publisher: Elsevier, [Impact Factor: 7.246]
- 3) N. Namngam, **W. Xue***, X. Liu, T. Kootattep, R.P. Shrestha, G. Wattayakorn, A.S. Tabucanon, S. Yu (2021). Sedimentary Metals in Developing Tropical Watersheds in Relation to Their Urbanization Intensities, *Journal of Environmental Management*, 278 (111521). Publisher: Elsevier, [Impact Factor: 5.647]
- 4) N. Udomkittayachai, **W. Xue***, K. Xiao, C. Visvanathan, A.S. Tabucanon (2021). Electroconductive moving bed membrane bioreactor (EcMB-MBR) for single-step decentralized wastewater treatment: Performance, mechanisms, and cost, *Water Research*, 188 (116547). Publisher: Elsevier, [Impact Factor: 9.130]
- 5) **W. Xue***, L. Husna, S. Yu, T. Jenkhetkan, B. Hong, X. Liu, P Chen, N. Namngam, A.S. Tabucanon (2020). Spatial and temporal variability of sedimentary nutrients in relation to regional development in the urbanizing lower Chao Phraya watersheds of Thailand, *Journal of Soils and Sediments*, 20 (11), 4042-4054. Publisher: Springer, [Impact Factor: 2.763].
- 6) **W. Xue***, M. Zaw, X. An, Y. Hu, A.S. Tabucanon (2020). Sea salt bittern-driven forward osmosis for nutrient recovery from black water: A dual waste-to-resource innovation via the osmotic membrane process, *Frontiers of Environmental Science and Engineering*, 14 (2), 32. Publisher: Springer, [Impact Factor: 4.053].
- 7) J. Yu, K. Xiao, **W. Xue**, Y. Shen, J. Tan, S. Liang, Y. Wang, X. Huang (2020). Excitation-emission matrix (EEM) fluorescence spectroscopy for characterization of organic matter in membrane bioreactors: Principles, methods and applications, *Frontiers of*

- Environmental Science and Engineering*, 14 (2), 31. Publisher: Springer, [Impact Factor: 4.053].
- 8) A. S. Tabucanon, **W. Xue**, and T. Fujino (2019). Assessing Alteration of Leaf Litter Breakdown Rate Influenced by Dam Operation in Nakatsugawa River and Arakawa River, Central Japan, *Watershed Ecology and the Environment*, 1, 1-9. Publisher: KeAi.
 - 9) **W. Xue***, K. Sint, C. Ratanatamskul, P. Prasertthdam, and K. Yamamoto (2018), Binding TiO₂ nanoparticles to forward osmosis membranes via MEMO–PMMA–Br monomer chains for enhanced filtration and antifouling performance, *RSC Advances*, 8(34), 19024-19033. Publisher: Royal Society of Chemistry.
 - 10) **W. Xue**, K. Xiao, P. Liang, and X. Huang (2018). Roles of Membrane and Organic Fouling Layers on the Removal of Endocrine Disrupting Chemicals in Microfiltration, *Journal of Environmental Sciences*, 72, 176-184. Publisher: Elsevier.
 - 11) **W. Xue***, K. Yamamoto, T. Tobino, and C. Ratanatamskul (2016). Modeling Prediction of the Process Performance of Seawater-Driven Forward Osmosis for Nutrients Enrichment: Implication for Membrane Module Design and System Operation, *Journal of Membrane Science*, 515, 7-21. Publisher: Elsevier.
 - 12) **W. Xue**, K. Yamamoto, and T. Tobino (2016). Membrane Fouling and Long-Term Performance of Seawater-Driven Forward Osmosis for Enrichment of Nutrients in Treated Municipal Wastewater, *Journal of Membrane Science*, 499, 555-562. Publisher: Elsevier.
 - 13) **W. Xue**, T. Tobino, F. Nakajima, and K. Yamamoto (2015), Seawater-Driven Forward Osmosis for Enriching Nitrogen and Phosphorous in Treated Municipal Wastewater: Effect of Membrane Properties and Feed Solution Chemistry, *Water Research*, 69, 120-130. Publisher: Elsevier.
 - 14) **W. Xue**, C. Wu, K. Xiao, X. Huang, H. Zhou, H. Tsuno, and H. Tanaka (2010). Elimination and Fate of Selected Micro-organic Pollutants in a Full-scale Anaerobic/Anoxic/Aerobic Process Combined with Membrane Bioreactor for Municipal Wastewater Reclamation, *Water Research*, 44(20), 5999-6010. Publisher: Elsevier.
 - 15) C. Wu, **W. Xue**, H. Zhou, X. Huang, and X. Wen (2011). Removal of Endocrine Disrupting Chemicals in A Large Scale Membrane Bioreactor Plant Combined with Anaerobic-Anoxic-Oxic Process for Municipal Wastewater Reclamation, *Water Science & Technology*, 64(7):1511-1518. Publisher: IWA Publishing.
 - 16) Y. Zhou, X. Huang, H. Zhou, J. Chen, and **W. Xue** (2011). Removal of Typical Endocrine Disrupting Chemicals by Membrane Bioreactor: in Comparison with Sequencing Batch Reactor, *Water Science & Technology*, 64(10):2096-2102. Publisher: IWA Publishing.
 - 17) Y. Mo, J. Chen, **W. Xue**, and X. Huang (2010), Chemical Cleaning of Nanofiltration Membrane Filtrating the Effluent from a Membrane Bioreactor, *Separation & Purification Technology*, 75, 407-414. Publisher: Elsevier.

Note: *: as corresponding author

2. Papers in Workshops

- 1) **W. Xue** et al., (2018). Integrating TiO₂ Nanoparticles on Forward Osmosis Membranes for Advanced Filtration Performance, presented at the World Water Congress & Exhibition 2018, Tokyo, Japan, 16-21 September 2018.
- 2) **W. Xue** et al., (2018). Global Development with Environmental Sustainability, presented at The 3rd Environment and Natural Resources International Conference (ENRIC 2018), Chonburi, Thailand, 22-23 November 2018.
- 3) **W. Xue** et al., (2018). Spatial and Temporal Distribution of Sedimentary Heavy Metals in Response to Anthropogenic Impact in Lower Chao Phraya River watershed, Thailand. The 3rd International Workshop on Urbanization in Watersheds, Xiamen, China, 31 October - 2 November 2018.
- 4) M. Sriratana, **W. Xue**, A. S. Tabucanon (2017). Capacity Building of Big-Data from Earth Observation for Water and Land Management in Thailand, The 2nd International Conference of Digital Belt and Road, 6-8 December 2017, Hongkong, China
- 5) **W. Xue** and M. Sriratana (2016). Watershed Management and Land Use Expansion: A Case Study on Cha-am Municipality, Phetchaburi Province, Thailand, 2nd International Workshop on Urbanization in Watersheds: Towards A Sustainable Urbanization, 26-28 October 2016, Xiamen, China.
- 6) **W. Xue**, K. Yamamoto, T. Tobino, C. Ratanamskul (2016). Modeling Prediction of the Process Performance of Seawater-Driven Forward Osmosis for Nutrients Enrichment: Implication for Membrane Module Design and System Operation, 5th IWA Regional Conference on Membrane Technology, 22-28 August 2016, Kunming, China.
- 7) T. Tobino, J. Chen, **W. Xue**, O. Sawai, T. Nunoura, K. Yamamoto (2013). Resources Productive Membrane Integral-System for Sewage, IDA World Congress 2013 on Desalination and Water Reuse, 20-25 October 2013, Tianjin, China.
- 8) **W. Xue**, T. Tobino, K. Yamamoto (2013), Long-term Operation and Membrane Fouling Properties of A Seawater Driven Forward Osmosis for Concentrating Nutrients in treated Municipal Wastewater, 7th IWA Specialized Membrane Technology Conference, 25-29 August 2013, Toronto, Canada.
- 9) **W. Xue**, T. Tobino, F. Nakajima, K. Yamamoto (2013). Modeling Simulation of Forward Osmosis Plate Membrane Modules for Concentrating Nutrients, Water and Environment Technology Conference 2013, 15-16 June 2013, Tokyo, Japan.
- 10) **W. Xue**, T. Tobino, K. Yamamoto (2012). Effects of Chemical and Physical Parameters on Nitrogen Retention by Cellulose Triacetate FO Membrane, IWA 3rd Regional Conference in Membrane Technology, 3-6 December 2012, Buenos Aires, Argentina.

- 11) **W. Xue**, T. Tobino, K. Yamamoto (2012), Characteristics of Forward Osmosis (FO) on Concentrating Nutrients from Wastewater, IWA World Water Congress & Exhibition 2012, 16-21 September 2012, Busan, Korea.
 - 12) **W. Xue**, T. Tobino, K. Yamamoto (2012). Nutrient Recovery Performance by Forward Osmosis Membrane Filtration from Wastewater treated by Inclined Tube-Membrane Bioreactor, The 49th Sewer Research Symposium, July 2012, Kobe, Japan.
 - 13) **W. Xue**, T. Tobino, K. Yamamoto (2012). Fundamental Performance of Forward Osmosis on Nutrients Recycling from MBR Effluent. The 46th Annual Conference of Japan Society on Water Environment, April 2012, Tokyo, Japan.
3. Invited Lectures and Keynote Addresses
- 1) Invited speaker, “Incorporating Big Earth Data into the Monitoring and Evaluation of SDGs Indicator 6.3.2: A Proposed Application for BMR”, Thailand Research EXPO 2020, Bangkok Thailand, 5 July 2020.
 - 2) Key note speaker on Digital Belt & Road Seminar on “Introduction to DBAR Big Earth Data Platform and Its Applications for Disaster Risk Management”, National Research Council of Thailand, Bangkok and Prince of Songkla University, Hat Yai, Thailand, 20 and 22 Augusts 2019.
 - 3) Invited lecture on “Water Reuse and Energy Recovery from Wastewater towards SDG 6”, International Certificate Course on Water Resources for Unbundling the Engineering to Achieve Sustainable Development Goal 6, Asian Institute of Technology, Thailand, 26 March 2019.
 - 4) Invited lecture on “Membrane technologies for sustainable wastewater treatment: Is forward osmosis a potential solution?” King Mongkut’s University of Technology Thonburi, Bangkok, Thailand, 14 November 2018.
 - 5) Invited lecture on “Innovative membrane technologies for sustainable Urban Water Solution-An exploration on the future potential of forward osmosis technology”, Sun Yat-Sen University, Guangzhou, China, 25-28 March 2018.
 - 6) Invited lecture on “Forward Osmosis: A Green Technology for Future Water Solution?” at Department of Environmental Engineering, Chulalongkorn University, Bangkok, Thailand, 2 October 2016.
4. Total number of citations to the faculty member’s published work, as shown by SCOPUS. See Appendix IV.
- SCOPUS
Document = 16
Total citations = 370 by 342 documents
H index = 9

B. Research projects

Duration	Project Title	Sponsor	Role
May 2020 to Oct 2021	“Integrated Assessment of SDGs Using Big Earth Observation Data for Bangkok Metropolitan Region (BMR)”	The National Research Council of Thailand	Co-PI
Sep 2018 to Apr 2019	“Forward Osmosis for Nutrient Recovery from Black Water”	Asian Institute of Technology	PI
Jan 2018 to Dec 2020	“Simultaneous wastewater treatment with electricity generation based on pressure retarded osmotic microbial fuel cell technology.”	National Natural Science Foundation of China (NSFC)	PI
Jan 2017 to Dec 2020	“Biogeochemical changes and adaptation mechanisms in response to anthropogenic impacts in watersheds: A comparative study between Jiulong River (China) and Chao Phraya River (Thailand).”	National Research Council of Thailand (NRCT)	Co-PI
Aug 2016 to July 2017	“Development of a Novel Catalytic Forward Osmosis Membrane for Industrial Wastewater Reuse”	KWEF-AIT Research Grant	PI