



# **Applied Hydrogeology**

**GMT-405 (2 Credits hours)**

**Muhammad Risalat Rafiq**

# Course Instructors



This course will be  
jointly run by  
*Muhammad  
Risalat Rafiq  
& Sukhen  
Goswami*

# Course outlines

Topics	Classes
Water wells	~ 3
GW sampling and lab analysis	~ 1
Hydrogeochemistry	~ 6
Tracer/isotope hydrology	~ 2
Groundwater pollution	~ 4
Recharge assessment	~ 3

# Water wells (~3 classes)

- Drilling methods
  - Soil sampling and bore logs
  - Well design
  - Gravel packing
  - Well development
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- GW sampling and lab analyses

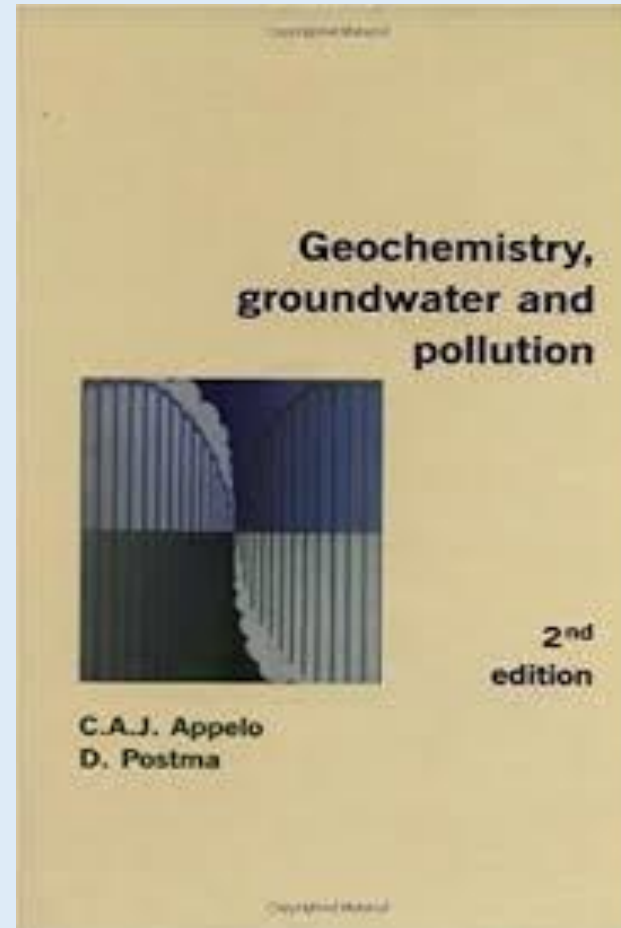
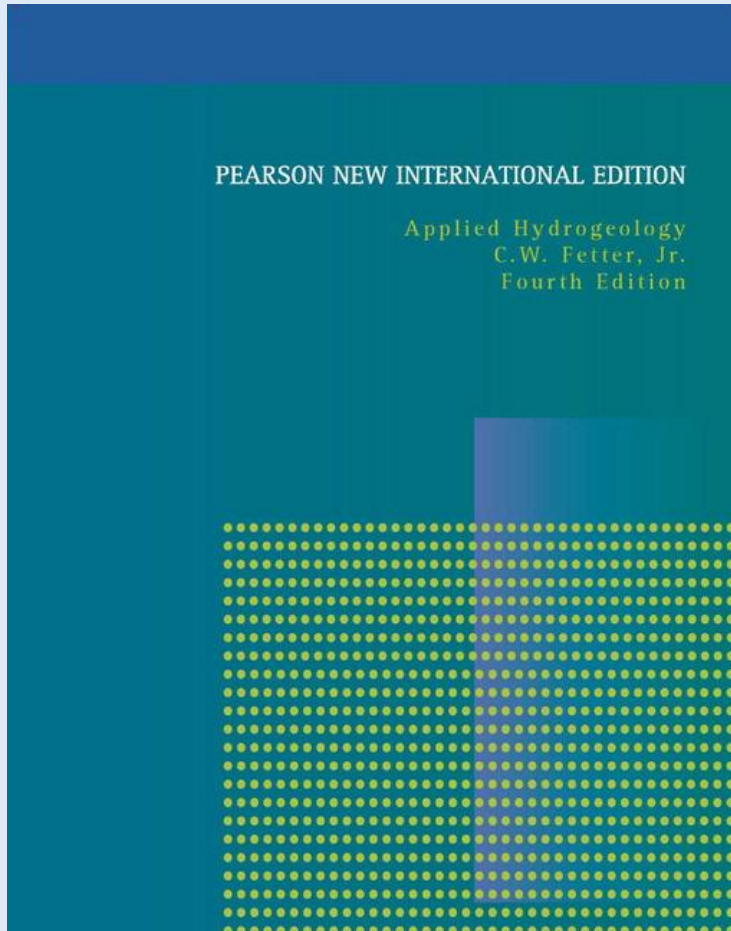
# Hydrogeochemistry (~6 classes)

- Introduction to GW chemistry
- Rainwater to GW (HG cycle)
- Minerals and water
- Carbonates
- Ion exchange
- Silicate weathering
- Redox processes

- Isotope and tracer hydrology (~2 classes)
- Groundwater pollution (~4 Classes)
- Aquifer recharge (~3 classes)
  - Managed aquifer recharge
  - ASR
  - ASRT



# References



# References

- Chow, V.T. Handbook of applied hydrology
- Fetter, C.W. Applied Hydrogeology. Johnson Division Groundwater and Wells
- Appelo, T., and D. Postma, 2005, Geochemistry, Groundwater and Pollution. A.A, v. 1996
- Linsley, R.K., Kohler, M.A. and Paulhus, J.L.H. Applied hydrology
- Sterrett, R. J. (2007). *Groundwater and wells*. New Brighton, MN: Johnson Screens
- UNICEF Reports: Understanding Groundwater & Wells