

457.562 Sediment Transport

- **Class Goal**
 - Develop the understanding needed to find solutions to sediment transport process in the stream

- **Lecturer:** Prof. Dr. Jin Hwan Hwang
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 - Anytime with appointment

- **Pre-requite:**
 - Elem. fluid mechanics or hydraulics, ordinary differential equations

- **Requirements and policies:**
 - The homeworks (35%)
 - Try each problem alone before asking your classmates for help. After an honest try, you may ask your classmates for help; however, you must write up your solution by yourself.
 - The 50-minute midterm is given with 30% portion
 - Three-three hour final (35%) will be at the end of semester.

- **Text book**
 - Main contents will be distributed as a form of class material (or packet)
 - Sub-readings can be found through internet
 - Gregory L. Morris and Jiahua Fan, 2010, Reservoir Sedimentation Handbook: Resign and Management of Dams, Reservoirs, and Watersheds for Sustainable Use, Ver. 1.04. (You can find electronic version)
 - Recommended Text-book
 - Pierre Y. Julien, 2010, Erosion and Sedimentation, 2nd Edition, Cambridge
 - Marcelo H. Carcia (Editor), 2006, Sedimentation Engineering: Processes, Measurements, Modeling, and Practice, ASCE Manuals and Reports on Engineering Practices NO. 110, ASCE. * Chapter 2.

Course schedule

Week	Contents	HW/MP
1 st	Introduction/Sediment properties	Homework 1
2 nd	Review of fluid mechanics 1	
3 rd	Review of fluid mechanics 2	Homework 2
4 th	Equations of particle motion 1	
5 th	Equations of particle motion 2	Mini-project 1
6 th	Macroscopic view of sediment transport	
7 th	Threshold condition for sediment movement	Homework 3
8 th	Threshold condition on side slope/stable channels	
9 th	Mechanics of bedload transport	Homework 4
10 th	Introduction to bedload transport/ Stability analysis of bedforms	Mini-project 2
11 th	Effects of bedforms on flow/sediment transport	
12 th	Suspended sediment	Homework 5
13 th	Morpho-dynamics and turbidity currents	
14 th	Turbidity current and sedimentation	
15 th	Reservoir sedimentation	Mini-project 3
16 th	Local scouring	