

River Mechanics

Fall 2019

COURSE INFORMATION: River Mechanics. Credits 3 hrs.

COURSE SCHEDULE: Lecture – Sunday 10:30 – 12:30 AM, Monday 12:30 – 1:30 PM

TEXTBOOK(S):

- Graf, W.H. 1998. Fluvial Hydraulics: Flow and Transport Processes in Channels of Simple Geometry. John Wiley and Sons, New York.
- ASCE. Sedimentation Engineering: Processes, Measurements, Modeling and Practice. ASCE Manual and Reports on Engineering Practice No. 110, ed. M.H. Garcia, ASCE, Reston, VA.

INSTRUCTOR: Abdul-Sahib T. Al-Madhhachi, Ph.D., F.E., Associate Professor and Hydraulic Laboratory Supervision, Water Resources Engineering, College of Engineering, Mustansiriyah University.

COURSE OBJECTIVES: Principles of detachment, entrainment and transport of sediment in surface flows. Topics include open channel flow principles, particle detachment and suspension, suspended and bed load transport processes, design of stable channels, and cohesive sediment transport.

GRADING: Homework 15%, Exam 25%, Final Exam 60%.

HOMEWORK ASSIGNMENTS (15%): Homework assignments should be done neatly with the problem defined and solution clearly outlined. Final answers should have appropriate units and should be circled or underlined. The more clearly a problem is presented and solved, the more likely you will receive partial credit. Late homework will not be accepted unless you have a valid university excused absence. Make sure what you turn in as your work, really is your work. Simply copying another student's homework solution is a breach of academic honesty and will result in a zero for all involved parties. Homework is due at the beginning of class on the day assigned.

ARTICLE REVIEW/PRESENTATION (5%): Students will be required to write-up a 5-page summary of at least 5 peer-reviewed journal articles on a topic of interest to them. Optimally, this review topic will align with thesis/dissertation topics related to fluvial hydraulic. At the end of the semester, students will be required to make a 15- minute presentation giving an overview and summarizing the 5 review articles. The 5-page summary should be provided to all students in the course.

EXAM or QUIZZES (25%): Quizzes or one exam (depend on student desire) will be given periodically throughout the semester. Quizzes or one exam will consist of qualitative questions including definitions, concept questions, and writing expressions or equations and quantitative questions.

Mid Term and FINAL EXAMS (60%): The final exams will consist of a qualitative and quantitative section. The qualitative section will be closed book/closed notes, and will consist of definitions, concept

questions, and writing expressions or equations. The quantitative section will be closed book, and will consist of 3-5 problems of similar nature, but not exactly like, the assigned homework problems, example problems illustrated during lectures, and example problems in the textbook.

ATTENDANCE AND RESPECT: Attendance is required. When you are in class, please be respectful to other students by being on time to class, not leaving class early, and not doing other work during class.

PRELIMINARY COURSE SCHEDULE

Chapters	Topic
I	Syllabus/Introduction - Flow in Channels/Pressure and Velocity Distributions
II	Dimensional Analysis
III	Continuity, Energy, Hydrodynamic Equations, Distribution of Velocity
III	Uniform Flow – Hydrodynamic Equations/Coefficient of Friction, Discharge Calculations (Fixed/Mobile Beds), Flow in Curves
	Basic Fluvial Geomorphology, Regional Curves
IV	Uniform Flow – Stable Channel Design
IV	Non-Uniform flow
	Final Exam