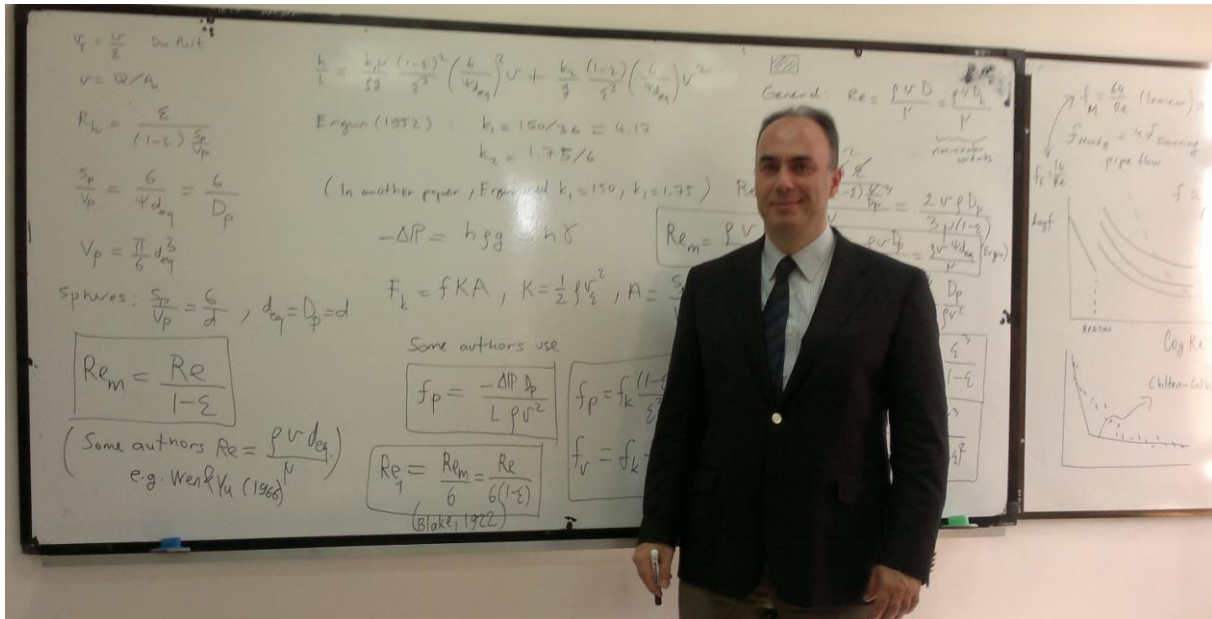


Ömer Akgiray



CURRENT RESEARCH ACTIVITIES

My research interests may perhaps be categorized under the title “*Mathematical modeling and computer applications in Chemical and Environmental Engineering.*” Within the Environmental Engineering field, I am particularly interested in water and wastewater treatment technologies, with more emphasis on water than wastewater. Application of rational analysis methods and mathematics that can lead to better understanding of treatment processes and development of new accurate design equations and calculation procedures that can be used by practicing engineers are among the primary goals of our efforts. An outline of our current work is as follows:

Deep-bed filtration:

The use of alternative filter media (e.g. crushed recycled glass)

Declining rate filtration (DRF)

Theories of filtration

Liquid-solid fluidization:

Filter backwash hydraulics

Expansion of granular beds during fluidization

Mixing and inversion phenomena in liquid-solid fluidization

Particle characterization (granular media)

Porous media hydraulics:

Models for head-loss prediction

Models for non-spherical, non-uniform media

Effect of shape for granular media used in water filtration

COURSE HANDOUTS BASED ON ORIGINAL RESEARCH

I published a couple of papers in 2004 and 2005 proposing a number of simple explicit solutions of the Manning equation for partially filled circular pipes. A handout that was prepared for students of ME262 Basic Fluid Mechanics can be found in the following link:

[MANNING EQUATION APPLIED TO PARTIALLY FILLED CIRCULAR PIPES](#)

Some of the important results of our research in solid-liquid fluidization are explained in the following handout:

[ON THE PREDICTION OF BED EXPANSION FOR LIQUID FLUIDIZED BEDS](#)