

Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

An oral exam model for teaching advanced "Batchelor-level" fluid mechanics in the US. JONATHAN FREUND, University of Illinois at Urbana–Champaign — A teaching model is developed to meet the challenge of teaching fluid mechanics at what might be considered a high level, at least by the current norms in the US. The initial goal was to avoid loss of concepts amidst the challenge of particular mathematical manipulations on particular assignments. However, it evolved toward fostering facile working knowledge of challenging material, such as in the books by Batchelor (e.g. streaming flow), Whitham (e.g. ship waves), and van Dyke (e.g. second-order boundary layer). To this end, the course model forgoes traditional assigned problems to focus on completion, augmentation, and in-depth understanding of the lecture material. The lectures are relatively traditional in structure, albeit with somewhat more interactive examples. The main unusual feature—again, by modern US standards—was assessment via multiple half-hour oral exams. This model has now been successful over 8 semesters for 3 different graduate courses in 2 departments. For all, students were assumed to have already completed a full course at a "Navier–Stokes level". The presentation will include specifics of the course and exam structure, impressions of positive outcomes from the instructor, and a summary of the overwhelmingly positive student feedback.

Jonathan Freund
University of Illinois at Urbana–Champaign

Date submitted: 27 Jul 2016

Electronic form version 1.4