Fluid Dynamics II
M.R.E.Proctor
Lent 2010

CONTENTS

Chapter 4. LUBRICATION THEORY AND THIIN FILMS [3]

4.1 Basic equation for flows in a narrow gap.

4.2 Examples: Hele-Shaw cell, spreading drop, fluid between two plates.

Chapter 5. VORTICITY DYNAMICS [3]

5.1 Vorticity equation and Vortex stretching (review)

5.2 Vorticity generation at boundaries.

5.3 Vorticity confinement: Flow along plane wall with suction: line vortex: stagnation point flow.

Chapter 6. FLOWS AT LARGE Re [6]

6.1 $Re \to \infty$ as a singular limit: the Euler and Prandtl limit.s

6.2 Singular perturbation theory (an introduction)

6.3 The boundary-layer equations: similarity solutions for an external velocity proportional to x^m, examples, e.g. Blasius boundary at a semi-infinite flat plate.

*6.4 Boundary layer separation: wakes behind moving bodies.

6.5 Boundary layers at a free surface: rising spherical bubble.

Chapter 7. VORTEX SHEETS [2]

7.1 The Kelvin-Helmholtz instability of vortex sheets and simple jets.