Biological Fluid Mechanics:
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The course will start with a general overview of biological fluid mechanics and give short review of the relevant fluid and solid mechanics. Following this, four problems in the area of physiological fluid mechanics will be studied in greater detail. Simple mathematical models of the physiological systems will be developed and used to analyse their behaviour. Finally, an overview of current research problems will be given.

1. Overview of problems in biological fluid mechanics. Brief review of the relevant fluid and solid mechanics.

2. Pulse wave propagation and flow patterns in the arteries.

3. Collapsible tube models for blood flow in the veins.

4. Flow patterns in the lung; Taylor dispersion.

5. Airway closure; surface-tension-driven instabilities of the lung's liquid lining.

6. Current research problems.

Reading:

Pedley, T.J. The Fluid Mechanics of Large Blood Vessels. Cambridge University Press, 1980.

Lighthill, Sir J. Mathematical Biofluiddynamics. SIAM, Philadelphia, 1975.

For those who have forgotten everything they learnt in their fluid mechanics lectures, here are two of my favorite fluids books:

Panton, R.L. Incompressible Flow, (second edition), Wiley, 1996.

Acheson, D.J. Elementary Fluid Dynamics. Clarendon Press, Oxford, 1990.