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Online Subscriptions:

ASME - The most extensive online resource on mechanical engineering which includes technical papers from journals and conference proceedings .

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Disclaimer:

This pathfinder contains suggested materials on Fluid Mechanics that are available at the College of Engineering Library I. However, some references were not included.

We welcome suggestions for new pathfinder topics.

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http://www.damtp.cam.ac.uk/user/ngb23/FD/droplet.jpg

FLUID MECHANICS

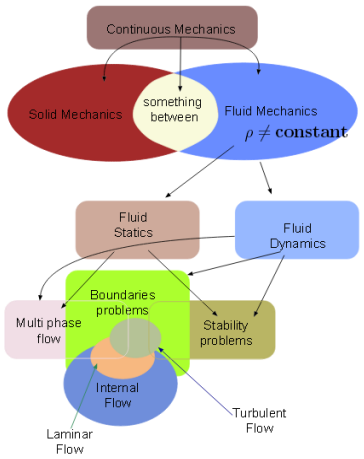
PATHFINDER

FLUID MECHANICS

Fluid mechanics is the study of fluids either in motion (fluid dynamics) or at rest (fluid statistics). Both gases and liquids are classified as fluids, and the number of fluid engineering applications is enormous: breathing, blood flow, swimming, pumps, fans, turbines, airplanes, ships, rivers, windmills, pipes, missiles, icebergs, engines, filters, jets, and sprinklers, to name a few. When you think about it, almost everything on this planet either is a fluid or moves within or near a fluid.

The essence of the subject of fluid flow is a judicious compromise between theory and experiment. Since fluid flow is a branch of mechanics, it satisfies a set of well-documented basic laws, and thus a great deal of theoretical treatment is available. However, the theory is more often frustrating because it applies mainly to idealized situations, which may be invalid in practical problems.

Source: White, Frank M. "Preliminary Remarks." Introduction. *Fluid Mechanics*. 7th Ed ed. Singapore: McGraw-Hill, 2011. 3. Print.



Relationships of fluid mechanics branches

Image URL: http://www.potto.org/fluidMech/intro/whatFluid.png

HISTORY

The study of fluid mechanics goes back at least to the days of ancient Greece, when Archimedes investigated fluid statics and buoyancy and formulated his famous law known now as the Archimedes' principle, which was published in his work *On Floating Bodies* - generally considered to be the first major work on fluid mechanics. Rapid advancement in fluid mechanics began with Leonardo da Vinci (observations and experiments), Evangelista Torricelli (invented the barometer), Isaac Newton (investigated viscosity) and Blaise Pascal (researched hydrostatics, formulated Pascal's law), and was continued by Daniel Bernoulli with the introduction of mathematical fluid dynamics in Hydrodynamica (1738).

Inviscid flow was further analyzed by various mathematicians (Leonhard Euler, Jean le Rond d' Alembert, Joseph Louis Lagrange, Pierre-Simon Laplace, Siméon Denis Poisson) and viscous flow was explored by a multitude of engineers including Jean Léonard Marie Poiseuille and Gotthilf Hagen. Further mathematical justification was provided by Claude-Louis Navier and George Gabriel Stokes in the Navier–Stokes equations, and boundary layers were investigated (Ludwig Prandtl, Theodore von Kármán), while various scientists such as Osborne Reynolds, Andrey Kolmogorov, and Geoffrey Ingram Taylor advanced the understanding of fluid viscosity and turbulence.

Source: http://en.wikipedia.org/wiki/Fluid_mechanics

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