

Fluids

Properties:

- density
- viscosity
- **compressibility**
- surface tension
- vapor pressure

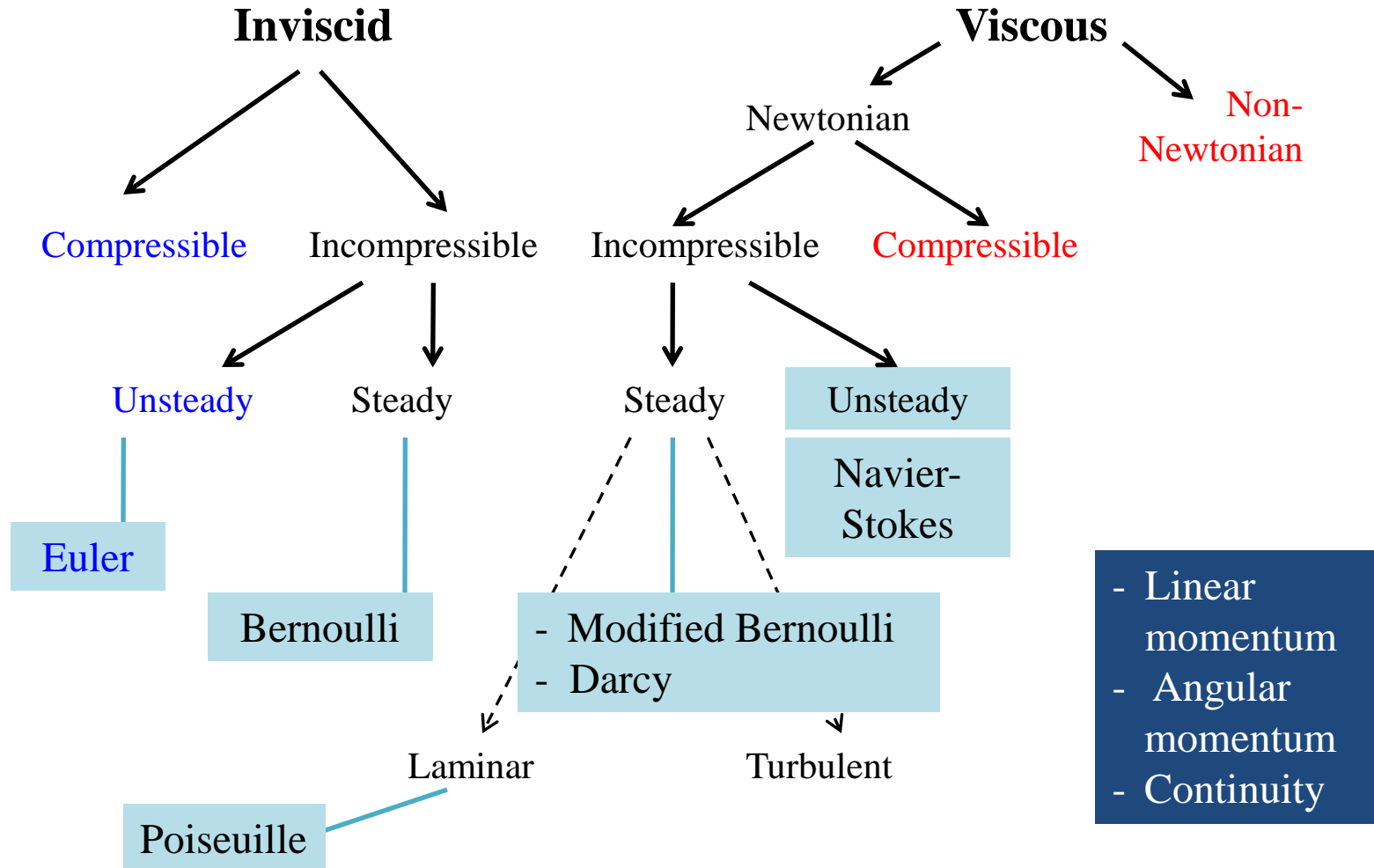
Statics:

- pressure
- center of pressure
- buoyancy
- capillary effect
- cavitation

Dynamics:

- flow rate
- continuity
- linear momentum
- heads
- losses
- laminar/turbulent
- pipe flow
- immersed bodies
- **open surface**
- **compressible flow**

Fluid flows



Fluid flows

Pipe flow:

- fully developed
- laminar/turbulent
- Reynolds number
- Poiseuille
- major losses
- Darcy friction factor
- roughness effects
- Moody chart
- Colebrook formula
- minor losses
- noncircular ducts

Flows over immersed bodies:

- drag force
- drag coefficient
- friction drag
- pressure drag
- shape factor
- reference area
- lift force
- lift coefficient
- center of pressure
- circulation

Open surface

Pumps and turbines

Flow modeling

Analytical:

Navier-Stokes equations

With restrictions:

- Bernoulli
- modified Bernoulli
- Poiseuille

Numerical:

Computational Fluid Dynamics (CFD)

Experimental:

Dimensional analysis and similitude

Data:

- Moody chart
- Dimensionless groups
- Minor loss coefficients
- Drag coefficients
- Lift coefficients