**Lecture 12 Notes**

***Chapter 11:***

**Goals for today - Lecture 12**

1. What is a pump and its applications

2. Discussion of different types of pumps and their characteristics

3. Best Efficient Operating point (BEP) for pumps

**Sec 11.1**

*Pumps:*

1. Positive Displacement Pump (PDP)- pushes the liquid by compressing it against a cavity, with an opening suddenly becoming available.
2. Rotodynamic Pump(RP): Pushes the fluid by adding momentum to it by means of a fast moving blade

*PDP advantage:*

* works with any liquid (viscos or not, Newtonian or not)
* has constant (almost) flow for any system head

*PDP disadvantage:*

* usually low Q
* pulsating/unsteady flow (unless a settlement tank is used)

RD advantage:

* steady flow
* high flow rates compared to PDP
* variable flow depending on the system head

RD diasvantages:

* Needs “priming” unlike PDP. Priming means that the pump needs to be filled with liquid to start, i,e, to suck liquid
* Moderate pressure
* High viscous liquids (or shear thickening) will degrade the pump performance, significantly.

**Types of Pump Video:**

<https://www.youtube.com/watch?v=wsm5zzsBI4s&ab_channel=LearningEngineering>

**Video for working Centrifugal Pump:**

<https://www.youtube.com/watch?v=BaEHVpKc>

**Good video to watch to understand how different pumps work!**

<https://www.youtube.com/watch?v=1huJZ1XChYE&ab_channel=PipingAnalysis>

See Figs. 11.1-11.3 & 11.6 & 11.7 & 11.3

Fig 11.6 7 11.7:

* Pump curves are strictly for a given fluid
* At low Const. (but pump is inefficient)
* Max is at 0.6
* Max point is called BEP (Best Efficiency point) and one should aim for running the pump at BED.