

# Design of Machines and Mechanical Systems (PC-BTM711)

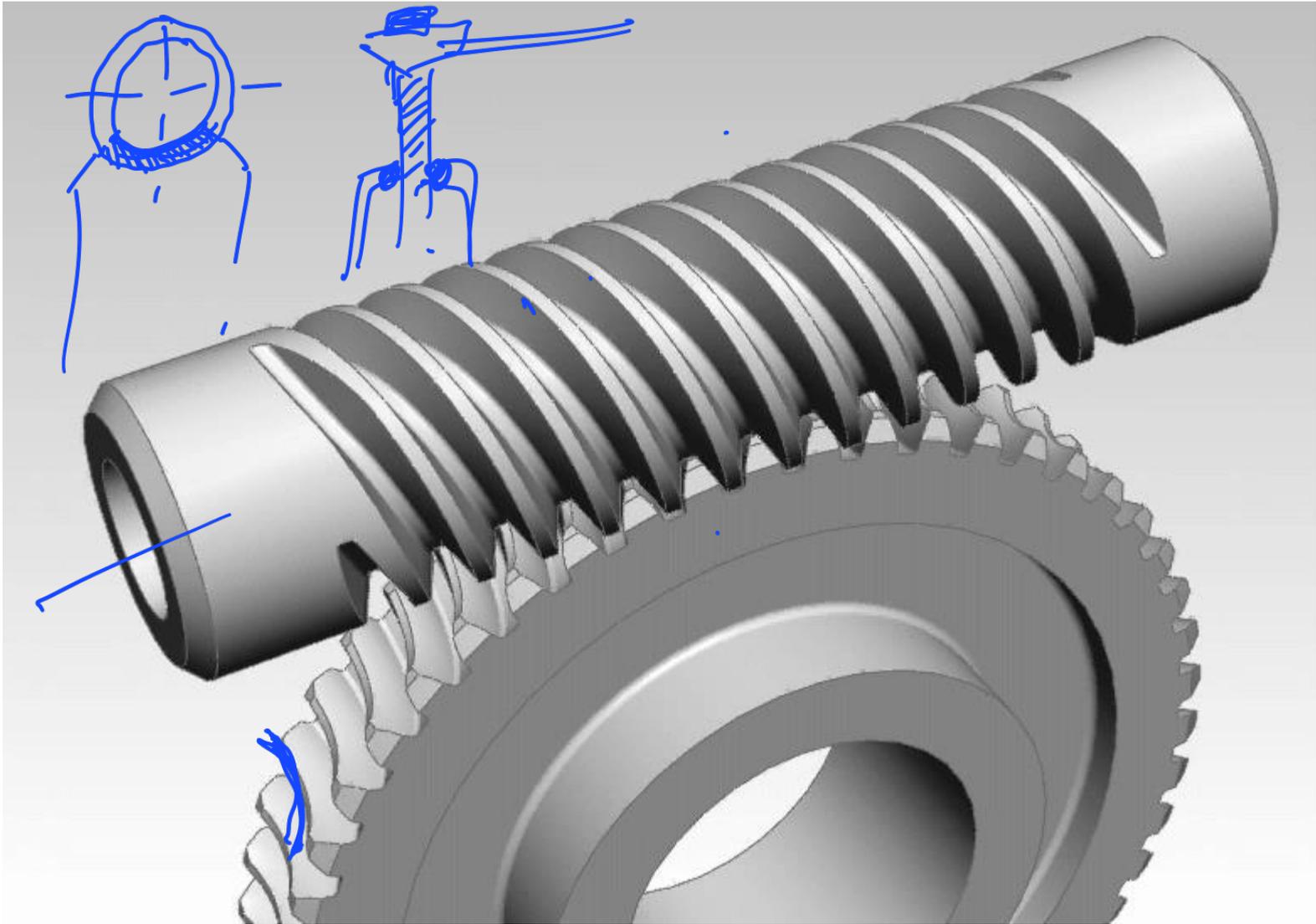
Session 11b

Module 1: Worm Gear Design

# Session Outcomes

- Describe terminology of Worm gear
- Force analysis of worm gear

# Worm and Worm Wheel



[https://commons.wikimedia.org/wiki/File:Worm\\_Gear.gif](https://commons.wikimedia.org/wiki/File:Worm_Gear.gif)

# Worm Gear – Pros and Cons

## Adv

- ① High sp. red<sup>n</sup>
- ② Compact
- ③ Self-locking
- ④ Smooth & opr<sup>n</sup>

Silent

## Disadv

- ① low efficiency
- ② Heat generation - spl. cooling arm
- ③ steel # phosphor bronze → cost ↑ transmission capacity
- ④ Power<sup>n</sup> is low (< 100 kW)

**SELF-STUDY**

## No. of starts

intermittent ~~start~~ single threaded →

highest speed reduction,  $\eta \downarrow$

lower " " " ,  $\eta \uparrow$

multi-start

continuous opr<sup>n</sup>

# Worm Gear Terminology

- Design Data Book – Chapter 23