From *Semiconductor Physics and Devices: Basic Principles* (4th Edition), Donald A. Neamen, McGraw Hill, 2012, ISBN 978-0-07-352958-5.

n-channel enhancement mode MOSFET

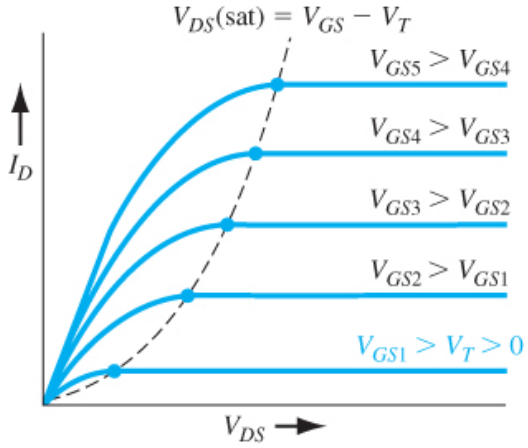

Figure 10.40 | Family of I_D versus V_{DS} curves for an n-channel enhancement mode MOSFET.

- Here, the gate voltage must be positive and greater than the threshold voltage to create a channel, i.e., $V_{GS} > V_T > 0$.
- Note how both the drain saturation voltage $V_{DS}(\text{sat})$ and saturation current $I_D(\text{sat})$ increase as the gate voltage V_{GS} increases.

n-channel depletion mode MOSFET

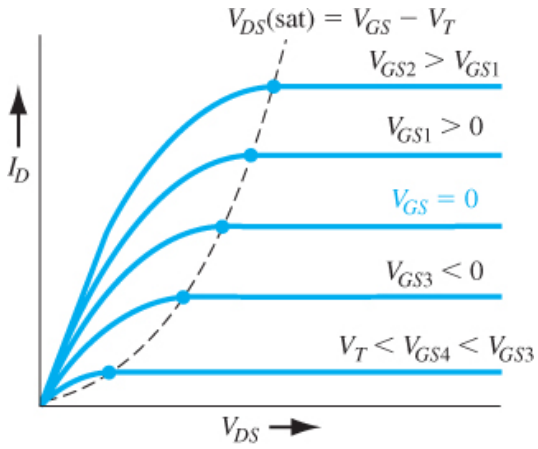

Figure 10.42 | Family of I_D versus V_{DS} curves for an n-channel depletion mode MOSFET.

- Here, an inversion layer or channel exists with no voltage applied to the gate.
- So, we can have I-V curves with $V_{GS} < 0$.