Program : **Diploma in Electrical and Electronics Engineering**	
Course Code : **4031**	Course Title: **Power Electronics Devices and Circuits**
Semester : **4**	Credits: **4**
Course Category: **Program Core**	
Periods per week: **4 (L:3 T:1 P:0)**	Periods per semester: **60**

SYLLABUS

MODULE 1

Contents:

Power Electronic Devices- List various devices -Symbols (MOSFET, IGBT,GTO, LASCR,SCS,UJT, DIAC, TRIAC and SCR) -MOSFET - list different types -structure and working of N-channel enhancement type-IGBT--structure-working principle - applications-UJT- schematic diagram and working-DIAC & TRIAC-schematic diagram-working- V/I characteristics.

Silicon Controlled Rectifier (SCR)-structure-V-I characteristics- definitions- holding current- latching current

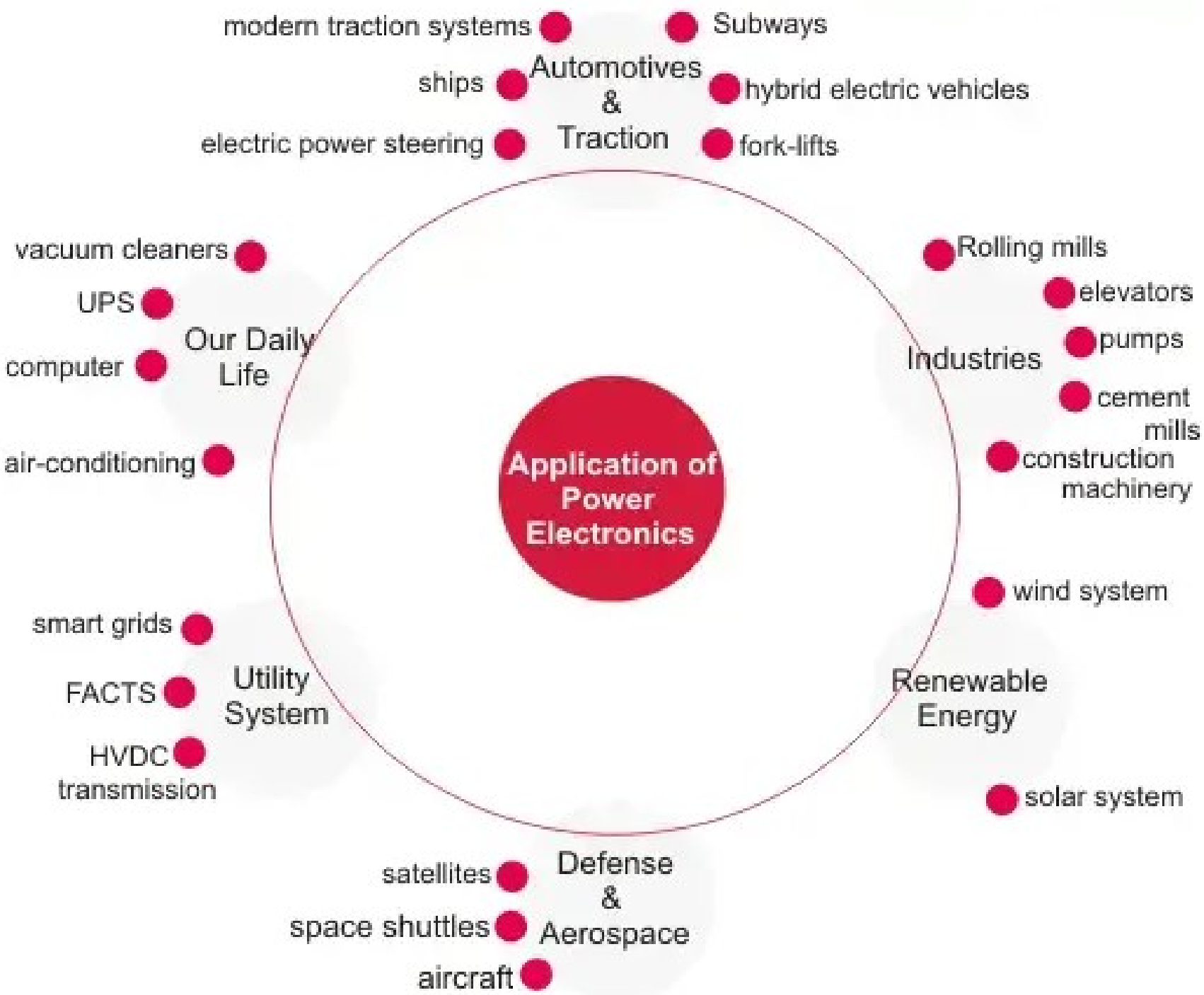
SCR Turn on and Turn off Methods -SCR Turn-On methods -list various methods - basic concepts - gate triggering -forward voltage triggering- resistance triggering-temperature triggering-light triggering- dv/dt triggering-SCR Turn-Off methods-list various methods-basic concepts-Thyristor protection circuits-snubber circuits.

Specifications of SCR -List parameters (Datasheet interpretation only)

POWER ELECTRONICS

- A study that utilizes electronic power devices for converting one form of electric power into another form of electric power with proper control is known as **Power Electronics**.

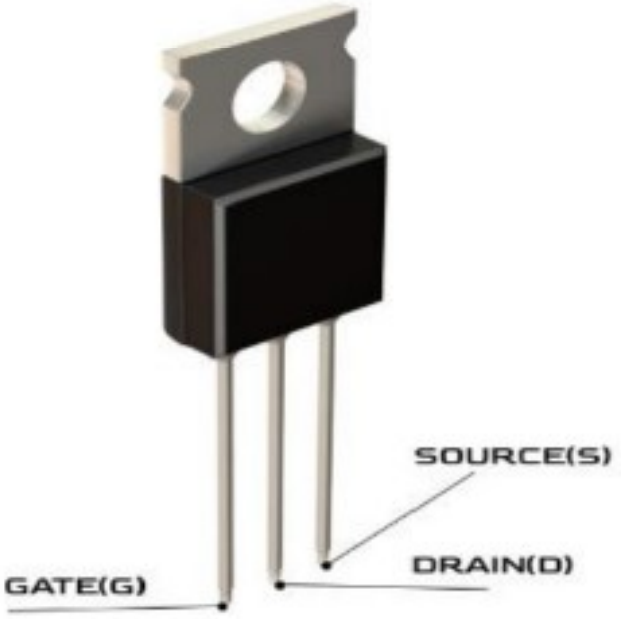
- Basically, in power electronics, solid-state electronics, is used that performs the action of control and convert of the electric power.

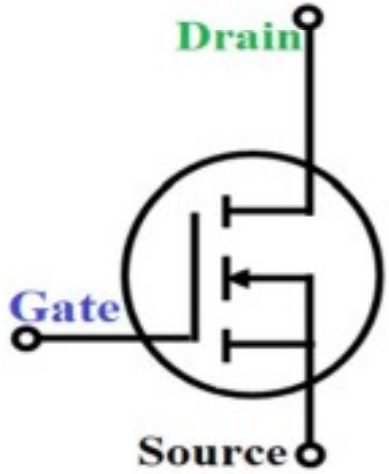

Application of Power Electronics
Automotives & Traction
modern traction systems
Subways
ships
hybrid electric vehicles
electric power steering
fork-lifts
Our Daily Life
vacuum cleaners
UPS
computer
air-conditioning
Industries
Rolling mills
elevators
pumps
cement mills
construction machinery
Utility System
smart grids
FACTS
HVDC transmission
Renewable Energy
wind system
solar system
Defense & Aerospace
satellites
space shuttles
aircraft

POWER ELECTRONIC DEVICES - symbols

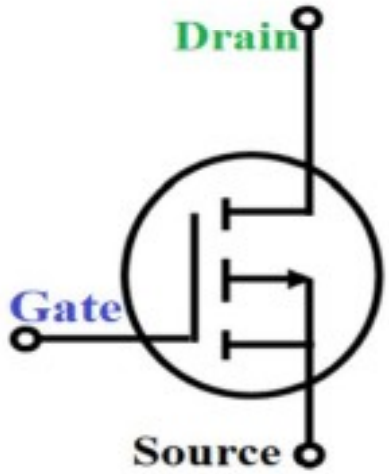
- MOSFET, IGBT,GTO,LASCR,SCS,UJT, DIAC, TRIAC and SCR

MOSFET- METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR



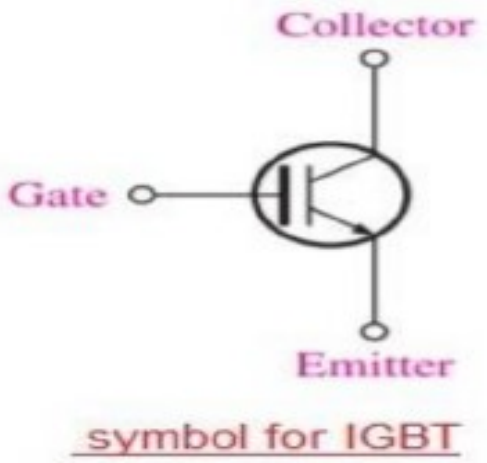


N-Channel MOSFET

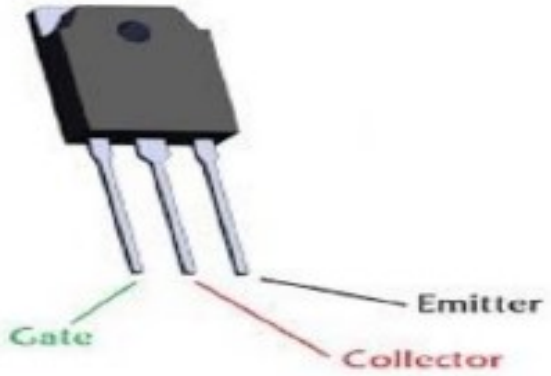


P-Channel MOSFET

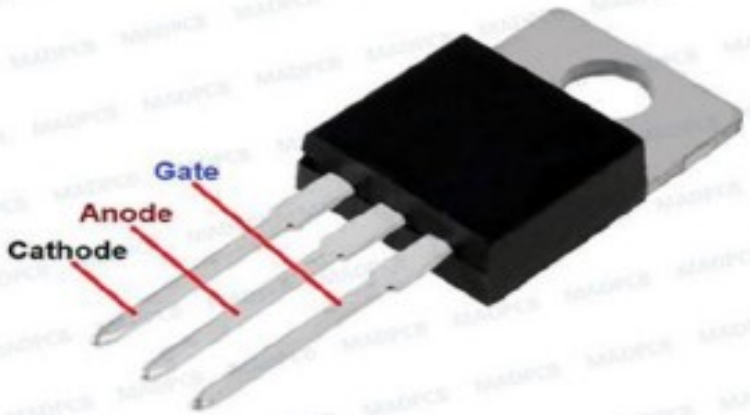
IGBT- INSULATED GATE BIPOLAR TRANSISTOR

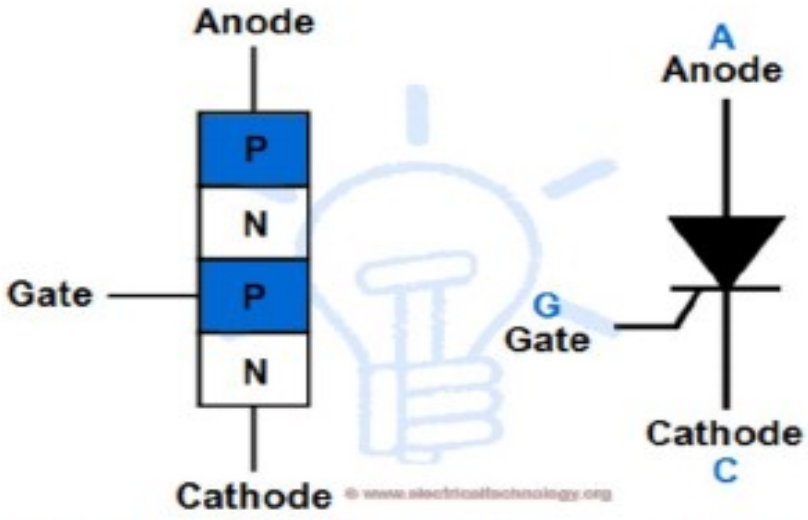


symbol for IGBT



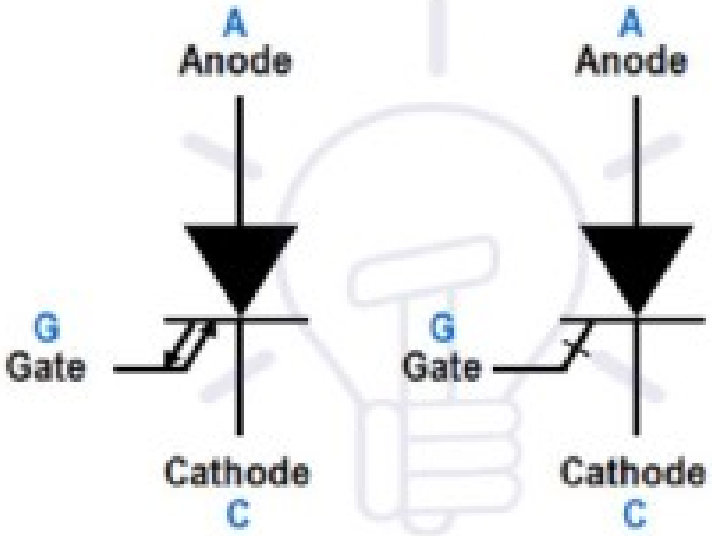
SCR –SILICON CONTROLLED RECTIFIER



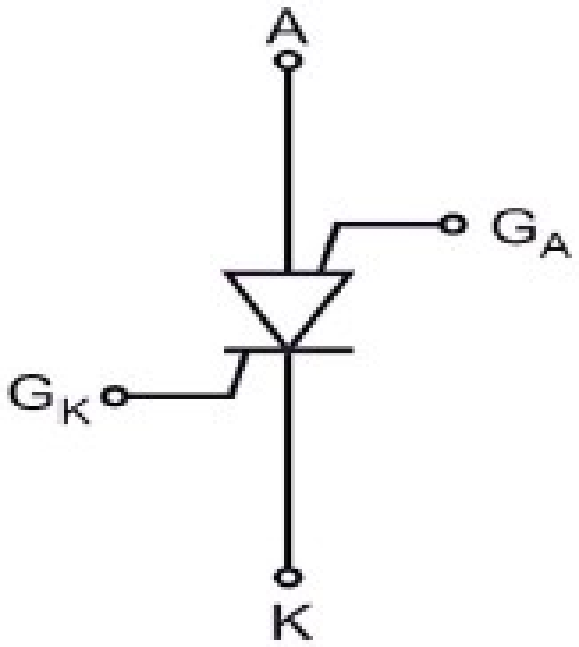


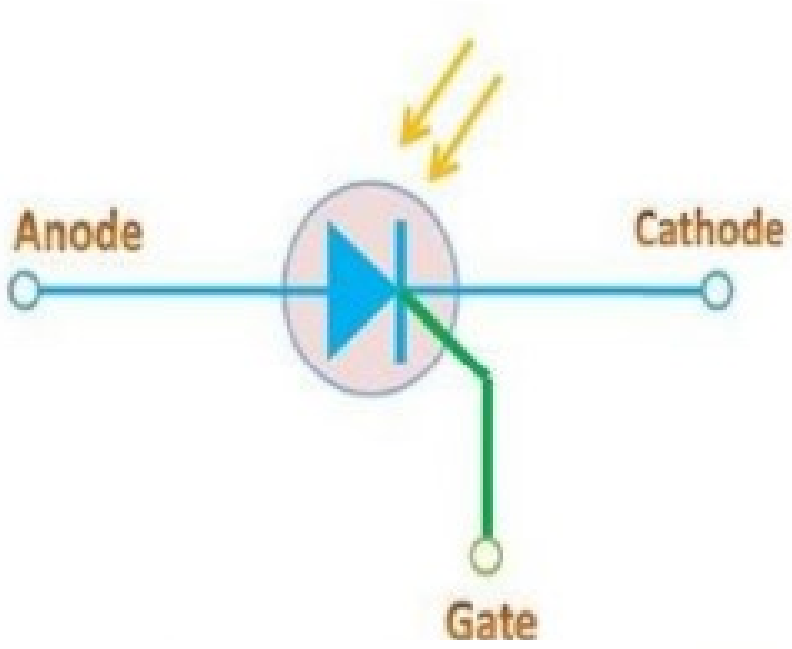
Thyristor (SCR) Structure & Symbol

GTO-GATE TURN OFF THYRISTOR

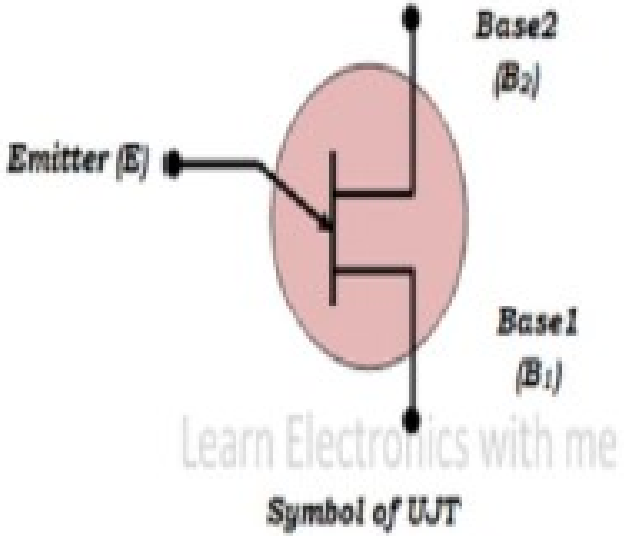


SCS- SILICON CONTROLLED SWITCH





LASCR-LIGHT ACTIVATED SCR



UJT- UNI JUNCTION TRANSISTOR