Amplification classes

Component
École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

In brief

- **Ametys Code:** N7EE07B
- **Open to exchange students:** Yes

Presentation

Objectives

The aim is to learn how to design power amplifiers to achieve maximum efficiency.

Description

In order to interact with the world around us, it is often necessary to deliver significant power to the load, which may be an electromechanical object to set it in motion (speakers, motors, piezoelectric elements, etc.), or an antenna to transmit over long distances. This task falls to the output stage of an amplifier that is directly connected to this load. The amplifier must therefore be capable of delivering a high-power signal without deteriorating its properties.

The output stage must also have the following properties:

— Low output impedance so that the impedance of the output load does not generate a loss of gain.

— Provide high-amplitude signals (in voltage and current).

— Distort the signal as little as possible when dealing with high-amplitude signals (to be compared with small-signal studies in linear electronics to achieve the amplification function).

— Transfer power to the load with maximum efficiency, which means that the

power dissipated by the output stage must be as low as possible. This is all the more important today in order to make battery-powered devices more autonomous.

— Be able to dissipate power without deteriorating the performance of its active components

Pre-requisites

Signal transistors and power components

Transistor amplifier circuits

Continuous linear systems automation

Methods for analyzing electrical circuits