

## Tutorial Title

# Modern Capacitor Technologies for Power Electronic Applications

## Instructor Team

Team Chair: Prof. Dr. Thomas Ebel

## Abstract

Capacitors are one of the fundamental components in electronics. Nowadays the increasing power density and new semiconductor power devices like SiC or GaN are requiring new capacitors and designs.

This ECCE Europe 25 capacitor tutorial will introduce into different capacitor technologies like Aluminium Electrolytic Capacitors (Wet, Polymer, Hybrid); Metallized Film Capacitors (inc. Power Capacitors), Ceramic Capacitors and Supercapacitors with a focus on:

- Physics of capacitors
- Properties of different capacitor technologies
- Materials of capacitors
- Applications of capacitors in power electronics with dedicated design in examples
- Discussion of reliability and lifetime model

## Instructor Team Biographies

Thomas Ebel graduated as PhD from Münster University in Solid State Chemistry in 1995. After his PhD he joined Siemens Matsushita Components now TDK/EPCOS for 13 years in several R&D and management positions in the field of Aluminium Electrolytic Capacitors in Germany and Italy.

From 2008 - 2018 he was Management director of FTCAP a capacitor specialist, manufacturer of customized Metallized Film and Aluminium Electrolytic Capacitor, in Germany.

Since 2018 he is as Associate Professor nor Full Professor, Head of the Centre for Industrial Electronics in Sønderborg, Denmark. The Centre is ECPE competence center of passive components (Capacitors)

His research is in the field of new dielectric materials, new electrolytes and new capacitor designs mainly for industrial and automotive applications.

He published over 150 scientific papers and holds 14 patents.

Prof. Ebel is IEEE Senior and PCIM Advisory board member.