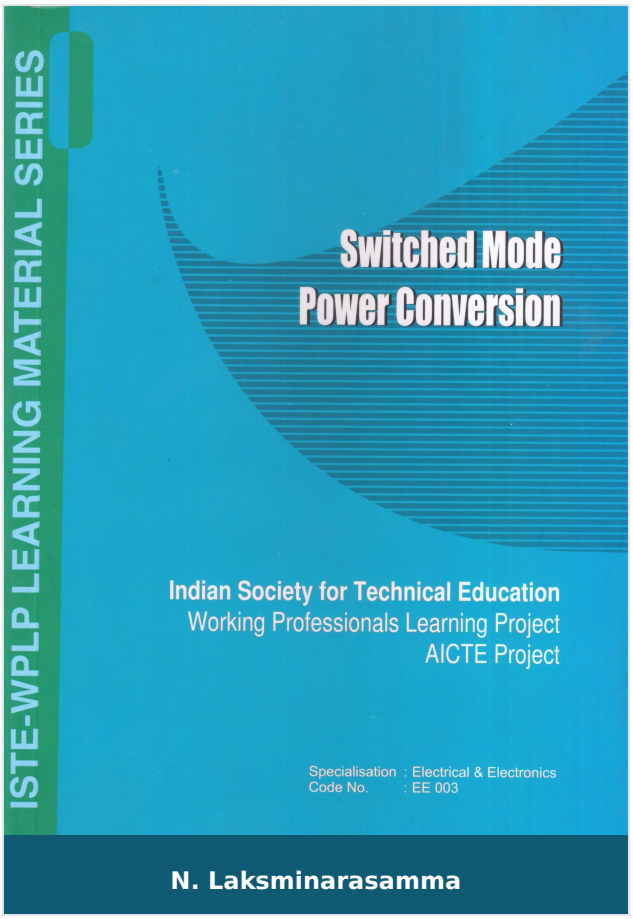


Switched Mode Power Conversion

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Product Description

The switched mode power conversion course is a design and application oriented subject with vast employment and career potential. Presently, the subject invariably has no laboratory component at all. When present, the laboratory session is a euphemism for a dry PC based entry and print out sessions linked to some branded circuit simulation software. However, the students rarely learn the skills of assembling circuits, testing & debugging the same and designing application circuits.

This learning module is intended to serve as a bridge course for fresh engineers who take up power engineering as their career. This will aid in filling the gap between the academics and the industry requirement. The material is designed to be schedules for five days. The study material gives an overview of switched mode power conversion with a design example organized in five Chapters as follows.

The concepts of power processing, a simple power processing system such as a power converter, elements available at the disposal of a power engineer in the design of efficient power converters are discussed in chapter 1. The study state analyses of the basic converter topologies are explained. The basic design of a power converter is explained in Chapter 2 by a spread sheet procedure. Simulation of the designed topology using circuit simulation software SEQUEL (Solver for Equation with User defined Elements) is discussed. The theoretical estimation of the efficiency of the designed power converter is discussed in Chapter 3. The effects of increase in the switching frequency on the losses incurred in the power converter are discussed with a design example.

The state of the art in the power converters are discussed in Chapter 4. The demand is forever moving towards high power densities for which higher switching frequencies becomes inevitable. The problems associated with higher switching frequency are discussed. The technology which provides a solution for high power density power converters such as soft switching are discussed. The concepts of soft switching with an

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example is explained. Chapter 5 gives an Introduction to construction projects of scaled down power level. These may be used as training kits along with this learning module to get an overview of switching converters.

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Dr. N. Lakshminarasamma, Faculty, Dept. of Electrical Engineering, Indian Institute of technology, Madras, Chennai. Email: lakshmin@iitm.ac.in N. Lakshminarasamma received B.E. degree in Electrical Engineering in 1994, Master in power electronics in 1997 from Bangalore University, and Ph.D. degree from Indian Institute of Science, Bangalore, India in 2007. Currently she is faculty at Indian Institute of Technology Madras, Chennai. She has 4 years of academic experience in B.M.S. college of Engineering, Bangalore and Nitte Institute of Technology, Bangalore in the Dept. of Electrical Engineering; she has worked as a software engineer with 12 Technologies India Private Limited and as a Systems Engineer in GE Healthcare India Limited. She has coauthored four journal papers in peer-reviewed journals, including the IEEE Transactions on Power Electronics and several premier conferences. Her areas of interest are power electronics, switched mode power converters and resonant converters.

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