

Course Title	Design of Switched Mode Power Supplies	Course No	To be filled by the office		
Specialization	Electronics Engineering	Structure (IPC)	3	0	3
Offered for	M. Des (EDS), Dual (EVD and ESD), B. Tech (EDM)	Status	Core <input type="checkbox"/> Elective <input checked="" type="checkbox"/>		
Prepared by (Faculty Name)	Dr. Damodharan. P				
Pre-requisite	Basic Electrical and Electronics Engg., Power Electronics and Control System	To take effect from	Jan 2017		
Course Objectives	Understand the concepts, basic operation, steady-state operation of efficient switched mode power conversion techniques, including basic circuit operation and magnetic design.				
Course Outcomes	At the end of the course, students will be able to do the Steady-State Analysis, modelling, Design of switched-mode DC-DC power converters and corresponding control techniques. Become proficient with computer skills (e.g., PSPICE and MATLAB) for the analysis and design of switched mode power converters.				
Contents of the course (With approximate break up of hours)	Switching devices: Ideal and real characteristics, control, drive and protection. (5) Design constraints of reactive elements in Power Electronic Systems: Design of inductor, transformer and capacitors for power electronic applications, Input filter requirement. (5) Switching power converters: Circuit topology, operation, steady-state model, dynamic model. PWM DC - DC Converters (CCM and DCM) - operating principles, constituent elements, characteristics, comparisons and selection criteria. (14) Soft-switching DC - DC Converters: Zero-voltage-switching converters, zero-current switching converters, Multi-resonant converters and Load resonant converters. (5) Pulse Width Modulated Rectifiers: Properties of ideal rectifier, realization of near ideal rectifier, control of the current waveform, single phase and three-phase converter systems incorporating ideal rectifiers and design examples. (5) Review of linear control theory. Closed-loop control of switching power converters. Sample designs and construction projects. (8)				
Text and References	Text: 1. R. W. Erickson and D. Maksimovic, Fundamentals of Power Electronics, 2 nd ed., Kluwer Academic Publishers, 2000. References: 1. Marian K. Kazimierczuk, 'Pulse-width Modulated DC-DC Power Converters' John Wiley & Sons Ltd., 1st Edition, 2008. 2. Philip T Krein, 'Elements of Power Electronics', Oxford University Press, 2nd Edition, 2012. 3. Batarseh, 'Power Electronic Circuits', John Wiley, 2nd Edition, 2004. 4. H. W. Whittington, B. W. Flynn, D. E. Macpherson, 'Switched Mode Power Supplies', John Wiley & Sons Inc., 2nd Edition, 1997.				