

**Digital Control Techniques in Switched Mode Power Converters (SMPCs) –  
Part I (April 19 to April 24, 2021)**

Module number	Major topics & hours	Content overview
Module#M <sub>11</sub>	Modulation Techniques in SMPCs (6 hrs)	<ul style="list-style-type: none"><li>• Commonly used isolated and non-isolated SMPC topologies</li><li>• Trailing-edge, leading-edge, dual-edge PWM techniques</li><li>• Phase shift modulation – Single phase, dual phase shift, etc.</li><li>• Constant on-time, constant off-time modulation</li><li>• MAT:AB based simulation case studies</li></ul>

**Reference book and material:**

- [1] R. W. Erickson and D. Maksimovic, *Fundamentals of Power Electronics*, 3<sup>rd</sup> Ed., Springer, 2020.
- [2] S. Kapat and P. T. Krein, "A Tutorial and Review Discussion of Modulation, Control and Tuning of High-Performance DC-DC Converters based on Small-Signal and Large-Signal Approaches" *IEEE Open Journal of Power Electronics*, vol. 1, pp. 339 - 371, Aug. 2020.