

**Organizer and Host Institution**

Roma Tre University – Department of Engineering,  
Power Electronics and Electric Drives Laboratory,  
[luca.solero@uniroma3.it](mailto:luca.solero@uniroma3.it)

**Technical Sponsorship**

ECPE – European Center for Power Electronics

**In cooperation with**

Infineon Technologies, National Instruments,  
Semikron, Huawei Technologies, The University of  
Nottingham, University of Roma Tor Vergata

**Chairman**

Fabio Crescimbinì - *Roma Tre University*

**Lecturers**

Stefano Bifaretti - *University of Roma Tor Vergata*  
Fabio Brucchi - *Infineon Technologies Austria AG*  
Valeriano Cardi – *Semikron*  
Petar Grbovic - *Huawei Technologies*  
Alessandro Lidozzi - *Roma Tre University*  
Luca Solero - *Roma Tre University*  
Pericle Zanchetta - *The University of Nottingham*

The course is scheduled in 3 weeks, 4 days a week, 3 ECTS each week. Each course week can be attended independently and as a single short course. The course is primarily intended for PhD and Master students; however, it is also open to staff of companies interested in the topic.

No fees for attending people.

**Registration**

Register before June 23<sup>rd</sup>, 2015. Please email a copy of the completed registration form to [luca.solero@uniroma3.it](mailto:luca.solero@uniroma3.it)

**Venue**

Roma Tre University, Department of Engineering  
Via della Vasca Navale, 79 – 00146 Roma, Italy  
Mechanical and Industrial Engineering Division  
2nd floor, Conference Room n. dir.01  
Ph. +39 06 5733 3277





# Roma Tre Summer Course on Power Electronics and Applications



Roma Tre Summer Course on <u>Power Electronics and Applications</u>	
Registration Form (email to <a href="mailto:luca.solero@uniroma3.it">luca.solero@uniroma3.it</a> )	
Week 1 <input type="checkbox"/>	Week 2 <input type="checkbox"/>
Week 3 <input type="checkbox"/>	
Attendee:	
	<i>Title, Given Name, Name</i>
	<i>Company, Department</i>
	<i>Full Address</i>
	<i>Phone, Fax</i>
	<i>Email</i>
	<i>Date, Signature</i>



## Week 1 (3 ECTS) - Trends in Power Electronics Tuesday, June 30<sup>th</sup>

14.00-14.15	Welcome, Introduction	F. Crescimbinì
14.15-16.00	Power Semiconductor Switches and Failure Modes	P. Grbovic
16.15-18.00	Design of Power Modules	V. Cardì

Wednesday, July 1<sup>st</sup>

10.00-11.30	Gate Drivers: High Switching Frequency Applications, SiC & GaN	P. Grbovic
11.30-13.00		
14.00-15.30	Thermal Design of Power Modules	V. Cardì
15.30-17.00	Multilevel Converters	S. Bifaretti

Thursday, July 2<sup>nd</sup>

10.00-11.30	Control in Power Electronics	P. Zanchetta, S. Bifaretti
11.30-13.00		
14.00-15.30	Tour at Semikron Italy Factory	V. Cardì
15.30-17.00		

Friday, July 3<sup>rd</sup>

09.00-11.00	Testing and Characterization of Power Semiconductor Devices + Lab. Exercise	P. Grbovic, A. Lidozzi
11.00-13.00	Power Electronics in More Electric Aircraft	P. Zanchetta

## Week 2 (3 ECTS) - Present and Future Applications of Power Electronics

Monday, July 6<sup>th</sup>

14.00-14.15	Welcome, Introduction	F. Crescimbinì
14.15-16.00	Power Electronics Today and Tomorrow: Challenges, Issues and Perspectives	P. Grbovic, L. Solero
16.15-18.00		

Tuesday, July 7<sup>th</sup>

10.00-11.30	Power Electronics in Microgrids and Smart Grids	S. Bifaretti, L. Solero
11.30-13.00		
14.00-15.30	Design of Modern IGBT According to Application Requirements	F. Brucchi
15.30-17.00	IGBT and FRD in UPS Applications	

Wednesday, July 8<sup>th</sup>

10.00-11.30	Power Electronics in Ground Vehicles	L. Solero
11.30-13.00		
14.00-15.30	IGBT and FRD in Motor Drives Applications	F. Brucchi
15.30-17.00	IGBT and FRD in Welding Applications	

Thursday, July 9<sup>th</sup>

10.00-11.30	Tour at Semikron Italy Factory	V. Cardì
11.30-13.00		

## Week 3 (3 ECTS) - Practice on Power Electronics (Hands-on class)

Instructors: A. Lidozzi, P. Zanchetta

Monday July 13<sup>th</sup> 14.00-18.00

Tuesday July 14<sup>th</sup> 10.00-13.00 and 14.00-17.00

Wednesday July 15<sup>th</sup> 10.00-13.00 and 14.00-17.00

Thursday July 16<sup>th</sup> 09.00-13.00

Theory and practice on National Instruments boards based on the new Xilinx Zynq® System on Chip with Linux real-time OS. Insight view and develop of specific Power Electronics applications.

- LabVIEW basic concepts, front panel and block diagram, debugging, programming guidelines. Application development. Programming on-board Real-Time target. Programming on-board FPGA target. Communication between targets.
- Development of the control structure for a Buck Power Converter using Real-Time and FPGA capabilities.