



2nd level Master in Power Electronics Devices and Technologies CALL for Applications

Students are invited to apply for the second-level Master in "**Power Electronics Devices and Technologies**" for the academic year 2023/2024.

The maximum number of admissions is 30 and applicants will be ranked based on evaluation criteria.

The program will start if a minimum of 10 applicants is reached.

1. Objectives

The main objective of the Master in **Power Electronics Devices and Technologies** is the development of skills and advanced knowledge on solving multidisciplinary problems related to physics, chemistry and engineering, based on the research, development, production and testing of WBG power electronics devices.

The program also focuses on the analysis, design, and application of WBG Devices in electronic systems and converters in modern applications like electric traction and renewable energy.

The master includes a prestigious collaboration with STMicroelectronics which funds the initiative with a specific agreement. A number of scholarships or grants offered by STMicroelectronics will partially or fully cover the tuition fees. Scholarships and partial grants are awarded to students based on evaluation criteria according to the outcome of the selection process.

2. Career opportunities

The aim of the Master is to train advanced technical profiles in the field of Power Electronics able to study materials, know technologies and supervise the processes for the production of power devices, as well as to develop electronic discrete and system-on-chip converters.

After the Master, the graduates can pursue their career in manufacturing industries of power electronic devices, systems and equipment .

3. Candidate profile

The program is open to all applicants including early career professionals with a **Master degree** ("Laurea Magistrale", Master of Science, 4-year or 5-year Degree) in industrial engineering disciplines, computer science, mathematics, physics, chemistry, received from an Italian or a non-Italian university. Final-year students, who have not completed their degree can apply and be admitted upon condition that they receive their degree within 90 days from the beginning of the program.

Applicants are required to be proficient in English.

Be strongly motivated.

4. Master's organization

The Master's activity includes a total of 1500 hours in one academic year organized as follows:

- n. 396 hours of lectures, exercises and guided study;

- n. 804 hours of individual study (75 for the preparation of the final project work);
- n. 300 hours of industrial internship.

Lectures will be mainly held in the premises of the University of Catania at the Department of Electrical Electronic and Computer Engineering.

Attendance is compulsory.

Students are allowed a maximum 20% of absences out of the total hours established for the course. The Master's course will award 60 ECTs.

5. Educational program

The Master's course includes 7 subjects, split into 15 modules;

Subject 1: Physics of semiconductors and WBG materials

Module 1 - Physics of Semiconductors: energy bands and electrical properties

Module 2 - Physics of Semiconductors: optical properties and wide band gap materials

Subject 2: Process Technology and Characterization

Module 1 - Crystal growth, thin film deposition and processing

Module 2 - Surface and interface analyses

Module 3 – Structural characterization and microscopies

Subject 3: Microelectronic circuits

Module 1 - Circuit theory for microelectronics

Module 2 - Analog IC design

Module 3 - Digital IC design

Subject 4: Electronic measurements

Module 1- Measurement uncertainty

Module 2 - Digital Instrumentation

Subject 5: Electronic power converters

Module 1 – AC/DC and DC/DC converters

Module 2 – Inverter topologies and applications

Subject 6: Design principles of discrete and integrated power converters

Module 1 - Design of discrete power converters

Module 2 - Design of integrated circuit for energy management

Subject 7: Device Physics and reliability

Module 1- Device physics

Module 2- Thermal behavior and reliability of power devices

6. Application procedure

Students can apply **exclusively on-line** at the website www.unict.it.

Visit the University of Catania's website at www.unict.it, on the home page go to ‘Services’, click on "**Portale Studenti**" (Students) and follow the instructions:

- Register if you do not have a PIN, then log in;
- Click on "Portale Studenti" (Students), then on "**Iscrizione**" (admission tests), then "**Master**", click on "**domanda di ammissione**" choose the Master in Power Electronics devices and Technologies course;

- Fill in the on-line form.

For more details, please refer to:

<https://www.unict.it/it/didattica/master-universitari/2023-2024/power-electronics-devices-and-technologies>

Participation in the selection is subject to the correct payment of the fee by 11.59 pm on 26 September 2023.

7. Processing of personal data

The notice on the processing of personal data (art. 13 of the Leg. Decree of 30/06/03 n. 196 "Personal data") is included in Attachment 1 of this announcement, published in the following link: https://www.unict.it/sites/default/files/files/Informativa%20studenti_aprile%202021-DEF.pdf

8. Selection and ranking

Holding one of the degrees listed in chapter 3 of the present announcement is an indispensable requirement.

As previously stated, consider that a selection will be carried out based on the qualifications included in the application.

The qualifications reported in the application will award the following points:

- University degree: up to *16 points* depending on the mark;
- Final dissertation on topics relevant to the subjects taught in the MA course: up to *6 points*;
- Other degrees (second degree, specialization, PhD, other diplomas or MA degrees): up to *6 points*;
- Documented experience in activities relevant to the subjects taught in the MA course, projects including stays at other universities, research studies and traineeships in activities relevant to the subjects taught in the MA course (traineeships carried out during academic courses will not be taken into consideration): 1 point for each period of at least 6 months, up to a maximum of *8 points*;
- Scientific publications relevant to the subjects taught in the MA course: up to a maximum of *5 points*;
- English language certification: up to *4 points*.

The maximum total will be: 45 points.

The Assessment Commission reserves the right to evaluate the requirements through a test and/or an interview that will be held in English. The interview is scheduled for **9 October 2023 starting from 9.00** on the Teams platform.

In case two or more students have the same number of points, preference will be given to the youngest ones (art. 2, subsection 9, L. 16/06/1998 n. 191).

The list of the admitted students, selected based on the above criteria will be published on the 16 October 2023 at <http://www.unict.it/it/didattica/master-universitari> .

9. Traineeship

The Master program includes 300 hours of traineeship to be carried out in companies and bodies dealing with the themes studied in the course, allowing the students to put in practice the competences they have acquired during lectures.

During traineeships, reference people from the companies will follow the student activities in order to identify and develop each one's skills with the cooperation of university tutors.

The aim is to develop a Project Work that will include all the competences acquired during the course. The traineeship will be held mainly in STMicroelectronics.

10. Scientific committee

The coordinator of the Master is Prof. Mario Cacciato of the Department of Electrical Electronic and Computer Engineering of the University of Catania. The Scientific Committee is composed by professors of the University of Catania as well as engineers and scientists from STMicroelectronics:

Name	Department/Company
Prof. Mario Cacciato (coordinator)	UniCT Electrical Electronic and Computer Engineering
Prof. Compagnini Giuseppe	UniCT Chemistry
Prof. Condorelli Guglielmo Guido	UniCT Chemistry
Prof. Mirabella Salvatore	UniCT Physics and Astronomy
Prof. Salvatore Pennisi	UniCT Electrical Electronic and Computer Engineering
Prof. Antonio Terrasi	UniCT Physics and Astronomy
Giuseppe Arena, Mario Saggio, Michele Calabretta	STMicroelectronics
Rosario Scollo, Filippo Scrimizzi, Vincenzo Randazzo, Gianfranco Di Marco	STMicroelectronics

11. Information

For further information or **problems with the registration procedure** students can contact the Secretariat at +39 095 7382602, or send an e-mail at master-power-electronics@outlook.it

12. Person in charge of the program

In compliance with Law 241/1990, the Person in charge of the program is Mrs. Venera Fasone, also in charge of the MA Office at the University of Catania, venera.fasone@unict.it.

Catania,

Head of Master Program
M. Cacciato

Administrative Services Director
G. Caruso

University Dean
F. Priolo