

30 Years of Promoting Electronic Packaging PCB Education and Training Topics In Romania

Three decades ago, the **Tehnici de Interconectare in Electronica**- Interconnection Techniques for Electronics (TIE) program (www.tie.ro) was launched at the **University Politehnica of Bucharest, Romania**, a program that today has expanded to all universities in Romania with departments that educate and train future engineers for the electronics industry. In those early years all TIE activities were conducted in the Romanian language.

Like any beginning, the start of TIE was not a piece of cake. First, we had to overcome the barriers of ignorance that considered the problem of PCB design as a trivial matter, without academic flavor! Luckily for us, there were, within some prestigious technical universities such as the **Technical University of Cluj-Napoca**, the **Technical University Gh. Asachi** from Iasi and **University Politehnica of Timisoara**, universities joined by the younger **University of Pitesti**, teaching staff with a very good perception of the evolution of the electronics field, joining the colleagues from UPB.

After not many editions, the TIE event had participants from all universities inside the country that have a specialization in the electronics industry.

In the last decade of the last century, it was difficult to talk about an electronics industry in Romania but starting with the new millennium this industry became more and more present, and as a result required engineers capable of being involved in the design of printing circuit board.

TIE's motto is: **TIE a Way to Turn Your Hobby into Profession**, which made it easier for many students, former participants in TIE editions, to find a very good job in a field they mastered very well and enjoy it. And this was possible because it was always aimed to bring the TIE edition issues to be resolved as close as possible to the specifics of industry issues.

And so, year after year, edition after edition a stage was reached, I think after the 15th edition, which necessitated a better correlation of student training with industry requirements. Within the TIE Steering Committee, it was decided to set up two committees, the Technical one (composed of the teaching staff involved in students' education and training) and the Industrial one (composed exclusively of people from industry, many of whom as students, participated in TIE). The first committee's role deals with the training of students while the second committee is concerned with preparing the topics that students must solve in the current edition. In addition, it was decided that the TIE, subjects, evaluation, etc. should be conducted in English.

During each four-hour session of intense design activity, participating students were formed into teams and were asked to solve topics prepared by the Industrial Committee. Each student, at the beginning of the session received all the needed information including clarification regarding the subject.

After the time allocated for solving the topic, there is a relaxation break, and then each participant demonstrates to the evaluator team the solutions developed during the four hours of hard work. The evaluation process is open, with the opportunity for any TIE participant to be present. The evaluation team is composed of the members of the TIE Industrial Committee and the members of the TIE Technical Committee. The existing interaction between members from the two TIE committees has led, during the evaluation process, to a very good relationship between the evaluator teams. The members of the teaching staff could have the possibility to obtain clearer perception about the industry requirements and to use them in further training activities.

Following the evaluation, the ranking is drawn up and the Head of the Industrial Committee establishes the minimum score necessary for a participant to receive the certificate of competence as a PCB designer.

TIE subjects, considering that they address undergraduate students, mainly consider the formation of skills required for the use of CAD programs for the realization of electronic schemes as well as the design of PCBs, on rigid / flex substrate, respecting conditions of technological restrictions.

But things have evolved and for about six years a more complex stage has been added, the **TIE Plus** (<http://www.tie.ro/tie-plus/>) on PCB design. This time, the students' level of knowledge regarding Signal and Power Integrity is followed. The TIE Plus format is more advanced and requires participants to have a high level of specialized knowledge. The web page mentioned above provides ample information on TIE Plus topics which also takes place in English.

As a general conclusion regarding an activity that takes place thanks to a very good collaboration between the electronics packaging community created in Romania, the electronics industry employees, former participants in TIE / TIE Plus and academia, we can conclude that after three decades a platform was created to support students interested in finding a job in the electronics industry as a PCB designer.

Both TIE and TIE Plus are conducted in English, and the TIE programs are open to those students interested in TIE / TIE Plus subjects, to take part in future editions. The IEEE EPS Student Chapters established in Romania can be used as contact points and can support those willing to participate.

I cannot finish my short presentation about three decades of TIE environment, without acknowledging and thanking, from the depth of my heart, all the teaching staff from universities and the industrialists, who throughout the thirty years have been (some have remained) with the spirit of TIE.

Professor Emeritus, DHC mult. Paul Svasta, PhD

TIE initiator

IEEE Life Senior Member

IEEE EPS Hu&Ro Joint Chapter, Senior Past Chapter Chair



TIE 2016 participants



TIE students working hard to solve the subject



TIE 2016 Evaluation