

# How to Educate the Next Generation IC Debug / FA Engineer at Academia

*“The debug of logic, the skills to use probing tools and understand the results are not yet taught in schools”*

- Howard Marks (Director Silicon Technology FA at NVIDIA)

At TU Berlin, significant effort was taken over the past 10+ years to successfully develop an educational framework focused on FA and Debug, unique in academia to-date. It satisfies the need for young and skilled engineers in this field and finds great appreciation among students and industry.

*“Recruiting TUB graduates means to hire experienced FA engineers with rich background in design, test and technology.”*

- Siegfried Goerlich (Director FA at Infineon)

*“TUB’s graduates have in depth experience and knowledge in their fields to immediately contribute to semiconductor companies in the failure analysis arena.”*

- Mike DiBattista (Senior Staff Engineer/Manager at Qualcomm)

*“I would be happy to have an education like TU Berlin also in Portland and look forward to a cooperation of TU Berlin and Portland State University.”*

- Zhiyong Ma (Vice President at Intel)

The essential parts of our curriculum towards IC Debug are two practical courses: one concluding the bachelor phase with the design, layout, manufacturing and electrical characterization of a real custom CMOS test chip and thereby drawing attention to the interface of circuit design to technology. The other, part of master studies, is an integrated lecture with practical course explaining and applying FA and Debug process flow, tools and techniques of fault isolation and circuit edit in our lab.

This curriculum not only grows engineers for FA and IC debug, it also raises attention to the important role analysis plays in electronic device development and production in the education of circuit design and technology engineers.

Such an educational concept is based on three fundamental components for our work: A cooperating research institute and foundry at IHP close by Berlin in Frankfurt (Oder) for chip production, an FA laboratory with up-to-date equipment for hands-on experience that TU Berlin happens to operate, and a tight connection to extremely supportive industrial partners providing internships, tool support and job opportunities.

This keynote presentation shows that other universities could also be empowered to offer courses teaching the full picture of electronic device development with respect to analysis and quality assessment when industrial partners provide support with test chip contingencies and some donation or access to fault isolation and /or circuit edit equipment. We believe that an international network of such educational cooperations, ideally hosted by EDFAS, will be an excellent fundament for a strong and creative next generation of Debug / FA employees.

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