Executive Technical Talk on Introduction to Semiconductor and Testing at Jabatan Kejurutereaan Elektrik Politeknik Ungku Omar (PUO)

By
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He is the eETD Honourary Secretary cum Treasurer for 2025/2026 session.

Jabatan Kejuruteraan Elektrik (JKE), PUO and eETD IEM successfully organized Executive Technical Talk on **Introduction to Semiconductor and Testing** on 29th April 2025. The program attended approximately about 61students from JKE. The purpose of the executive talk is to provide exposure to the "Semiconductor and Testing Industry knowledge to the JKE students who will be taking CMOS VLSI Design and CMOS IC Design and Fabrication course in upcoming semester.

The executive talk introduces semiconductor technology and testing, connecting academic theory with industry practice. It covers technological evolution, front-end and back-end processes, and manufacturing tests. The executive talk began with a formal introduction of the speaker, Ir. Sivarama Rukumangatha Rajah, by a member of the JKE, PUO Organizing Committee. The speaker began the session by providing an overview of semiconductor fabrication and manufacturing processes, highlighting the critical steps involved from wafer production to device assembly. He then introduced the students to integrated circuit (IC) packaging and the importance of rigorous testing in ensuring product reliability. During the session, the speaker shared examples of common testing challenges, such as detecting faults in increasingly complex circuits and maintaining accuracy under high-speed conditions. The Semiconductor Fabrication and Manufacturing shared as shown in figure 1 below (Source Intel):

Figure 1: Semiconductor Fabrication and Manufacturing Process

The speaker then introduced an overview of semiconductor manufacturing and testing. The process of semiconductor manufacturing and testing involves several key stages. It begins with wafer fabrication, is

used to pattern circuits onto the wafer's surface, followed by doping, etching, and deposition steps to build up the layers of the integrated circuits. After the circuits are formed, the wafer undergoes slicing and individual chips are separated and packaged. In the testing phase, each chip is rigorously tested for functionality and reliability, using both electrical and physical tests to detect faults or defects. These steps ensure that only high-quality, reliable semiconductor devices proceed to final assembly and deployment. The process is shown in figure 2 below.

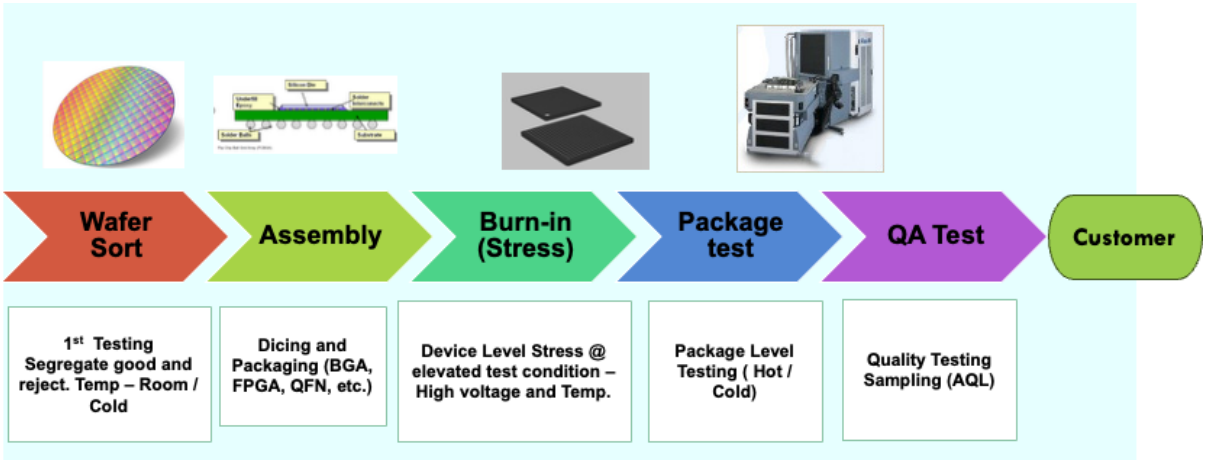

Figure 2: Semiconductor Fabrication and Manufacturing Process

To engage the audience and make the session interactive, the speaker posed questions to the students and encouraged responses. Several students asked about topics such as the CPU, FPGA, and the reasons why semiconductor materials are preferred in electronic devices. The speaker explained that semiconductors are chosen due to their unique electrical properties, which allow for precise control of current flow, essential for modern electronics. He further clarified that materials like silicon are widely used because they offer a balance of conductivity and reliability, making them ideal for integrated circuits and various applications. This interactive segment provided students with valuable insight into the practical aspects of semiconductor technology.

The key takeaway from the executive technical talk is the pivotal role that semiconductors play in driving innovation and enabling emerging technologies across various industries. As the foundation of modern electronics, semiconductors are essential for the advancement of everything from computers and smartphones to medical devices and renewable energy systems. This dynamic field offers tremendous career prospects for future talents—whether as engineers, researchers, scientists, or technical professionals—by providing opportunities to contribute to ground-breaking developments that shape the technological landscape. Mastery in semiconductor technology not only opens doors to rewarding careers but also empowers individuals to be at the forefront of transformative change in society.

At the conclusion of the session, the JKE, PUO Organizing Committee expressed their gratitude to Ir. Sivarama Rukumangatha Rajah for his insightful presentation by presenting a token of appreciation. The event concluded with a group photo, capturing memorable moments with the speaker, committee members, and participating students. This gesture highlighted the committee's recognition of the speaker's valuable contribution and fostered a sense of camaraderie among all attendees.


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Photos taken during the technical talk