



# Tabaqat Training Presentation

tabaqat ~ layers of technology

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# Overview - Integrated Circuits

In 1958, Jack Kilby built the first integrated circuit flip-flop with two transistors at Texas Instruments. In 2008, Intel's Itanium microprocessor contained more than 2 billion transistors and a 16 Gb Flash memory contained more than 4 billion transistors. This corresponds to a compound annual growth rate of 53% over 50 years. No other technology in history has sustained such a high growth rate lasting for so long.

This incredible growth has come from steady miniaturization of transistors and improvements in manufacturing processes. Most other fields of engineering involve tradeoffs between performance, power, and price. However, as transistors become smaller, they also become faster, dissipate less power, and are cheaper to manufacture. This synergy has not only revolutionized electronics, but also society at large. [1]

[1] "CMOS VLSI Design - A Circuits and System Perspective" by Neil Weste & David Harris



# Overview - tabaqat

Founded in 2020, **tabaqat** was established to be pioneers in the VLSI space (very large scale integration). **tabaqat** is an IC design service provider and a training center, with engineers having years of experience in the VLSI space. **tabaqat** trains EEE/ECE engineering students and fresh grads to become the future VLSI designers of IC's.

Why the name **tabaqat**?

**tabaqat** in the Arabic language means layers. VLSI IC's are built using many layers of material over one another, which is why we chose the name.



# Global Demand

Electronic chips are like food => It is becoming an essential part of our everyday lives; from our phones, computers, cars, smart devices, IoT, home appliances, and much more.

A combination of different events has led to major production stoppages in 2020, especially in the automobile industry. The factories are full of vehicles that cannot yet go on the market because they have not been equipped with chips. It is estimated that the automotive industry will produce four million fewer vehicles than it would under normal conditions.

But chips are not only needed for cars, they are also present in many of the electronic objects and devices that we use in our day to day: from our phones to our televisions, through our computers or consoles. An increase in remote work and remote learning caused a surge in demand for computers, network peripherals, and other consumer electronics with chips.



# Global Demand

Qualcomm Inc, whose chips feature in Samsung phones, is one major chipmaker struggling to keep up with demand. Apple Inc's major supplier Foxconn also warned of the chip shortage affecting supply chains to clients.

Cars account for **15%** of global chip production, while personal electronics account for around **50%**.

U.S. semiconductor companies account for 47% of global chip sales, but only 12% of global manufacturing is done in the United States.



# Global Demand

Factories that produce wafers cost tens of billions of dollars to build, and expanding their capacity can take up to a year for testing and qualifying complex tools.

U.S. President Joe Biden has sought \$37 billion in funding for legislation to supercharge chip manufacturing in the country.

Currently, four new factories are slated in the country, two by Intel Corp and one by TSMC in Arizona, and another by Samsung in Texas.

China has also offered a myriad of subsidies to the chip industry as it tries to reduce its dependence on Western technology.



# Potential Salaries

The salaries in this profession are quite handsome and increase as you climb up the corporate ladder. Of course, like the compensation for any job, here too, it depends on your location. You can always use glassdoor to get the latest average salaries for your designation in your geographical area.

The national average salary for a VLSI Design Engineer is **\$99,726** in United States.

The national average salary for a IC Design Engineer is €77,291 (**\$87,280**) in Germany.





# Is VLSI for you?

VLSI field is highly technical and completely based on electronics engineering. Usually, only candidates with a background in **electrical engineering** (of any specialization; such as communication, electronics, computer, mechatronics, power, biomedical, and similar) can get into semiconductor industries because it requires a minimum of BE/BTech/BS in ECE/EEE as a necessary qualification.

However, Computer Science / IT engineers can also try for some specific jobs, with good knowledge of digital fundamentals and software programming. It is a lucrative field that is automation-resistant. You always need SoCs and embedded systems to design the robots!

<https://technobyte.org/vlsi-career-vlsi-engineer/>

# Training Material

What are you going to learn in this VLSI Digital Circuit design course?

- VLSI and CMOS history in a glance.
- VLSI structure & P/N junction.
- Logical sequential and combinational cells.
- Stick diagrams.
- VLSI Layout.
- Introduction to VLSI verification.
- Bonus: soft skills, interview preparation, and working etiquette.





# Interesting Reads

Read about how the art of integration of circuits was developed - with an emphasis on the smartphone industry.

<https://www.geeksforgeeks.org/the-vlsi-revolution/>

What Is the Average VLSI Design Engineer Salary by State

<https://www.ziprecruiter.com/Salaries/What-Is-the-Average-VLSI-Design-Engineer-Salary-by-State>

Samsung is investing \$115 billion into the #semiconductor space in order to become the market leader in both memory and logic chips by 2030.

<https://www.electronicdesign.com/technologies/embedded-revolution/article/21807909/samsung-plots-out-115-billion-of-semiconductor-spending>



# Register & Contact Us

## Interested?

Register online to enroll in tabaqat's VLSI training program:

<https://forms.gle/6WsubeA3LKd7X6556>

And feel free to drop us an email at:

[hello@tabaqat.io](mailto:hello@tabaqat.io)

