**System Design:**

1. What is system design?
2. Why do we need it?
3. What are the required components?

**What is system design?**

It is the process of defining the components, API , database tables, etc. for a system to satisfy the specified functional and non-functional requirements.

System: Assembly of different components for the specified requirements.

Design: How efficiently the assembly of different components is done.

Requirements:

* Functional requirements.
* Non-functional requirements.

Functional requirements for Instagram:

* Upload image
* Like
* Share
* Comment

Functional requirements for YouTube:

* Upload video
* View
* Like
* Comment
* Search
* Subscribe to channel

Non-functional requirement:

* Any image uploaded by the a user should not be lost.
* There should be no downtime.
* The system should be easily scalable.

Important and not important:

* [Important] Fast image rendering
* [Not important] Number of comments on a post

**Why do we need it?**

* Easily scalable
* No downtime
* Low latency
* Multiple copies
* Data consistency
* Even load distribution
* Reusable
* Work together
* Best efficiency

What are the required concepts?

* Computer Networking
* Distributed system
* Parallel computing

By using the concepts, we do the following:

* Estimation
* Database design
* API Design
* Storage system
* Caching
* Load-balancing
* etc.