Digital logic design is a branch of electrical engineering and computer science that focuses on designing digital circuits and systems. Digital circuits process and manipulate binary data (0s and 1s) using a combination of logic gates and other electronic components. These circuits are the building blocks of digital computers, microcontrollers, and a wide range of digital devices. Here are some key concepts and components of digital logic design:

1. **Binary System:** In digital logic, information is represented using a binary system, where everything is expressed in terms of 0s and 1s. This binary system is the foundation for all digital computations.
2. **Logic Gates:** Logic gates are the basic building blocks of digital circuits. They perform logical operations such as AND, OR, NOT, XOR, etc. These gates take one or more binary inputs and produce a binary output based on a defined logical function.
3. **Boolean Algebra:** Boolean algebra is a mathematical system used to describe and analyze the behavior of digital circuits. It deals with binary variables and logical operations. It is a fundamental tool for simplifying and optimizing digital circuits.
4. **Combinational Logic:** Combinational logic circuits produce an output based solely on their current input values. There is no memory element in these circuits. Examples include adders, multiplexers, and decoders.
5. **Sequential Logic:** Sequential logic circuits have memory elements (typically flip-flops) that store information. The output depends not only on the current inputs but also on the past history of inputs. Examples include registers, counters, and memory units.
6. **Flip-Flops:** Flip-flops are bistable multivibrators that store one bit of information. They are used to build sequential logic circuits and are the basic storage elements in digital systems.
7. **Registers and Counters:** These are collections of flip-flops used to store and manipulate multiple bits of data. Registers are often used for temporary storage, and counters are used for counting operations.
8. **Multiplexers and Demultiplexers:** Multiplexers select one of several inputs and route it to a single output. Demultiplexers perform the reverse operation. They are useful for data routing and selection.
9. **Decoders and Encoders:** Decoders take a binary input and activate one of several output lines based on the input value. Encoders perform the opposite operation, converting multiple inputs into a single binary output.
10. **Arithmetic Logic Units (ALUs):** ALUs are components used in microprocessors and CPUs to perform arithmetic and logic operations like addition, subtraction, AND, OR, etc.