Unit: IV
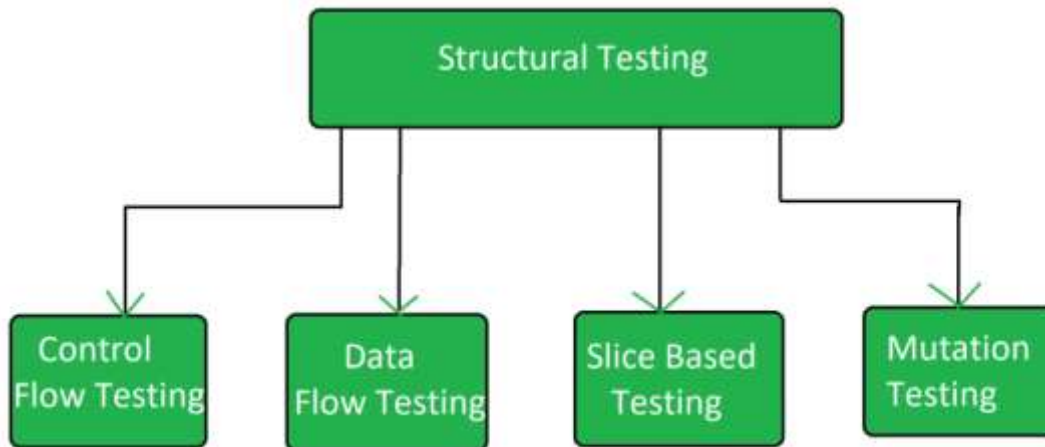**Lecture: 3**
Structural Testing

Structural testing is a type of software testing which used the internal design of the software for testing.

- i.e. the software testing which is performed by the team which knows the development phase of the software, is known as structural testing.
- Structural testing is opposite of behavioral testing.

Type of structural testing:

- **Control Flow Testing:**
  - o Control flow testing is a type of structural testing that uses the programs's control flow as a model.
  - o The entire code, design and structure of the software have to be known for this type of testing.
  - o Often this type of testing is used by the developers to test their own code and implementation.
  - o This method is used to test the logic of the code so that required result can be obtained.
- **Data Flow Testing:**
  - o It uses the control flow graph to explore the unreasonable things that can happen to data.
  - o The detection of data flow anomalies are based on the associations between values and variables.
- **Slice Based Testing:**
  - o It is useful for software debugging, software maintenance, program understanding and quantification of functional cohesion.

- o It divides the program into different slices and tests that slice which can affect the entire software.
- **Mutation Testing:**
  - o It is performed to design new software tests and also evaluate the quality of already existing software tests.
  - o Mutation testing is related to modification a program in small ways.
  - o It focuses to help the tester develop effective tests or locate weaknesses in the test data used for the program.

Advantages of Structural Testing:
- It provides thorough testing of the software.
- It helps in finding out defects at an early stage.
- It helps in elimination of dead code.
- It is not time consuming as it is mostly automated.

Disadvantages of Structural Testing:
- It requires knowledge of the code to perform test.
- It requires training in the tool used for testing.
- Sometimes it is expensive.

Structural Testing Tools:
- JBehave
- Cucumber
- Junit
- Cfix