SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF AEROSPACE ENGINEERING

23AST206 – AERODYNAMICS

II YEAR IV SEM

UNIT 1 – BASIC AERODYNAMICS AND FLUID MECHANICS

TOPIC – TYPES OF FLOW

TYPES OF FLOW

❑ Types Of Fluid Flow:-

1) Steady & Unsteady Flows.

2) Uniform & Non-uniform Flows.

3) Laminar & Turbulent Flows.

4) Compressible & Incompressible Flows.

5) Rotational & Irrotational Flows.

6) One , Two & Three Dimensional Flows.

TYPES OF FLOW

❖ Steady & Unsteady Flows:-

➢ Steady Flows:-

In which the fluid Characteristics Like velocity, pressure, density , etc. At a Point do not change with time.

➢ Unsteady Flow:-

➨In which the fluid velocity , pressure or density at a point changes with respect to time.

TYPES OF FLOW

Uniform & Non-uniform Flow :-

➢ **Uniform Flow:-**

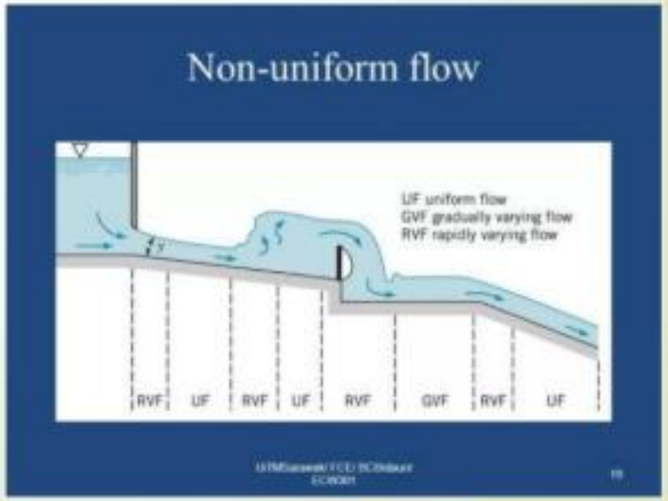
In which the velocity at given time does not change with respect to space (length of direction of the flow).

TYPES OF FLOW

➢ **Non-Uniform Flow:-**

Changing in space

In which the velocity at any time changes with respect to space.



TYPES OF FLOW

❑ Laminar & Turbulent flows:-

➢ **Laminar Flow:-**

- in which the fluid particles move along well defined paths or stream line.

Fig. Laminar Flow

Turbulent Flow:-

✓ fluid moves in very irregular paths or zig – zag Way.

✓velocity at a point fluctuates.

TYPES OF FLOW

Compressible & Incompressible Flows:-

➢Compressible Flows:-

✓In which the density of the fluid changes from point to point.
✓The density is not constant for the fluid.

➢Incompressible Flows:-

✓ In which the density of fluid changes from point to point.
✓ the density is constant for the fluid.

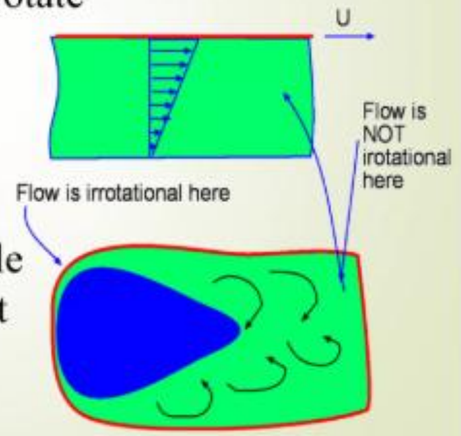
Rotational & Irrotational Flows:-

❖Rotational Flow :-

➢In which the fluid particles while flowing along stream lines, Also rotate about their own axis.

❖ Irrotational Flow:-

➢In which the fluid particles while flowing along stream lines, do not rotate about their own axis.



TYPES OF FLOW

One , Two & Three Dimensional Flows:-

One Dimensional Flow:-

- In which the flow parameter such as velocity is a function of time and
- one space co-ordinate only.

Two Dimensional Flow:-

- In which the velocity is a function of time and
- two rectangular space co-ordinates.

Three Dimensional Flow:-

- In which the velocity is the function of time and
- Three mutually perpendicular directions.


Thank You