Welcome students in this session

will talk about Folds Part 2.

This is module number 7.

Outline
introduction to folds.

Parts of a fold

nomenclature of folds.

Learning outcomes

students will be

able to recognize folds in the field,

name the parts of a fold,

name the fold in the field.

Parts of a fold.

The hinge may be horizontal

in A, in D and in E.

The hinges are horizontal whereas

they are inclined in B or F

or they are vertical as in C.

So the hinge lines could be horizontal

as well as inclined as well as vertical.

The axial plane is the surface

connecting all the images,

so this is axial plane that

connects all the hinges.

It may be a simple plane or a curved surface.

In cross sections the axial

plane is represented by a line,

so AP represents axial plane.

In some folds, the axial plane is vertical.

For example in A ,B & C,

whereas in others it is inclined that is

in D & F and is horizontal in case of E.

So this part is an axial plane,

so it is vertica in this case, it is vertical in C.

Then it is inclined in D, it is

inclined in F and it is horizontal in E.

In B also it is inclined.

In many folds, the axial surface

is relatively a smooth plane,

it may be curved.

The attitude of the axial plane

is defined by its strike and dip.

In these figures, the North

is marked here in all the three places.

In A, B & C

the axial plane strikes

North and has a vertical dip.

So the axial plane has vertical dip

i.e. the axial planes are vertical.

In the D, the strike is North and it

dips 45 degrees towards West,

so the dip angle is in this direction.

For in F the axial plane strikes North

and 60 degrees in West,

so this inclination is 60 degrees in west. In E it is horizontal,

so this axial plane is horizontal.

The axis of a fold.

The Axis is a line parallel to the hinges,

so it is that straight line moving

parallel to itself that generates the fold.

The sides of a fold are called

as limbs or his flanks,

so these are limbs or flanks.

A limb extends from the axial plane in

one fold to the axial plane in the next.

So if this is an axial plane into

consideration, this limb extends from one

axial plane to the next axial plane.

So although in many instances the

hinge line the hinge is at the highest

part of the fold, that is in A

so hinge is in highest part of a fold,

but this is not necessarily in the case of B

the hinge line is here and highest

part of the fold is here. So hinge

is here and the highest part is here.

So hinge line may not always be

in the highest part of a fold.

In B, AA'

are hinges and CC' are

the highest points on the fold.

So CC' are the

highest points in the folds.

The Crest is a line along the highest

part of a fold or the line connecting

the highest points on the same bed in

an infinite number of cross sections.

There is a separate crest for each bed.

The planar surface formed by all the

crests is called as crestal plane, i.e. CC'. So these are the crests,

or the crestal planes.

These are the crestal these are the crestal planes.

However, in economic geology terms,

accumulation of oil and

gas occurs in the Crest,

and the crestal planes, that is,

it occurs in the Crest in the

ceystal planes rather than by

the hinge or the axial planes.

The trough is the line occupying

the lowest part of the fold or

the line connecting the lowest

parts in the same bed in an

infinite number of cross sections.

That is TT'. That is this this part.

The plane connecting such lines

may be called as a trough plane.

Nomenclature of folds.

In general, an anticline is defined as

this is an anticline.

An anticline is defined as

fold that is convex upward,

or the fold that has oldest rocks in the

center and the youngest rocks on the top.

The term anticline is used in

simplest conditions of the limbs,

dipping away from each other,

but also in limbs,

dipping in the same directions but at different angles.

So here the dipping amount is the same.

But here the dipping amount is different.

But still it is called as an anticline.

Here the age of the rocks is known.

That is the oldest rock formations

are in the center of the folds.

So when the oldest rock formations are in

the center and youngest are in the outside,

the fold is called is an anticlinal fold.

In general, a syncline is defined as a fold

this is a syncline. It is defined

as a fold that is convex downward.

The two limbs dip away from each other.

Sorry, the two limbs dip towards each other.

And the term is also extended to B, C & D.

The primary factor responsible for syncline

is youngest formation is in the center

and oldest formation is on the outside.

So youngest formation is in the center

and oldest formation is on the outside.

A symmetrical fold.

A symmetrical fold is also called as

an upright fold if it is vertical.

Axial plane is essentially vertical.

Conversely, an asymmetrical fold is

the one in which axial plane is inclined.

Now overturned fold

Overturned fold is the one in which axial

plane is inclined and both

limbs dip in the same direction,

usually at different angles,

that is, C so both the limbs

dip in the same direction, but

are usually at different angles.

The overturned inverted or reversed

Limb is the one that has been rotated

through more than 90 degrees to

attain its present attitude.

The normal limit is the one that

is right side up.

Nomenclature of Folds

A recumbent fold is the one in which the axial

plane is essentially horizontal.

Rather,

elaborate terminology is present

to describe such folds.

So the strata in the inverted limb

are generally much thinner than the

corresponding beds in the normal limb.

The term arch bend has been used

for the curved part of the fold.

Between the normal and the

inverted limb that is this part.

The term core and the shell is

refers respectively to inner

and outer parts of a fold.

Many recumbent folds

have subsidiary recumbent anticlines

attached to them called as Digitations.

Because they look like great

fingers extending from hand.

All recumbent folds may be

traced back to a root to zone from

where to the place on the surface

of the earth from which they arise.

That is, in other words,

from where the axial plane

becomes much steeper.

So here the axial plane is much gentler,

whereas in this place the

axial plane is much steeper.

An isoclinal fold,

which means inclinations are the same,

so these inclinations are the same.

Equally inclined refers to folds in

which the two folds dip at equal

angles in the same direction.

A vertical isoclinal fold in A is

the one in which axial plane is vertical.

Then it is inclined or overturned

isoclinal Fold is the one in which

axial plane is inclined. A recumbent

isoclinal fold is the one in which

the axial plane is horizontal,

so many recumbent folds are also isoclinal.

A Chevron fold is of this type,

wherein a fold is the one in which

the hinges are sharp and angular.

So here there is an angular

nature for the folds.

A box fold is the one in

which the Crest is broad.

and flat. Two hinges are present, one

on either side of the flat Crest.

This hinge and this hinge.

A Fanfold is the one in which

both limbs are overturned.

In anticlinal fanfold,

the two limbs dip towards each other.

That is like this,

whereas in the synclinal fanfold the

two limbs dip away from each other,

that is, here in this manner,

kink bands are narrow bands,

usually only a few inches or a few feet wide,

in which the beds assume a dip that is

steeper or gentler than the adjacent beds.

So this dip is gentler this dip is steeper

And again, this dip is

gentler.

This defines a Kink fold. In plateau areas

where the bedding is relatively flat

The strata may locally assume a steep

dip in A such fold is a monocline.

The beds in a monocline may dip at angles

ranging from a few degrees to 90 degrees,

and the elevation of the same

bed on the opposite sides of

the monoclines maybe differ by

hundreds or even thousands of feet.

The term homocline may

be applied to strata that dip in one direction at

a relatively uniform angle.

The direction is here.

In areas where dipping strata locally

assume or horizontal attitude,

the structural terrace is formed.

A closed or a tight fold is the

one in which deformation has been

sufficiently intense to cause the

flowage of the more mobile beds so

that the beds thicken and thin.

So here the beds thicken and

hear the beds thin out.

Conversely,

an open fold is the one in which flowage

has not taken place,

so the thickness here and in the thickness

along the hinges remains the same.

Drag folds form when competent beds

slide past each other in this manner.

So when the competent beds slide past,

such minor folds may form on

the limbs of the larger folds,

so the movement is in this manner wherein

these represents competent beds in the

center represents incompetent beds,

so this incompetent beds get

folded in this manner where the

orientation of the axial plane

is in the direction of movement.

The traces of the axial planes

of the folds are formed.

The acute angles between the axial planes

and the main bedding plane point in

the direction of differential movement.

The shape of the folds

may vary along the axial plane

at right angles to the fold axis.

Line A is taken for in the form as the form

of the fold shown by one bedding plane.

The other lines that is this, this,

and this are being drawn on the assumption

that they have the same form is line A.

In this way the form of the fold is

propagated indefinitely upward and downward.

Moreover, lines B & C have the

same length as the line A.

Here thinning along the limbs and

thickening along the hinges takes place.

So here there is thinning,

and here there is thickening.

Considerable plastic movement of

material away from the limbs and

towards the hinges. In natural folds

the competent beds preserve relatively

uniform thickness, but the weaker,

less competent beds adjust themselves

by flowage and folding.

Parallel folding.

Parallel folding is also

called us concentric folding. Line

A is taken as in the form of the

fold shown by one bedding plane.

The rest of the beds preserve

the thickness due to folding,

so the thickness of the beds

is preserved all along.

Under such conditions,

the form of the fold must

change upward and downward.

The anticlines become sharper

with the depth but broader

and more open upward.

Conversely,

the synclines become broader

with depth but sharper upward.

The folds die out upward and downward.

These are the references.

Thank you.