

بسمه تعالی

دانشگاه شهید باهنر کرمان

دانشکده فنی و مهندسی

بخش مهندسی معدن

زمین شناسی برای مهندسین

ترم اول ۱۳۹۷

(۴)

سعید کریمی نسب

Geology for Engineers Course-1397
Kariminasab

اگر یک میله مغناطیسی را، در همین کلاس درس از وسط آن به نخی آویزان کنیم کدامیک از گزینه (گزینه های) زیر صحیح می باشند؟

الف– میله مغناطیسی بطور افقی قرار می گیرد.

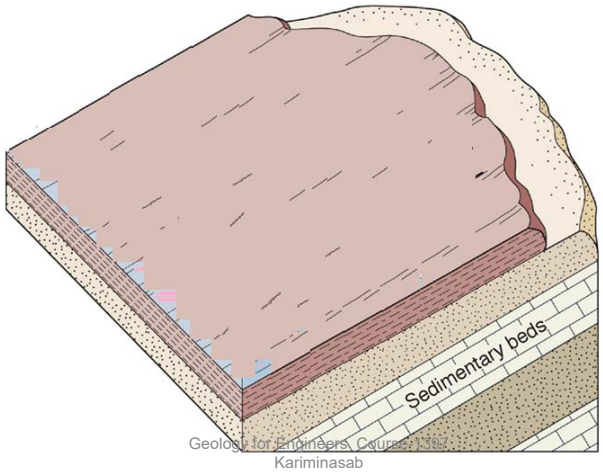
ب– میله مغناطیسی در سمت شمال جغرافیائی، به سمت پائین منحرف می شود.

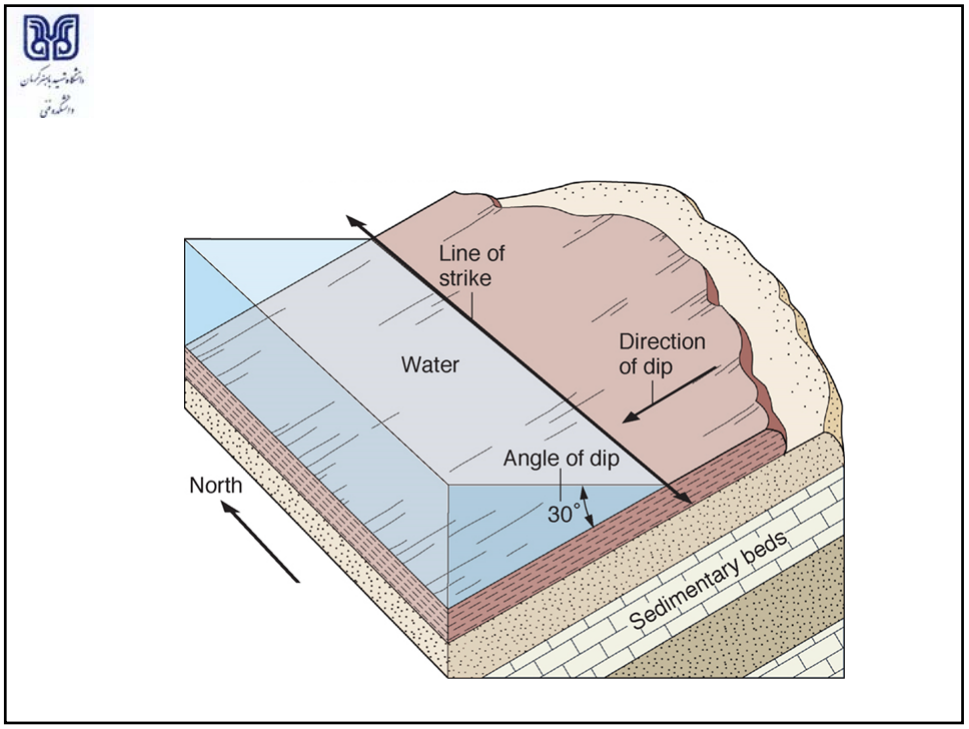
ج–میله مغناطیسی در سمت جنوب جغرافیائی، به سمت پائین منحرف می شود.

د– میله مغناطیسی در سمت شمال جغرافیائی، به سمت بالا منحرف می شود.

ه–میله مغناطیسی در سمت جنوب جغرافیائی، به سمت بالا منحرف می شود.

لایه زمین شناسی زیر ۳۰ درجه نسبت به افق قراردارد، اگر در جلو این سطح شیبدار آب فرا گیرد، زاویه سطح آب با لایه شیبدار چه زاویه ای خواهد بود؟ چرا؟





اگر یک میله مغناطیسی را، در همین کلاس درس از وسط آن به آویزان کنیم کدامیک از گزینه (گزینه های) زیر صحیح می باشند؟

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قطب نمای برانتون

The Brunton compass

Brunton compass



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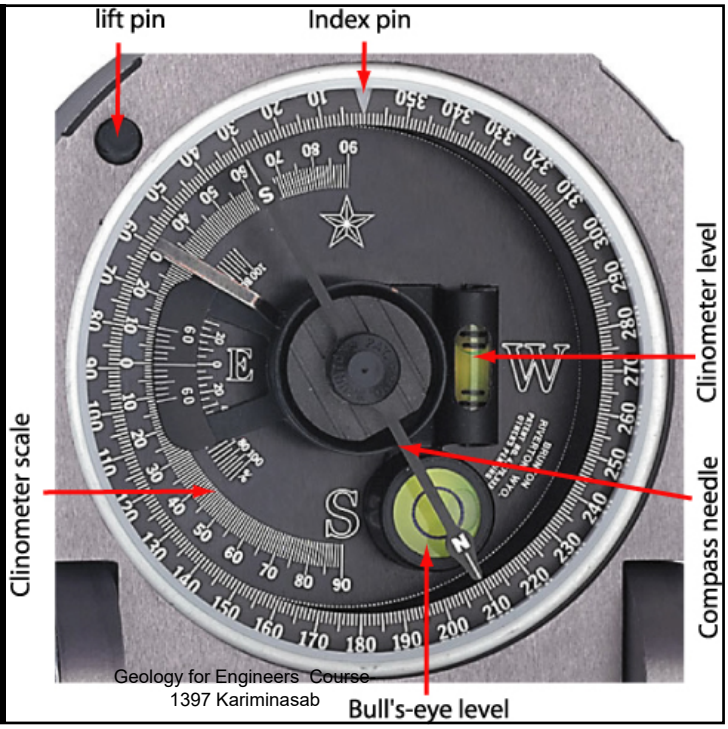
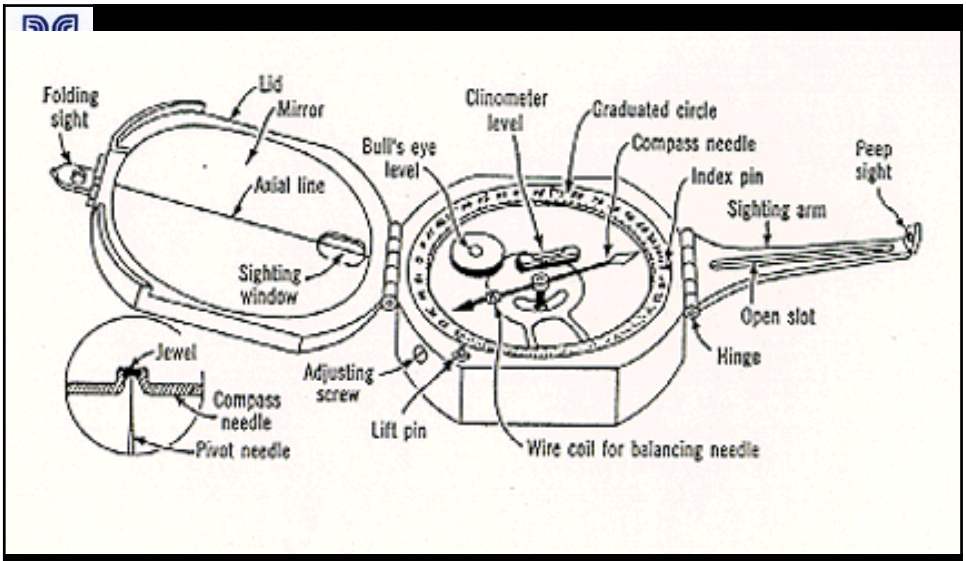
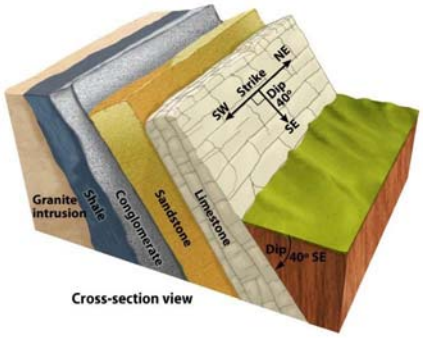
Brunton compass

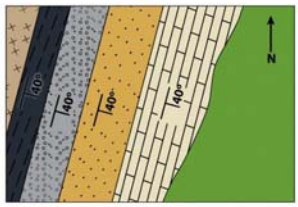




Brunton compass

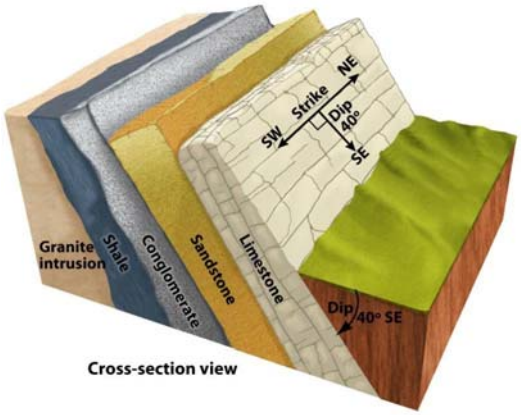
نقشه

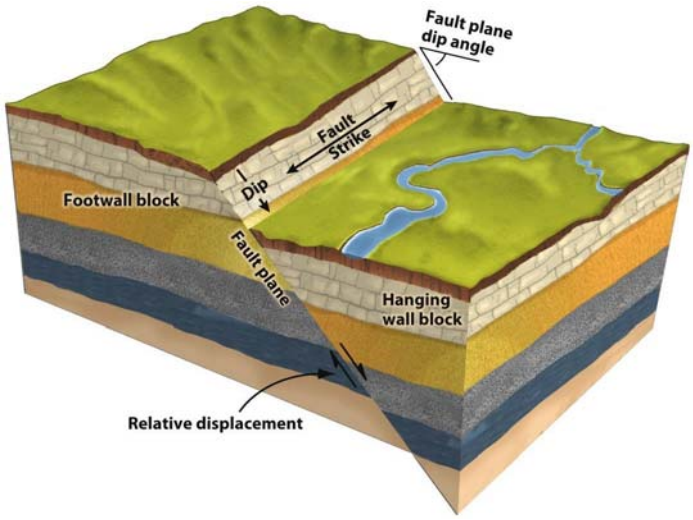




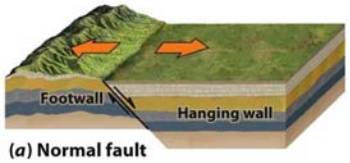
Strike and Dip

- **The Strike** of a body of rock is a line representing the intersection of that feature with the plane of the horizon (always measured perpendicular to the Dip).
- **Dip** is the angle below the horizontal of a geologic feature.





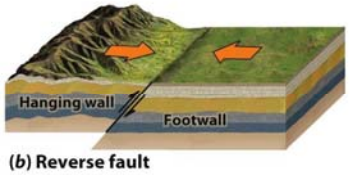
Major Fault Types



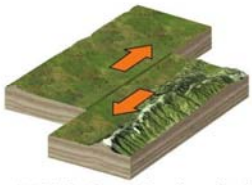
(*a*) Normal fault



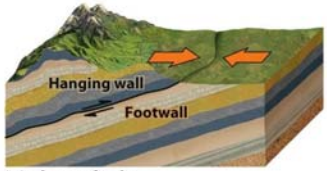
(*d*) Left lateral strike-slip fault



(*b*) Reverse fault

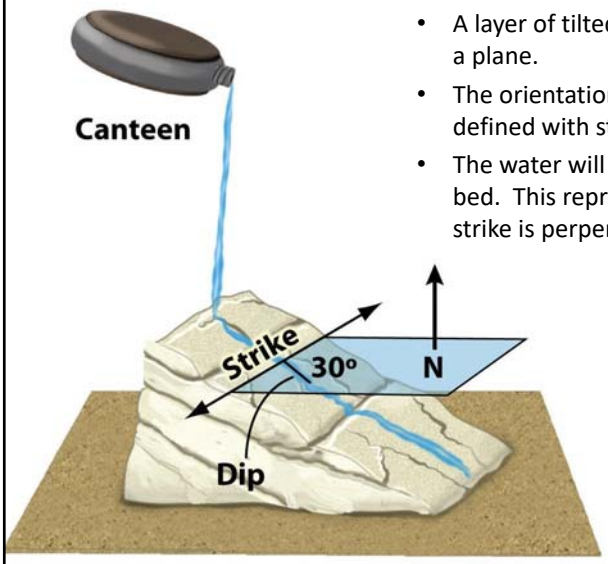


(*e*) Right lateral strike-slip fault

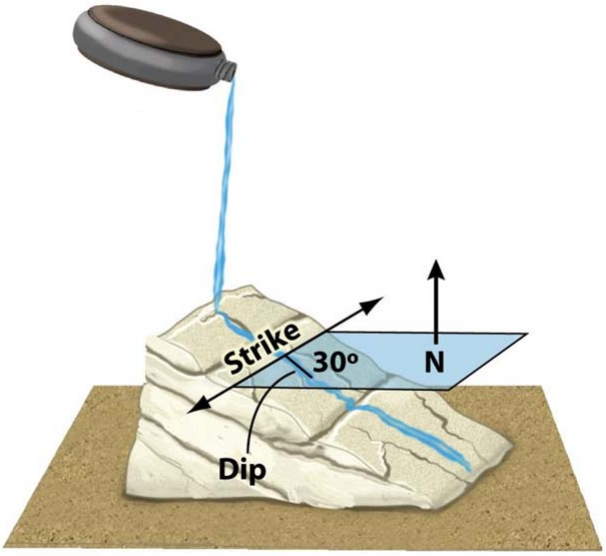


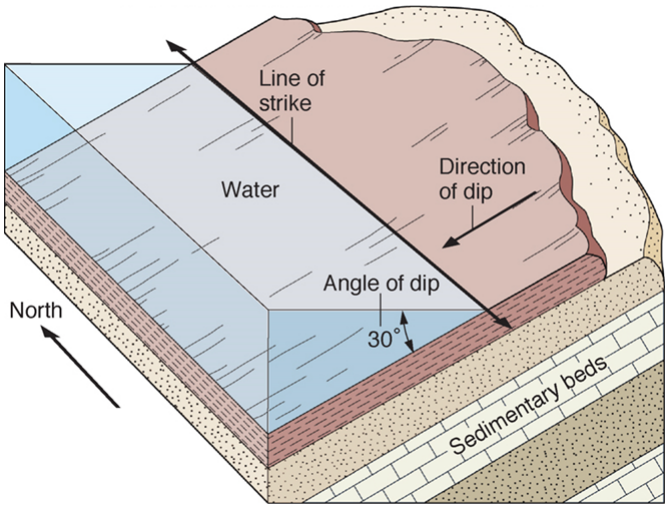
(*c*) Thrust fault

Representing Layers

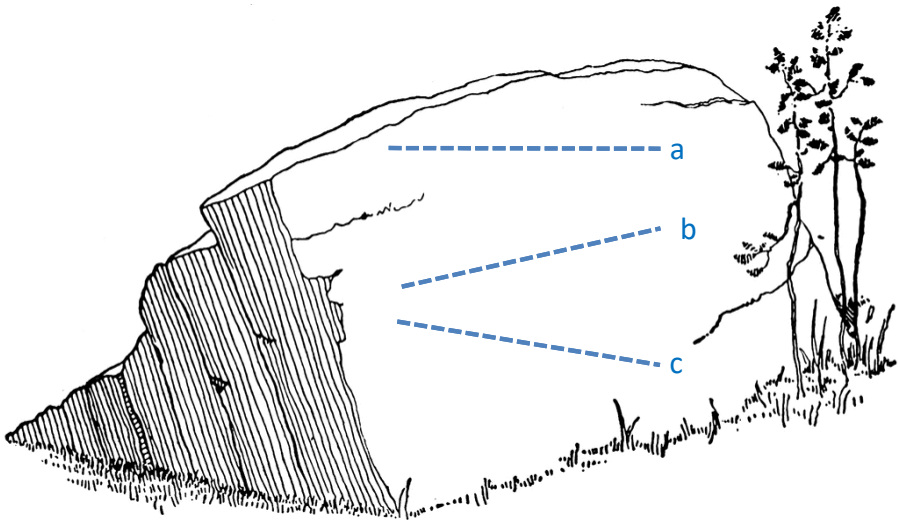


- A layer of tilted rock can be represented with a plane.
- The orientation of that plane in space is defined with strike-and-dip notation.
- The water will flow straight down the sloping bed. This represents the dip direction. The strike is perpendicular to the dip direction.

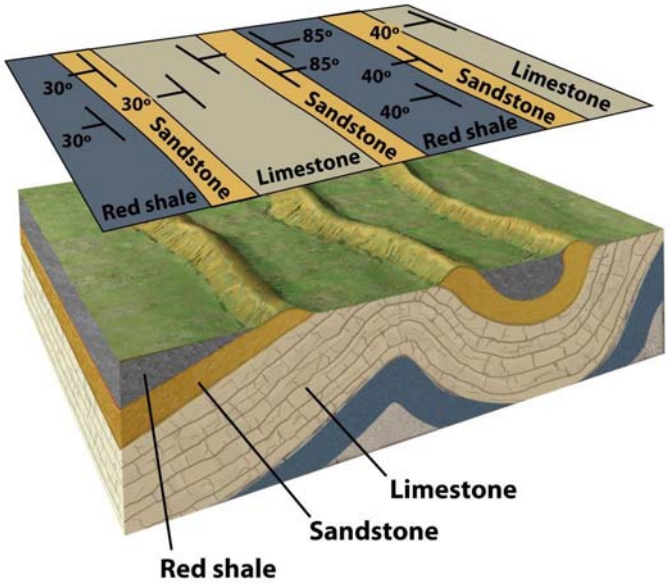




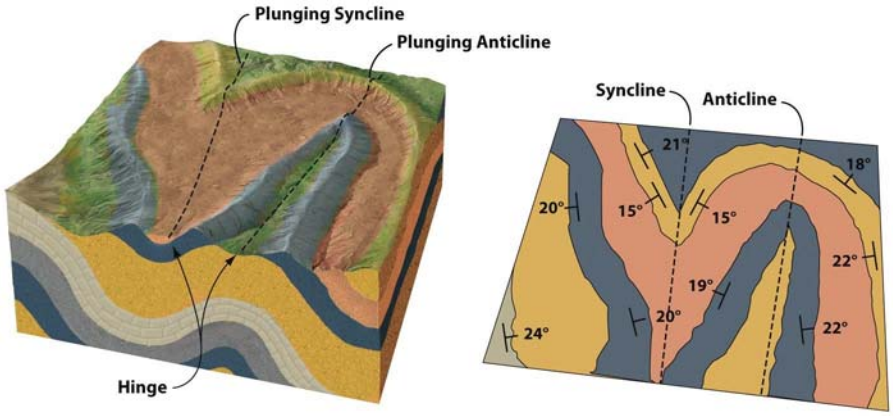
راستا یا امتداد



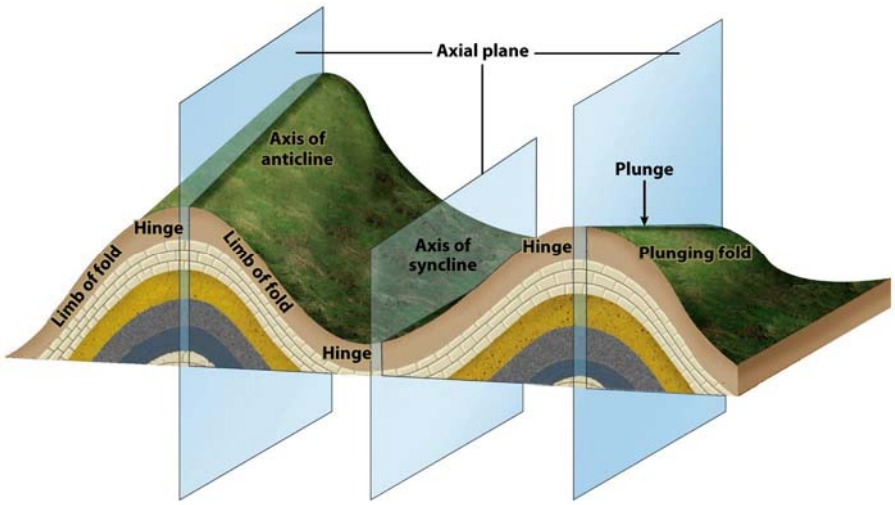
نقشه زمین شناسی

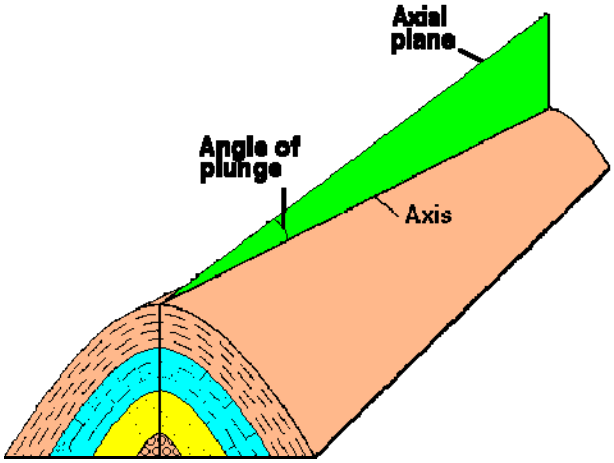


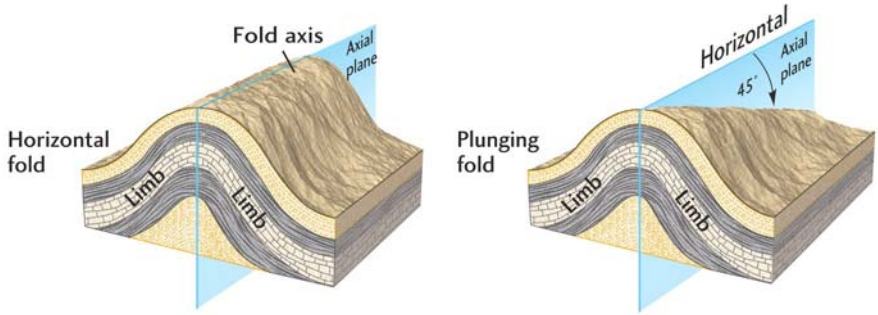
الگوی ۷



اصطلاحات چین







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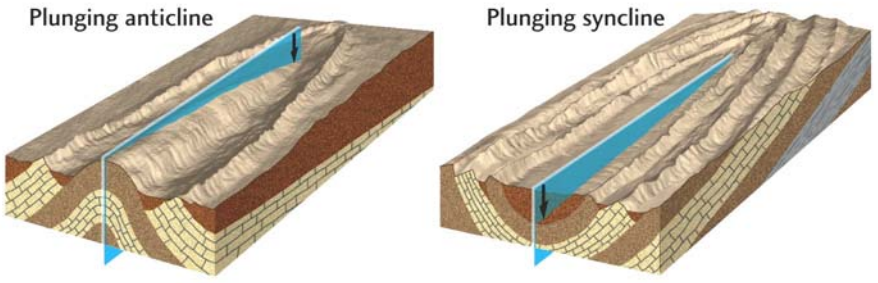

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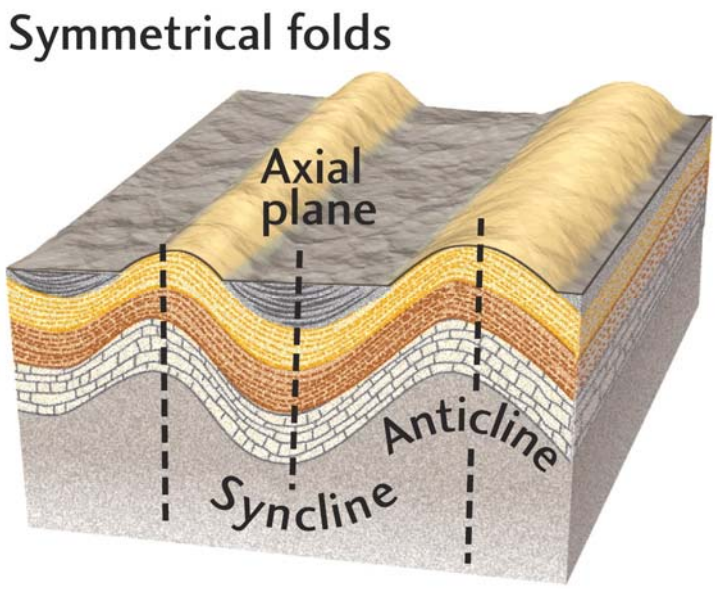
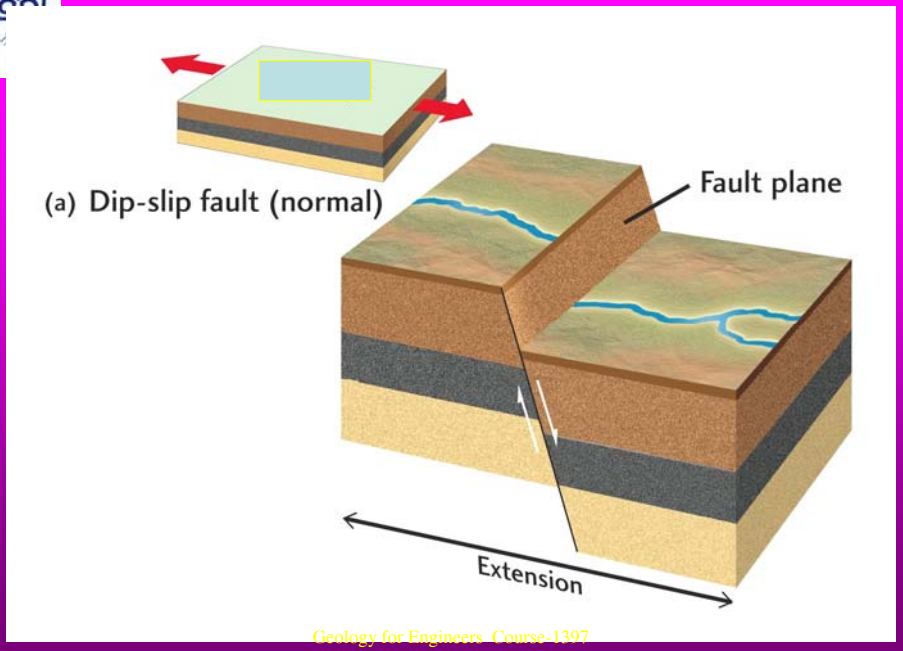
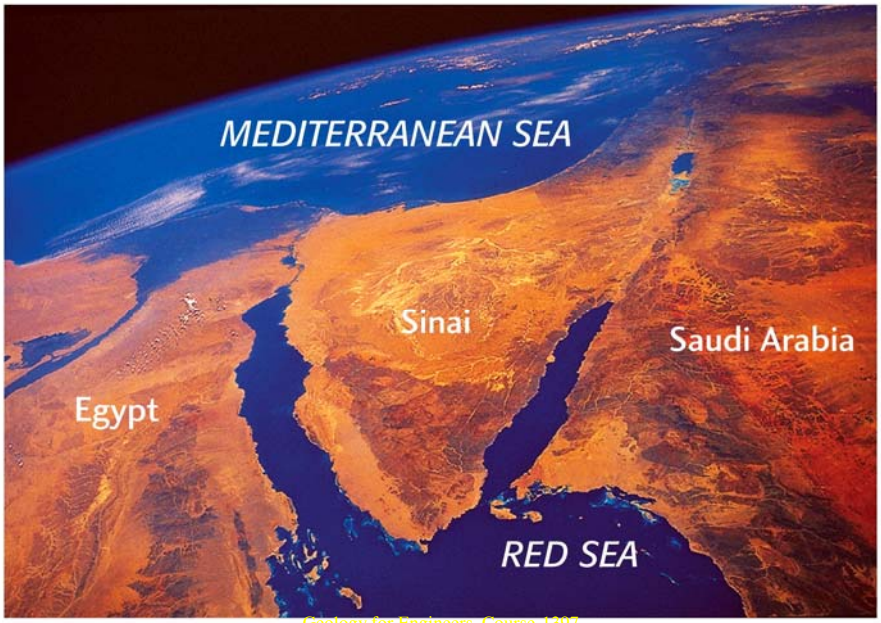
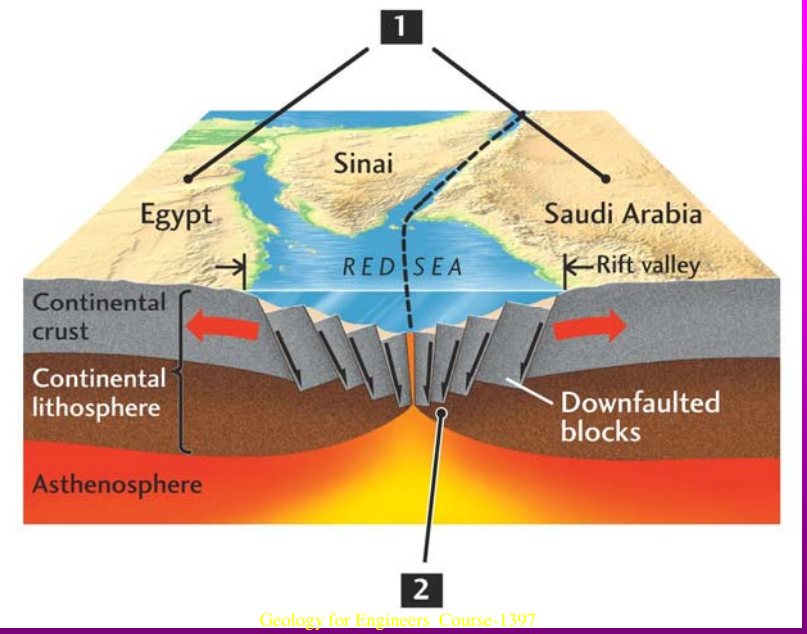
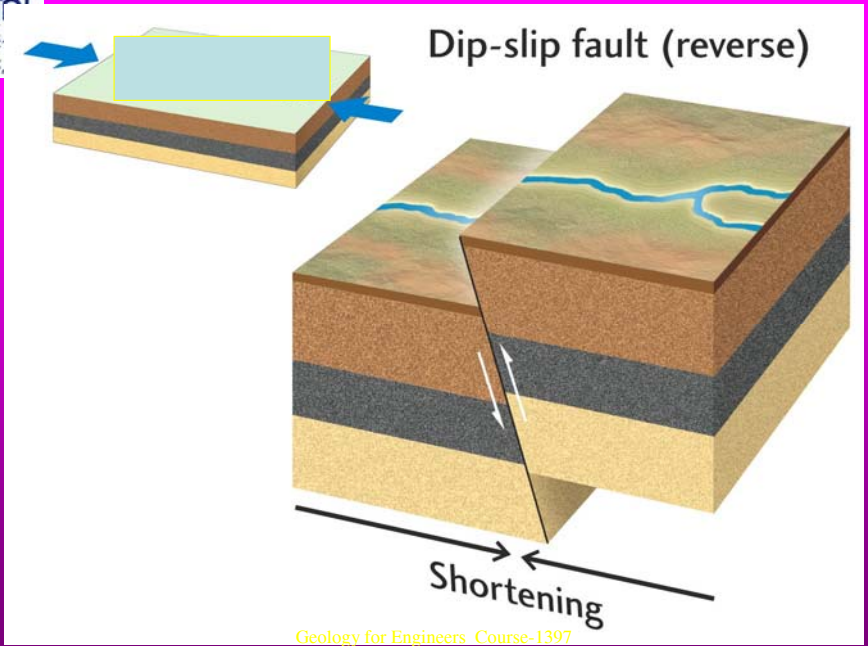

Symmetrical folds
Axial plane
Anticline
Syncline

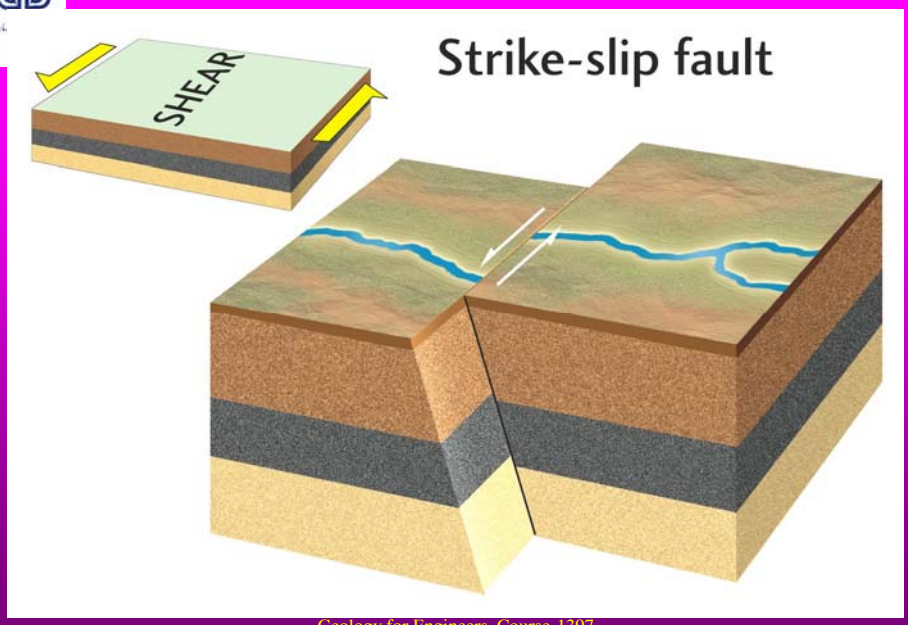



(a) Dip-slip fault (normal)
Fault plane
Extension


MEDITERRANEAN SEA
Sinai
Saudi Arabia
Egypt
RED SEA


1
Sinai
Egypt
Saudi Arabia
RED SEA
Rift valley
Continental crust
Continental lithosphere
Asthenosphere
Downfaulted blocks
2


Dip-slip fault (reverse)
Shortening



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Nature of Fault Surfaces

Discrete fracture or fault zone





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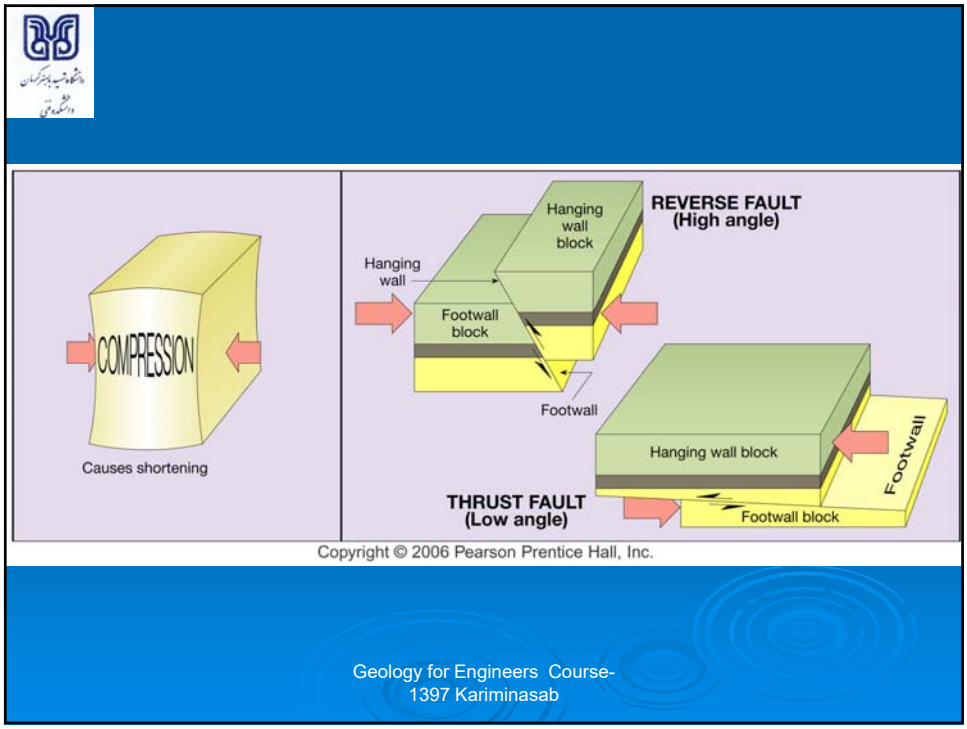
COMPRESSION
Causes shortening
REVERSE FAULT
(High angle)
Hanging wall block
Hanging wall
Footwall block
Footwall
THRUST FAULT
(Low angle)
Hanging wall block
Footwall
Footwall block
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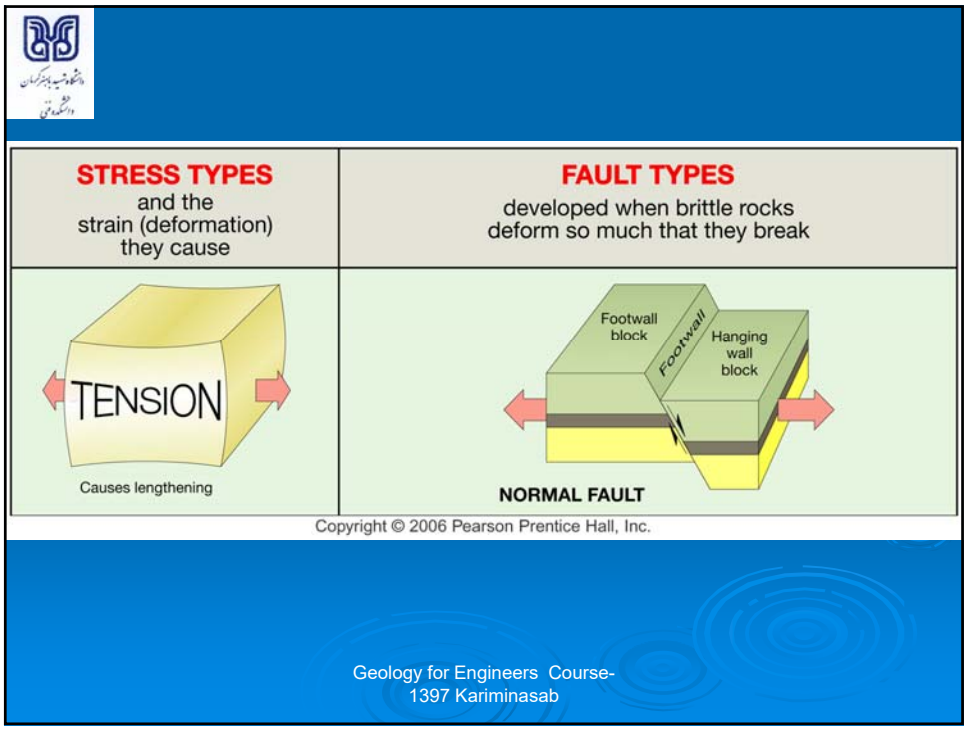
STRESS TYPES
and the
strain (deformation)
they cause
FAULT TYPES
developed when brittle rocks
deform so much that they break
TENSION
Causes lengthening
Footwall block
Footwall
Hanging wall block
NORMAL FAULT
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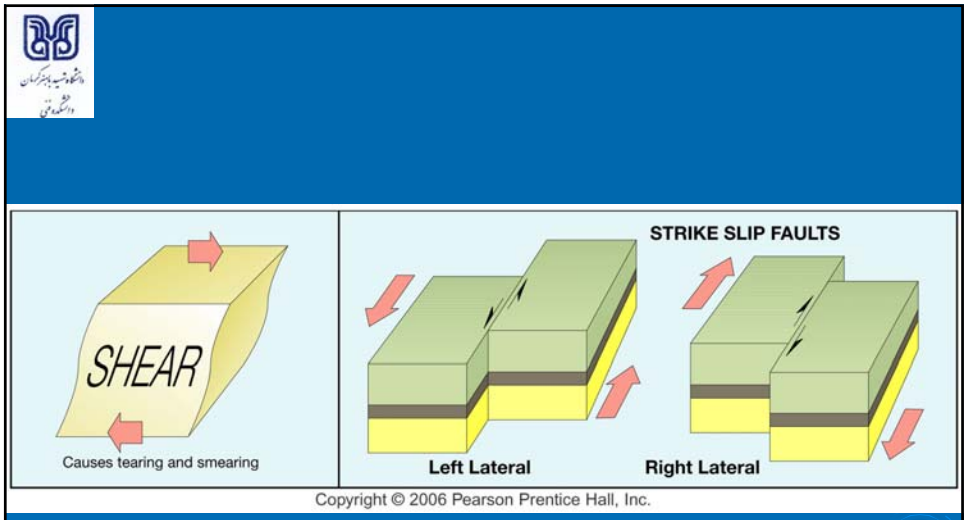


Normal Faults



Normal Faults



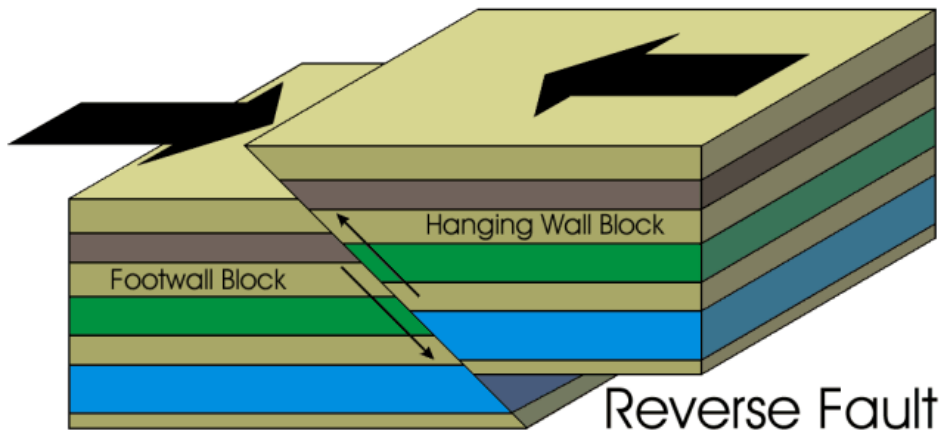
Normal fault cutting across volcanic tuff layers near Kingman, Arizona

Normal Faults

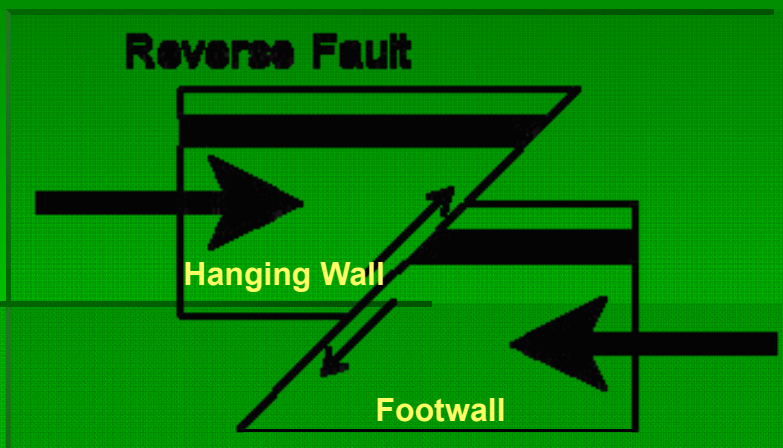


Normal fault in Navajo Sandstone, near Glen Canyon Dam, Arizona

Reverse Fault



Reverse Fault



Reverse Fault



Reverse fault in Entrada Fm., Grand Staircase-Escalante National Monument, Utah

Reverse Fault



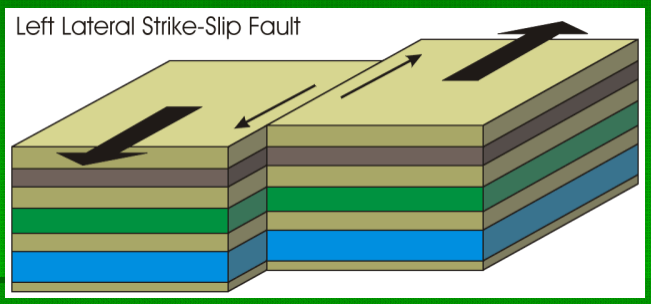
Reverse fault, outcrop near mile marker 90, I-40, Arizona

Reverse Fault



Reverse faults in shale layers, Trail to the Base of the Torres, Parque Nacional Torres de Paine, Chile

Strike-Slip Faults



Strike-Slip Fault



Strike-Slip Fault



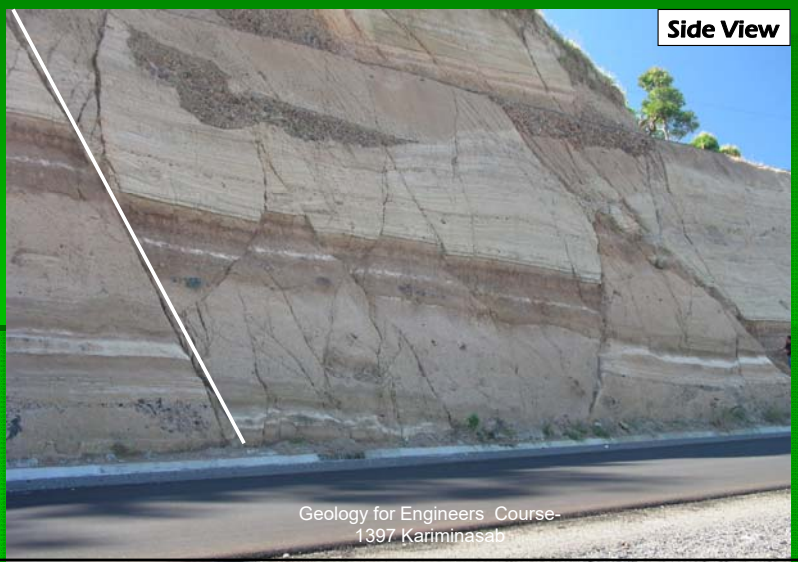
Strike-Slip Fault



Strike-Slip Fault



نوع گسل چیست؟



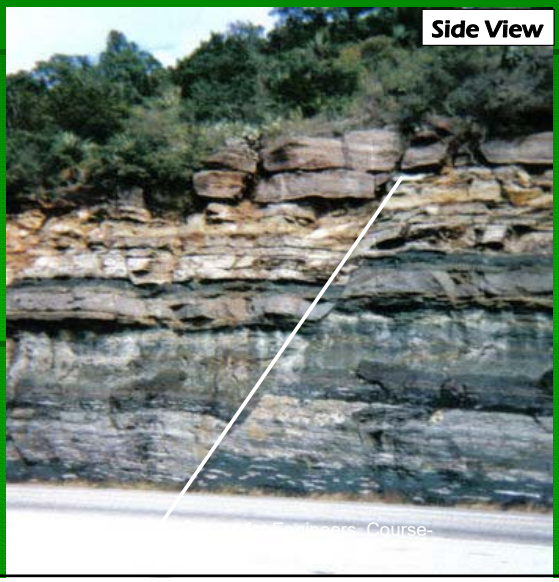
نوع گسل چیست؟



نوع گسل چیست؟



نوع گسل چیست؟



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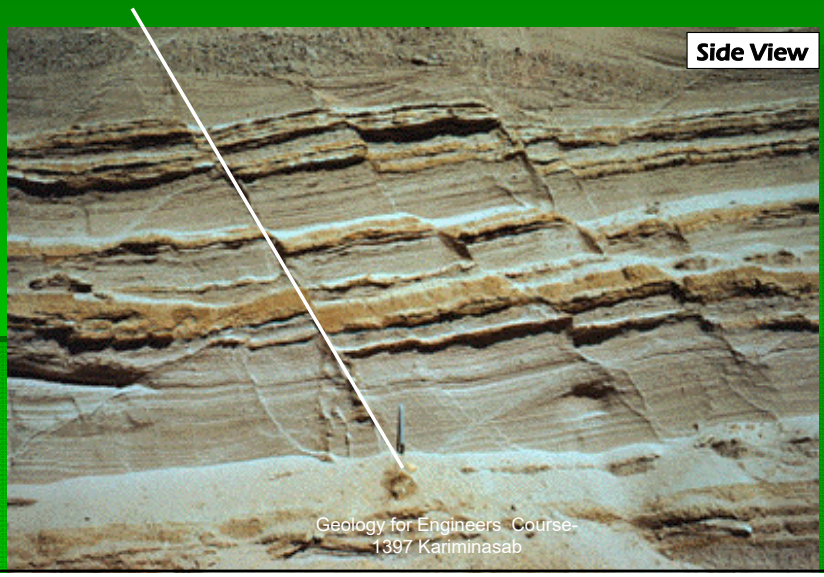
نوع گسل چیست؟

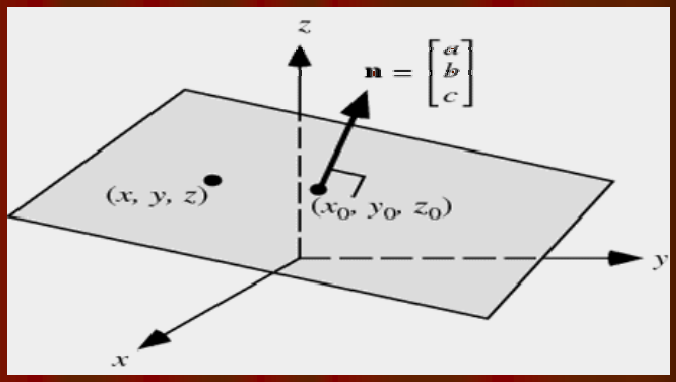


نوع گسل چیست؟

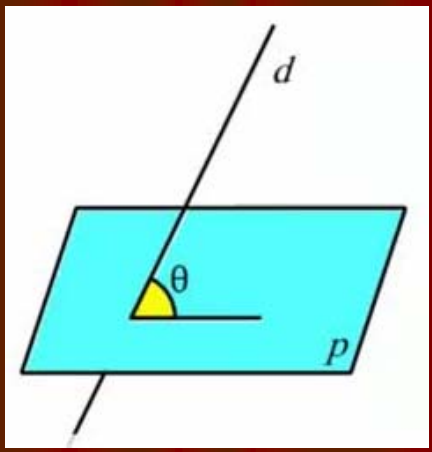


- کدامیک از گزینه های زیر صحیح می باشند:
- سطح مشترک یک صفحه مستوی متقاطع با کره یک:
- الف– دایره
- ب– بیضی
- ج– مثلث
- د–بیضی و یا دایره

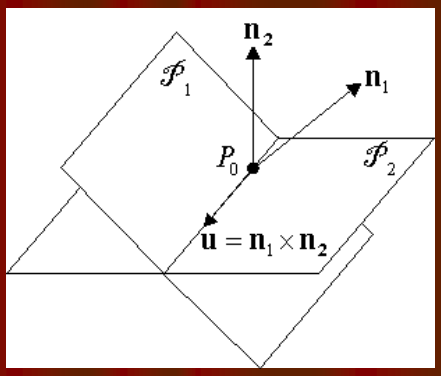
نمایش یک صفحه در هندسه

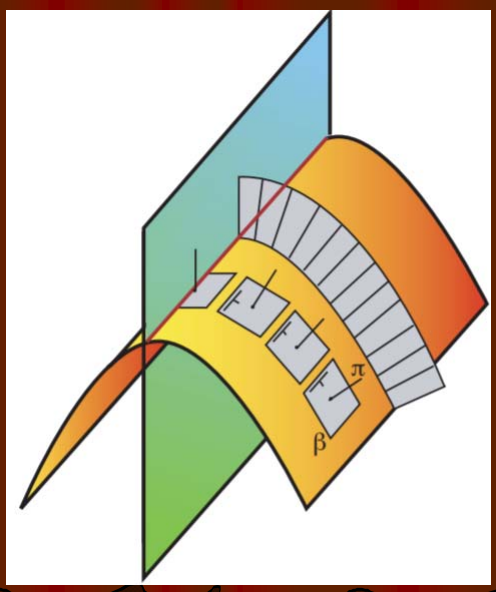


زاویه یک خط با یک صفحه مستوی



زاویه تلاقی دوصفحه





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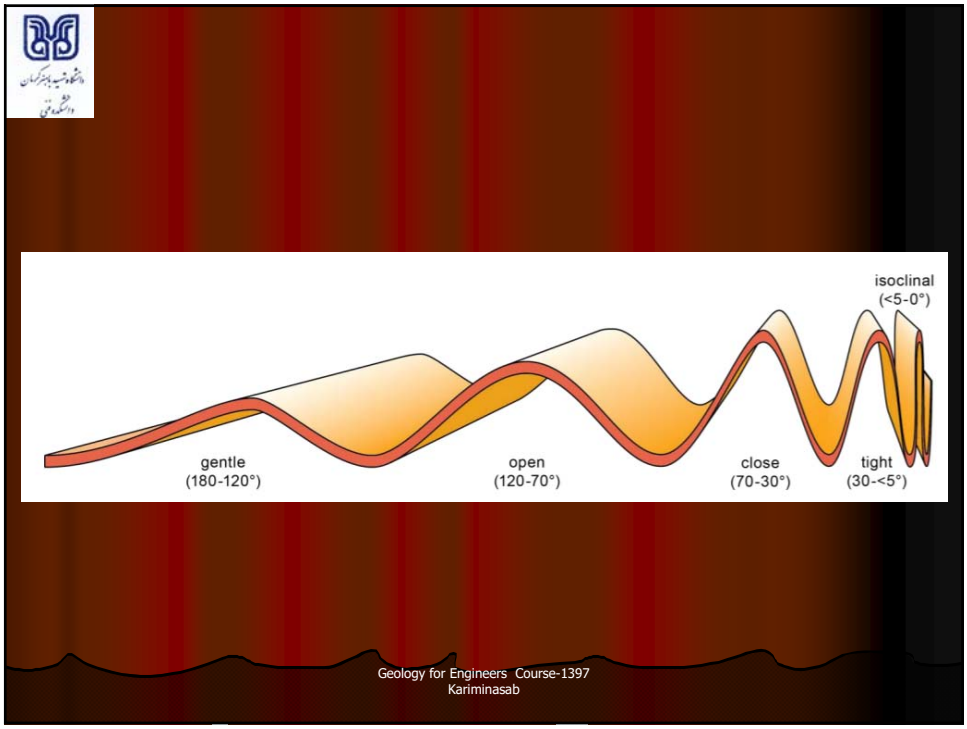
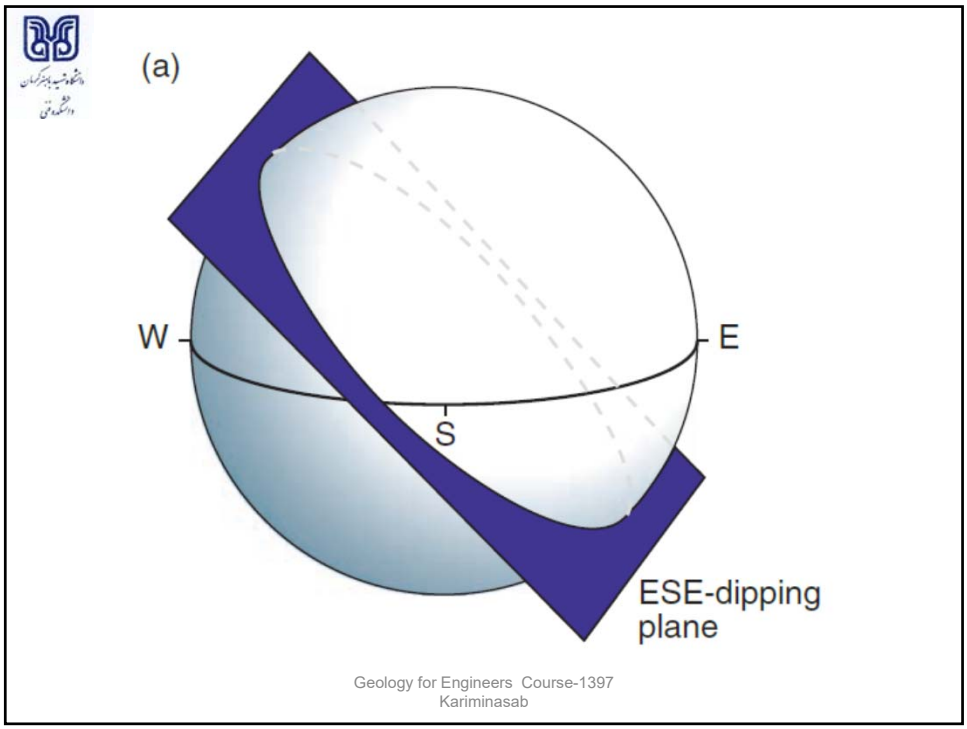
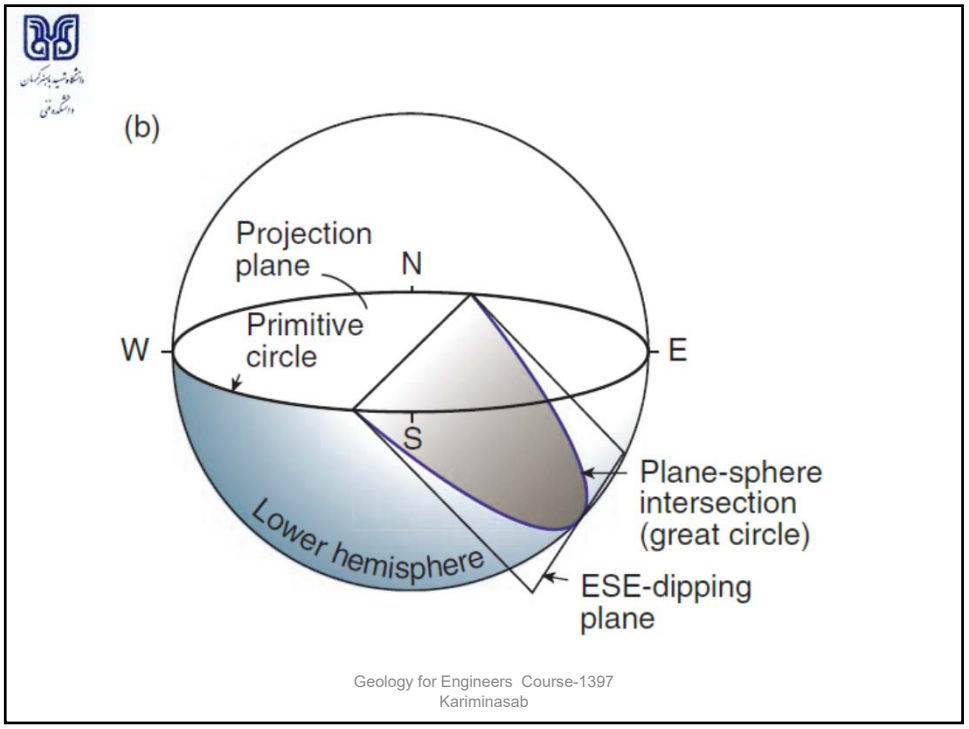
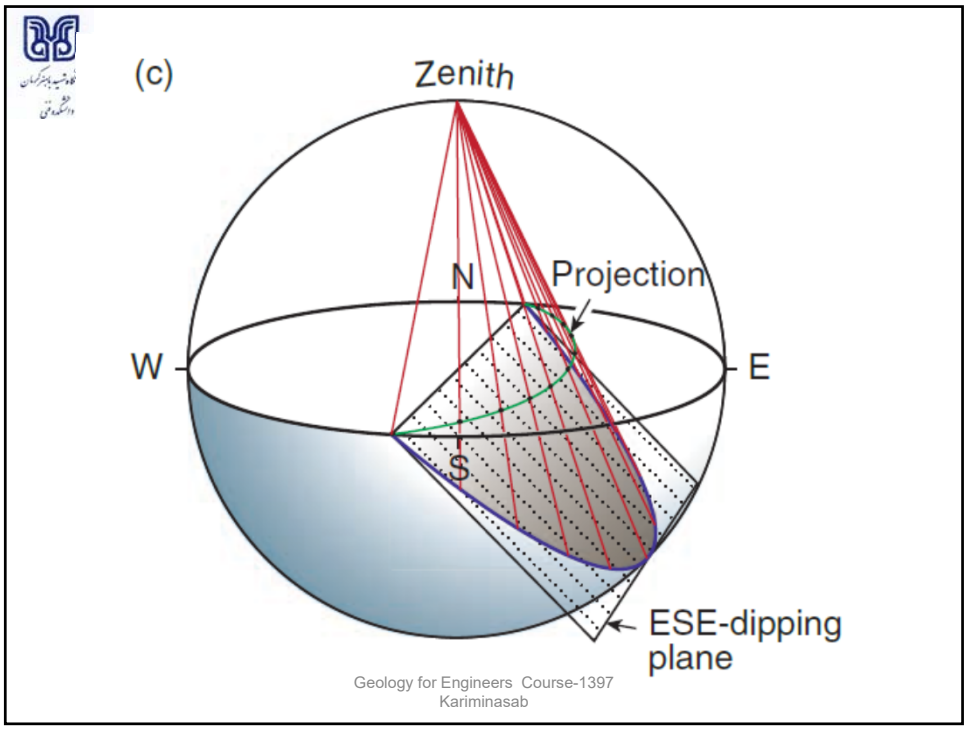
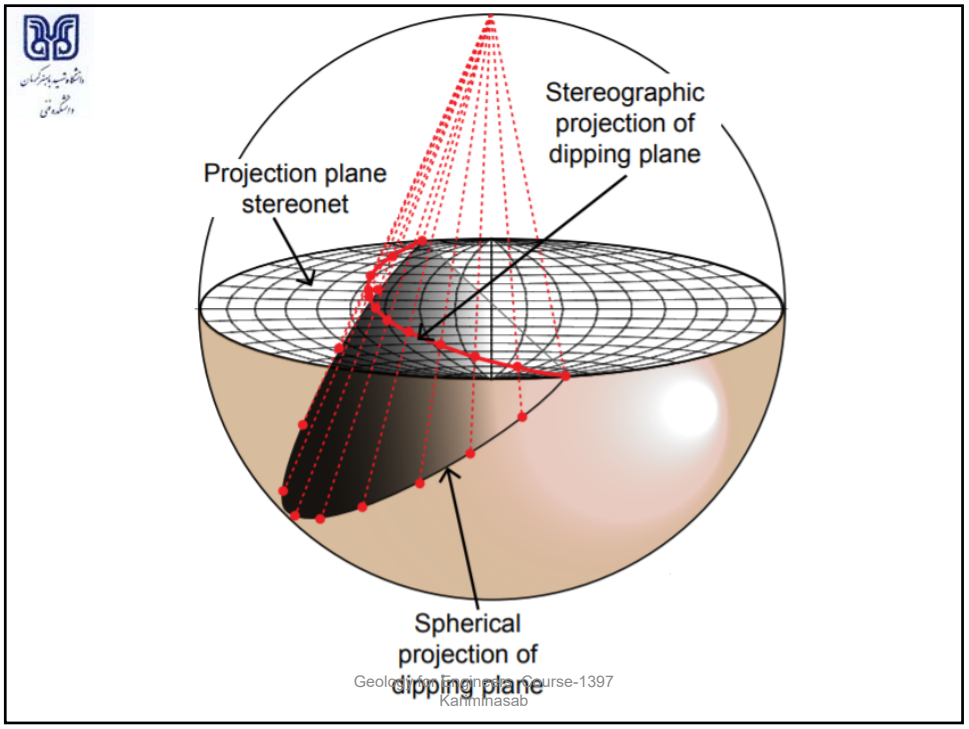
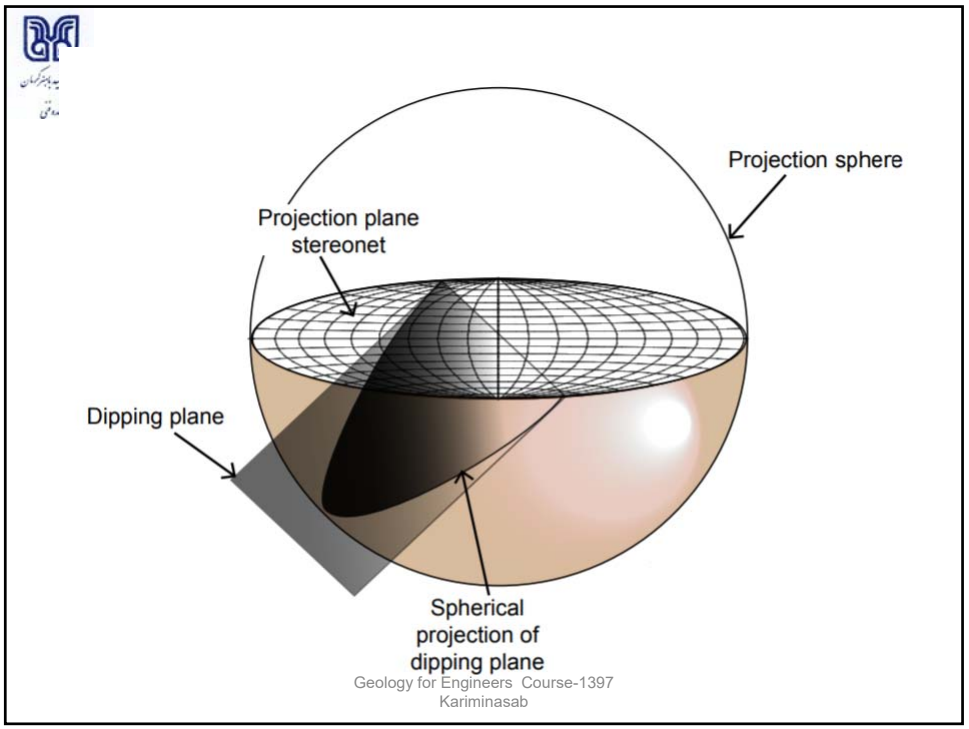

isoclinal
(<5-0°)
gentle
(180-120°)
open
(120-70°)
close
(70-30°)
tight
(30-<5°)

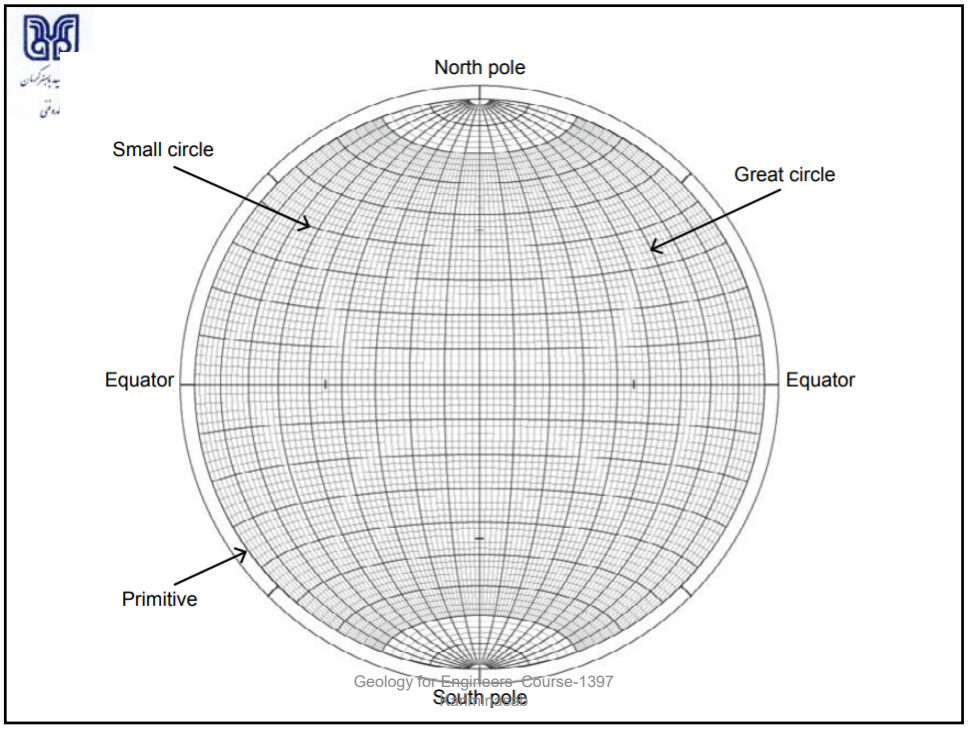

(a)
W
E
S
ESE-dipping
plane

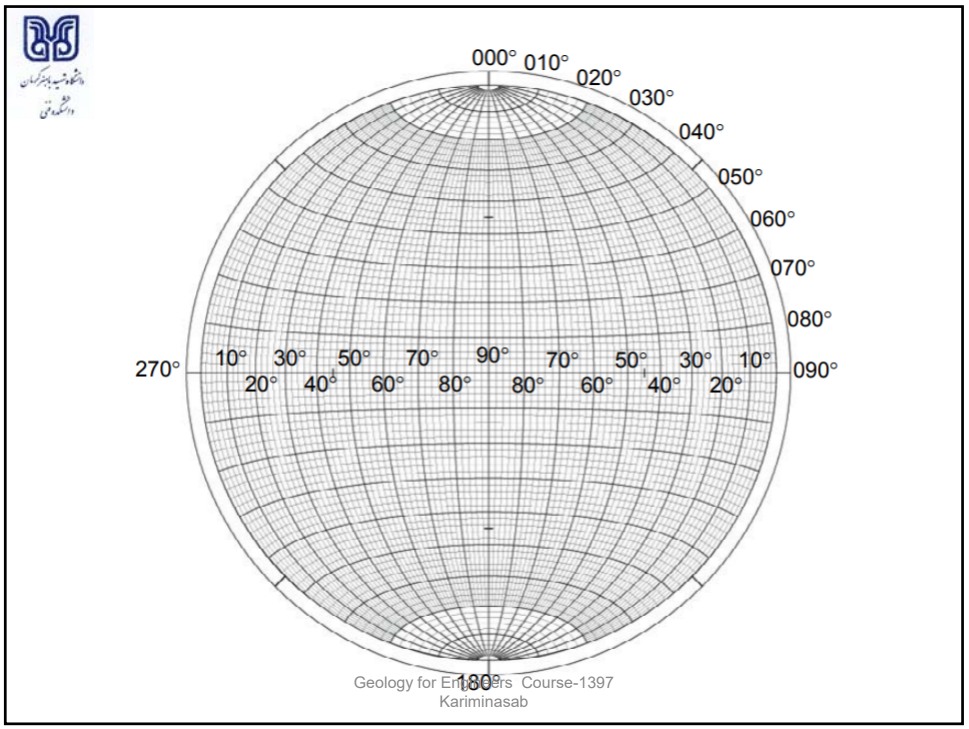

(b)
Projection plane
N
Primitive circle
W
E
S
Plane-sphere intersection (great circle)
Lower hemisphere
ESE-dipping plane

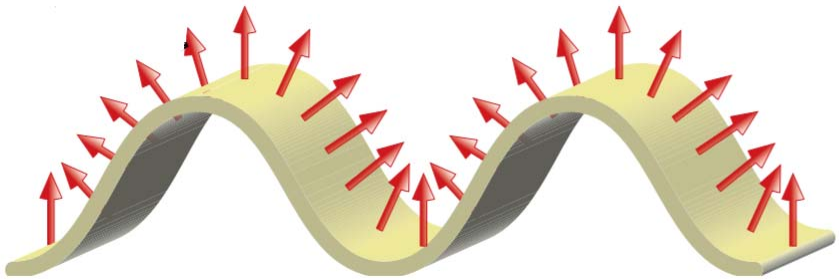

(c)
Zenith
N
Projection
W
E
S
ESE-dipping plane

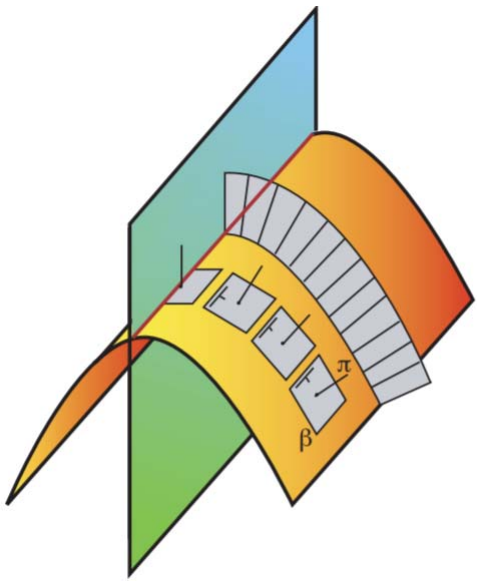

Stereographic
projection of
dipping plane
Projection plane
stereonet
Spherical
projection of
dipping plane

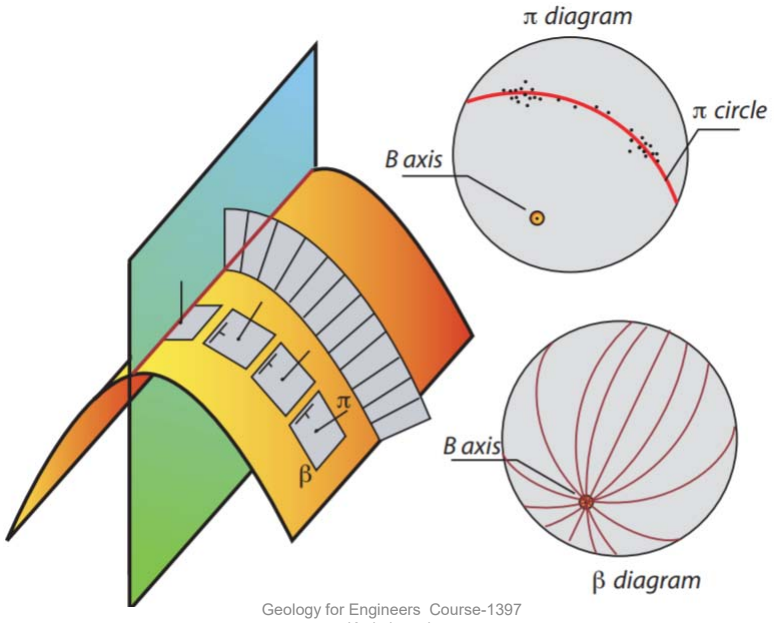

Projection sphere
Projection plane
stereonet
Dipping plane
Spherical
projection of
dipping plane

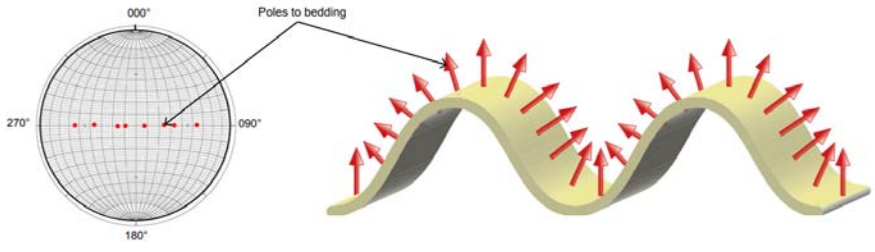

North pole
Small circle
Great circle
Equator
Equator
Primitive
South pole

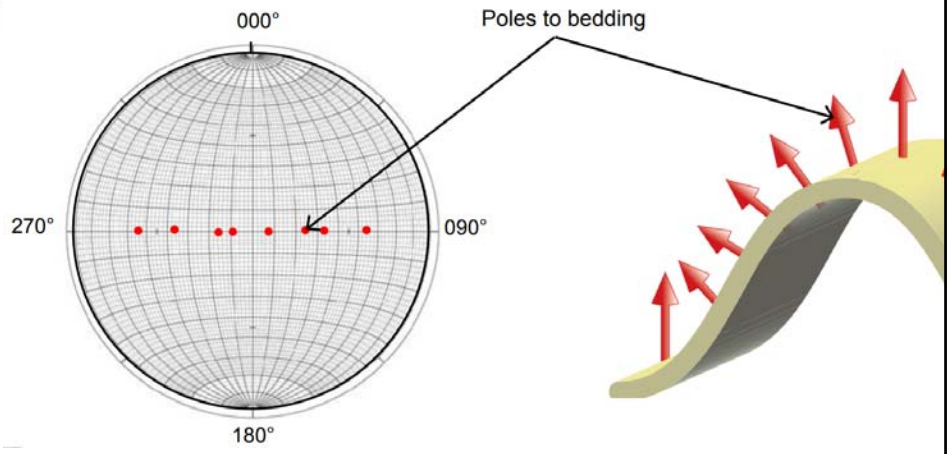

000°
010°
020°
030°
040°
050°
060°
070°
080°
090°
180°
270°
10°
20°
30°
40°
50°
60°
70°
80°
90°

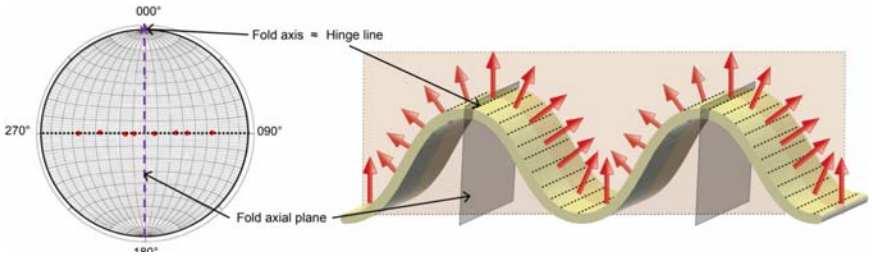


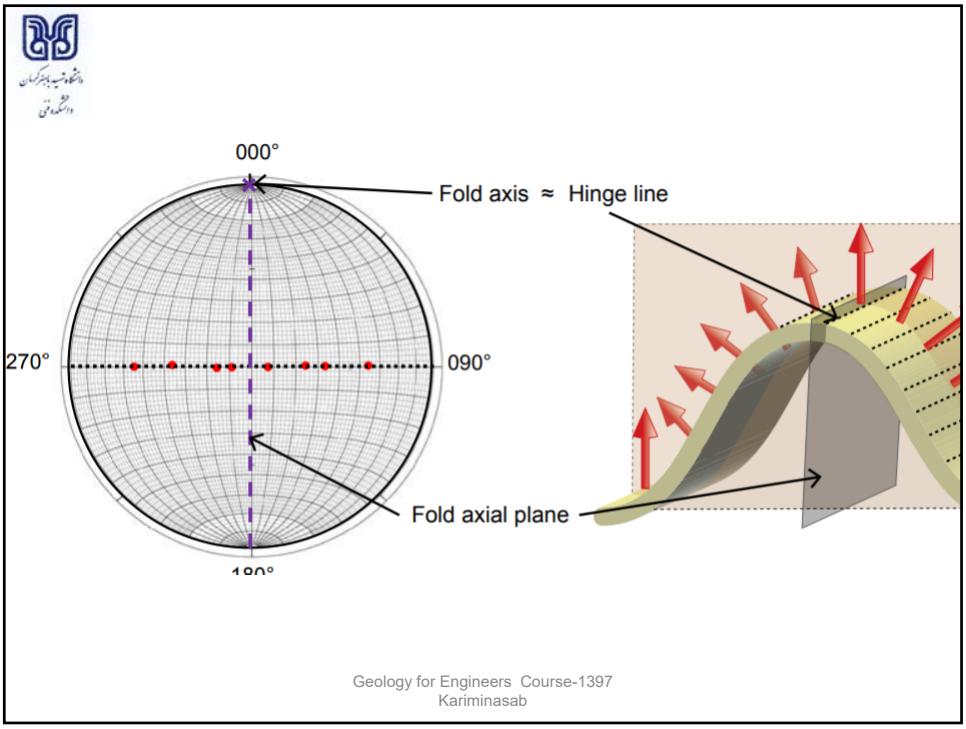

π
β

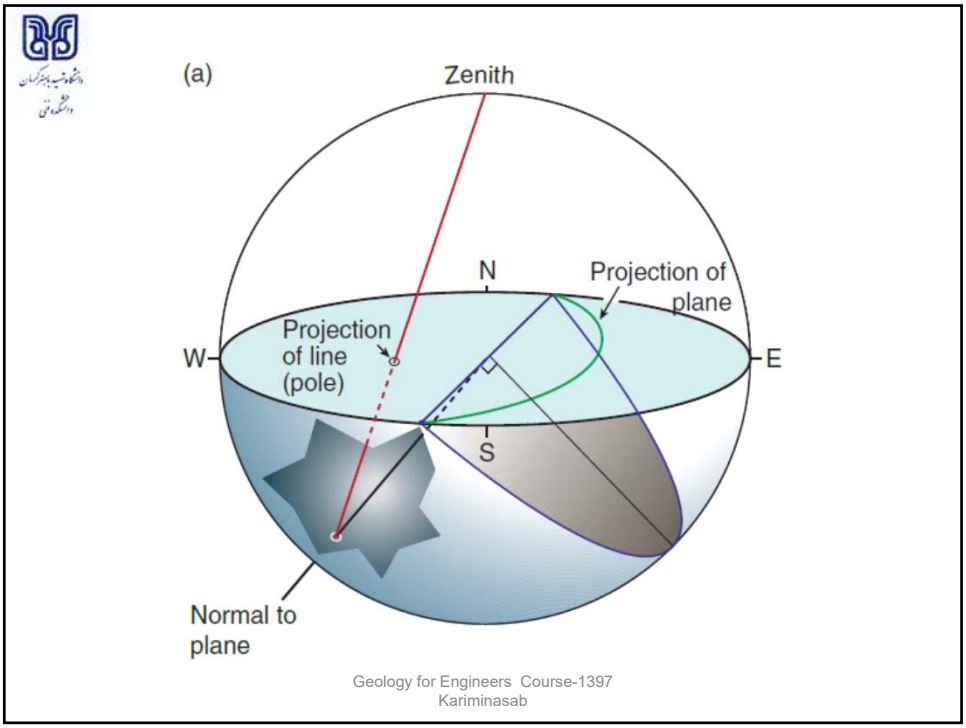

π diagram
π circle
B axis
π
β
B axis
β diagram


000°
Poles to bedding
270°
090°
180°


000°
Poles to bedding
270°
090°
180°

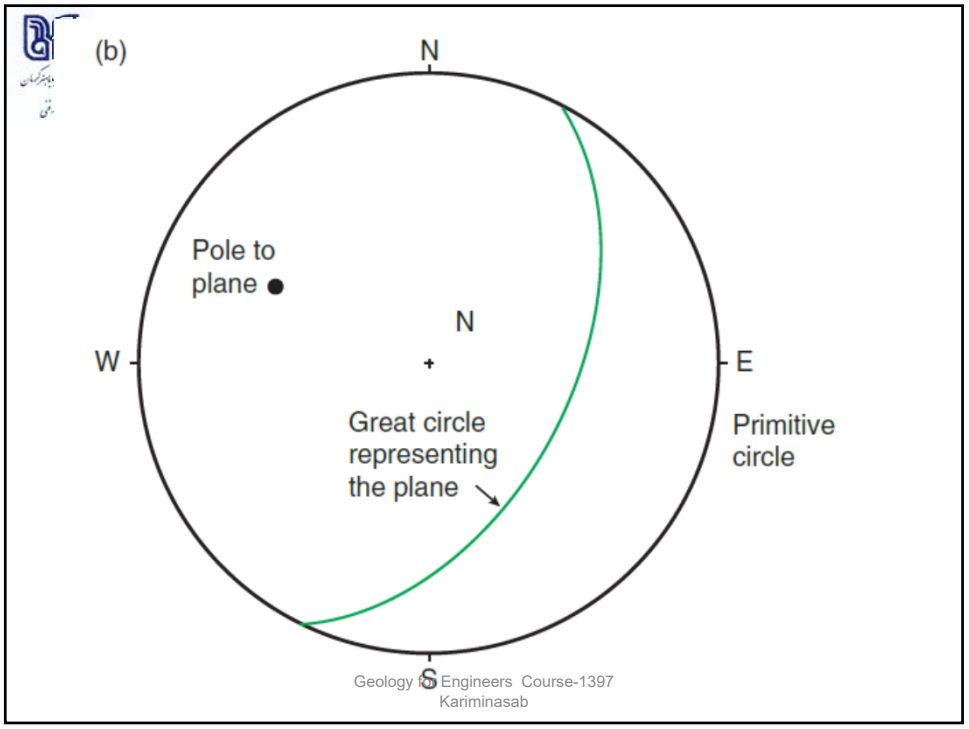

000°
Fold axis ≈ Hinge line
270°
090°
Fold axial plane

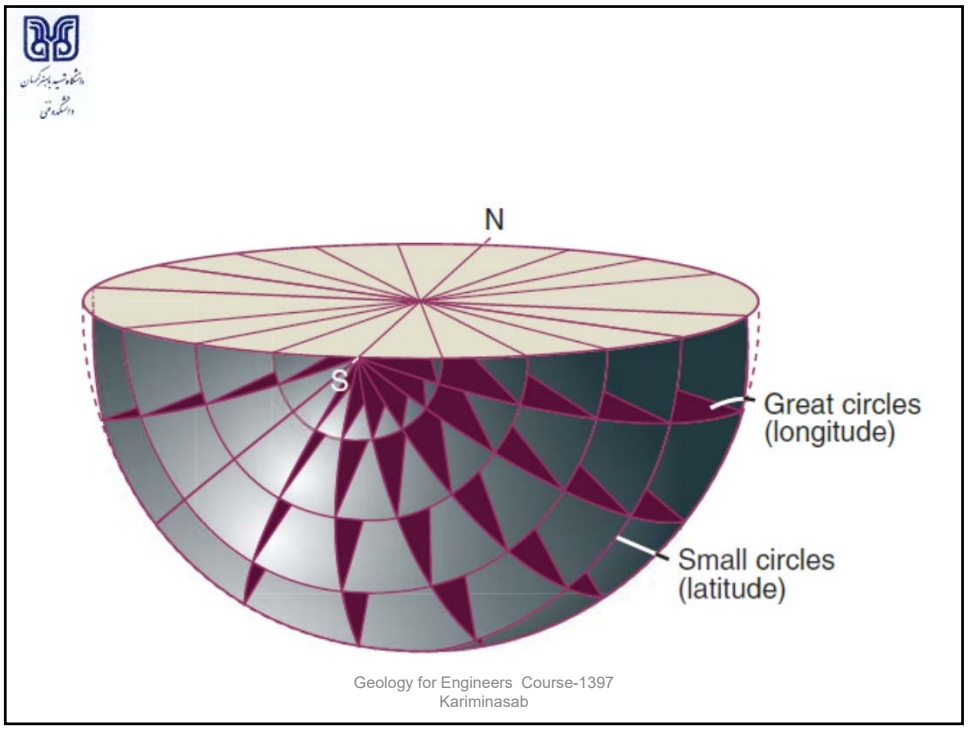

000°
Fold axis ≈ Hinge line
270°
090°
Fold axial plane

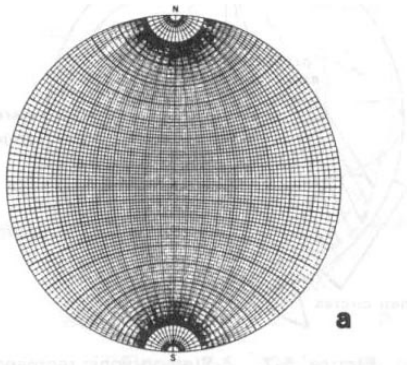

(a)
Zenith
N
Projection of plane
Projection of line (pole)
W
E
S
Normal to plane



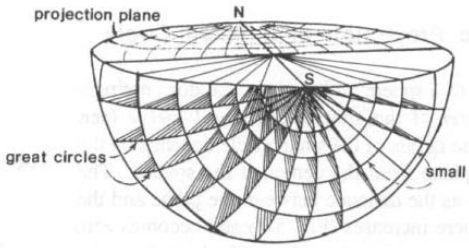



(b)
N
Pole to plane
N
W
E
Great circle representing the plane
Primitive circle
S


N
S
Great circles (longitude)
Small circles (latitude)

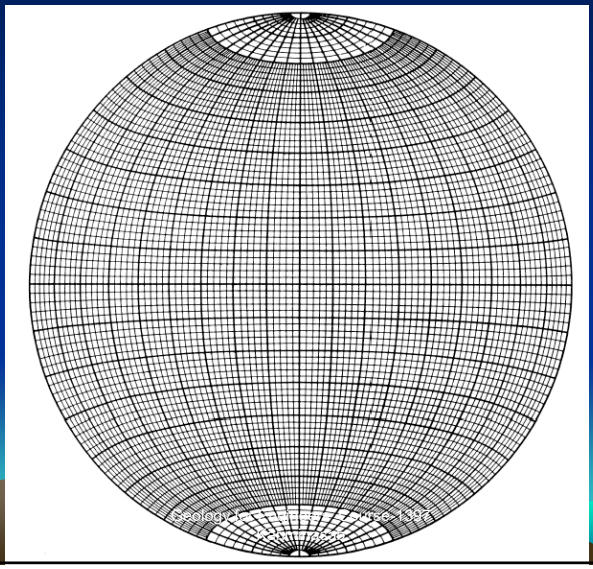


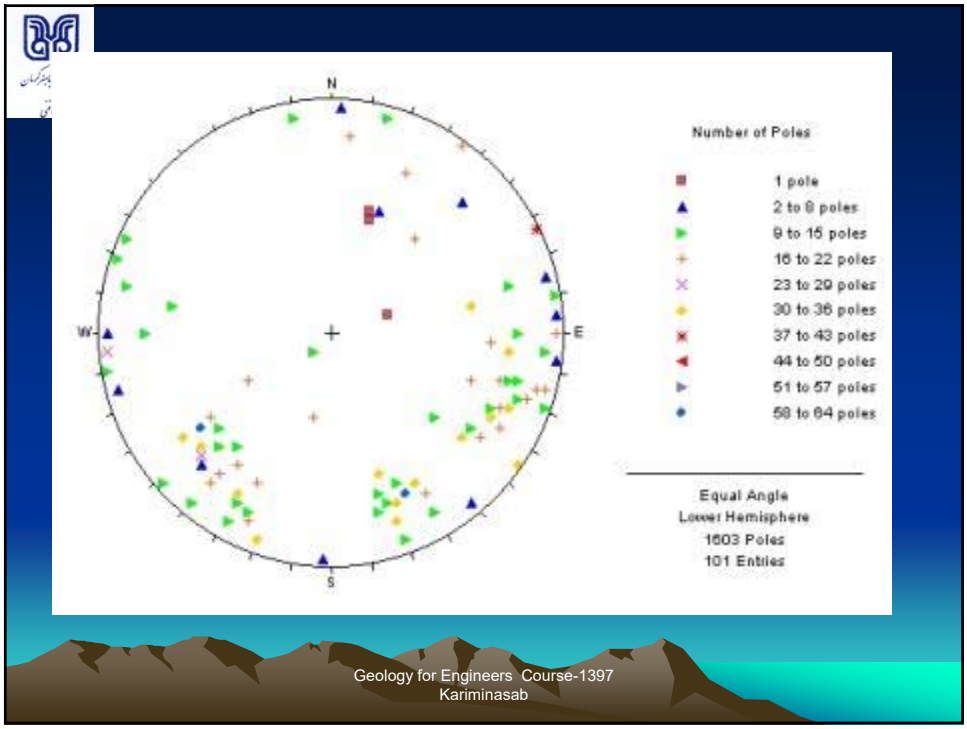
a



b

Equal area projection




N
W
E
S
Number of Poles
1 pole
2 to 8 poles
9 to 15 poles
16 to 22 poles
23 to 29 poles
30 to 36 poles
37 to 43 poles
44 to 50 poles
51 to 57 poles
58 to 64 poles
Equal Angle
Lower Hemisphere
1603 Poles
101 Entries
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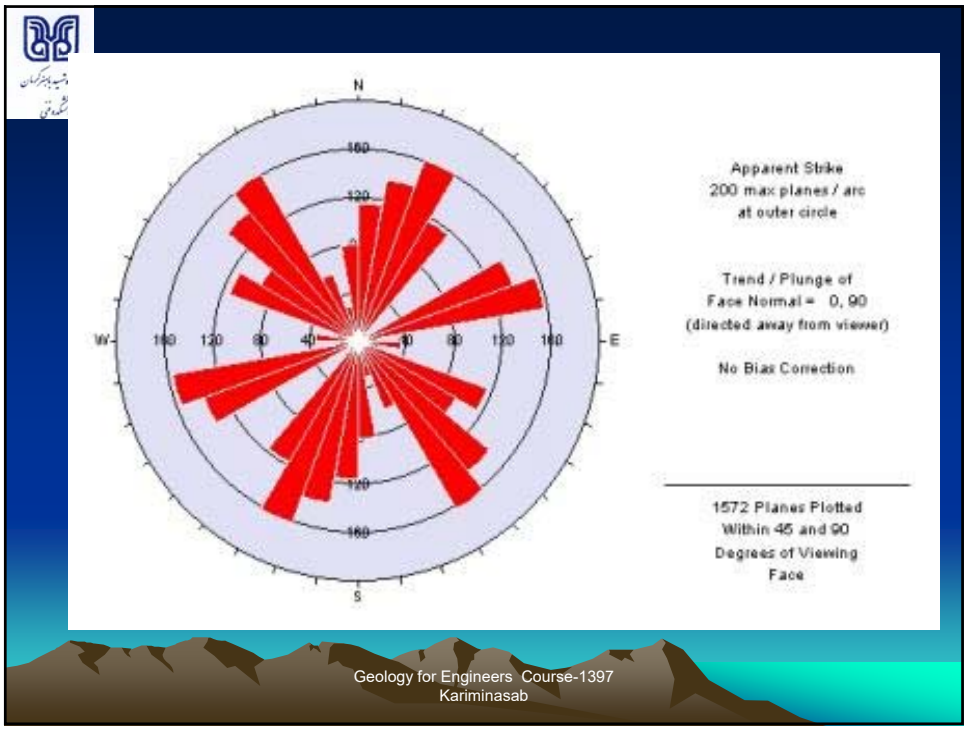
Kariminasab


N
W
E
S
160
120
80
40
0
Apparent Strike
200 max planes / arc
at outer circle
Trend / Plunge of
Face Normal = 0, 90
(directed away from viewer)
No Bias Correction
1572 Planes Plotted
Within 45 and 90
Degrees of Viewing
Face
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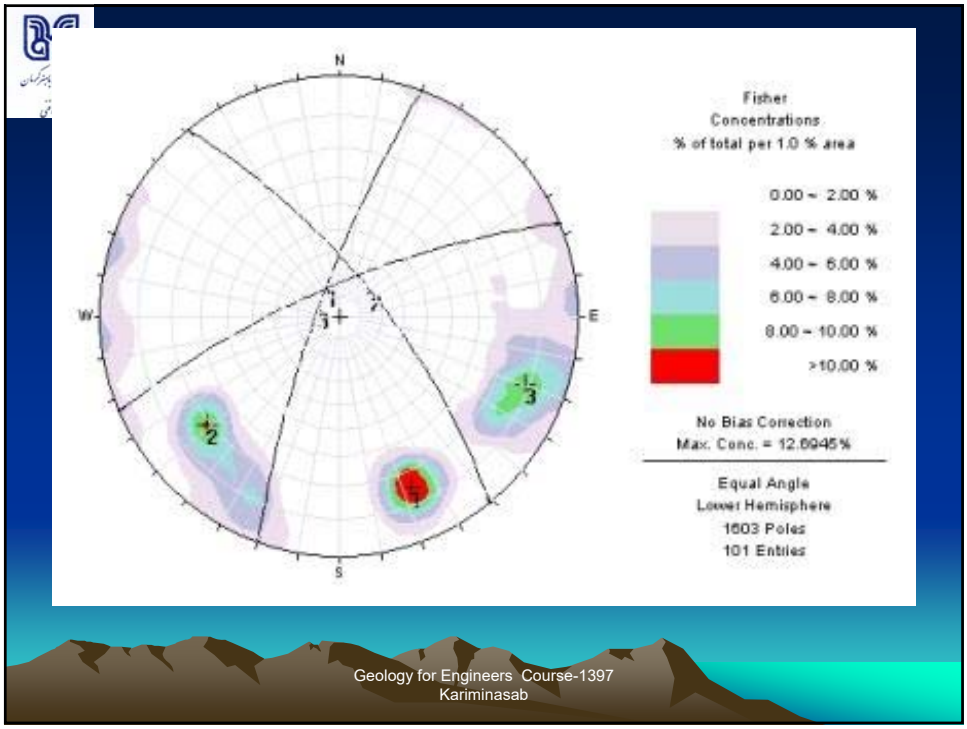
Kariminasab



مراحل ترسیم ساختمانهای زمین شناسی بر روی استرئونت

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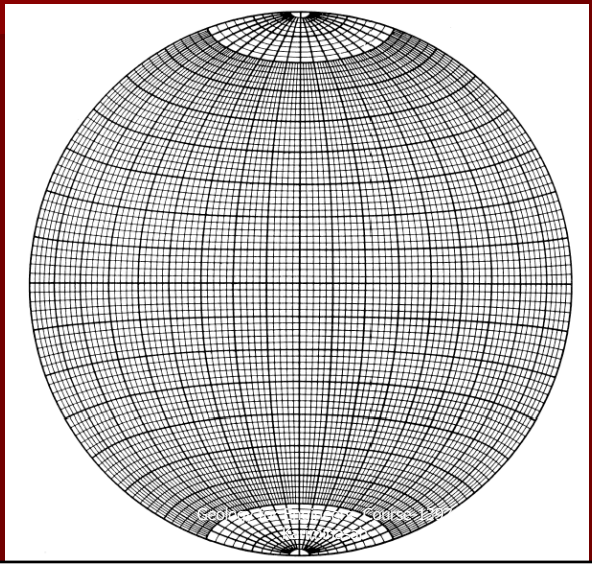
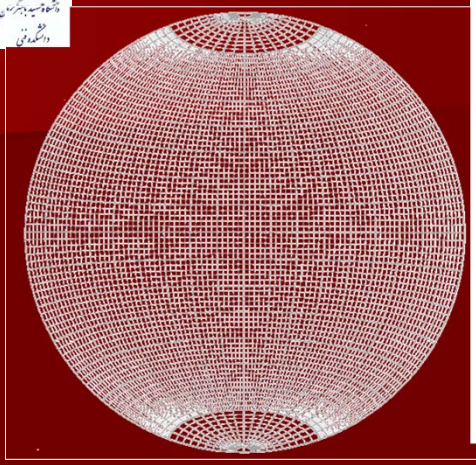
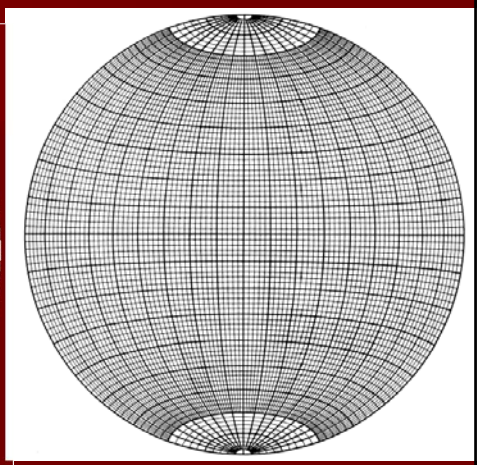
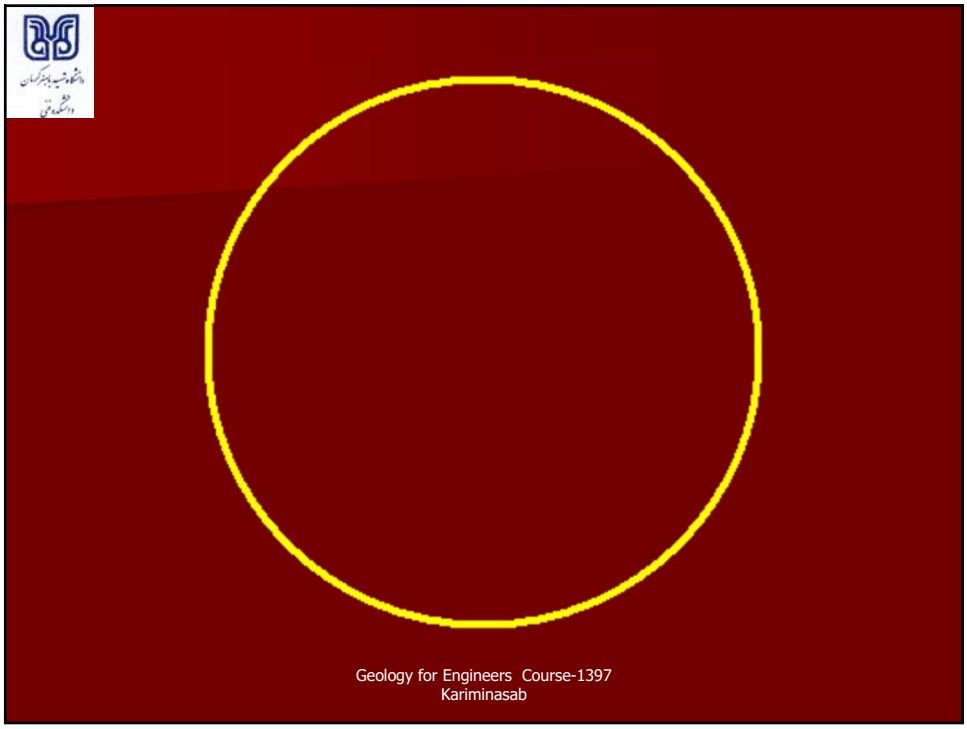
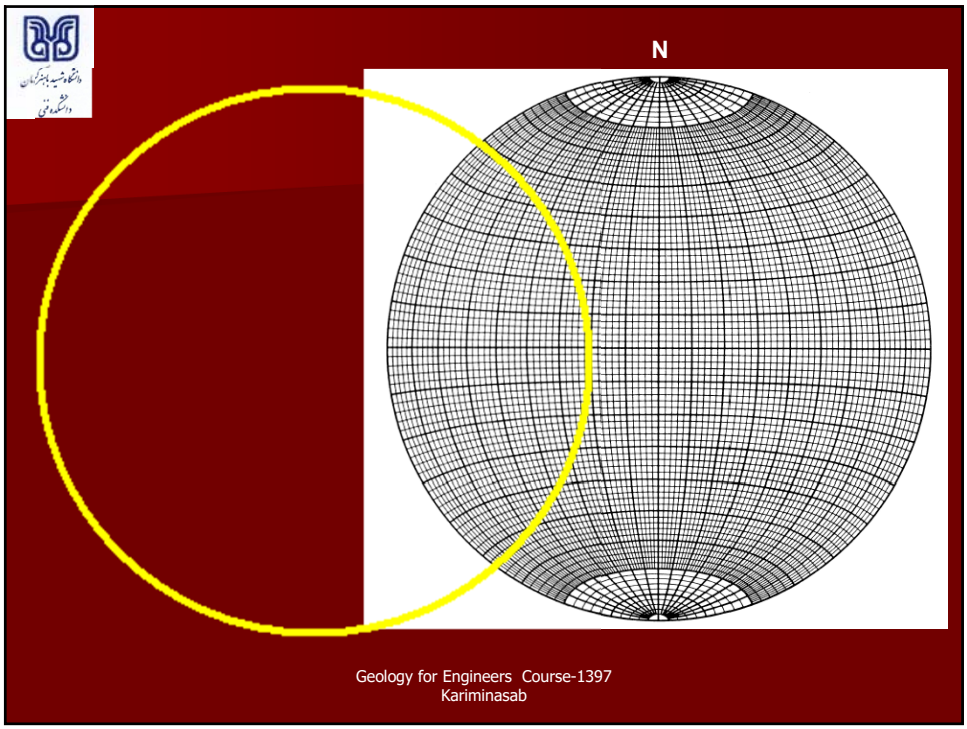
Equal area projection

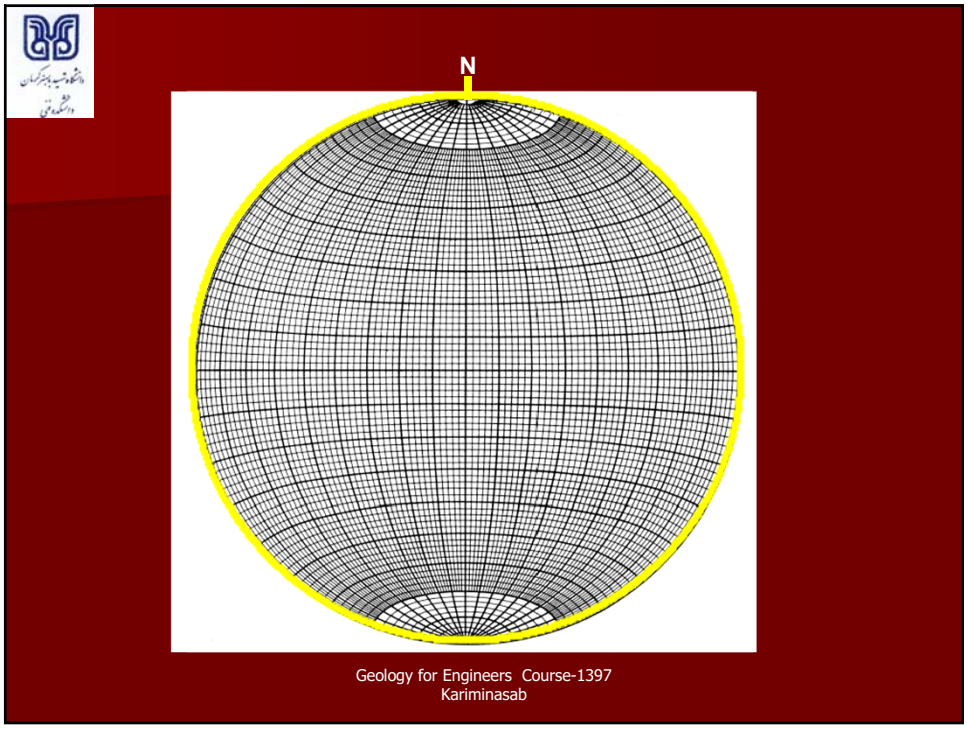









N



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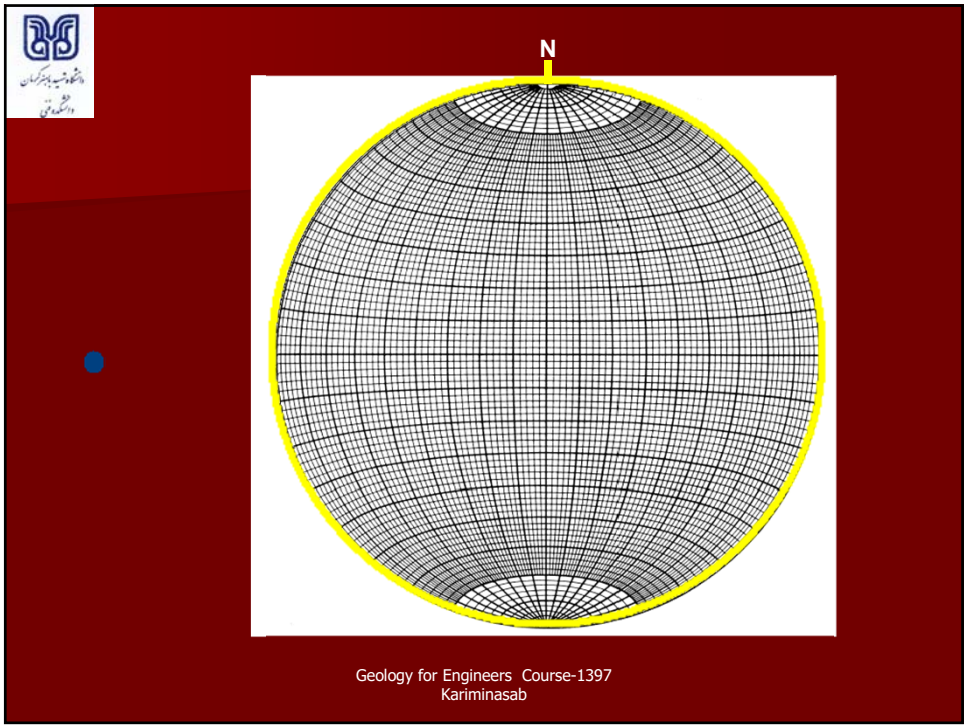

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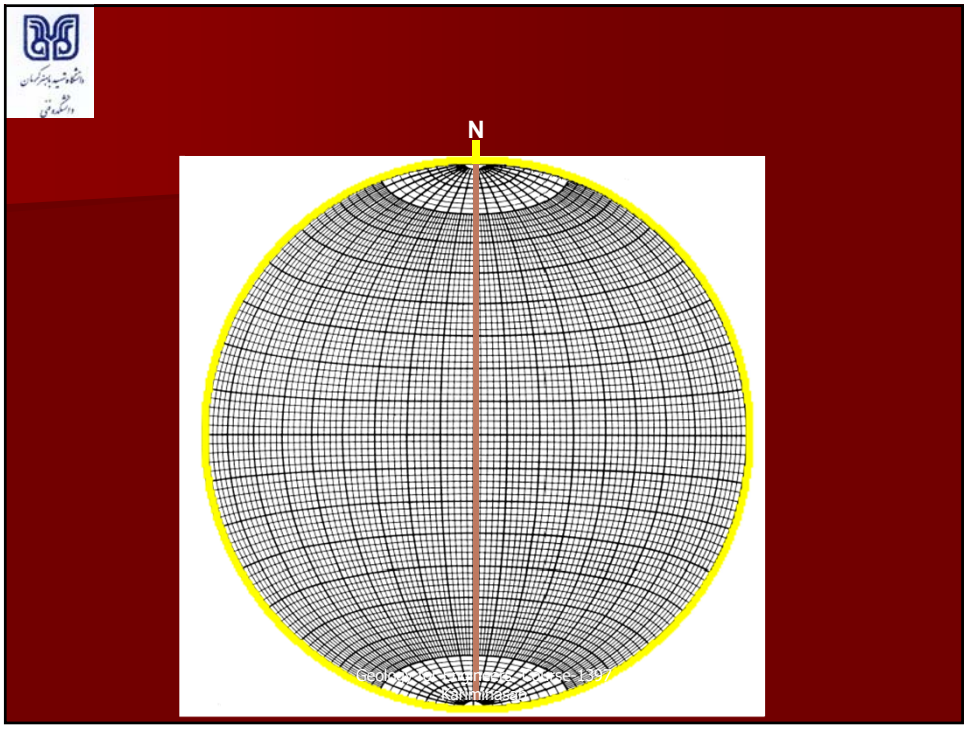
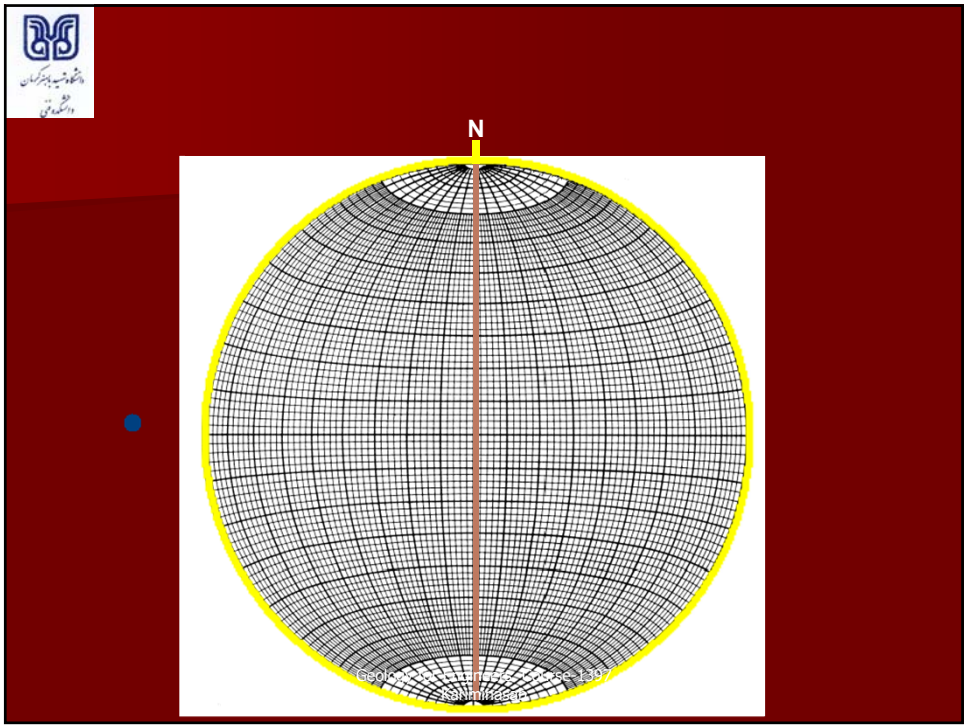
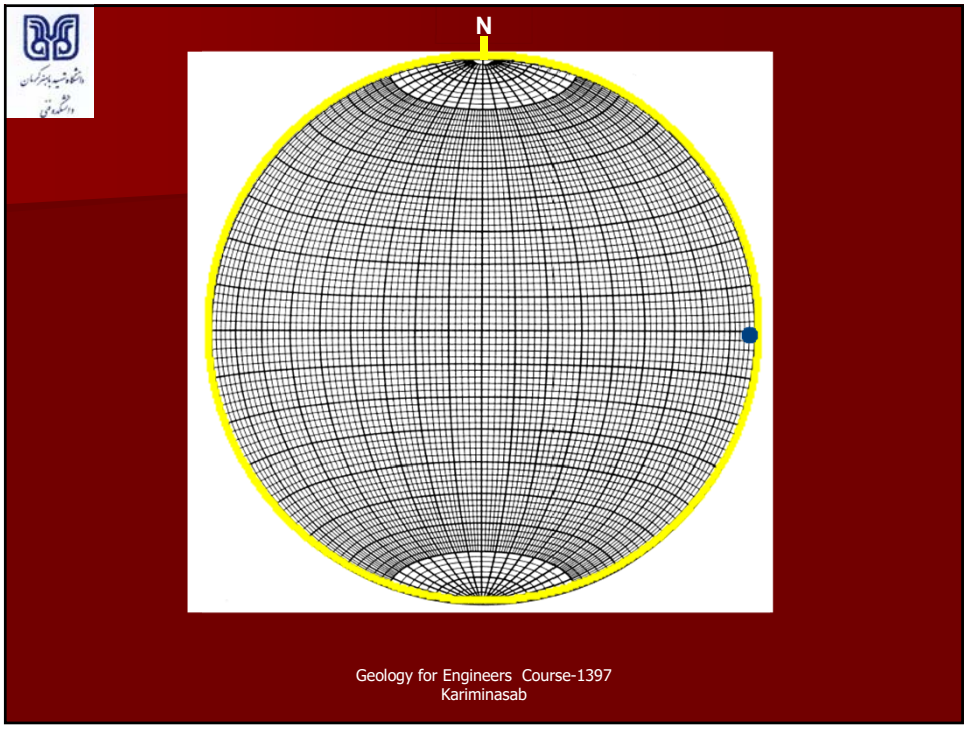

N


N


N
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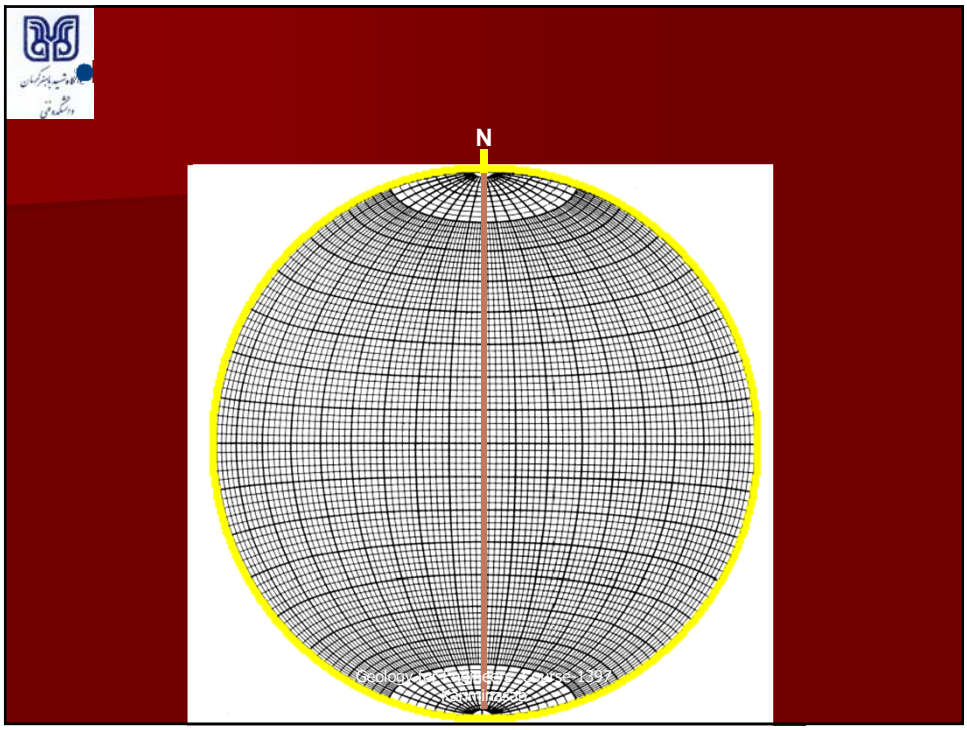
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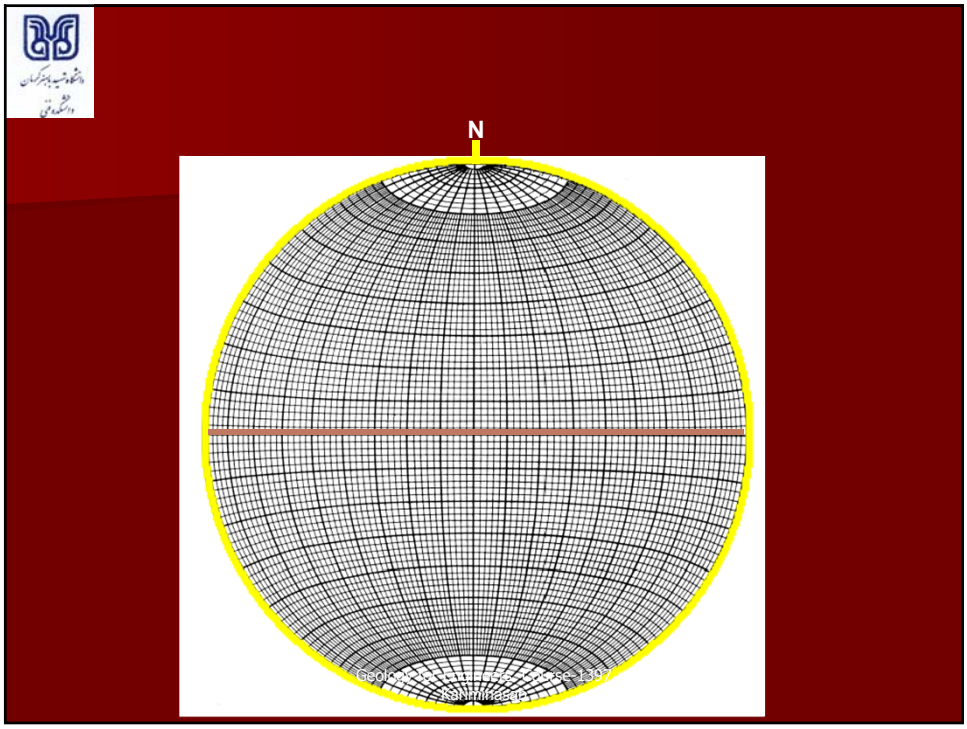
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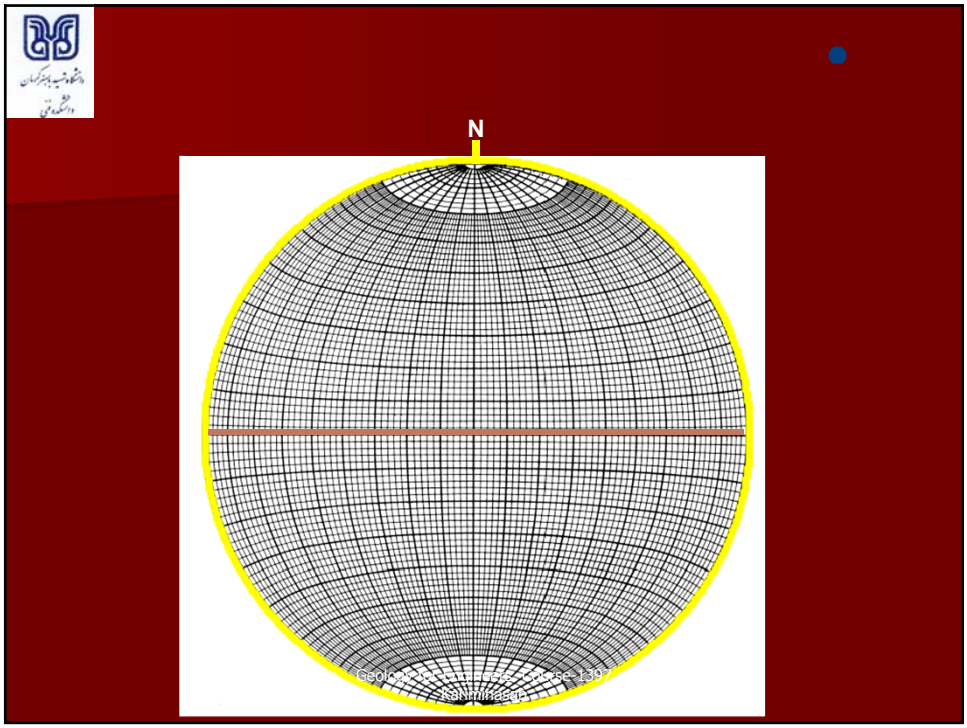
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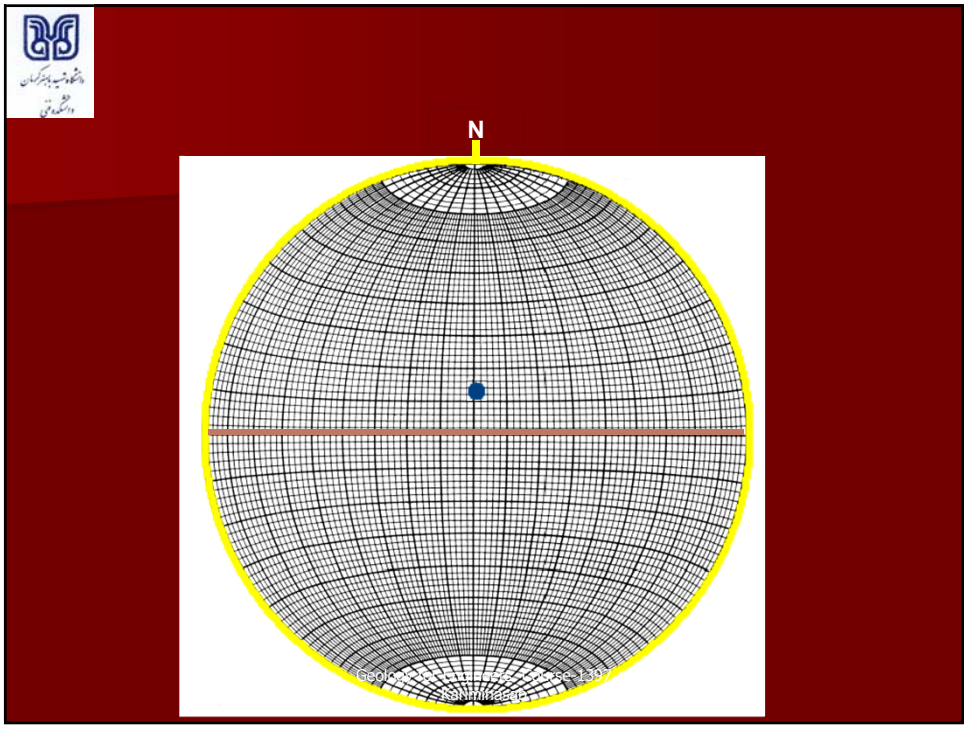
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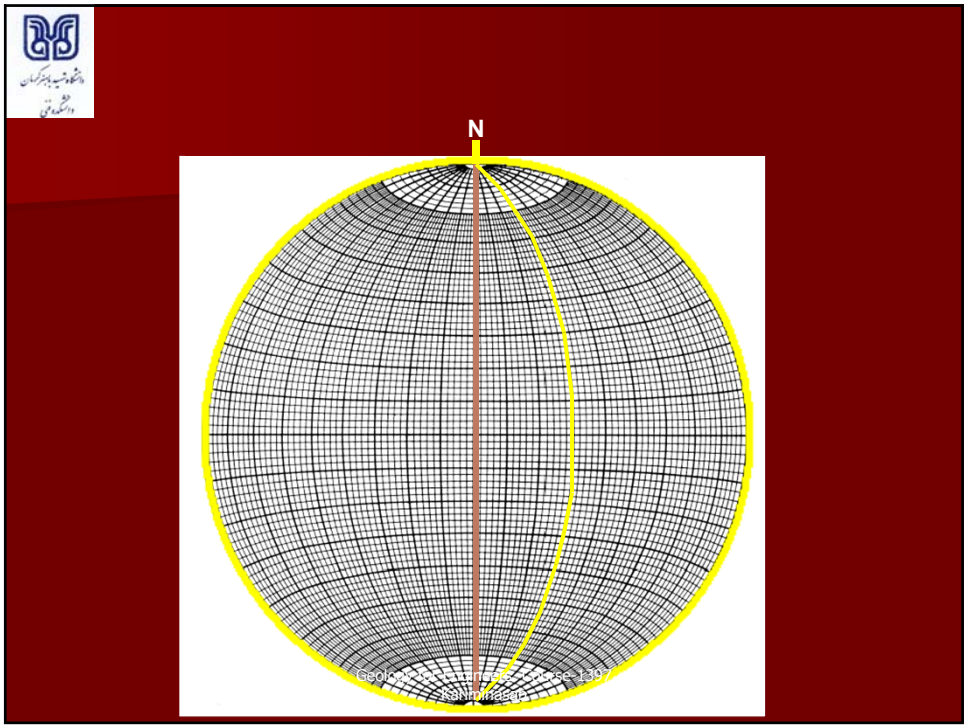
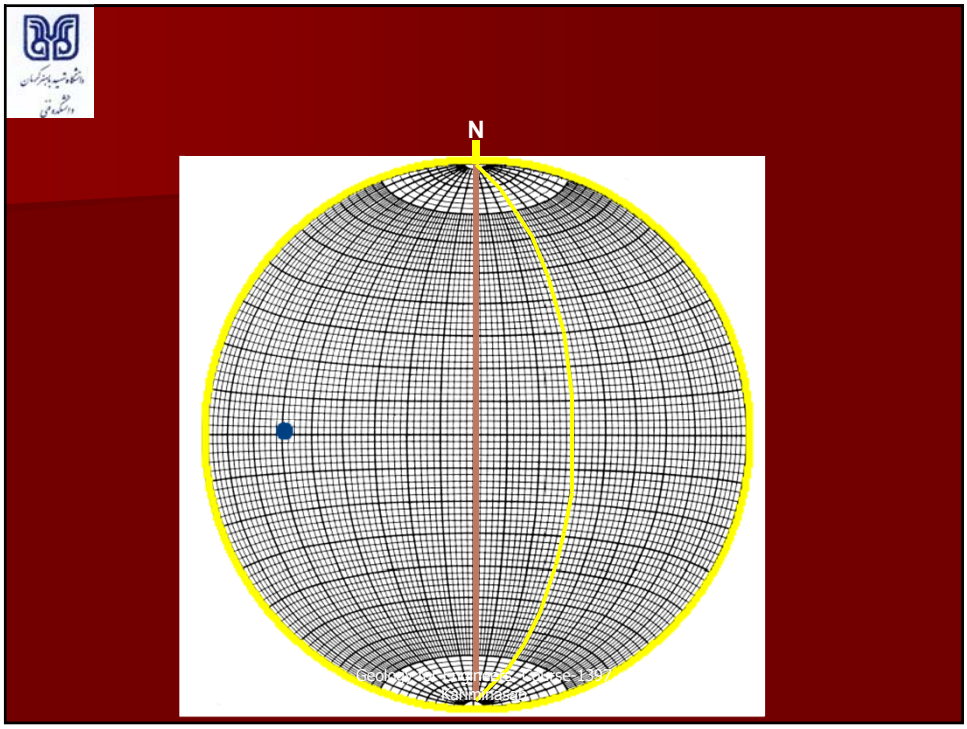
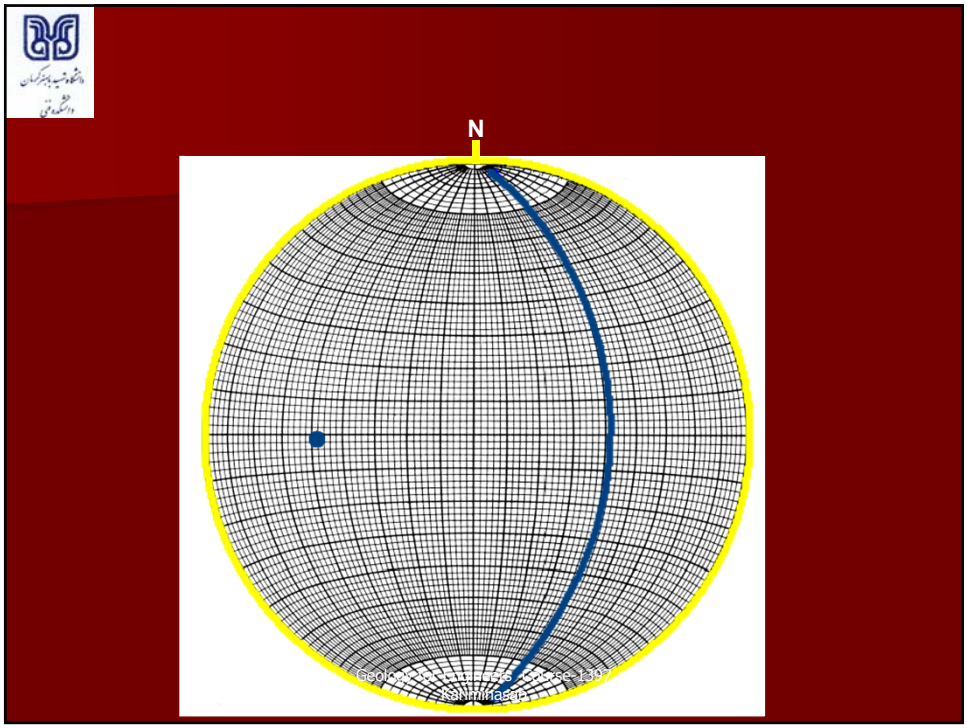
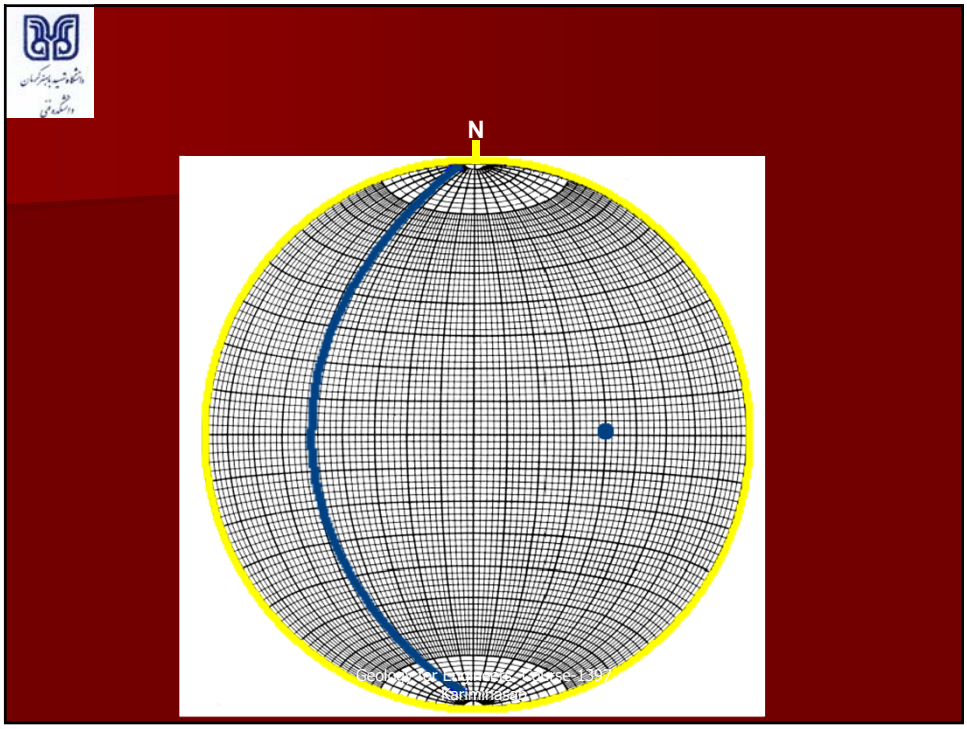

N


N


N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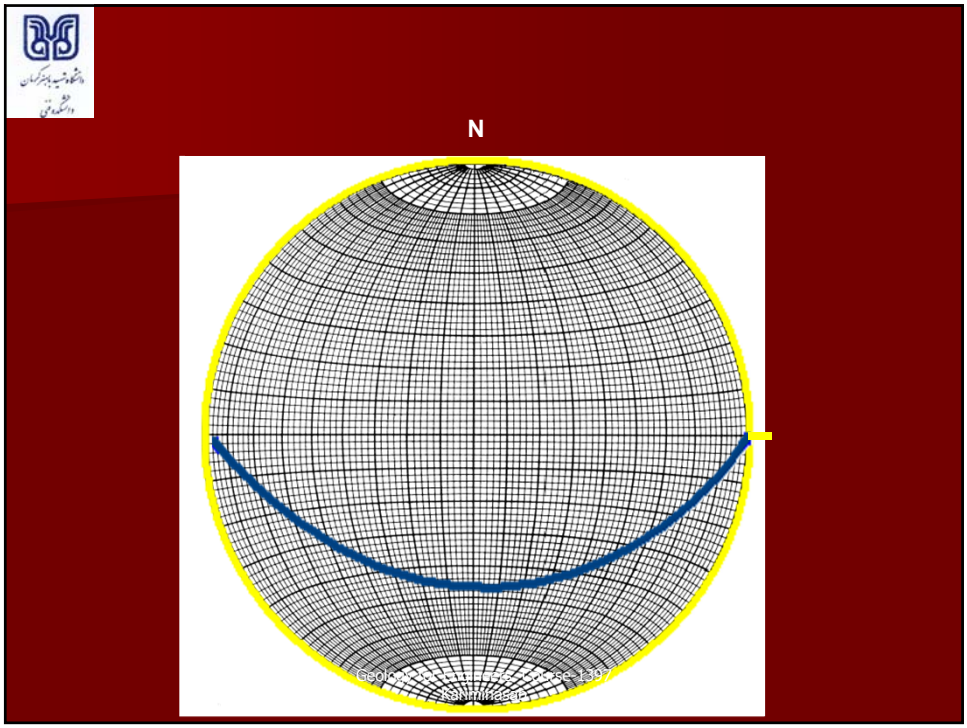
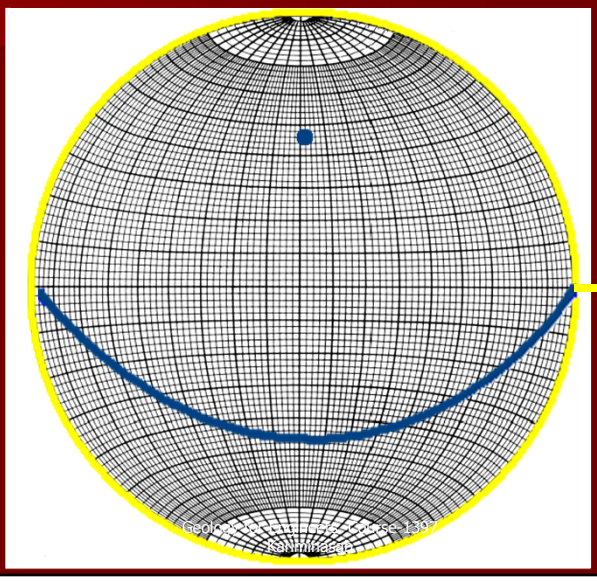

N

N



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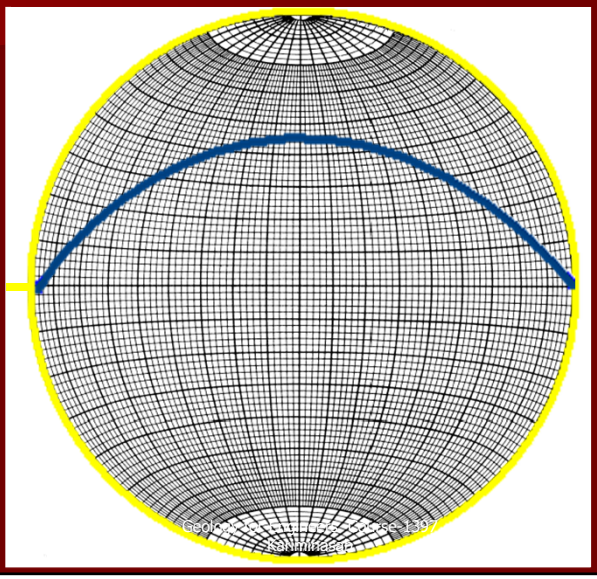

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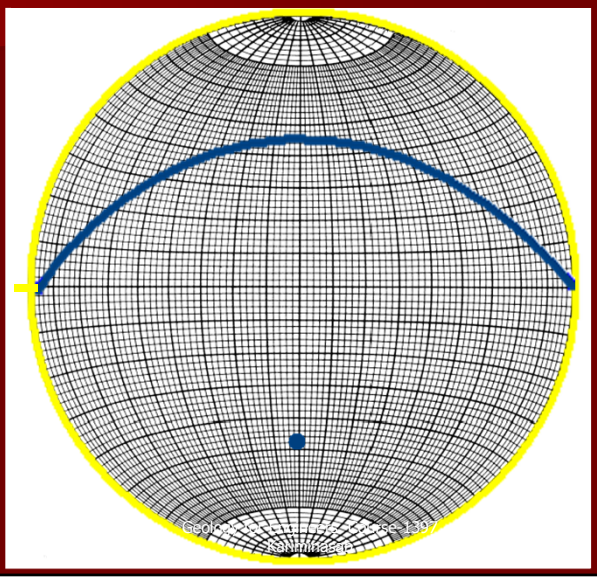
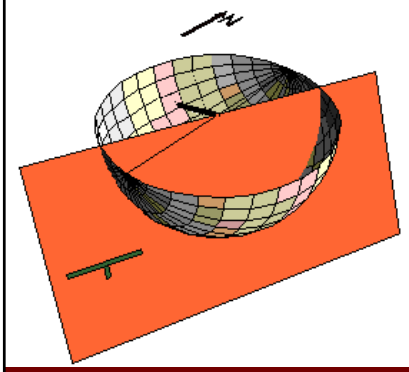


Quiz

- بر روی استرئونت صفحه و پل، صفحه ای با مشخصات زیر را ترسیم نمائید.

023/63 SE

Projection of plane 023/63 SE and its pole



Projection of plane 023/63 SE and its pole

