line of curvature

Canonical name	LineOfCurvature
Date of creation	2013-03-22 18:08:44
Last modified on	2013-03-22 18:08:44
Owner	pahio (2872)
Last modified by	pahio (2872)
Numerical id	5
Author	pahio (2872)
Entry type	Definition
Classification	msc 53A05
Classification	msc 26B05
Classification	msc 26A24
Synonym	curvature line
Related topic	TiltCurve

A line γ on a surface S is a *line of curvature* of S, if in every point of γ one of the principal sections has common tangent with γ.

By the http://planetmath.org/NormalCurvaturesparent entry, a surface $F(x,\,y,\,z)=0,$ where F has continuous first and partial derivatives, has two distinct families of lines of curvature, which families are http://planetmath.org/ConvexAngle to each other.

For example, the meridian curves and the circles of latitude are the two families of the lines of curvature on a surface of revolution.

On a developable surface, the other family of its curvature lines consists of the generatrices of the surface.

A necessary and sufficient condition for that the surface normals of a surface S set along a curve c on S would form a developable surface, is that c is a line of curvature of S.