Advanced Surface II (221U4330)

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Course outline:
1. Elliptic Fibration  
   Kodiara’s table of singular fibers.  
   Classification of elliptic surface.  
   Logarithmic transformation.
2. Surfaces singularities  
   DuVal singularities.  
   Elliptic singularites.  
   Canonical and terminal singularites.  
   Quotient singularities
3. Surfaces of general type  
   Miyaoka-Yau inequality.  
   Some more inequalities.  
   Pluricanonical maps  
   Geography of Chern numbers  
   Surfaces with $\chi=1$.  
   Moduli spaces
4. Abelian surfaces  
   Cohomology of line bundles.  
   Projective embedding.  
   Endomorphisms.  
   Moduli spaces.
5. K3-Surfaces and Enriques surfaces  
   Divisors on K3-surface  
   Local Torelli theorem for K3-surface  
   Moduli spaces of vector bundle on K3-surface.
Divisors on Enriques surface.
The period map and period domain

Reference:
1. Barth, Peters, Van de Ven, *Compact Complex Surface.*
4. Griffiths, Harris, *Principle of Algebraic Geoemtry*
5. Lange, Birkenhake, *Complex Abelian Varieties*

Grading:
1. Homework/Attendance  40%
2. Term Paper  60%