Griffiths - Harris

1. 复分析 P. 1 – 9.
   One variable. brief review / omit.
2. Several variables:
   1) Hartog's Thm
   2) Weierstrass Thms
   } explain in details.

2. Analytic varieties. complex manifold.

   Given definitions, examples
   inverse function Thm / implicit function thm.

3. Dolbeault & de Rham cohomology.
   ($\bar{\partial}$-) Poincaré Lemma

   Analytic subvar & integration.
   Explain why integration makes sense for singular subvar.

   Stokes Thm, Wirtinger Thm

4. Sheaf & Cohomology.
   - exponential sequence.
   - de Rham Thm / Dolbeault Thm. explain the idea.
     Everyone do it once by himself.
   - computations.

5. Intersection & holomorphic bundles.

~~interst~~ positivity of intersection numbers.

holomorphic v.b. curvature computation.
connection sub-bundle less positive. quotient more positive.

6. Hodge thm.

Statement. (Harmonic form. Green operator)
Proof depending on interests.
Application.

7. Kähler manifolds. & Hodge decomposition.

Equiv. definitions of Kähler manifolds.

Hodge identities (Maybe only explain the idea of the proof)

* Hodge decomposition, Hodge number. Hodge diamond

Hard Lefschetz.

Hodge index thm. & Hodge Riemann bilinear relation
explicit form for surfaces.

Chap 1.

1) divisors & line bundles. ×2.
correspondence w/ Cartier divisors & line bundle.

-* Bertini's thm

1st Chern class (GH has a serious mistake, See Zinger's website / notes)

2). Kodaira vanishing.

Statement. Key steps in proof, Some ~~variations~~ verifications are better left to the audience

Application

3). Algebraic variety.
Chow's thm.
Mention Serre's GAGA.
deg. varieties of minimal deg.

4. Kodaira embedding.
Explain details of the proof.

5. Grassmannian.
Schubert Calculus: What is the number of lines that intersect 4 general lines in $\mathbb{P}^3$?