Seminarplan geometric asymptotics (Vorschlag)

1. Chapter 1: Method of Stationary phase, p.1 -19
Erste Anwendung auf Probleme der geometrischen Optik; Morse-Lemma
2. ChapterII: 1-3
Differential operators on vector bundle. Asymptotic sections, asymptotic operators. Lax-Lneburg-Ludwig technique: Construct asymptotic expansions via solution of transport equations
3. Chapter II, 4. method of characteristics
obtain local solutions for first order PDE in geometric formulation
4. Chapter II, 5: Bicharacteristics
Reduction to ODE theory, via some geometry (Lagrange manifolds); hyperbolic operators.
5. Chapter II, 6: Transport equation
interpretation in a space of half-densities; invariant definition of the subprincipal symbol.
6. Chapter II, 7: Maslov cycle and Bohr-Sommerfeld quantization
Pedestrian introduction to the problem from the classical point of view: Construct an asymptotic solution
7 und 8. ?Chapter III: Geometric Optics?
Applications of Chapter II. Interesting, but not logically necessary.
9. ChapterIV, 1-2: Symplectic Geometry
Darboux-Weinstein, but concentrate on 2: Symplectic vector spaces punch line: Manifold of Lagrangian planes; Maslov class and Maslov cycle (as in Chapter II)

10. ChapterIV, 3: Cross index and Maslov class
Describe the Maslov class using Cech theory (Hörmander)

11. ChapterIV, 4+5: Functorial properties and local parametrization of Lagrangian submanifolds

12. Chapter VI, 1: Distributions and functors

13. Chapter VI, 3: Wave front set of a distribution
This is slightly different from the introduction via Fourier transform, see e.g. Hörmander. Uses Radon and Fourier transform.

14. Chapter VI, 4: Lagrangian distributions
Discuss this via push forward and pullback; the wavefront set uf the distribution on X is in Lagrangian submanifold Λ of T^*X.

Damit ist man vorbereitet für symbol calculus, Fourier integral operators, review of transport equations
und:
Chapter VIII: Compound Asymptotics.