

## 5. LECTURE 5

22 February, 2007.

- (1) Matrices of differential operators
- (2) Operators on vector bundles
- (3) Global elliptic estimates
- (4) Elliptic operators are Fredholm on Sobolev spaces and  $\mathcal{C}^\infty$ .
- (5) Index theorem.
- (6) Self-adjointness, resolvent family, compactness.
- (7) Discreteness of spectrum; completeness.
- (8) Homogeneous first order operators with constant coefficients on  $\mathbb{R}^n$ .
- (9) Compact manifolds with boundary
- (10) The b-Sobolev spaces
  - Integral order
  - Mellin transform
  - General real order
- (11) Radial compactification of  $\mathbb{R}^n$ .
- (12) Isomorphism properties of homogeneous elliptic operators (of first order).

## REFERENCES

- [1] L. Hörmander, *The analysis of linear partial differential operators*, vol. 2, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo, 1983.