

ABSTRACT. We prove index formulas for elliptic operators acting between spaces of sections of C^* -vector bundles on a closed manifold. The formulas involve Karoubi's Chern character from K -theory of a C^* -algebra to de Rham homology of smooth subalgebras. We show how they apply to the higher index theory for coverings and to flat foliated bundles, and prove an index theorem for C^* -dynamical systems associated to actions of compact Lie groups. In an Appendix we relate the pairing of odd K -theory and KK -theory to the noncommutative spectral flow and prove the regularity of elliptic pseudodifferential operators over C^* -algebras.