A methodology is presented which enables isogeometric analysis on trimmed NURBS surfaces. The general limitations of NURBS-based isogeometric analysis are roughly delineated to resolve the associated issues. A local reconstruction technique using a geometric basis is developed and applied to evaluate the finite element constituents of the trimmed knot spans in terms of the underlying control variables. This paper covers the algorithmic treatment of single patches as well as of multi-patches. Moreover, the proposed methodology gives rise to a new feature in the case of load application, what we refer to as Isogeometric Load Design. It provides the possibility to apply an arbitrarily shaped loading area onto a patch. Consequently, the restriction of the alignment of the loading with the underlying parameterization is canceled. In several significant examples the capabilities and effectiveness of this new method are demonstrated and confirm that the proposed method produces compelling results.