In this study, heterogeneous gold/niobium oxide nanomaterials were prepared and investigated. The possibilities of preparing these materials with two different niobium oxide architectures, namely thin sputtered layers and nanoparticle layers deposited using a gas aggregation source of nanoparticles, were tested. To achieve various oxide states of Nb, the thin Nb films and Nb nanoparticles were annealed at different temperatures. The resulting materials were subsequently decorated with Au nanostructures. The possibility of using such fabricated nanomaterials for SERS detection and photoinduced degradation of organic substances was successfully demonstrated. It was found that the highest SERS signal of methylene blue, which was chosen as a model system, can be achieved for sputtered films of orthorhombic T-Nb_2O_5 decorated with Au, while this material also exhibits sufficient photoactivity required for methylene blue degradation. In the case of nanoparticle layers of Nb_2O_5/Au, significantly lower SERS activity was observed compared to thin layers of Nb_2O_5/Au. However, the results obtained indicate a higher efficiency of photodegradation for these nanomaterials.