The problem of model reduction by moment matching for linear and nonlinear differential time-delay systems is studied. The class of models considered includes neutral differential time-delay systems with discrete-delays and distributed-delays. The description of moment is revisited by means of a Sylvester-like equation for linear time-delay systems and by means of the center manifold theory for nonlinear time-delay systems. In addition the moments at infinity are characterized for both linear and nonlinear time-delay systems. Parameterized families of models achieving moment matching are given. The parameters can be exploited to derive delay-free reduced order models or time-delay reduced order models with additional properties, e.g., interpolation at an arbitrary large number of points. Finally, the problem of obtaining a reduced order model of an unstable system is discussed and solved.