ABSTRACT: The first part of the chapter provides a state-of-the-art review on the development of the AISC-LRFD beam-column interaction equations. The LRFD equations provide a good fit to the 'exact' strength curves for beam-column members only when the column effective lengths and amplified moments are evaluated properly. Various methods of computing the effective length factors and the elastic moment amplification factors have been discussed. An analytical expression has been proposed to compute second-order moments for an end-loaded beam-column member. This expression is recommended for use with second-order elastic analysis programs since if one element is used per member, only the member end moments are computed directly in the analysis procedure. The storey-buckling concept and system buckling analysis procedure are found to be the most general methods. The alignment chart procedure, which is based on the buckling of an idealised subassemblage, is limited in its applicability and validity. The use of the alignment chart for leaned column frames or for simple portal frames with unequal column stiffness parameters can result in unconservative estimates of member capacity. Inelastic reduction of column effective length factors is found to have little consequence on beam-column capacity in many types of frameworks. A portion of the chapter addresses the question of whether it is necessary to use K factors for beam-column design. If appropriate limits are placed on equations that are based on $K=1$, the interaction equations that are devoid of K are attractive. The last part of the paper attempts to identify directions for use of inelastic analysis as a tool for more rational design of steel beam-columns. Future refinements in frame analysis and member design are likely to focus more on the overall system response and less on individual member response.