Abstract: These lecture notes are a guided tour through the fascinating world of polymer chains interacting with themselves and/or with their environment. The focus is on the mathematical description of a number of physical and chemical phenomena, with particular emphasis on phase transitions and space-time scaling. The topics covered, though only a selection, are typical for the area. Sections 1-3 describe models of polymers without disorder, Sections 4-6 models of polymers with disorder. Appendices A-E contain tutorials in which a number of key techniques are explained in more detail.

Keywords: