*- Theory of Neutralization Titrations*
- *pH calculation and Acid - base titration curves*
- *Titration Curve for strong acid and strong base, Titration Curve for strong acid and weak base, Titration Curve for strong base and weak acid*
- *Effect of dissociation constant on the shape of titration curves*
- *Effect of concentration on the shape of titration curves*

*- Theory of acid - base indicators*
- *Types of acid - base indicators*
- *Effect of pH on the color change of indicator, choice of indicator for Acid - base titration system, Titration errors associated with acid - base indicator*

*- Titration of mixtures and ploy functional acids and bases*
- *Titration of mixture of strong and weak acids with strong base*
- *Titration of a mixture of strong and weak base with strong acid*
- *Titration of ploy functional weak acid or weak base with strong base or strong acid.*
- *Composition of ploy basic acid solutions as a function of pH ($\alpha$- functions*

*- Application of Neutralization Titrations*
   *Carbonate and carbonate mixtures*
   *phosphate and phosphate mixtures , Other inorganic and organic application*

*- Buffer systems*
- *properties of buffer solution*
- *Importance of buffer solution, Buffer concentration and its effect, Buffer capacity and its effect, Buffer Range, Selection of buffer components and pka tables*

*- Preparation of buffer solution*
- *Weak acid (or base) and their salts, Strong acids and weak bases, Strong bases and weak acids, Strong acid and salts of weak acids, Strong base and salts of weak bases*

**الكتب الأساسية:**

**Fundamental of analytical chemistry, D.A. Skoog, D. M.West, F. J. Holler and S. R. Crouch, 8th ed., 2004, Brooks/Cole.**

**المرجع المساند:**

**Analytical chemistry, "Theoretical and Metrological Fundamentals", K. Danzer, 1st ed., 2006, Springer.**