Fundamentals of organic coatings

Undergraduate 3 credit course in Polymer Engineering curriculum
Amirkabir University of Technology

Chapter 1: Introduction to surface coatings (History, importance and its role in industry and assortment of coatings. The process of film formation)

Chapter 2: Paint components (Resin (application and properties), Pigments and fillers, Solvents and Additives. Role of each one in paints and coatings)

Chapter 3: Paint producing procedure (Dispersion, Mixing, Milling. Mill base and let- down preparation)

Chapter 4: Coating characteristics (Mechanical, physical, optical, chemical and rheological properties. Change in properties due to ageing)

Chapter 5: Paint manufacturing equipment and pigment grinding methods (Mixers, roller mills, ball and pebble mills, sand mills and high speed dispersers)

Chapter 6: Application methods (Brush, roller, air spray, airless spray, dipping. Rheological consideration in each method)

Chapter 7: Principles of paint formulation (solvent based and water based) (PVC, CPVC, LCPVC, calculations. Role of solid weight and volume)

Chapter 8: Quality control of paint and coatings (Testing of raw materials, liquid coating, dried and cured coating. Examples of some general international and national standards)

Chapter 9: Paint defects (Some common failures due to formulation and application)

Reference:

1) Z. W. Wicks, Organic coatings: Science and technology, 4 th edition, Wiley Interscience, 2017.
2) W. Freitag, D.Stoye , Paints, Coatings and Solvents, Wiley, 2008.
3) S. Paul , Surface coatings: science & technology, Wiley, 1996.
4) R. Lambourne, T. A. Strivens, Paint and Surface Coatings: Theory and Practice, 2 th edition William Andrew Pub, 1999.