

# **PHYSICAL CHEMISTRY OF SURFACE COATINGS**

**Undergraduate 3 credit course in Color Technology curriculum**

**Amirkabir University of Technology**

- 1. Definition of physical chemistry and its application. Physical chemistry from different point of views.**
- 2. Brief introduction to paint and coatings ingredients with special emphasis on pigments and fillers.**
- 3. Different geometries between particles. Packing factor and the effect of different geometrical parameters.**
- 4. Pigment-binder geometry. PVC and CPVC concepts. Other parameters deduced from volume models.**
- 5. Calculation of CPVC using different methods from solid films, liquid paint and pigment powder.**
- 6. Concept of CPVC in latex system and mechanism of film formation.**
- 7. Dispersion and wetting phenomena. Surface tension and surface energy concepts.**
- 8. Capillarity and its role in dispersion of pigment/filler.**
- 9. Stabilization of dispersion and selection of the right surfactants. HLB concept and its measurement. Iso-electric point and Zeta potential in powders.**

## References

- 1- Temple C. Patton, Paint Flow and Pigment Dispersion, A rheological approach to coating and ink technology, Wiley , 2<sup>nd</sup> edition, 1979
- 2- Z. W. Wicks, F. N. Jones, S. P. Papas, D. A. Wicks, Wiley 3<sup>rd</sup> edition, 2007
- 3- R. Lambourne, T. A. Strivens, Paint and Surface Coatings: theory and practice, 2<sup>nd</sup> edition, William Andrew Pub, 1999
- 4- M. P. Diebold, Application of Light Scattering to Coatings, Springer, 2014

