



## UNIVERSITI TEKNOLOGI MARA

### CMT605: COLLOIDS AND SURFACE CHEMISTRY

<b>Course Name (English)</b>	COLLOIDS AND SURFACE CHEMISTRY <b>APPROVED</b>
<b>Course Code</b>	CMT605
<b>MQF Credit</b>	3
<b>Course Description</b>	This course will introduce students the basic principles of colloid and surface chemistry. Foundation of colloid surface chemistry will be explained and details. Essentially, colloids involving solid and liquid adsorption, stability, destabilization, surface tension and contact angle properties will be taught and assigned. Measurements of colloids properties and characterization method will also discussed. Application of the theories will be adapted in laboratory practical.
<b>Transferable Skills</b>	Journal/article critiques and knowledge.
<b>Teaching Methodologies</b>	Lectures, Blended Learning, Journal/Article Critique
<b>CLO</b>	CLO1 Identify, describe and analyze a disperse system and determine whether it is colloidal or non-colloidal.(LO1) CLO2 Develop practical skills that may be applied to solving problems involving colloid surface (LO5)
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Introduction to Colloid and Surface Chemistry</b> 1.1) Characterisation of Colloidal Dispersion 1.2) Properties of Colloid 1.3) Classification of colloids	
<b>2. Preparation of Colloidal Dispersions</b> 2.1) Dispersion methods 2.2) Condensation methods	
<b>3. Stability of Colloidal Dispersions</b> 3.1) Meaning of stability 3.2) Surface free energy 3.3) Repulsive and attractive forces – the total free energy curves 3.4) Colloid stability 3.5) Intermolecular forces 3.6) Effect of adsorbed or anchored layers	
<b>4. Electric double layer</b> 4.1) Origin of electrical charges in colloids 4.2) Potential due to ions on and near the solid surface 4.3) Models of the electric double layer	
<b>5. Destabilisation of colloidal dispersions</b> 5.1) Flocculation and coagulation of electrically stabilised dispersions 5.2) Flocculation Value 5.3) Shultz Hardy Rules	
<b>6. Surface Tension and Contact Angle</b> 6.1) Introduction to Surface Tension 6.2) Measurement of surface tension 6.3) Introduction to Contact angle 6.4) Young Equation 6.5) Measurement of contact angle	

**7. Adsorption at Liquid and Solid Surface**

- 7.1) Introduction to adsorption
- 7.2) Physisorption and Chemisorption
- 7.3) Langmuir, Freundlich
- 7.4) B.E.T

**8. Association colloids**

- 8.1) Micellisation
- 8.2) Hydrophilic-Lipophilic balance
- 8.3) Solubilisation
- 8.4) Detergency

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Journal/Article Critique	One journal Critique.	20%	CLO2
	Test	2 tests will be held. First test within first half semester, whilst other, at the end of second half semester.	40%	CLO1

Reading List	Reference Book Resources	<ul style="list-style-type: none"> <li>• Duncan J. Shaw 2007, <i>Introduction to Colloid and Surface Chemistry</i>, Butterworths</li> <li>• Paul C. Hiemenz 1997, <i>Principles of Colloid and Surface Chemistry</i>, Dekker</li> <li>• D. H. Everett 1989, <i>Basic Principles of Colloid Science</i>, Royal Society of Chemistry</li> </ul>
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	