



## UNIVERSITI TEKNOLOGI MARA

### CMT674: CATALYST AND REACTOR APPLICATIONS

<b>Course Name (English)</b>	CATALYST AND REACTOR APPLICATIONS <b>APPROVED</b>
<b>Course Code</b>	CMT674
<b>MQF Credit</b>	3
<b>Course Description</b>	The course comprises description of the reactor concept, methods and calculation. The design principles for ideal homogeneous reactors are also introduced. It also covers chemical composition and physical properties of catalysts, and catalyst formulation. Students will also be introduced to the synergy of reactor and catalyst application in modern processes.
<b>Transferable Skills</b>	At the end of the course, students should be able to: 1. Explain the mechanism of the reaction, the role of catalyst and fundamental of chemical kinetics in area of catalyst and reactor application. 2. Discuss the common industrial's problem in areas of catalyst and reactor applications. 3. Demonstrate verbally the related formula for reactor design and catalyst formulation in areas of catalysts and reactor applications.
<b>Teaching Methodologies</b>	Lectures
<b>CLO</b>	CLO1 Able to explain the mechanism of the reaction, the role of catalyst and fundamental of chemical kinetics in area of catalyst and reactor application (C2). CLO2 Organise scientifically the related common industrial problem in areas of catalyst and reactor application (C4). CLO3 Communicate effectively the related formula for reactor design and catalyst formulation in areas of catalyst and reactor applications (A4).
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Introduction to Catalyst</b> 1.1) Types of catalyst 1.2) Synthesis and modification of catalyst	
<b>2. Characterization technique of the catalyst</b> 2.1) Instrument related to the characterization of catalyst 2.2) Physical and chemical properties of catalyst	
<b>3. Introduction to Chemical Kinetics</b> 3.1) The field chemical kinetics 3.2) Rate of reaction 3.3) Order of reaction	
<b>4. Reactors and catalyst</b> 4.1) Selection catalyst and reactor 4.2) Packing Technique 4.3) Catalyst deactivation	
<b>5. Rate and Design Equations in Different Reactor Types</b> 5.1) Mass balances for ideal homogenous reactor 5.2) Fractional conversion as a design variable in single reactions 5.3) Integration of kinetics into the reactor design equation 5.4) Graphical interpretation of reactor design equations	

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assignment	30%	CLO3
	Test	Test 1	30%	CLO1

Reading List	Recommended Text
	<ul style="list-style-type: none"> <li>• Octave Levenspiel, 1999, <i>Chemical Reaction Engineering</i>, 3rd edition Ed., John Wiley &amp; Sons</li> <li>• George W. Roberts 2009, <i>Chemical Reaction and Chemical Reactors</i>, John Wiley &amp; Sons</li> <li>• Fogler S. H., “, 4th Ed., , 2005 2005, <i>Elements of Chemical Reaction Engineering</i>, 4th Edition Ed., Prentice Hall, New Jersey</li> </ul>

Article/Paper List	
	This Course does not have any article/paper resources

Other References	
	This Course does not have any other resources