

**EBS201 – ORE DEPOSIT**

<p><b>Lecture Time :</b> Monday (02.00pm-4.00 pm) Tuesday (10.00-11.00 am)</p>	<p><b>Lecturer:</b> 1) Assoc. Prof. Dr. Kamar Shah Ariffin (KSA) 2) Dr. Zakaria Endut (ZE) (0006/19) 3) Assoc Prof. Dr. Hareyani Zabidi</p>
<p><b>Contribution of Assessments:</b> Final Examination: 60% Coursework: 40%</p> <ul style="list-style-type: none"> <li>• Quiz (5%)</li> <li>• Test (5%)</li> <li>• Assignment (30%)</li> </ul>	

COURSE OUTCOME	
<b>CO 1</b>	Able to recall the basic categories, genesis, classification of ore deposits formation, its main characteristics and the important to economic resource developments and market requirements. (U).
<b>CO 2</b>	Able to identify variety of ore metallic (iron, copper, lead, zinc, aluminium, cobalt, nickel, gold, REE etc geological resource formation) compare to non-metallic ore deposits/ industrials minerals. (U, A)
<b>CO 3</b>	Able to describe the uneven distribution of ore deposit formations in geological factor, space and time. Important to mineral exploration and development (mining and processing) (U,A).
<b>CO 4</b>	Be able to analyst various factors that influence the complexity of ore mineral formation, economic important and its marketability/application (U, A).

**ACTION FOR IMPROVEMENT FROM ACADEMIC YEAR 2019/2020**

<b>Comment :</b>	<b>Action for Improvement :</b>
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CO	LT	PO	Measuring Tools						Total marks	WP / EA	SLT	
			Quiz (10 %)	Test (30%)		Assignment (8 %)						Exam (60 %)
				1	1	2	1	2				
<b>CO1</b>	C1	PO1	5	1	2	1			15	20.0	WP1&3	20
<b>CO2</b>	C2	PO1			5	10			15	30.0	WP1&3	30
<b>CO 3</b>	C3	PO1					10		15	25.0	WP1&3	25
<b>CO 4</b>	C3	PO5						10	15	25.0	WP1&3	25



WEEK	LECTURER	TOPICS	ACTIVITY / ASSESSMENTS	COURSE OUTCOME	OTHER CLASS ACTIVITY
1-2 (2 week)	ZE	<u>Economic Mineral and Ore deposit</u> . Basic knowledge of ore deposit and types. Economic Mineral/geology, ore and ore minerals, Mineral occurrence and mineral prospect, and deposit, ore deposit, Economy Classification of Mineral deposit. Gred etc		CO1 - CO3	
3 (1 weeks)	ZE	<u>Introduction and Definitions</u> : Ore formation process Economic Ore mineralogy, Ore Geology, Ore Mineralogy, Ore-forming processes (geological, chemical, and physical process), hydrothermal geochemistry, metal transport and deposition in ore-forming systems			
4 (1 weeks)	ZE	<u>Ore deposit types, group, characteristics and classification</u> Epigenetic and Syngeneic mineral deposits, classification reasons, deposit class/categories, geology group, genetic and characteristics etc. Hydrothermal deposits, Magmatic, Sedimentary deposits, skarn deposit, placer/alluvial deposit, residual mineral deposits, volcanic massive sulphide etc (General)			
5-6 (2 weeks)	ZE	<u>Hydrothermal, Orogenic, magmatic deposit</u> Magmatic fluid - directly associated with magma/settling in magma chamber. Hydrothermal (Orogenic gold - Mesothermal, epithermal). Porphyries - Hot water heated by pluton (Cu, Mo) ,(Porphyry (Cu, Mo), Au.			
	ZE	Quartz veins hydrothermal deposits Hydrothermal and Metasomatism deposit : Exhalatives – hot water flowing to surface Volcanogenic massive sulfide (Pb-Zn) –VMS, Sulphide stratiform deposits: Pb-Zn stratabound deposits			
6-7 (2 weeks)	ZE	<u>Supergene deposit</u> . Nickel laterite – leaching of rock leaves residual materials behind (Al, Nickel, Fe) Supergene – reworking of primary ore deposits remobilizes metals (often over short distances)- weathering-erosion products/residual deposit (Laterite) and Bauxite.			
8	<b>MID TERM BREAK</b>				
9-10 (1 week)	KSA	<u>Residual, Ion-adsorption clay, Evaporite</u> Evaporite deposits –Gypsum and halite deposits. Rare Earth Element (REE) and Nickel Laterite			
11-13 (2 weeks)	KSA/ HZ	Banded Iron Formations. Sedimentary deposit : (Placer/alluvial, BIF, Laterite) Strata bound volcanogenic massive			
14-15	HZ	Placer/alluvial deposit – weathering of primary minerals and transport by streams (Gold, diamonds, tin/cassiterite etc.)			
16	<b>REVISION WEEK</b>				
17-19	<b>EXAMINATION</b>				

\*Other class activity: Active learning, etc with no marks allocation

Teaching staffs	Contact hours	Teaching weeks	No. of Exam Qs	CO	Format Exam Qs (7 Qs)			
					Part A (Compulsory)	Part B (Choose any 1 Qs)	Part B (Choose any 1 Qs)	
Dr. Zakaria Endut	21	7	3.5	CO1 CO2 CO3	Q1 CO1	Q4 CO2	Q6 CO3	
Assoc Prof. Dr Kamar Shah Ariffin	14	4.5	2	CO3 CO4	Q2 CO4	Q5 CO3		
Assoc Prof. Dr Hareyani Zabidi	7	2.5	1.5	CO2 CO4	Q3 CO3		Q7 CO4	
<b>Total</b>	<b>42</b>	<b>14</b>	<b>7</b>	<b>CO1, CO2 CO3, CO4</b>	<b>3 QS</b>	<b>2 QS</b>	<b>2 QS</b>	

Prepared by:	Endorsed by:	Approved by:
Course Coordinator	Program Chairman	Deputy Dean (Academic)
PM Kamar Shah bin Ariffin	Dr Suhaina Ismail	Prof. Zulkifli bin Mohamad Arif
Date: 01/09/2020	Date: 07/09/2020	Date: 15/09/2020