PHYSICAL CHEMISTRY(I) (Syllabus)		
Faculty:	Geoscience	
Name of study program:	Materials and Metallurgy	
Department:	Materials and Metallurgy	
Level:	Bachelor	
The code of subject:	3	
Subject:	Physical Chemistry I	
Subject Status:	Compulsory	(Compulsory or Elective)
Semester:	First (I) Winter	(Winter / Summer)
Total hours:	3+2	(According to approved programe)
ECTS:	6	(According to approved programe)
Schedule / Hall		
Academic year:		
Professor:	Nazmi Hasi	
Assistants:	Msc. Arbër Zeçiraj	
Contacts:		Assistant
Email:	Nazmi.Hasi@umib.net	arbër.zeqiraj@umib.net
Phone:		+38344565229

BRIEF CONTENT OF SUBJECT	The material of the course consists of three parts. The first part develops the concepts of equilibria in chemistry and physics. The second part introduces the structure: quantum theory, atomic and molecular structure, molecular spectroscope, statistical thermodynamics, molecular interactions, materials. The third part includes changes: the movements of molecules, the rate of chemical reactions, the kinetics of complex chemical reactions, the dynamics of molecular reactions, processes on solid surfaces.Lectures will be accompanied by numerical and laboratory exercises	
AIMS	The aim of the course is for students to acquire knowledge, to understand, physico-chemical equilibria, the meaning of atomic and molecular structure. Recognize chemical and kinetic reactions.	
EXPECTED LEARNING OUTCOMES	Upon successful completion of the course: 1. Students know the concepts of physical and chemical equilibria. 2. Students gain knowledge of atomic and molecular structure. 3. Students understand thermochemical processes 4. Students can choose the degree of chemical reactions. 5. Students to gain knowledge about collected materials and materials in solid state. 6. Students to distinguish the dynamics of molecular reactions.	
PROGRAM	Weeks	Topic and Readings
	Week - I	Equilibrium: The properties of gases; Real gas.
	Week - II	The First Law: The basic concepts

	Week - III	Thermochemistry
	Week - IV	State functions and exact differentials
	Week - V	The Second Law: The direction of spontaneous change
	Week - VI	Concentrating on the system: The Helmholtz and Gibbs energies Standard reaction Gibbs energies
	Week - VII	Combining the First and Second Laws
	Week - VIII	Physical transformations of pure substances
	Week - IX	Phase stability and phase transitions
	Week - X	Simple mixtures: The thermodynamic description of mixtures
	Week - XI	The properties of solutions
	Week - XII	Activities: The solvent activity; The activities of ions in solution
	Week - XIII	Phases, components, and degrees of freedom.
	Week - XIV	Chemical equilibrium
	Week - XV	Equilibrium electrochemistry
LITERATURE	1. Peter Atkins, Julio de Paula"Physical Chemistry, 2006 2. M. Shamsuddin Physical chemistry of metallurgical processes.Published by John Wiley & Sons, Inc., Hoboken, New Jersey. Published simultaneously in Canada.2016 3. *Journal of Physical Chemistry Letters* (from 2010, combined letters previously published in the separate journals) 4. David R.Gaskell, David E.Laughlin"Introduction to the THERMODINAMICS OF MATERIALS, SIXTH EDITION, 2018	
TEACHING METHODOLOGY	*Lectures, exercises, individual work, experimental work, seminar papers, mid term, essays, field work, group work, etc.*	

Contribution to student workload (which should correspond to student learning ou credit = 25 hours)

Activity	Hours	Day/Week	Total
Lectures	3	15	45
Exercise sessions - theoretical	2	15	30
Field exercises			
Practical work	2		2
Consultation with the professor / assistant	-	-	-
Colloquiums / seminars	2	2	4
Independent tasks (work)	2	3	6
Student self study time (in library or at home)	5	15	75
Final exam preparation	7	1	7
Time spent in assessment (tests, quizzes, final exams)	2	3	6
Projects, presentations, etc.	1	1	1
Total			175

EVALUATION

Evaluation methods
[according to the Statute and Regulation of UMIB Studies]

Tests	2x15(%)
Practical test during exercises	
Seminary work (in word)	10(%)
Interpretation and presentation of seminary work	5(%)
Tasks and essays during the semester	5(%)
Final exam	40(%)

ACADEMIC POLICIES

Seminars and presentations must be written on a computer and students will be given deadlines for submitting seminars, presentations and assignments.
During the student evaluation, active participation in lectures will be taken into account, for example: discussions, comments and free expression of opinion, opinion and academic position (with arguments). Also, it will be mandatory to work independently and use additional sources of information (various scientific websites, scientific journals, conference proceedings, etc.)
The obligation of the teacher is to prepare and equip with the relevant lectures.