COURSE TITLE	INORGANIC POLLUTANTS GEOCHEMISTRY AND DYNAMICS	CODE: GC 5201

LEVEL (UG-undergraduate/M-master) AND YEAR OF STUDY (1,2,3,4)	M2	SEMESTER	II	STATUS (CO-COMPULSORY/OP-OPTIONAL)	CO

NUMBER OF HOURS/ WEEK				TOTAL HOURS/ SEMESTER	TOTAL HOURS OF INDIVIDUAL WORK	CREDITS	EVALUATION TYPE (D-DURING THE SEMESTER, E-EXAM, M-MIXT)	LANGUAGE
L	S	P	Pr.					
2		2		48	192	8	M	English

LECTURER	POSITION, NAME AND SURNAME	DEPARTMENT
	PhD Reader Dumitru Bulgariu	Geology

PREREQUISITES	Inorganic geochemistry; Geochemical modeling with applications on environment issues. Geochemistry of continental waters; Physical geochemistry
OBJECTIVES	Assimilation and understanding of basic concepts in applicative context. Development of the application of concepts in specific cases - case studies, estimating the dynamics of inorganic pollutants and the environmental impact. Developing skills in working with specialized laboratory equipment.
COURSE CONTENTS	I. Inorganic Pollutants (Classifications. Sources of pollution. Toxicity and limit of permitted concentration. Mechanisms of interaction and environmental impact). II. Mechanisms of transport of inorganic pollutants (transport by diffusion and migration; reagent transport; in situ generation of pollutant species.). III. Dynamics of global inorganic pollutants (complex kinetic processes; speciation processes; actual distribution coefficients; mobility and real coefficients of retention in the environment; inactivation of migration and mitigate inorganic pollutants). IV. Geochemistry and dynamics of inorganic pollutants in the atmosphere (pollution sources and pollutant types; specific mechanisms of transmission and distribution; specific mechanisms of interaction and impacts). V. Geochemistry and inorganic pollutants in hydrological dynamic systems (pollution sources and pollutant types; specific mechanisms of transmission and distribution; speciation processes in continental and marine hydrographic systems; specific mechanisms of interaction and impacts). VI. Geochemistry and dynamics of inorganic pollutants in multiphase-multicomponent heterogeneous systems (pollution sources and pollutant types; specific mechanisms of transmission and distribution; speciation processes in multiphases-multicomponents systems; distribution processes at the solid/liquid interface; mobility and retention coefficients of pollutants in solid-liquid-gas heterogeneous systems; specific mechanisms of interaction and impacts).
PRACTICAL	I. River pollution by heavy metals: estimated distribution, effective mobility and retention coefficients (application: Hg, Cd, Cr, Pb, Se, Tl), cyanides, nitrites and ammonia. II. Lake pollution by heavy metals: estimated distribution, effective mobility and retention coefficients (application: Hg, Cd, Cr, Pb, Se, Tl), cyanides, nitrites and ammonia. III. Pollution of marine systems by heavy metals: estimated distribution, mobility and effective retention coefficients (application: Hg, Cd, Cr, Pb, Se, Tl). IV. Soil pollution by heavy metals: estimated distribution, effective mobility and retention coefficients (application: Hg, Cd, Cr, Pb, Se, Tl), cyanides, nitrites and ammonia. V. Study of the speciation processes influence on the dynamics of heavy metals (Cd, Cr, Pb) in hidrologic systems and soils. VI. The study of the influence of distribution processes at the mineral/solution interface on heavy metals dynamics in soils.
TEACHING METHODS	Reproductive-explanatory (exposition). Training conducted. Learning by discovery. Experimental - investigative (problematization, discussion of ideas, case studies)

RECOMMENDED READING	Kabata-Pendias A., Pendias H. (1992). Trace Elements in Soils and Plants. CRC Press. Inc., Boca raton, FL. Negoiu D., Kriza A. (1977). Poluanţi anorganici în aer. Ed. Acad. RSR, Bucureşti. Salomons W., Föstner U., Mader P. (eds.) (1995). Heavy Metals. Problems and Solutions. Springer, Berlin. Weber A.J. Jr., DiGiano F.A. (1996). Process Dynamics in Environmental Systems. Wiley & Sons, Inc., N.Y. Weber A.J. Jr. (2001). Environmental System and Processes. Principles, Modeling, and Design. Wiley, N.Y.	
ASSESSMENT METHODS	Conditions	Professional fulfillment (course + practical work)
	Criteria	Cumulative Assessment
	Way of evaluation	Testing Practice Exam + Project + Exam
	Formula of the final mark	0.40 Exam+ 0.40 Project + 0.20 Project Work Practice