Amtliche Bekanntmachungen der TU Bergakademie Freiberg

Nr. 35, Heft 2 vom 18. August 2010

Modulhandbuch

für den Internationalen

Masterstudiengang

Groundwater Management

Anpassung von Modulbeschreibungen

Zur Anpassung an geänderte Bedingungen können folgende Bestandteile der Modulbeschreibungen vom Modulverantwortlichen mit Zustimmung des Dekans geändert werden:

1. „Code/Daten“
2. „Verantwortlich“
3. „Dozent(en)“
4. „Institut(e)“
5. „Qualifikationsziele/Kompetenzen“
6. „Inhalte“, sofern sie über die notwendige Beschreibung des Prüfungsgegenstandes hinausgehen
7. „Typische Fachliteratur“
8. „Voraussetzungen für die Teilnahme“, sofern hier nur Empfehlungen enthalten sind (also nicht zwingend erfüllt sein müssen)
9. „Verwendbarkeit des Moduls“
10. „Arbeitsaufwand“

Die geänderten Modulbeschreibungen sind zu Semesterbeginn durch Aushang bekannt zu machen.

Code/ Dates	EMA .MA.Nr. 3045	Version: 11.09.2009	Start: WT 2009/10
Name	Applied Environmental Management (IBDEM, Geoökologie)		
Responsible	**Surname** Bongaerts **First name** Jan C. **Academic Title** Prof. Dr.		
Lecturer(s)	**Surname** Bongaerts **First name** Jan C. **Academic Title** Prof. Dr.		
Institute(s)	Chair of Environmental & Resource Management		
Duration	1 semester		
Competencies	The purpose of the cluster is to give students the competences to understand practical problems associated with the management of resources from certain ecological viewpoints, such as waste, the environmental (and health risks) and the environmental impacts associated with the exploration, the extraction and the processing of natural resources.		
Content	(1) Management of residuals (MOR): what is waste?, characteristics of waste legislation, waste legislation put to practice in management structures, case studies on waste management, environmental costing and waste, waste management and recycling, waste to energy. (2) Assessment and management of environmental risks with special attention to chemicals (ERA): environmental risk modelling, environmental risk management, instruments of environmental risk management, environmental risk and costing, case studies. (3) Environmental impact studies (EIS): purposes of environmental impact assessment, environmental impact study, phases of the environmental impact study, characteristics and elements of an environmental impact assessment, permitting process and procedures.		
Literature	Asian Development Bank (1997/2003): Guidelines for the Economic Analysis of Projects, ADB, Manila; Behrens, W.; Hawranek, P.M. (1991): The Manual for the Preparation of Industrial Feasibility Studies, Unido Publication, Vienna; Fletcher, C. D.; Paleologos, E. K. (2000): Environmental risk and liability management for corporation and consultants, AIPG, Westminster (CO); SWA General Secretariat (2001): International Dorectory of Solid Waste Management 2000/2001 – The ISWA Yearbook, Earthscan; Kausch, P.; Ruhrmann, G. (2002): Environmental Management, Environmental Impact Assessment of Mining Operations. Logabook; Lerche, I.; Paleologos, E. K. (2001): Environmental Rsk Analysis, McGraw-Hill, New York [et al.].		
Types of Teaching	Lectures (2 SWS) and tutorials (2 SWS)		
Pre-requisites	No previous knowledge is required.		
Applicability	MBA Programme IMRE, Master Programme in International Business in Emerging and Developing Markets (IBDEM), also for interested students of other programmes, such an engineering, geo-ecology.		
Frequency	The course is taught once within an academic year in the winter term.		
Requirements for Credit Points	For two courses within the cluster (MOR, ERA), papers of 15 pages length will have to be written.		
Credit Points	6		
Grade	The overall grade for the cluster is calculated as the arithmetic average of the grades of the two papers.		
Workload	The total time normally budgeted for the cluster is 180 h (60 h are spent in class, remaining 120 h are spent on preparation and self-study).		

Code/ Dates	CASEMAN.MA.Nr.2910	Version: 28.04.2010	Start: WT 2009/10
Name	Cases & Strategies in Environmental Management		
Responsible	**Surname** Bongaerts **First Name** Jan C. **Academic Title** Prof. Dr.		
Lecturer(s)	**Surname** Liu **First Name** Jiangxue **Academic Title** Dipl.-Kffrau		
Institute(s)	Chair for Environmental & Resource Management		
Duration	1 Semester		
Competencies	The cluster intends to give students the knowledge and the ability to understand the business and the strategic choices and decision making processes of corporations in the environmental sectors. Moreover, they will have to work themselves through case studies in order to be able to gain practical knowledge of these issues.		
Content	Definitions, structure size and trends of the international environmental industry, frameworks of business in the sector, in particular within the string regulatory arrangement and the high environmental standards, globalisation of companies and local delivery of services.		
Literature	- Mario Cogoy and Karl W. Steininger (2007): The Economics of Global Environmental Change – International Cooperation for Sustainability - International Energy Agency. (2009): World Energy Outlook - United Nations Development Programme; et al. [editor] (2008): World Resources 2008 – Growing the Wealth of the Poor, World Resources Institute, New York. Labatt S. & White R.R. (2007): Carbon finance – The financial implications of climate change		
Types of Teaching	Lectures (1 SWS), seminars (2 SWS) and tutorials (1 SWS)		
Pre-requisites	Admission to a graduate programme of the university (MBA IMRE or other Master's Programmes) or admission through Exchange programmes (e.g. ERASMUS)		
Applicability	The cluster and parts of it are not only accessible to the MBA IMRE students but also to interested students of other programmes, such an engineering, geo-ecology.		
Frequency	The cluster is offered once within an academic year.		
Requirements for Credit Points	For completion of the cluster an oral exam of 20 minutes will have to be taken, and a presentation of 10 minutes and a paper of 10 pages will have to be prepared.		
Credit points	6		
Grades	The overall grade for the cluster is composed by taking the arithmetic average of the grades of the individual tests.		
Workload	The total calculated time effort for the Cluster is set at 180 hours, of which 60 hours are dedicated to class attendance and 120 hours are budgeted for self-study.		

Code/ Dates	MKOMMU2.MA.Nr.2018	Verion: 17.08.2009	Start: ST 2010
Name	Geo-scientific communication II		
Responsible	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Lecturer(s)	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr. **Name** Ratschbacher **Vorname** Lothar **Titel** Prof. Dr. **Name** Matschullat **Vorname** Jörg **Titel** Prof. Dr. **Name** Stumm **Vorname** Andreas **Titel** Dr.		
Institute(s)	Institute for Geology, University Library		
Duration	1 Semester		
Competencies	The course intends to give students the knowledge and the ability to perform scientific database research and documentation as well as scientific writing, designing a scientific poster and presenting results in an oral talk.		
Content	Detailed database research, data mining, data management including raw data, scientific writing, rhetoric, and poster compilation. Major goals are learning and applying strategies of scientific enquiries using different techniques and digital sources, navigating reference management systems and compilation of bibliographies. Database concepts, publication strategies, citation of publications, Digital Object Identifier (DOI®) System, techniques for primary data publication incl. Meta data concepts are contents as well. Finally rhetoric and promoting results by means of scientific posters are content of the class. Seminar: working on a scientific topic for a defined time, writing a 10 pages paper and presenting the results in an oral presentation.		
Literature	Poetzsch, E. (2002). Information Retrieval: Einführung - Potsdam, Verl. für Berlin-Brandenburg. ; Horatschek & Schubert (1998). Richtlinie für die Verfasser geowissenschaftlicher Veröffentlichungen.		
Types of Teaching	Lectures and tutorials, seminar (2 SWS)		
Pre-requisites	Geo-scientific knowledge		
Applicability	Master course: Geowissenschaft, Geoökologie, Groundwater Management, Geosciences		
Frequency	Once within an academic year in the summer term.		
Requirements for Credit Points	Active participating in the lectures and seminar (PVL), oral talk of 15 minutes (AP1), scientific manuscript (10 pages) according to the guidline o the course (AP2).		
Credit Points	5		
Grades	The overall grade is calculated as the arithmetic average of the grades of the talk (weight 1) and the paper (weight 2).		
Workload	The total time is 150 h (30 h are spent in class, remaining 120 h are spent on preparation and self study).		

Code/ Dates	MGWCHE1.MA.Nr.2025	Version: 28.09.2009	Start: WT 2009/10
Name	Groundwater Chemistry I		
Responsible	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Lecturer(s)	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Institute(s)	Institute for Geology		
Duration	1 Semester		
Competencies	The student is widening his chemical know how in the field of hydrochemical aspects in particular with respect to groundwater. He will be able to solve basic but as well complex water quality problems by means of geochemical modeling on his own.		
Content	**Lecture groundwater chemistry:** basis of thermodynamics (ionic strength, calculating activity, saturation index), water as universal solvent, solution and precipitation of minerals, redox reactions, ion exchange, sorption, solubility of gases in water, balance between lime and carbonic acid. Basis of the chemistry of the elements Silicium, Aluminum, Sodium, Potassium, Carbon, Calcium, Magnesium, Halogens, Sulfur, Iron, Manganese, Nitrogen, Phosphorus, and the following trace elements: Pb, Cd, As, Hg, Zn, Cu, Ni, Cr, Mo, Co, Se in groundwater. Radioactivity, Uranium and gases in groundwater, microbiology and organic constituents in water. Practical training: chemical thermodynamics by means of PHREEQC, complex formation, species distribution, saturation index, mixing of waters, balance between lime and carbonic acid, gases in water, weathering of rocks, evaporation, reaction pass modeling.		
Literature	MERKEL & PLANER-FRIEDRICH (2002): Groundwater Geochemistry – A Practical Guide to Modeling of Natural and Contaminated Aquatic Systems, Springer. LANGMUIR (1997): Aqueous environmental geochemistry, Prentice Hall. APPELO & POSTMA (1993): Geochemistry, groundwater and pollution, Balkema. MERKEL & SPERLING (1996 & 1998): DVWK-Schriften 111 & 117, Hydrogeochemische Stoffsysteme I & II, Wirtschaft, Verlagsges. Gas und Wasser GmbH		
Types of Teaching	Lectures (2 SWS) and tutorials (2 SWS)		
Pre-requisites	Basic knowledge of chemistry and hydrogeology		
Applicability	Master Geowissenschaften, Geoökologie, Angewandte Naturwissenschaft, Groundwater Management, Geoscience		
Frequency	Once within an academic year in the winter term .		
Requirements for Credit Points	Written exam (duration 90 minutes). Report for 7 exercises with PHREEQC (AP1). web-based quiz along the lecture (AP2).		
Credit points	4		
Grades	The overall grade is calculated as the arithmetic average of the grades of the written exam (weight 2), grades for the 7 reports (weight 1) and grades for the web-based quiz (weight 1)		
Workload	The total time is 120 h (60 h are spent in class, remaining 60 h are spent on preparation and self study)		

Code/ Dates	MGWCHE2.MA.Nr.2026	Version: 28.09.09	Start: ST 2010
Name	Groundwater chemistry II		
Responsible	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Lecturer(s)	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr. **Name** Kummer **Vorname** Nicolai - Alexeji **Titel** Dr. **Name** Weise **Vorname** S. **Titel** Dr.		
Institute(s)	Institute for Geology, Zentrum für Umweltforschung, Halle-Leipzig		
Duration	1 Semester		
Competencies	Student will gain confidence and experience in sampling, sample treatment, sample storage as well as measuring field parameters and basic and advanced analytical techniques for ground water investigations and with respect to environmental isotopes in water.		
Content	Lecture groundwater chemistry (sampling and analytical techniques) combined with laboratory exercises: sampling (DIN/ISO and low flow sampling), impact of construction material of monitoring well, filtration and stabilization in the field, reading field parameters (pH, eH, temperature, EC, O_2). Determination of limit of detection and limit of quantification. Using photometry for different species (e.g. Fe(II), Fe(III), NO_2, NO_3, NH_4), titration to determine balance between lime and carbonic acid and Ks and Kb in comparison to the determination of TIC. Ion selective electrodes (activity versus concentration), Ion chromatography for anions and cations, HPLC for inorganic and organic compounds (evaluation of chromatograms), ICP-MS and coupling IC with ICP-MS, GC with FID, ECD, NPD, PID, MS. Elisa and toxicity tests. Lecture isotope hydrology: stable (H, O, C, N, S, and Sr) and radioactive isotopes (H, C, Sr, Cs, Ra, U, J, Rn, Ar, Kr, Cl) in aquatic systems.		
Literature	http://www.ile.tu-freiberg.de/ile2: ebook Grundwassermanagement, Kap. Monitoring. Schwedt (1996): Taschenatlas der Analytik, WILEY-VCH; Sigg & Stumm (1994): Aquatische Chemie, Teubner Verlag; Stumm & Morgan (1996): Aquatic Chemistry. John, Wiley & Sons; Otto (2000): Analytische Chemie, VCH, CLARK & FRITZ (1997): Environmental Isotopes in Hydrogeology, Lewis Publishers.		
Types of Teaching	Lecture (1 SWS) and exercise (3 SWS) and lecture (2 SWS)		
Pre-requisites	Basic knowledge in chemistry, water chemistry, and physics		
Applicability	Master Geowissenschaften, Geoökologie, Angewandte Naturwissenschaft, Groundwater Management, Geoscience		
Frequency	Once within an academic year in the summer term		
Requirements for Credit Points	Written exams (duration each 90 minutes) for both lectures and reports on lab exercises.		
Credit Points	6		
Grades	The overall grade is calculated as the arithmetic average of the grades of the two written exams (each weight 1) and the lab reports (AP, weight 2)		
Workload	The total time is 180 h (90 h are spent in class, remaining 90 h are spent on preparation and self study)		

Code/ Dates	MGWMAN.MA.Nr.2027	Version: 17.08.2009	Start: WT 2009/10
Name	Groundwater-Management		
Responsible	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Lecturer(s)	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Institute(s)	Institute for Geology		
Duration	1 Semester		
Competencies	Student will gain confidence and experience in navigation GIS software and applying his geo-scientific knowledge by means of GIS. Furthermore he will learn how to develop a project, calculate costs, writing tenders and quotes, and manage a project with respect to costs, time, and project goals.		
Content	Practical project management is a lecture with home works addressing aspects like designing contracts, billing and accounting, HOAI (Scale of Fees for Services by Architects and Engineers), tender, VOL, VOB, engineering contracts, project- management, development and controlling. Short course GIS Applications in Hydrogeology: Display and edit of raster, vector and CAD objects as well as handling of databases. Determination of subsurface and groundwater catchments based on a DTM. Utilization of slope, aspect, and shading. Groundwater exploration by means of remote sensing, compilation of land use maps. Raster-based calculation of evapotranspiration and groundwater recharge. Creating and managing well head protection zones for potable water withdrawal.		
Literature	HOAI 2009-Text Edition, Honorarordnung für Architekten und Ingenieure vom 18. August 2009/ Official Scale of Fees for Services by Architects and Engineers, Vieweg, ISBN: 978-3-8348-0984-1 Standardleistungsbuch für das Bauwesen (1985): Anwenderhandbuch. Beuth Verlag GmbH. Martin Brook (2004): Estimating and Tendering for Construction Work. 3rd edition, Elsevier Drury (1993): Image interpretation in geology		
Types of Teaching	Lecture (1 SWS) with home works, short course (4 days)		
Pre-requisites	Basic knowledge Hydrogeology and GIS		
Applicability	Master Geowissenschaften, Geoscience, Groundwater Management		
Frequency	Once within an academic year in the winter term		
Requirements for Credit Points	AP1: 7 reports AP2: compiling an digital atlas with concent form the GIS class		
Credit Points	3		
Grades	The overall grade is calculated as the arithmetic average of the grades of AP1 and AP2.		
Workload	The total time is 90 h (40 h are spent in class, remaining 50 h are spent on preparation and self study)		

Code/Dates	HRMOB.MA. Nr. 3203	Version 21.05.2010	Start: ST 2011
Name	Human Resource Management and Organizational Behavior (HRMOB)		
Responsible	**Surname** Nippa **First name** Michael **Academic Title** Prof. Dr.		
Lecturer(s)	**Surname** Nippa **First name** Michael **Academic Title** Prof. Dr.		
Institute(s)	Chair of Management, Leadership, & Human Resources		
Duration	1 term (Summer Term only)		
Competencies	The primary objective of this course is to help you learn to diagnose management situations so that you will be able to transfer this skill to your working world. Specific objectives of the course include: 1. Understanding the relevance of human resources for organizations and the key concepts of human behavior in organizations. 2. Appreciating how the human side of management is an essential complement to the technical skills you are learning in other courses. 3. Learning concepts and approaches that will enable you to analyze HR- and organizational problems and to develop appropriate solutions. 4. Developing the knowledge and skills you need to be a successful manager of yourself and others.		
Contents	1. Introduction 2. Organizational Behavior (OB) 2.1 **Individual level** (foundations of individual behavior; impacts of individual characteristics; impact of situational factors) 2.2 **Group level** (foundations of group behavior, understanding work teams; group processes e.g. communication, power, conflict) 2.3 **Leadership** 3. Human Resource Management (HRM) 3.1 Changing Nature of HRM 3.2 HRM Planning 3.3 Human Resource Adjustments 3.4 Training and Developing HR 3.5 Compensating HR Presentations and Conclusions		
Literature	Mathis, R.L.; Jackson, J.H.: „Human Resource Management“, 6th Ed. South Western College Publishing: Cincinnati 2006 Robbins, S.P.; Judge, T.A.: „Organizational Behavior“, 11th Ed. Pearson Prentice Hall: Upper Saddle River, N.J. 2007		
Type of Teaching	2 SWS lecture (including term assignments, student presentations)		
Prerequisites	None		
Applicability	Particularly appropriate for the MBA IMRE Program and similar courses		
Frequency	Every summer term		
Requirements for Credit Points	a) Individual case analysis paper and presentation, b) Teamwork assignment and presentation, c) Mid Term Test (20 min), and Final Test (40 min) as published in the respective course syllabus in advance.		
Credits Points	3		
Grade	The grade of the modul “HRMOB” is the computed, weighted average of the partial performance (a – d).		
Workload	The module needs 90 h of time, of which 22,5 h are to be spent in class.		

Code/ Dates	MHYGEO2 .MA.Nr. 2029	Version: 17.08.2009	Start: WT 2009/10
Name	Hydrogeology II		
Responsible	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Lecturer(s)	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Institute(s)	Institute for Geology		
Duration	1 Semester		
Competencies	The student will be able to solve practically relevant hydrogeological problems. He will be able to select appropriate techniques for both investigation and data evaluation. In particular he will gain knowledge with respect to all issues concerning groundwater protection.		
Content	1. Lecture Hydrogeology II: practically relevant hydrogeological tasks and techniques such as hydrogeological mapping, prognosis of water demand, geophysical exploration and measuring techniques, drilling of wells, well development and well rehabilitation, hydrogeological field measurements, pumping-test (design, performance, evaluation), parameter determination in the lab, natural/artificial tracers, groundwater chemistry (sensors, sampling, conservation, analytical techniques) . Paleohydrogeology, perma-frost, fresh-saltwater interface at coastal sites, geothermal systems and geothermal energy, engineering and mining hydrogeology, examples from regional hydrogeology 2. Practical exercises II: working with hydrogeological maps, groundwater recharge, saltwater intrusion, geodetic leveling, GPS, DGPS, water sampling, well design, well construction, and well rehabilitation, pumping test performance and evaluation (steady state and transient), diffusion and dispersion. 3. Lecture groundwater protection: Legal regulations, designing and controlling well head protection zones according to W 101, restrictions in protection zones. General groundwater protection, soil protection law, UVP-law (environmental assessment studies), European water frame work, calculating ground water vulnerability, groundwater information systems 4. Groundwater protection seminar and practical training: designing a well head protection zone, presenting a talk and a paper		
Literature	Fetter (1993): Applied Hydrogeology. Domenico & Schwartz (1996): Physical and Chemical Hydrogeology. Driscoll (1997): Groundwater and Wells. DWGW-Richtlinie W101		
Types of Teaching	Lecture (3 SWS) with practical training and seminar (2 SWS)		
Pre-requisites	Basic knowledge in Applied Geosciences		
Applicability	Bachelor Geoecology, Master Geowissenschaften, Master Geoscience, Master Groundwater Management		
Frequency	Once within an academic year in the winter term		
Requirements for Credit Points	Written exam (duration 90 minutes). AP 1: Report from practical training AP 2: Report of well head protection zone, Talk (10 min) and paper (6 pages)		
Credit Points	8		
Grades	The overall grade is calculated as the arithmetic average of the grades of the written exam (weigh 2), AP1 (weigh 1) and AP2 (weigh 2).		
Workload	The total time is 240 h (75 h are spent in class, remaining 165 h are spent on preparation and self study)		

Code/ Dates	MHYGEO3.MA.Nr.2030	Version: 17.08.2009	Start: ST 2009
Name	Hydrogeology III		
Responsible	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Lecturer(s)	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Institute(s)	Institute for Geology		
Duration	1 Semester		
Competencies	Student gains profound knowledge in karsthydrogeology and karst research. Furthermore his skills with respect to handling of data, multiple statistical evaluation will be enhanced to enable him solving hydrogeological problems on his own. Additional his team competencies and time management skills will be enforced.		
Content	Lecture karst hydrogeology: hydrogeological relevant karts features, rocks prone to karstification, karst indicators, karst processes (mixing corrosion, kinetics), modeling karstification, flow and transport in karst systems, storage, tracer, contaminations, protection, karst water exploration and exploitation, regional examples of different karst systems. Short course integrated data evaluation: data mining, handling and evaluation (database principles, t-test, anova, parameter free tests, correlation- and regression analysis, Factor and cluster-analysis, time series analysis, geo-statistics. Hydrogeological field exercises: working on a defined task with different techniques (sampling, measurements, data evaluation by means of statistics, GIS, models). Writing a report and presenting the results.		
Literature	Zötl (1974) Karsthydrogeologie, Springer. Dreybrodt (1988) Processes in Karst Systems Physics, Chemistry and Geology, Springer; Allg. Lehrbücher zur Statistik, Datenbankmanagement.		
Types of Teaching	Lecture (1 SWS), short course (4 days), field work (8 days)		
Pre-requisites	Basic skill in Hydrogeology, statistics, and data management.		
Applicability	Master Geowissenschaften, Groundwater Management, Geoscience		
Frequency	Once within an academic year in the summer term		
Requirements for Credit Points	Written examination (90 min) AP1: ca. 6 reports from short course AP2: ca. 20 pages report from field work		
Credit points	4		
Grades	The overall grade is calculated as the arithmetic average of the grades of the cluster: written exam (weight 1), AP1 (weight 1) and AP2 (weight 2)		
Workload	The total time is 120 h (45 h are spent in class, remaining 55 h are spent on field work, preparation and self study)		

Code/ Dates	MHYGEO4.MA.Nr.2031	Version: 11.08.2009	Start: WT 2009/10
Name	Hydrogeology IV		
Responsible	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Lecturer(s)	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Institute(s)	Institute for Geology		
Duration	1 Semester		
Competencies	Modeling of aquatic systems including flow, transport and chemical reactions. The student will be able to analyze a given situation, to choose an appropriate algorithm and software package to solve the given problem. Additional he will gain skill concerning geophysical methods that are important for groundwater issues.		
Content	Lecture Hydrogeological modeling : Basics of flow and transport modeling (analytical and numerical solutions, FDM, FEM, AEM), boundary conditions, numerical stability criteria, density driven flow, fracture flow, multi-phase flow, reactive transport modeling, impact of stress on pore volume, balancing and plausibility test, sensitivity analysis. Hydrogeological seminar: actually relevant research projects, literature research and presenting a talk. Practical exercise groundwater modeling: conceptual model, importing a map, discretization, defining boundary conditions and properties, calibration, wells and monitoring wells, particle tracking, modeling a contamination. 2d and 3d Model, simple transport modeling example Practical exercise reactive transport modeling: kinetically modeling within PHREEQC, 1d reactive transport for the unsaturated and saturated zone taking into account dilution and dual porosity.		
Literature	Kinzelbach & Rausch (1995): Grundwassermodellierung - eine Einführung m. Übungen. Bornträger Verlag. Anderson & Woessner (1992): Applied Groundwater modeling - Simulation of flow and advective transport, Acad. Press. Merkel, B & Planer-Friedrich B. (2005): Groundwater Geochemistry - A Practical Guide to Modeling of Natural and Contaminated Aquatic Systems. Edited by Nordstrom, Springer		
Types of Teaching	Lecture (2 SWS), 2 practical computer training courses (2x2 SWS), seminar (2 SWS)		
Pre-requisites	Basic knowledge hydrogeology, water chemistry and geophysics		
Applicability	Master Geowissenschaften, Geoinformatik und Geophysik, Geoökologie, Groundwater Management, Geoscience		
Frequency	Once within an academic year in the winter term .		
Requirements for Credit Points	Written examination (90 min) AP1: oral talk (10) minutes in the seminar AP2: reports from gw-flow course AP3. reports form reactive transport course		
Credit points	9		
Grades	The overall grade is calculated as the arithmetic average of the grades of the written exam, AP1, AP2, and AP3		
Workload	The total time is 270 h (120 h are spent in class, remaining 150 h are spent on field work, preparation and self study)		

Code/Dates	MAO .MA.Nr. 2906	Version: 10.07.2009	Start: WT 2009/10
Name	Management of Organizations		
Responsible	**Surname** Grosse **First Name** Diana **Academic Title** Prof. Dr.		
Lecturer(s)	**Surname** Kausch **First Name** Peter **Academic Title** Prof. Dr. **Surname** Grosse **First Name** Diana **Academic Title** Prof. Dr.		
Institute(s)	Chair for the Management of Research and Development Chair for Environmental and Resource Management		
Duration	One Semester		
Competencies	The cluster is dedicated to the management of organizations. Students are imparted principles and basic concepts of strategic management within corporations. Additionally, the theme of corporate ethics, the need to develop corporate ethics policies for a variety of reasons is part of this cluster.		
Content	Within the MBA IMRE Programme this Cluster comprises two courses both dealing with matters of organizational management: (1) Strategic Management (composition of a strategy, strategic base elements, examples for strategy development, company strategies (Rio Tinto, Billiton, Anglo American, Barrick Gold, Glencore), new developments, summary) (2) Corporate Ethics (overview of philosophical concepts: utilitarianism, Kant and discourse ethics, transfer of these individual concepts to institutions, business ethic principals and guidelines for decision-making, moral dimensions of strategy, structure, leadership, culture and self-regulation).		
Literature	David, F.R. (2006): Strategic Management, Concepts and Cases, Upper Saddle River, Pearson Prentice Hall. De George, Richard T. (1999): Business Ethics, Upper Saddle River, New Jersey.		
Types of Teaching	Lectures, practical exercises and assignments		
Pre-requisites	No previous knowledge of business administration is required.		
Applicability	The cluster is particularly appropriate for the MBA IMRE Programme.		
Frequency	Both courses are taught once per academic year.		
Requirements for Credit Points	For each of the two courses within the cluster, final tests in written form (Strategic Management: 120 minutes – Corporate Ethics: 90 minutes duration) will have to be taken.		
Credit points	Students can earn 6 credit points.		
Grade	Each course counts for three credits points. The overall mark for the cluster is computed as the average of the marks for each course.		
Workload	The total time budgeted for the cluster is set at 180 hours, of which 60 hours are spent in class, the remaining 120 hours being spent on seminar sessions and the seminar paper.		

Code/ Dates	MTGMAN .Ma.Nr. 3204	Version: 17.7.2010	Start: WT 2010/11
Name	Master thesis Groundwater Management		
Responsible	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Lecturer(s)	**Name** Merkel **Vorname** Broder **Titel** Prof. Dr.		
Institute(s)	Institute for Geology		
Duration	1 Semester		
Competencies	Student gains profound knowledge writing a scientific report respectively a scientific paper Furthermore he will enforce his skills with respect to handling of data, multiple statistical evaluation to enable him solving hydrogeological problems on his own. Additional his team competencies and time management skills will be improved.		
Content	Depending on the topic of the research. Possible topics may be related with a focus to hydrogeology: water chemistry questions in the laboratory, field work such as sampling, pumping test, and data acquisition, modeling tasks including development of improved models. On the other hand the thesis might be focused an applied management, environmental law, and business administration questions as well: risk assessment studies, management concepts (e.g. for well head protection zones), monetization of resources and risks.		
Literature	Yvonne N. Bui (2009) How to write a masters´s thesis, SAGE		
Types of Teaching	Advice according to request		
Pre-requisites	According to regulations in the examination regulations		
Applicability	Groundwater Management		
Frequency	arbitrary		
Requirements for Credit Points	Written thesis (monography or draft for a scientific paper) Public defence with discussion		
Credit Points	30		
Grades	The overall grade is calculated as the arithmetic average of the grades of the thesis (weight 2) and the oral defense (weight 1)		
Workload	6 months		

Code/Dates	OMIS .MA.Nr. 3202	Version: 23.07.2010	Start: WT 2010/11
Name	Project Management		
Responsible	**Surname** Winter **First Name** Christoph **Academic Title** Dr.		
Lecturer(s)	**Surname** Winter **First Name** Christoph **Academic Title** Dr.		
Institute(s)	Chair of Construction Business Management		
Duration	1 Semester		
Competencies	Students obtain an understanding of the concept of project management and become familiar with important tasks in relation to the management of projects.		
Contents	This course presents the principles and techniques of managing projects, primarily engineering projects, from the owner's feasibility study through design and development to completion. It emphasises project management during the early stages of project development because it is at that point that the ability to influence the quality, cost and time of a project is at its highest. It includes project scope definition, development of work plan, planning and scheduling, procurement strategies and highlights the management of the three basic components of a project: quality/scope, budget/cost and time/schedule. A simulation exercise is included to demonstrate working in a group and highlight the importance of communication against a backdrop of determining procurement strategy.		
Literature	Gilbreath, R.D. (1986): Winning at Project Management, New York, Wiley; Oberlender, G.D. (2000): Project Management for Engineering and Construction, 2nd edition, Boston, McGraw-Hill; Winter, C. (2003) : Contractor-Led Procurement, Wiesbaden, Deutscher Universitäts-Verlag; Walker, A. (2002): Project Management in Construction, 4th edition, Oxford, Blackwell Science; Smith N.J. (2008): Engineering Project Management, 3rd edition, Oxford, Blackwell Publishing		
Types of Teaching	Lectures and tutorials (2 SWS)		
Pre-requisites	No pre-requisites are required.		
Applicability	The module is particularly appropriate for any Master course which includes management elements.		
Frequency	All courses are taught once per academic year. The cluster starts in winter term.		
Requirement for Credit Points	For the course a final test in written form of 90 minutes length will have to be taken.		
Credit Points	3		
Grade	The grade obtained in the final test will determine the mark for the course.		
Workload	The total time budgeted is set at 90 h, of which 30 h are spent in class and the remaining 60 h are spent on self-study (including assignments, preparation, wrapping up of lectures and preparation of examinations).		

Code/Dates	RECONEV.MA.Nr.2911	Version: 28.04.2010	Start: WT 2010/11
Name	Resources Economics & Evaluation & Environmental Impact Studies		
Responsible	**Surname** Bongaerts **First Name** Jan C. **Academic Title** Prof. Dr.		
Lecturer(s)	**Surname** Bongaerts **First Name** Jan C. **Academic Title** Prof. Dr. **Surname** Kausch **First Name** Peter **Academic Title** Prof. Dr. **Surname** Florin **First Name** Jan Henrich **Academic Title** Prof. Dr. **Surname** Bartz **First Name** Stefan		
Institute(s)	Chair for Environmental & Resource Management		
Duration	One Semester		
Competencies	The cluster intends to give students the knowledge and the ability to understand the economic principles of resources and their usage as well as the methods and tools of an economic evaluation of natural resources. Moreover, the cluster is dedicated to the theme of assessing environmental impacts associated with the exploration, the extraction and the processing of natural resource		
Contents	Economics of Resources (ER): Optimal control theory and depletable and renewable resources, population growth and resources, resources in a globalized world the resource curse. Strategies of the International Resource Industry (SIR): Structure and size of the international resources industry, setting objectives and developing long-term planning instruments, assessing performance through controlling instruments, economic feasibility studies, in the mining and energy sectors, economic evaluation of environmental impacts, case studies. Environmental impact studies (EIS): purposes of environmental impact assessment, environmental impact study, phases of the environmental impact study, characteristics and elements of an environmental impact assessment, permitting process and procedures.		
Literature	Conrad, J. M. (1999): Resource Economics, New York (et al.), Cambridge University Press. United Nations Development Programme; et al. [editor] (2005): World Resources 2005 – The Wealth of the Poor, World Resources Institute, New York. United Nations Development Programme; et al. (2004): World Resources 2002-04 – Decision for the earth: Balance, Voice, Power, World Resources Institute, New York. Kausch, P.; Ruhrmann, G. (2002): Environmental Management, Environmental Impact Assessment of Mining Operations. Logabook. Lerche, I.; Paleologos, E. K. (2001): Environmental Risk Analysis, McGraw-Hill, New York [et al.]. Wellmer, F.-W., Dalheimer, M., Wagner, M. (2008): Economic Evaluations in Exploration, Springer Berlin Heidelberg New York. Rudenno, V. (2004): The Mining Valuation Handbook, 2nd ed., Wrightbooks, Melbourne.		
Types of Teaching	Teaching, seminars, individual course work and self-study, compilation of materials for presentations		
Pre-requisites	Admission to a graduate programme of the university (MBA IMRE or other Master's Programmes) or admission through Exchange programmes (e.g. ERASMUS)		
Applicability	The cluster and parts of it are not only accessible to the MBA IMRE students but also to interested students of other programmes, such an		

	engineering, geo-ecology.
Frequency	Every course within the cluster is taught once within an academic year.
Requirement for Credit Points	For completion of the cluster a paper of 15 pages length will have to be prepared and a written test of 120 minutes length and a test of 90 minutes length will have to be taken.
Credit Points	Within this cluster, 9 Credits can be awarded.
Grade	The overall grade for the cluster is composed by taking the arithmetic average of the grades of the individual tests.
Workload	The total calculated time effort for the cluster is set at 270 hours, of which 90 hours are dedicated to class attendance and 180 hours are budgeted for self-study.

Freiberg, den 17.08.2010

gez.:
Prof. Dr.-Ing. Bernd Meyer

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