

Amtliche Bekanntmachungen der TU Bergakademie Freiberg

Nr. 9, Heft 2 vom 18. März 2015



Modulhandbuch für den Masterstudiengang Sustainable Mining and Remediation Management

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Abkürzungen

KA: schriftliche Klausur / written exam

MP: mündliche Prüfung / oral examination

AP: alternative Prüfungsleistung / alternative examination

PVL: Prüfungsvorleistung / prerequisite

MP/KA: mündliche oder schriftliche Prüfungsleistung (abhängig von Teilnehmerzahl) / written or oral examination (dependent on number of students)

SS, SoSe: Sommersemester / sommer semester


WS, WiSe: Wintersemester / winter semester

SX: Lehrveranstaltung in Semester X des Moduls / lecture in module semester x


SWS: Semesterwochenstunden


Data:	BIOMIN. MA. Nr. 3043	Version: 25.09.2009	Start Year: SoSe 2010
Module Name:	Biotechnology in Mining		
(English):			
Responsible:	Schlömman, Michael / Prof. Dr.		
Lecturer(s):	Schlömman, Michael / Prof. Dr. Mühling, Martin / Dr.		
Institute(s):	Institute of Biosciences		
Duration:	1 Semester(s)		
Competencies:	The students will obtain knowledge about mechanisms of microbial leaching as about applications for the production of metals. They will understand problems related to mine waters and obtain insight into strategies for biotechnological treatment of such waters. In a lab course they will obtain experience with methods and problems related to the cultivation of corresponding microorganisms. In a seminar the students will gain experience with current literature and with reporting about it to other participants.		
Contents:	<p>1. Basics Concepts of microbial energy metabolism, chemolithotrophic growth, diversity of electron acceptors, microbial redox reactions with Sulphur, iron, manganese, arsenic, uranium.</p> <p>2. Microbial leaching Mechanisms of leaching, microorganisms involved, application of leaching for the production of copper, gold and diamonds, problem of mine waters.</p> <p>3. Biotechnological treatment of mine waters Microbial sulphate reduction for active treatment, microbial iron oxidation, wet lands.</p> <p>4. Lab course Special plating techniques for acidophilic bacteria, anaerobic cultivation techniques, measurement of parameters to follow growth of relevant microorganisms.</p>		
Literature:	<p>W. Reineke & M. Schlömman: Umweltmikrobiologie, Spektrum Akademischer Verlag;</p> <p>D. R. Lovley (Hrsg.): Environmental Microbe Metal Interactions, ASM Press;</p> <p>D. E. Rawlings & D. B. Johnson (Hrsg.): Biomining, Springer;</p> <p>L. L. Barton & W. A. Hamilton: Sulfate Reducing bacteria Environmental and Engineered Systems, Cambridge University Press</p>		
Types of Teaching:	<p>S1 (SS): Lectures (1 SWS)</p> <p>S1 (SS): Seminar (1 SWS)</p> <p>S1 (SS): Practical Application (1 SWS)</p> <p>S1 (SS): Excursion (0,5 SWS)</p>		
Pre requisites:	Recommendations: Master degree applied science and geocology or in another area of science or engineering.		
Frequency:	yearly in the summer semester		
Requirements for Credit Points:	<p>For the award of credit points it is necessary to pass the module exam. The module exam contains:</p> <p>KA [90 min]</p> <p>PVL: Passed exercises</p> <p>PVL have to be satisfied before the examination.</p> <p>Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst:</p> <p>KA [90 min]</p> <p>PVL: Übungsaufgaben</p>		


	PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.
Credit Points:	4
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA [w: 1]
Workload:	The workload is 120h. It is the result of 52.5h attendance and 67.5h self studies.

Data:	SUSBFR. MA. Nr. 090	Version: 01.05.2014 	Start Year: WiSe 2013
Module Name:	Brownfield Revitalisation		
(English):			
Responsible:	Klapperich, Herbert / Prof. Dr.		
Lecturer(s):	Klapperich, Herbert / Prof. Dr.		
Institute(s):	Institute of Geotechnics		
Duration:	1 Semester(s)		
Competencies:	Participants will get the qualification to gain knowledge and methods to evaluate contaminated sites soil and groundwater contaminations. They also learn to apply the interdisciplinary approach by focussing technique, economy, ecology and environmental law. The ovals issue is a Brownfield Manager.		
Contents:	<p><u>Technology of disposal sites and tailings:</u></p> <ul style="list-style-type: none"> • Geotechnical aspects related to the construction of disposal sites and tailings • site survey, investigations and characteristics • transport mechanisms of contaminants in the underground <p><u>Contaminated sites investigation assessment and reusing (Lifecycle):</u></p> <ul style="list-style-type: none"> • Environmental legislation relevant to contaminated sites • Quality control of sampling on contaminated sites, analytics of site contaminations, reclamation process and monitoring • Assessment of water, soil and air pollution level (risk assessment) • Overview of reclamation methods and geotechnical securing measures • Safety of operation in dealing with contaminated sites • Aspects and concepts of site revitalisation (innercity areas/landscaping) <p><u>Cost benefit considerations, case studies:</u></p> <ul style="list-style-type: none"> • Comparing various remediation strategies and selecting best option <p><u>Developing and assessing successful after use scenarios:</u></p> <ul style="list-style-type: none"> • Risk assessment, marketing studies, cost benefit analysis 		
Literature:	Handbuch: Altlastensanierung und Flächenmanagement, Franzius/ Wolf/ Brandt/ Altenbockum; TA Abfall/ Siedlungsabfall; Arbeitshilfen Altlasten, Sustainable Brownfield Regeneration: CABERNET Network Report; Proceedings ECI Conferences „Green Brownfields“		
Types of Teaching:	S1 (WS): Lectures (4 SWS) S1 (WS): Practical Application (2 SWS)		
Pre requisites:	Recommendations: B.Sc. in Geosciences or Geo Engineering; Basic Knowledge of Geosystems		
Frequency:	each semester		
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: MP/KA: Technology of disposal sites and tailings, Contaminated sites investigation assessment and reusing (KA if 15 students or more) [MP minimum 30 min / KA 90 min]		

	<p>AP: Project report: Cost benefit considerations, Developing and assessing successful after use scenarios The type of exam (KA or MP) will be set at the beginning of the modul.</p>
	<p>Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: MP/KA: Technologien bei Deponien und Tailings, Altlasten Untersuchung, Bewertung und Wiedernutzbarmachung (KA bei 15 und mehr Teilnehmern) [MP mindestens 30 min / KA 90 min] AP: Projektarbeit: Kosten Nutzen Betrachtungen, Entwicklung und Bewertung erfolgreicher Szenarien zur Folgenutzung Die Art der Prüfung wird beim Start des Moduls festgelegt.</p>
Credit Points:	6
Grade:	<p>The Grade is generated from the examination result(s) with the following weights (w): MP/KA: Technology of disposal sites and tailings, Contaminated sites investigation assessment and reusing [w: 2] AP: Project report: Cost benefit considerations, Developing and assessing successful after use scenarios [w: 1]</p>
Workload:	The workload is 180h. It is the result of 90h attendance and 90h self studies.

Daten:	DEU A1/ 1.Sem. Nr. 948	Stand: 27.11.2014 	Start: WiSe 2014
Modulname:	Deutsch A1/ 1. Semester		
(englisch):	German A 1/ 1st Semester		
Verantwortlich(e):	Glöckner, Günter / Dipl. Lehrer		
Dozent(en):	Glöckner, Günter / Dipl. Lehrer Paul, Sandra / Diplom Lehrerin		
Institut(e):	Internationales Universitätszentrum		
Dauer:	1 Semester		
Qualifikationsziele / Kompetenzen:	Im Kurs werden Grundlagen in Phonetik, Orthographie, Grammatik und Lexik vermittelt. Die Teilnehmer erwerben Grundkenntnisse und Grundfertigkeiten im Hören, Sprechen, Lesen und Schreiben auf der Basis der Allgemeinsprache sowie landeskundliche Kenntnisse.		
Inhalte:	Kommunikation im Alltag (Menschen kennen lernen, Einkaufen, Restaurantbesuch, Tagesabläufe, Uhrzeit); Grammatik: zum Beispiel Fragestellungen, Zahlen, Konjugation der Verben, Präsens und Präteritum, Mengenangaben, Plural der Nomen, Komposita		
Typische Fachliteratur:	Lagune, Band 1, Hueber		
Lehrformen:	S1 (WS): Übung (4 SWS)		
Voraussetzungen für die Teilnahme:	Empfohlen: Keine Vorkenntnisse der deutschen Sprache notwendig		
Turnus:	jährlich im Wintersemester		
Voraussetzungen für die Vergabe von Leistungspunkten:	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [90 min] PVL: Erfolgreiche aktive Teilnahme an mindestens 80% des Unterrichts PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.		
Leistungspunkte:	4		
Note:	Die Note ergibt sich entsprechend der Gewichtung (w) aus folgenden(r) Prüfungsleistung(en): KA [w: 1]		
Arbeitsaufwand:	Der Zeitaufwand beträgt 120h und setzt sich zusammen aus 60h Präsenzzeit und 60h Selbststudium.		

Daten:	DEU A1/ 2. Sem. BA. Nr. 949	Stand: 13.11.2014 	Start: SoSe 2014
Modulname:	Deutsch A1/ 2. Semester		
(englisch):	German A1/ 2nd Semester		
Verantwortlich(e):	Glöckner, Günter / Dipl. Lehrer		
Dozent(en):	Glöckner, Günter / Dipl. Lehrer Paul, Sandra / Diplom Lehrerin		
Institut(e):	Internationales Universitätszentrum		
Dauer:	1 Semester		
Qualifikationsziele / Kompetenzen:	Im Kurs werden Grundlagen in Phonetik, Orthographie, Grammatik und Lexik vermittelt. Die Teilnehmer erwerben Grundkenntnisse und Grundfertigkeiten im Hören, Sprechen, Lesen und Schreiben auf der Basis der Alltagsprache sowie landeskundliche Kenntnisse.		
Inhalte:	Orientierung in der Stadt beziehungsweise in der Firma, öffentliche Verkehrsmittel, Wegbeschreibung, Berufe und Arbeitsalltag, Körper und Gesundheit, Wohnungssuche und einrichtung, Lebenslauf, Kleidung; Grammatik: zum Beispiel Präpositionen, Frageartikel, Modalverben, Possessivartikel, Perfekt, Konjunktionen, Demonstrativpronomen, Graduierung und Komparativ		
Typische Fachliteratur:	Lagune, Band 1, Hueber		
Lehrformen:	S1 (SS): Übung (4 SWS)		
Voraussetzungen für die Teilnahme:	Obligatorisch: Deutsch A1/ 1. Semester, 2014 11 27 oder äquivalente Sprachkenntnisse		
Turnus:	jährlich im Sommersemester		
Voraussetzungen für die Vergabe von Leistungspunkten:	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [90 min] PVL: Aktive Teilnahme am Unterricht (mindestens 80%) PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.		
Leistungspunkte:	4		
Note:	Die Note ergibt sich entsprechend der Gewichtung (w) aus folgenden(r) Prüfungsleistung(en): KA [w: 1]		
Arbeitsaufwand:	Der Zeitaufwand beträgt 120h und setzt sich zusammen aus 60h Präsenzzeit und 60h Selbststudium. Der Zeitaufwand beträgt 120 Stunden und setzt sich zusammen aus 60 Stunden Präsenzzeit und 60 Stunden Selbststudium.		

Daten:	BGM. BA. Nr. 640	Stand: 21.03.2014 	Start: WiSe 2010
Modulname:	Grundlagen der Bodenmechanik und der Gebirgsmechanik		
(englisch):	Fundamentals of Soil Mechanics and Rock Mechanics		
Verantwortlich(e):	Konietzky, Heinz / Prof. Dr. Ing. habil.		
Dozent(en):	Konietzky, Heinz / Prof. Dr. Ing. habil. Klapperich, Herbert / Prof. Dr. Tamáskovics, Nándor / Dr.		
Institut(e):	Institut für Geotechnik		
Dauer:	1 Semester		
Qualifikationsziele / Kompetenzen:	Studierende erlangen grundlegendes Fachwissen des geotechnischen Ingenieurwesens auf dem Gebiet der Bodenmechanik und der Gebirgsmechanik		
Inhalte:	<p>Bodenmechanik Grundlagen:</p> <ul style="list-style-type: none"> • Spannungszustände in Lockergesteinen • Wasserströmung in Lockergesteinen • Konsolidationstheorie • Bruchzustände in Lockergesteinen • Aktiver und passiver Erddruck • Standsicherheit von Böschungen <p>Angewandte Gebirgsmechanik:</p> <ul style="list-style-type: none"> • Kennenlernen der Grundbegriffe der Geomechanik inklusive deren mathematischen bzw. geometrischen Darstellung • Vermittlung gebirgs- und felsmechanischer Grundlagen zur Bewertung gebirgsmechanischer Erscheinungen • Verformungs- und Festigkeitseigenschaften von Gesteinen und geklüftetem Gebirge • Gebirgsklassifikationen • Sekundäre Spannungszustände für verschiedene Querschnittsformen unterirdischer Hohlräume und Ursachen für Brucherscheinungen unter der Mitwirkung von Trennflächen (Klüftung, Schichtung, Schieferung) 		
Typische Fachliteratur:	<p>Förster, W.: Bodenmechanik, Teubner Verlag, 1997; Kempfert, H. G., Raithel, M.: Bodenmechanik und Grundbau, Bauwerk Verlag, 2009; Grundbau Taschenbuch, Teil I III, Ernst Sohn Verlag, 2009; Einschlägige DIN Normung; Jaeger J.C. et al.: Fundamentals of Rock Mechanics, Blackwell Publ., 2007; Brady & Brown: Rock Mechanics for Underground Mining, Kluwer Academic Publishers, 2004;</p>		

	Hudson u. a.: Comprehensive Rock Engineering, Pergamon Press, Oxford, 1993
Lehrformen:	S1 (WS): Vorlesung (4 SWS) S1 (WS): Übung (1 SWS)
Voraussetzungen für die Teilnahme:	Empfohlen: Theoretische Grundlagen der Geomechanik, 2014 03 21 Mechanische Eigenschaften der Festgesteine, 2014 03 21 Mechanische Eigenschaften der Lockergesteine, 2011 07 29
Turnus:	jährlich im Wintersemester
Voraussetzungen für die Vergabe von Leistungspunkten:	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA: Bodenmechanik Grundlagen, Angewandte Gebirgsmechanik [180 min]
Leistungspunkte:	6
Note:	Die Note ergibt sich entsprechend der Gewichtung (w) aus folgenden(r) Prüfungsleistung(en): KA: Bodenmechanik Grundlagen, Angewandte Gebirgsmechanik [w: 1]
Arbeitsaufwand:	Der Zeitaufwand beträgt 180h und setzt sich zusammen aus 75h Präsenzzeit und 105h Selbststudium. Letzteres umfasst die Vor- und Nachbereitung der Lehrveranstaltung und die Prüfungsvorbereitung.

Data:	SUSLSE. MA. Nr. 088	Version: 01.01.2014	Start Year: SoSe 2014
Module Name:	Licensing, Stakeholder Involvement and Expectation Management		
(English):			
Responsible:	Jakubick, Alexander / Dr. Bongaerts, Jan C. / Prof. Dr.		
Lecturer(s):			
Institute(s):	Professor of Environmental & Resource Management		
Duration:	1 Month(s)		
Competencies:	<p>Upon completion of industrial activity at a given site (e.g., mining, chemical production), liabilities must be investigated, assessed, and removed/remediated with respect to safe usage in the future. This is an iterative decision process involving many parties, often with conflicting interests and different ways to influence the outcome of this decision process. This module addresses the need to handle public inquiries, concerns, or conflicts on environmental and remediation issues. It shows environmental managers, regulators and public servants in this field, and consultants at industrial facilities how to identify the causes of environmental issues and concerns, create community relations programs to address issues or establish a proactive dialogue to prevent or minimise future environmental conflicts, and handle technical and risk communication in a highly efficient manner.</p> <p>The aspects which have to be observed within such a complex process include (but are not restricted to)</p> <ul style="list-style-type: none"> • legal requirements, • economic conditions, • environmental objectives and regional political aims, • communication, information management and negotiation methods. <p>The subjects will be presented using overview texts and summary texts, graphs, and case studies. Discussions among students and between tutors and students will be facilitated by electronic means of communication such as email and a web based discussion platform. Special emphasis will be laid on presentation of selected cases and discussion of critical parameters like timing cost, communication problems, information handling. Students will be trained in groups and individually. This module will also feature checklists, forms and worksheets as tools for further reference in the daily work.</p>		
Contents:	<p>Expectations by the various stakeholders are identified as driving forces within a remediation project. The management of expectations of all involved stakeholders as well as transparent assessment and decision procedures are a core ingredient of this module, and will be discussed using case studies from a great variety of real world projects and experiences. Students will be encouraged to contribute their personal and professional experiences to the module in order to both focus the content to the specific needs of the audience and to demonstrate the great cultural variety of negotiation and management styles.</p>		
Literature:	<p>John D. Leshy: The Mining Law: A Study in Perpetual Motion, Resources for the Future, ISBN: 0915707268, ISBN 13: 9780915707263, 542pp, 1987;</p> <p>Warren Richard Plunkett, Raymond F. Attner, Gemmy Allen: Management: Meeting and Exceeding Customer Expectations, Thomson South Western, 2005, ISBN 0324259131, 742 pp</p>		

Types of Teaching:	S1 (SS): Lectures (4 d) S1 (SS): Seminar (1 d)
Pre requisites:	Recommendations: No previous knowledge of management is required.
Frequency:	yearly in the summer semester
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: KA [120 min] PVL: Preparation and presentation of a project on a practical case PVL have to be satisfied before the examination. Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [120 min] PVL: Ausarbeitung und Vorstellung eines Projekts über ein Fallbeispiel PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.
Credit Points:	6
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA [w: 1]
Workload:	The workload is 180h. It is the result of 40h attendance and 140h self studies.

Data:	SUSGMF. MA. Nr. 083	Version: 01.01.2014	Start Year: WiSe 2014
Module Name:	Management and Finance of Mining Operations along the Life Cycle		
(English):			
Responsible:	Kunze, Christian / Dr. Bongaerts, Jan C. / Prof. Dr.		
Lecturer(s):			
Institute(s):	Professor of Environmental & Resource Management		
Duration:	1 Month(s)		
Competencies:	<p>Environmental remediation projects require careful financial planning and control since their time frame can be often quite long and uncertain and considerable financial means are required from different sources. Public funding institutions and private/corporate sources require that a remediation project be carried out at minimal cost in minimal time. Strong financial skills are absolutely essential for a successful future career of this course's participants. Students will, therefore, be equipped with a sound knowledge and broad overview of general management concepts with special emphasis on project finance, financial control and accounting, cost estimating and forecasting/simulation techniques as well as funding mechanisms. Students will also familiarise themselves with concepts how to handle uncertainty and risk.</p>		
Contents:	<p>According to the objectives, the module is structured into two separate but closely linked parts:</p> <p><u>Part A: General management</u></p> <ul style="list-style-type: none"> • Management and strategic thinking • Project and team structures, management styles • Introduction to structural models of corporations and project teams • Fundamentals of human resources management: choosing the right people and structures <p><u>Part B: Financial management</u></p> <ul style="list-style-type: none"> • Fundamentals of finance, basic concepts: balance sheets, profit/loss statements, cash flow reports, ratio analysis • Using conceptual models for financial planning: fundamentals and practical use of soft ware tools • Cost estimating techniques for large scale remediation projects • Cash flow planning in remediation projects • Dealing with uncertainties in financial forecasts • Cost control and reporting • Sources of finance: public, corporate, foundations. Their role and specific expectations/requirements to spending money and reporting • Incorporating the potential after use and redevelopment scenarios of remediated site into the planning and evaluation of remediation projects • Communication of financial information at different levels <p>The subjects will be presented using overview texts and summary texts, and graphs. The students will receive numerous handouts that not only contain the content of the lectures and case studies but will also serve for future reference. Students will be encouraged to participate actively</p>		


	<p>in the presentation to solicit ideas as well as individual situations experienced and integrate these in the structured presentation. Where appropriate real life situations will be simulated.</p> <p>A wide range of software tools for simulation of financial processes will be presented in the context of case studies to demonstrate their application to practical situations.</p> <p>Presentation of small group projects and case studies forms an essential part of the module in order to train communication skills.</p>
Literature:	<p>Peter Attril & Eddie McLaney: Financial Accounting for decision makers, Fourth edition, Pearson education, 2004;</p> <p>Kenneth Merchant, Wim Van der Stede; Management Control Systems, Performance Measurement, Evaluation and Incentives, 2nd Edition , Pearson education, 2007;</p> <p>Rudolf Volkart: Corporate Finance</p>
Types of Teaching:	<p>S1 (WS): Lectures (4 d)</p> <p>S1 (WS): Exercises (4 d)</p>
Pre requisites:	<p>Recommendations:</p> <p>No previous knowledge of management is required.</p>
Frequency:	yearly in the winter semester
Requirements for Credit Points:	<p>For the award of credit points it is necessary to pass the module exam.</p> <p>The module exam contains:</p> <p>KA [120 min]</p> <p>PVL: Home assignment</p> <p>PVL have to be satisfied before the examination.</p> <p>Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst:</p> <p>KA [120 min]</p> <p>PVL: Hausaufgabe</p> <p>PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.</p>
Credit Points:	6
Grade:	<p>The Grade is generated from the examination result(s) with the following weights (w):</p> <p>KA [w: 1]</p>
Workload:	The workload is 180h. It is the result of 64h attendance and 116h self studies.

Data:	MASMRM. MA. Nr. 2093	Version: 02.05.2014	Start Year: SoSe 2014
Module Name:	Master Thesis Sustainable Mining and Remediation Management with Colloquium		
(English):			
Responsible:	Drebenstedt, Carsten / Prof. Dr.		
Lecturer(s):			
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	4 Month(s)		
Competencies:	The students should get the ability to solve scientific tasks in the field of sustainable mining and remediation management. They should be able to prepare a scientific presentation of its work and defend it in front of an audience. Economic aspects also have to be considered in the work. The master thesis is a kind of examination which completes the entire course. The work is the proof, that the students are able to solve scientific problems by their own.		
Contents:	<ul style="list-style-type: none"> • Concept of the work schedule • Analysis of literature • Familiarize with methods, testing equipment, numerical methods • Realization and analysis of tests in situ and in the laboratory • Realization of calculations and numerical simulations • Summary, scientific analysis and generalization of the results (period of four months) <p>Preparation of a scientific work and paper in a colloquium (30 min oral presentation with discussion)</p>		
Literature:	Guideline for the preparation of scientific works at TU Bergakademie Freiberg from 27.06.2005, DIN 1422, part 4 (08/1985); Hints for task specific literature will be given.		
Types of Teaching:	S1 (SS): Thesis (4 Mon)		
Pre requisites:	Proof of the successful conclusion of mandatory and optional modules. Abschluss aller Pflicht und Wahlpflichtmodule.		
Frequency:	constantly		
Requirements for Credit Points:	<p>For the award of credit points it is necessary to pass the module exam. The module exam contains:</p> <p>AP*: Master thesis AP*: Defence of the work in a colloquium</p> <p>* In Modules with more than one exam, this exams has to be pass successfully respectively has to have a result at least "ausreichend" (4,0).</p> <p>Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst:</p> <p>AP*: Master Thesis AP*: Kolloquium</p> <p>* Bei Modulen mit mehreren Prüfungsleistungen muss diese Prüfungsleistung bestanden bzw. mit mindestens "ausreichend" (4,0) bewertet sein.</p>		
Credit Points:	20		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): AP*: Master thesis [w: 2] AP*: Defence of the work in a colloquium [w: 1] * In Modules with more than one exam, this exams has to be pass successfully respectively has to have a result at least "ausreichend"		

(4,0).


Workload:

The workload is 600h.

Data:	SEMSMRM. MA. Nr. 2092	Version: 02.05.2014 	Start Year: WiSe 2014
Module Name:	Master-Seminar Sustainable Mining and Remediation Management with Colloquium		
(English):			
Responsible:	Drebenstedt, Carsten / Prof. Dr.		
Lecturer(s):			
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Month(s)		
Competencies:	Experiences with own scientific work, written and oral summary and presentation of the results		
Contents:	The students will get a specific topic for their work as well as hints for the literature study. The students have to familiarize with this topic and they have to prepare an oral 30 min presentation. A written copy of the presentation has to be prepared as well. The students should improve their ability to communicate and to speak free in front of a greater audience. They should learn how to prepare a presentation (Selection of literature, material, time schedule) and they should gain experience how to prepare scientific papers. Seminar lecture to specific topics with guest lecturers from the industry complete the module.		
Literature:	Will be specified according to the topic of the work		
Types of Teaching:	S1 (WS): Colloquia (lecture with discussion, 8 hours) / Seminar (1 d) S1 (WS): Seminar (1 d)		
Pre requisites:	Recommendations: Knowledge and abilities from the 1. and 2. semester of the study course Sustainable Mining and Remediation Management. (see study order)		
Frequency:	yearly in the winter semester		
Requirements for Credit Points:	<p>For the award of credit points it is necessary to pass the module exam. The module exam contains: AP*: Written paper AP*: Oral presentation [30 min]</p> <p>* In Modules with more than one exam, this exams has to be pass successfully respectively has to have a result at least "ausreichend" (4,0).</p> <p>Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: AP*: Schriftliche Ausarbeitung AP*: Vortrag [30 min]</p> <p>* Bei Modulen mit mehreren Prüfungsleistungen muss diese Prüfungsleistung bestanden bzw. mit mindestens "ausreichend" (4,0) bewertet sein.</p>		
Credit Points:	4		
Grade:	<p>The Grade is generated from the examination result(s) with the following weights (w): AP*: Written paper [w: 1] AP*: Oral presentation [w: 1]</p> <p>* In Modules with more than one exam, this exams has to be pass successfully respectively has to have a result at least "ausreichend" (4,0).</p>		
Workload:	The workload is 120h. It is the result of 16h attendance and 104h self studies. The self study includes the preparation of the presentation, the written copy of the presentation and consultations.		


Data:	MINEWAT. MA. Nr. 2085	Version: 01.05.2014	Start Year: WiSe 2014
Module Name:	Mine water: Chemistry and Treatment		
(English):			
Responsible:	Merkel, Broder / Prof. Dr.		
Lecturer(s):			
Institute(s):	Institute of Geology		
Duration:	1 Month(s)		
Competencies:	Participants will improve their basic chemistry knowledge with respect to water chemistry and in particular mining water problems and mine water treatment. Participants will be able to handle simple and complex water quality problems and decide which treatment technique is appropriate for a given problem.		
Contents:	<ul style="list-style-type: none"> • Basics of chemical thermodynamics (ionic strength, calculation of activity, saturation index) • dissolution, precipitation • redox reactions, ion exchange, sorption • dissolution of gas in water, calcite carbon dioxide equilibrium • knowledge on chemical properties of important elements • basic exercises concerning thermodynamics with PHREEQC • basic of water treatment: <ul style="list-style-type: none"> ◦ precipitation, flocculation ◦ biological techniques, membrane and ion exchange methods ◦ sorption, sludge management ◦ the most important passive treatment techniques incl. constructed wetlands ◦ pros and cons of passive and active treatment 		
Literature:	Langmuir (1997): Aqueous environmental geochemistry, Prentice Hall Appelo & Postma (1993): Geochemistry, groundwater and pollution, Balkema Merkel & Planer Friedrich (2005): Groundwater Geochemistry A practical guide to modeling of natural & contaminated systems. Springer Younger, Banwart & Hedi (2002): Mine Water: Hydrology, Pollution, Remediation, Kluwer Academic Publishers		
Types of Teaching:	S1 (WS): block course / Lectures (5 d) S1 (WS): block course / Practical Application (5 d)		
Pre requisites:	Recommendations: Basic knowledge on chemistry and process engineering		
Frequency:	yearly in the winter semester		
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: KA [120 min] AP: Report 1 related to the practicals AP: Report 2 related to the practicals PVL: Home assignment PVL have to be satisfied before the examination. Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [120 min] AP: Belegarbeit 1 AP: Belegarbeit 2 PVL: Hausarbeit PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.		
Credit Points:	6		
Grade:	The Grade is generated from the examination result(s) with the following		

	weights (w): KA [w: 1] AP: Report 1 related to the practicals [w: 1] AP: Report 2 related to the practicals [w: 1]
Workload:	The workload is 180h. It is the result of 80h attendance and 100h self studies. The latter comprises time for preparation and homework as well as preparation for exams.

Data:	MWGEOMO. MA. Nr. 2089	Version: 01.06.2014 	Start Year: WiSe 2014
Module Name:	Mine water: Hydrogeology and Modeling		
(English):			
Responsible:	Merkel, Broder / Prof. Dr.		
Lecturer(s):			
Institute(s):	Institute of Geology		
Duration:	1 Month(s)		
Competencies:	The students will improve their knowledge on Hydrogeology and in particular in the field of groundwater flow and transport with special emphasis on mining and rehabilitation and remediation of mining related problems. They will be able to understand basic and complex mining related groundwater problems and to evaluate numerical groundwater models.		
Contents:	<ul style="list-style-type: none"> • Basic of hydraulic subsurface flow in granular and fractured rocks • Basic of transport of contaminants in seepage and groundwater • Basic of water balance in particular in mining environments • Analytical and numerical modeling • Pros and cons of FD and FE models • Setting up a 3d steady state flow and transport model, discretization, parameterization, defining boundary conditions, defining sinks and sources • Manual and inverse calibration, sensivity analysis • Special aspects of dewatering open pit and deep mines, groundwater recovery and mine flooding 		
Literature:	Domenico & Schwartz (1996): Physical and Chemical Hydrogeology, Wiley & Sons Anderson & Woessner (1992): Applied Groundwater modeling Simulation of flow and advective transport, Academic Press		
Types of Teaching:	S1 (WS): block course / Lectures (5 d) S1 (WS): block course / Practical Application (5 d)		
Pre requisites:	Recommendations: Physik für Naturwissenschaftler II, 2014 06 02 Physik für Naturwissenschaftler I, 2014 06 02 Grundlagen der Hydrogeologie, 2009 08 11 Grundlagen der Geowissenschaften für Nebenhörer, 2014 02 03 Basic knowledge of physics, geology, and hydrogeology.		
Frequency:	each semester		
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: KA [120 min] AP: Report 1 related to the practials AP: Report 2 related to the practials PVL: Home assignment PVL have to be satisfied before the examination. Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [120 min] AP: Belegarbeit 1 AP: Belegarbeit 2 PVL: Hausarbeit PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.		
Credit Points:	6		
Grade:	The Grade is generated from the examination result(s) with the following		

	weights (w): KA [w: 1] AP: Report 1 related to the practicals [w: 1] AP: Report 2 related to the practicals [w: 1]
Workload:	The workload is 180h. It is the result of 80h attendance and 100h self studies. The latter comprises time for preparation and homework as well as preparation for exams.

Data:	PRAKGTB. MA. Nr. 2096	Version: 01.05.2014	Start Year: WiSe 2014
Module Name:	Practical Training SMRM		
(English):			
Responsible:	Drebenstedt, Carsten / Prof. Dr.		
Lecturer(s):			
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	4 Week(s)		
Competencies:	By help of own practical work and observation the students should get abilities and skills in the field of sustainable technologies in geotechnics and mining, rehabilitation and the design and recultivation of former mining areas.		
Contents:	The practical training consists of practical work in enterprises and institutions with relation to mining and remediation.		
Literature:	Ordnung für das Grundpraktikum, TU Bergakademie Freiberg, 2003		
Types of Teaching:	S1 (WS): Practical training in enterprises and institutions working in the field of mining or remediation / Practical Application (4 Wo)		
Pre requisites:	Recommendations: Students have to apply by their own in recognized enterprises/institutions. Recommendations can be obtained from institutes of TU Bergakademie Freiberg which are included in the course.		
Frequency:	yearly in the winter semester		
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: PVL: Written confirmation of 20 shifts of practical work in recognized enterprises AP: Written report (approximately 20 pages A4) about practice in the enterprise and shift diary PVL have to be satisfied before the examination. Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: PVL: 20 Praktikumsschichten mit Praktikumsbestätigung AP: 20 seitiger Praktikumsbericht (A4) PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.		
Credit Points:	6		
Grade:	The examination results are not rated. The credits are given when the exams are passed successfully.		
Workload:	The workload is 180h. It includes practical work (20 shifts) and preparation of the report.		

Data:	SUSPCM. MA. Nr. 084	Version: 01.01.2014 	Start Year: WiSe 2014
Module Name:	Project and Contract Management		
(English):			
Responsible:	Bongaerts, Jan C. / Prof. Dr.		
Lecturer(s):	Ruhmann, Gerhard / Dr.		
Institute(s):	Professor of Environmental & Resource Management		
Duration:	1 Semester(s)		
Competencies:	<p>The objectives of the module are to convey principal elements of project and contract management.</p> <p>Project Management: The student will be able to identify, analyze and structure the issues involved in a large scale environmental remediation project. On the basis of this skill, the student will be in a position to set up, organise, and control a project and its components including the procurement of outside services. He/she will be capable of managing the tendering of contracts, identifying critical paths, setting up financial controlling, initiating technical controlling as well as establishing quality assurance and control.</p> <p>Contract Management: The student will be able to identify the various types of contracts required to manage large scale environmental remediation projects. In particular, he/she will be in a position to compile information required to generate contracts, formulate draft contracts, expedite the execution of contracts, and to establish the organizational structures to facilitate the storage and retrieval of crucial information by project personnel. Presentation of small group projects and case studies forms an essential part of the module in order to train communication skills.</p>		
Contents:	<p>Project management is a set of principles, practices, and techniques applied to lead project teams and control project schedule, cost, and performance risks. The basic elements are</p> <ul style="list-style-type: none"> • Project integration including the establishment of life cycle phases ending in milestones, producing a set of project documents and preparing a project management plan, • Project scope definition including the definition of requirements, breaking down the work into single components, establishing cost and schedule baselines, • Time management using automated scheduling systems, conducting critical path analysis, • Cost management covering the preparation of cost estimates, tracking costs at the work package level, • Quality management by defining goals and stating methods to achieve quality assurance, implementing quality measurement and continuous quality improvement, • Risk management composed of risk analysis and implementing measures for risk avoidance and mitigation • Human Resources management entailing the establishment of clear goals, maintaining channels of communication, and instruments to resolve conflicts, • Communications, including internal project team communication and external public relations, • Procurement. <p>Contract management covers aspects that are part of project management such as Procurement. Although contract management is an integral part of project management it deserves particular attention</p>		

	<p>due to its legal implication during the execution of a project and the potential to preserve knowledge in spite of long term staff attrition. Therefore, it is focused on further by discussing</p> <ul style="list-style-type: none"> • Life Cycle of contracts, contract types, e.g. expert opinions, services, supplies and contract structures • Parties involved in designing contracts • Contract elements, e.g. risks, occupational health and safety, conflicts of interest, ownership and rights to the use of intellectual property, dispute resolution, regulatory controls) • Contract negotiations and elements of contract administration • Cost and price analysis <p>The subjects will be presented using summary texts, graphs, software demonstration and case studies. Students shall participate in the presentation to solicit ideas as well as individual situations experienced and integrate these in the structured presentation. Where appropriate, real life situations will be simulated.</p>
Literature:	Johanna Rothman, Successful Project Management, The Pragmatic Programmers, 2007; Tom de Marco: The Deadline: A Novel About Project Management, B & T Publishing, 1997
Types of Teaching:	S1 (WS): Lectures (6 d) S1 (WS): Seminar (9 d)
Pre requisites:	Recommendations: No previous knowledge of management is required.
Frequency:	yearly in the winter semester
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: KA [120 min] PVL: Presentation of results of practical training PVL have to be satisfied before the examination. Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [120 min] PVL: Ausarbeitung und Vorstellung eines Projekts im Rahmen eines Kolloquiums PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.
Credit Points:	6
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA [w: 1]
Workload:	The workload is 180h. It is the result of 120h attendance and 60h self studies.

Data:	SUSRAD. MA. Nr. 2091	Version: 17.12.2014	Start Year: SoSe 2015
Module Name:	Radioactivity		
(English):			
Responsible:	Mischo, Helmut / Prof. Dr. Ing.		
Lecturer(s):	Mischo, Helmut / Prof. Dr. Ing. Weyer, Jürgen / Dr. Ing.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	Basic knowledge of radioactive decay, measurement of radiation, units, technique of sampling, decontaminations techniques, ventilation		
Contents:	<ul style="list-style-type: none"> • Radioactive decay • Special consideration of Rn222 and Radon decay • Products • ICRP principles • Protection against radiation • Measurement and sampling • Pathways • Risk analysis • Optimal remedial procedures • Decontamination techniques • Ventilation systems • Gases • Airway resistance 		
Literature:	ICRP publications, especially ICRP 43 and 65, conference proceedings		
Types of Teaching:	S1 (SS): 45 hours / Lectures (3 SWS) S1 (SS): seminars and practical training, excursions to rehabilitation sites 45 hours / Practical Application (3 SWS)		
Pre requisites:	Recommendations: Fundamentals in engineering and natural science		
Frequency:	yearly in the summer semester		
Requirements for Credit Points:	<p>For the award of credit points it is necessary to pass the module exam. The module exam contains: MP [30 min] PVL: Project report PVL have to be satisfied before the examination.</p> <p>Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: MP [30 min] PVL: Projektbericht PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.</p>		
Credit Points:	6		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): MP [w: 1]		
Workload:	The workload is 180h. It is the result of 90h attendance and 90h self studies. The latter includes industrial placement.		

Data:	BBREKL. MA. Nr. 2087	Version: 13.07.2014	Start Year: SoSe 2014
Module Name:	Reclamation		
(English):			
Responsible:	Drebenstedt, Carsten / Prof. Dr.		
Lecturer(s):	Drebenstedt, Carsten / Prof. Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	The module provides the development of expertise and methodological skills in the field of mining engineering. The students learn the theory and practice of reclamation in mining as essential element of balance for mining impacts. They understand the parallelism of mine and reclamation planning and the fact, why reclamation can exceed the mine project phase. Additionally the students will be qualified to explain scientifically reclamation measures, plan technical measures and calculate the financial expenses.		
Contents:	<ul style="list-style-type: none"> • Impacts of mining and its effects • Legal requirements for permission • Scientific fundamentals of reclamation (soil, ground water balance,...) • Concepts • Utilization requirements and realization in the post mining landscaping (agriculture, forestry, waterbodies, nature protection, recreation, miscellaneous) • Case studies 		
Literature:	Pflug (Hrsg.), 1998, Braunkohlentagebau und Rekultivierung, Springer Verlag Olschowy, Bergbau und Landschaft, 1993, Paray Verlag Gilscher, Bruns, 1999, Renaturierung von Abbaustellen, Verlag Eugen Ulmer Stuttgart		
Types of Teaching:	S1 (SS): Lectures (3 SWS) S1 (SS): Exercises (2 SWS) S1 (SS): Practical Application (1 SWS)		
Pre requisites:	Recommendations: Mathematic scientific fundamentals		
Frequency:	yearly in the summer semester		
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: MP/KA (KA if 21 students or more) [MP minimum 30 min / KA 60 min] PVL: Submission and positive evaluation of module exercises PVL: Participation in 2 excursions of the chair Surface Mining PVL have to be satisfied before the examination. Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: MP/KA (KA bei 21 und mehr Teilnehmern) [MP mindestens 30 min / KA 60 min] PVL: Erfolgreicher Abschluss der Übungsaufgaben PVL: 2 Fachexkursionen Tagebau PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.		
Credit Points:	6		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): MP/KA [w: 1]		
Workload:	The workload is 180h. It is the result of 90h attendance and 90h self studies. Self study includes autonomous and instructed preparation and performance of follow up course work and examination preparation.		

Freiberg, den 13. März 2015

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

Herausgeber: Der Rektor der TU Bergakademie Freiberg

Redaktion: Prorektor für Bildung

Anschrift: TU Bergakademie Freiberg
09596 Freiberg

Druck: Medienzentrum der TU Bergakademie Freiberg