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:	SDG.MA. / Examination number: 31749	Version: 05.05.2025	Start Year: WiSe 2025
Module Name:	**Alchemy and Natural Magic: The Birth of European Science**		
(English):			
Responsible:	Drebenstedt, Carsten / Prof. Dr.		
Lecturer(s):			
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	This course explores the foundations of science and engineering through the lens of alchemy, natural philosophy, and magic in European history. Designed for students with a technical background, it presents the evolution of scientific thought from ancient practices to early modern science, emphasizing how alchemists, natural philosophers, and occasional occultists contributed to today's scientific principles. Students will come in contact with primary texts, meet influential figures, and see landmark experiments, to understand the blend of mysticism, experimentation, and technical advancement that characterized early scientific exploration. This course aims to deepen students' understanding of the roots of their disciplines while offering insight into the cultural, philosophical, and technological legacy that paved the way for modern engineering.		
Contents:	Introduction to the history of science: development of understanding and awareness of the origins of science in Europe, insight into the thought patterns of science and technology, and the development of public expectations from the techno-scientific endeavor. Guest lecturers from other universities are planned. Topics: **1. Introduction to Alchemy and Natural Magic** Definitions and origins: Alchemy, natural magic, and the quest for hidden knowledge Influence of ancient Egyptian, Greek, and Islamic alchemical traditions Alchemy’s goals: transformation, transmutation, and enlightenment **2. The Philosophical Foundations of Alchemy** The concept of the Philosopher’s Stone and the Elixir of Life Key alchemical principles: Prima Materia, Sulphur-Mercury theory, and the Four Elements Paracelsian alchemy: iatrochemistry, medicine and chemical principles **3. Alchemy, Technology and Mining: The Artisans' Science** Practical aspects of alchemy: metallurgy, glassmaking, and early chemistry Alchemical contributions to materials science and engineering practices Case studies on inventions and industrial processes influenced by alchemical knowledge **4. Natural Magic and Early Experimental Science** The role of natural magic in understanding nature and manipulating it Key figures: Roger Bacon, Agrippa, and Giambattista della Porta The relationship between natural magic and emerging scientific methods **5. Alchemy, Mysticism, and Early Modern Science** The blending of mysticism, religion, and empirical science The rise of Hermeticism, Neo-Platonism, and the influence on natural philosophy The tension between “magical” and “rational” approaches in scientific progress **6. The Transition to Modern Chemistry and Scientific Thought**		

	From alchemy to chemistry: Robert Boyle, Antoine Lavoisier, and the scientific method The decline of alchemy and natural magic in scientific discourse Legacy and influence of alchemy on contemporary science and engineering
Literature:	**1. Primary Sources** The Book of the Secrets of Alchemy by Khalid ibn Yazid The Alchemical Writings of Paracelsus (edited and translated by Arthur Edward Waite) Theatrum Chemicum Britannicum by Elias Ashmole Excerpts from De Magnete by William Gilbert The Hermetic and Alchemical Writings of Paracelsus (trans. by Arthur Edward Waite) **2. Secondary Sources** Principe, Lawrence M. The Secrets of Alchemy. University of Chicago Press, 2013. Newman, William R. Promethean Ambitions: Alchemy and the Quest to Perfect Nature. University of Chicago Press, 2004. Eamon, William. Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture. Princeton University Press, 1994. Moran, Bruce T. Distilling Knowledge: Alchemy, Chemistry, and the Scientific Revolution. Harvard University Press, 2005. Debus, Allen G. The Chemical Philosophy: Paracelsian Science and Medicine in the Sixteenth and Seventeenth Centuries. Dover Publications, 2002. **3. Supplementary Reading** Alchemy and Mysticism by Alexander Roob Holmyard, Eric J. Alchemy. Dover Publications, 1990. Kieckhefer, Richard. Magic in the Middle Ages. Cambridge University Press, 1990. Servants of Nature by Lewis Pyenson and Susan Sheets-Pyenson
Types of Teaching:	S1 (WS): Lecture Series – Challenge learning approach through case studies and group work / Lectures (2 SWS)
Pre-requisites:	**Mandatory:** English
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
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA
Credit Points:	3
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA [w: 1]
Workload:	The workload is 90h. It is the result of 30h attendance and 60h self-studies.

Daten:	DEU A1/ 1.Sem. BA. Nr. 948 / Prüfungs-Nr.: 71101	Stand: 04.08.2017	Start: WiSe 2016
Modulname:	**Deutsch A1/ 1. Semester**		
(englisch):	German A 1/ 1st Semester		
Verantwortlich(e):	Polanski, Katja		
Dozent(en):			
Institut(e):	Internationales Universitätszentrum/ Sprachen		
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, Präsenz und Präteritum, Mengenangaben, Plural der Nomen, Komposita		
Typische Fachliteratur:	Begegnungen A1+, Schubert Verlag		
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: 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 / Prüfungs-Nr.: 71102	Stand: 04.08.2017	Start: SoSe 2017
Modulname:	**Deutsch A1/ 2. Semester**		
(englisch):	German A1/ 2nd Semester		
Verantwortlich(e):	Polanski, Katja		
Dozent(en):			
Institut(e):	Internationales Universitätszentrum/ Sprachen		
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:	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:	Begegnungen A1+, Schubert Verlag		
Lehrformen:	S1 (SS): Übung (4 SWS)		
Voraussetzungen für die Teilnahme:	**Obligatorisch:** Deutsch A1/ 1. Semester, 2015-08-26 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 an mind. 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. Der Zeitaufwand beträgt 120 Stunden und setzt sich zusammen aus 60 Stunden Präsenzzeit und 60 Stunden Selbststudium.		

Daten:	DEU A2/1. Sem. BA.Nr. 950 / Prüfungs-Nr.: 71103	Stand: 04.08.2017	Start: WiSe 2016
Modulname:	**Deutsch A2/ 1. Semester**		
(englisch):	German A2/ 1st Semester		
Verantwortlich(e):	Polanski, Katja		
Dozent(en):			
Institut(e):	Internationales Universitätszentrum/ Sprachen		
Dauer:	1 Semester		
Qualifikationsziele / Kompetenzen:	Die Teilnehmer erweitern ihre Kenntnisse zu Grundlagen der deutschen Grammatik sowie ihren allgemeinsprachlichen Wortschatz und führen Gespräche zu verschiedenen Themen des Alltags.		
Inhalte:	Familie und Verwandtschaft, Feste und Feiern in Deutschland, Wohnung und Wohnungseinrichtung, Schule und Ausbildung, Aussehen und Mode, Jahreszeiten, Wetter und Urlaub, Aspekte der Geschichte (Deutschland, Österreich, Schweiz); Grammatik: z.B. Nebensätze mit weil, wenn, dass; Rektion der Verben; Ordinalzahlen; Präpositionen; Reflexivpronomen; Zukunft ausdrücken; Adjektivdeklination		
Typische Fachliteratur:	Begegnungen A2+, Schubert Verlag		
Lehrformen:	S1 (WS): Übung (4 SWS)		
Voraussetzungen für die Teilnahme:	**Obligatorisch:** Deutsch A1/ 2. Semester, 2015-08-26 oder äquivalente Sprachkenntnisse		
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: Aktive Teilnahme an mind. 80% d. 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:	DEUA/2.Sem BA.Nr. 951 / Prüfungs-Nr.: 71105	Stand: 26.08.2015	Start: SoSe 2017
Modulname:	**Deutsch A2/ 2. Semester**		
(englisch):	German A2/ 2nd Semester		
Verantwortlich(e):	Polanski, Katja		
Dozent(en):			
Institut(e):	Internationales Universitätszentrum/ Sprachen		
Dauer:	1 Semester		
Qualifikationsziele / Kompetenzen:	Die Teilnehmer erweitern ihre Kenntnisse zu Grundlagen der deutschen Grammatik sowie ihren allgemeinsprachlichen Wortschatz und führen Gespräche zu verschiedenen Themen des Alltags.		
Inhalte:	Freizeitaktivitäten (Sport, Vereine), Arbeit und Arbeitssuche, Politik in Deutschland, Städte (Leipzig, Berlin), Verkehr und Verkehrsmittel, Medien, Fernsehen in Deutschland, Kulturelle Unterschiede; Grammatik: z.B. Indefinita, Relativsätze, Nebensätze mit bevor, bis, als, deshalb, wenn, Konjunktiv II,		
Typische Fachliteratur:	Begegnungen A2+, Schubert Verlag		
Lehrformen:	S1 (SS): Übung (4 SWS)		
Voraussetzungen für die Teilnahme:	**Obligatorisch:** Deutsch A2/ 1. Semester, 2015-08-26 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 an mind. 80% d. 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:	DEUB1/1.Sem. Nr. 952 / Prüfungs-Nr.: 71104	Stand: 04.08.2017	Start: WiSe 2016
Modulname:	**Deutsch B1/ 1. Semester**		
(englisch):	German B1/ 1st Semester		
Verantwortlich(e):	Polanski, Katja		
Dozent(en):			
Institut(e):	Internationales Universitätszentrum/ Sprachen		
Dauer:	1 Semester		
Qualifikationsziele / Kompetenzen:	Die Teilnehmer bauen die in den Modulen Deutsch A1 und A2 erworbenen sprachlichen Kenntnisse und Fertigkeiten unter besonderer Berücksichtigung der mündlichen Kommunikation aus. Sie wiederholen und erweitern ihren Wortschatz. Auf der Basis aktueller und historischer Texte erhalten die Teilnehmer landeskundliche Informationen über die Bundesrepublik Deutschland.		
Inhalte:	Zusammenleben der Menschen in Deutschland (Wohn- und Lebensformen, Vorstellungen über berufliche Entwicklung und Freizeitgestaltung, Konsumverhalten, Beziehung zur Natur)		
Typische Fachliteratur:	Begegnungen B1+, Schubert Verlag		
Lehrformen:	S1 (WS): Übung (4 SWS)		
Voraussetzungen für die Teilnahme:	**Obligatorisch:** Deutsch A2/ 2. Semester, 2015-08-26 oder äquivalente Sprachkenntnisse		
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: Aktive Teilnahme an mind. 80% d. 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:	DEUB1/2. Sem. 953 / Prüfungs-Nr.: 71106	Stand: 26.08.2015	Start: SoSe 2017
Modulname:	**Deutsch B1/ 2. Semester**		
(englisch):	German B1/ 2nd Semester		
Verantwortlich(e):	Polanski, Katja		
Dozent(en):			
Institut(e):	Internationales Universitätszentrum/ Sprachen		
Dauer:	1 Semester		
Qualifikationsziele / Kompetenzen:	Die Teilnehmer bauen die in dem Modul Deutsch b1/1.Semster erworbenen sprachlichen Kenntnisse und Fertigkeiten unter besonderer Berücksichtigung der mündlichen Kommunikation aus. Sie wiederholen und erweitern ihren Wortschatz. Auf der Basis aktueller und historischer Texte erhalten die Teilnehmer landeskundliche Informationen über die Bundesrepublik Deutschland.		
Inhalte:	Zusammenleben der Menschen in Deutschland (Wohn- und Lebensformen, Vorstellungen über berufliche Entwicklung und Freizeitgestaltung, Konsumverhalten, Beziehung zur Natur)		
Typische Fachliteratur:	Begegnungen B1+, Schubert Verlag		
Lehrformen:	S1 (SS): Übung (4 SWS)		
Voraussetzungen für die Teilnahme:	**Obligatorisch:** Deutsch B1/ 1.Semester, 2015-08-26 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 an mind. 80% d. 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:	B2.1 BA. Nr. 3636 / Prüfungs-Nr.: 70311	Stand: 05.05.2022	Start: WiSe 2016
Modulname:	**Deutsch B2/ 1. Semester**		
(englisch):	German B2/ 1st Semester		
Verantwortlich(e):	Polanski, Katja		
Dozent(en):			
Institut(e):	Internationales Universitätszentrum/ Sprachen		
Dauer:	1 Semester		
Qualifikationsziele / Kompetenzen:	Die Teilnehmer bauen ihre sprachlichen Kenntnisse und Fertigkeiten auf dem Niveau B2.1 aus. Mithilfe handlungsorientierter Aufgaben und Aktivitäten entwickeln die Teilnehmer ihre Kenntnisse zu Lernstrategien, Grammatik, Wortschatz, Landeskunde und interkulturellen Aspekten weiter. Die Teilnehmer verstehen den Hauptinhalt komplexer, authentischer Texte. Sie können längeren Redebeiträgen folgen und sich spontan und fließend verständigen. Sie können sich zu einem breiten Themenbereich klar und detailliert ausdrücken, ihren Standpunkt erläutern und die Vor- und Nachteile verschiedener Möglichkeiten angeben.		
Inhalte:	globales, selektives, detailliertes Hör- und Leseverstehen; Halten eines strukturierten Kurzvortrags, Textproduktion, z.B. Grafikbeschreibung, Erörterung, mündliche und schriftliche Stellungnahme; sprachliche Strukturen und Wortschatz gemäß Lehrmaterial (u.a. Satzbau, verschiedene Satzkombinationen, Passivformen, Nominalisierung, Wortbildung)		
Typische Fachliteratur:	Kompass DaF B2.1 (Klett Verlag)		
Lehrformen:	S1 (WS): Übung (4 SWS)		
Voraussetzungen für die Teilnahme:	**Obligatorisch:** Deutsch B1/ 2.Semester oder äquivalente Sprachkenntnisse		
Turnus:	jährlich im Wintersemester		
Voraussetzungen für die Vergabe von Leistungspunkten:	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: AP: Portfolioprüfung bestehend aus 4 Teilen zum Nachweis aller Sprachfertigkeiten (Hörverstehen, Leseverstehen, Sprechen, Schreiben) AP: Aufgaben und aktive Teilnahme an mind. 80% d. Unterrichts		
Leistungspunkte:	4		
Note:	Die Note ergibt sich entsprechend der Gewichtung (w) aus folgenden(r) Prüfungsleistung(en): AP: Portfolioprüfung bestehend aus 4 Teilen zum Nachweis aller Sprachfertigkeiten (Hörverstehen, Leseverstehen, Sprechen, Schreiben) [w: 1]		
Arbeitsaufwand:	Der Zeitaufwand beträgt 120h und setzt sich zusammen aus 60h Präsenzzeit und 60h Selbststudium. Letzteres umfasst die Vor- und Nachbereitung von Lehrveranstaltungen sowie die Vorbereitung der Aufgaben und der Prüfungsleistung.		

Daten:	B2.2 BA. Nr. / Prüfungs-Nr.: 70312	Stand: 05.05.2022	Start: SoSe 2017
Modulname:	**Deutsch B2/ 2. Semester**		
(englisch):	German B2/ 2nd Semester		
Verantwortlich(e):	Polanski, Katja		
Dozent(en):			
Institut(e):	Internationales Universitätszentrum/ Sprachen		
Dauer:	1 Semester		
Qualifikationsziele / Kompetenzen:	Die Teilnehmer bauen ihre sprachlichen Kenntnisse und Fertigkeiten auf dem Niveau B2.2 aus. Mithilfe handlungsorientierter Aufgaben und Aktivitäten entwickeln die Teilnehmer ihre Kenntnisse zu Lernstrategien, Grammatik, Wortschatz, Landeskunde und interkulturellen Aspekten weiter. Die Teilnehmer verstehen den Hauptinhalt komplexer, authentischer Texte. Sie können längeren Redebeiträgen folgen und sich spontan und fließend verständigen. Sie können sich zu einem breiten Themenbereich klar und detailliert ausdrücken, ihren Standpunkt erläutern und die Vor- und Nachteile verschiedener Möglichkeiten angeben.		
Inhalte:	Schriftliches und mündliches Zusammenfassen von Texten; informelle/ formelle E-Mails schreiben; Grafikinterpretation; in einer Diskussion Tatsachen, Meinungen und Argumentation erkennen, auf Redebeiträge eingehen und eigene Redebeiträge halten; Grammatik und Wortschatz gemäß Lehrmaterial (u.a. Textzusammenhang; Partizipien als Adjektiv, indirekte Rede, Konjunktiv I & II, Modalsätze; Passiversatz; Wortbildung; Nomen-Verb-Verbindungen)		
Typische Fachliteratur:	Kompass DaF B2.2 (Klett Verlag)		
Lehrformen:	S1 (SS): Übung (4 SWS)		
Voraussetzungen für die Teilnahme:	**Obligatorisch:** Deutsch B2/ 1. Semester, 2016-04-04 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: AP: Portfolioprüfung bestehend aus 4 Teilen zum Nachweis aller Sprachfertigkeiten (Hörverstehen, Leseverstehen, Sprechen, Schreiben) AP: Aufgaben und aktive Teilnahme an mind. 80% d. Unterrichts		
Leistungspunkte:	4		
Note:	Die Note ergibt sich entsprechend der Gewichtung (w) aus folgenden(r) Prüfungsleistung(en): AP: Portfolioprüfung bestehend aus 4 Teilen zum Nachweis aller Sprachfertigkeiten (Hörverstehen, Leseverstehen, Sprechen, Schreiben) [w: 1]		
Arbeitsaufwand:	Der Zeitaufwand beträgt 120h und setzt sich zusammen aus 60h Präsenzzeit und 60h Selbststudium. Letzteres umfasst die Vor- und Nachbereitung von Lehrveranstaltungen sowie die Vorbereitung der Aufgaben und der Prüfungsleistung.		

Data:	SUSBFR. MA. Nr. 090 / Examination number: 35706	Version: 01.06.2023	Start Year: SoSe 2021
Module Name:	**Environmental Geotechnics**		
(English):			
Responsible:	Butscher, Christoph / Prof. Dr.		
Lecturer(s):	Butscher, Christoph / Prof. Dr.		
Institute(s):	Institute of Geotechnics		
Duration:	1 Semester(s)		
Competencies:	Students become familiar with topics of environmental geotechnics. They know the relevance and consequences of waste disposal and old mining. They understand the respective processes and can discuss and plan mitigation measures.		
Contents:	Waste disposal: scientific fundamentals; legal framework; geological-hydrogeological aspects of construction and operation of landfills, industrial sedimentation basins and deep geological repositories. Old mining: legal framework; exploration methods; methods of assessment, remediation and securing; regional topics in Saxony (lignite open pits, uranium mining); water management of flooded underground mines.		
Literature:	Price, D.G.: Engineering Geology, Principles and Practice, Springer-Verlag, Berlin-Heidelberg, 2009 Suthersan et al. (2017): Remediation Engineering. CRC Press, Boca Raton Daniel (ed.) (1993): Geotechnical Practice for Waste Disposal. Chapman & Hall, London		
Types of Teaching:	S1 (SS): Waste disposal - Waste disposal / Lectures (1 SWS) S1 (SS): Old mining - Old mining / Lectures (1 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: KA: Environmental Geotechnics [120 min]		
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA: Umweltgeotechnik [120 min]		
Credit Points:	3		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA: Environmental Geotechnics [w: 1]		
Workload:	The workload is 90h. It is the result of 30h attendance and 60h self-studies. Latter includes the review of the teached materials and exam preparation.		

Data:	EURVAL. BA.Nr. / Examination number: 31733	Version: 04.07.2022	Start Year: SoSe 2023
Module Name:	**European Values and Culture**		
(English):	European Values and Culture		
Responsible:	Kreßner, Martin / Prof.		
Lecturer(s):	Bongaerts, Jan C. / Prof. Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	Students learn to understand the origins and the development of European values within the European cultural context. They understand the relevance and importance of European Values for technology development and for management processes at all levels. They understand how to integrate European Values into the value creation of business and other organizations.		
Contents:	The origins of European values from Antiquity and Early Christianity through Renaissance, the Enlightenment and the French Revolution to postwar European political initiatives and modern-day trends. Insights in the relevance of European values for the development of public administrations and society, the advancement of education and research and the management of business operations of all kinds. Potential threats to Europe by “competing” value systems Applications to specific areas of technology innovation with a reflection of the respective Sustainable Development Goals. Examples include technologies and systems for mobility, agriculture and food production, IT and data management, intergenerational equity and the circular economy, health, safety and job satisfaction.		
Literature:	Halman, L., Reeskens, T., Sieben, I., & Zundert, M. van. (2022). Atlas of European Values. *Open Press TiU*. DOI: 10.26116/p8v-tt12 Soboleva, N. (2022), “The determinants of the link between life satisfaction and job satisfaction across Europe”, International Journal of Sociology and Social Policy, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/IJSSP-06-2021-0152		
Types of Teaching:	S1 (SS): Lectures (2 SWS) S1 (SS): Seminar (1 SWS)		
Pre-requisites:			
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: AP: Presentation with Questions and Answers [45 min] AP: term paper (minimally 12 pages)		
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: AP: Präsentation mit Fragen und Antworten [45 min] AP: Ausarbeitung (mindestens 12 Seiten)		
Credit Points:	5		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): AP: Presentation with Questions and Answers [w: 1] AP: term paper (minimally 12 pages) [w: 1]		
Workload:	The workload is 150h. It is the result of 45h attendance and 105h self-studies.		

Data:	GM MA. / Examination number: 30114	Version: 24.11.2022	Start Year: SoSe 2026
Module Name:	**Geomodelling – Geostatistics for Natural Resource Modelling**		
(English):			
Responsible:	Benndorf, Jörg / Prof. Dr.-Ing.		
Lecturer(s):	Benndorf, Jörg / Prof. Dr.-Ing.		
Institute(s):	Institute for Mine Surveying and Geodesy		
Duration:	1 Semester(s)		
Competencies:	After successful completion of the course, students are able to: • explain the theoretical foundation of spatial data analysis, • geostatistical model building and estimation, • apply geostatistical methods in the context of estimating natural resources/reserves, • critically evaluate model assumptions of different estimation and simulation method and choose suitable methods for specific applications, • discuss the critical character of the SMU-size to recoverable reserves, • conduct a resource/reserve estimation in a simple case study.		
Contents:	Importance of Resource Modelling and Estimation in the Value Chain of Mining, Uni-variate and Multi-variate Explorative Data Analysis, Analysis of Spatial Continuity, the Spatial Random Function Model, Model Assumptions of Stationarity and Ergodicity, Inference of a Spatial Random Function using unbiased Estimators, Dealing with Preferential Sampling, Variography and Variogram Modeling, Simple Methods for Spatial Estimation including the Polygon Method, Triangulation, Inverse Distance Power and Polynomial Regression, Geostatistical Methods for Spatial Estimation including Simple Kriging, Ordinary Kriging and Universal Kriging, Integrating Secondary Information into Spatial Modeling using Techniques of Co-Kriging, other methods including Indicator Kriging and Block Kriging, Introduction in Modeling spatial Uncertainty using Conditional Simulation, the Method of Sequential, Gaussian Simulation, Geostatistical Considerations in Estimating Reserves in Terms of Volume-Variance Relationship for defining Smallest Minable Units and Grade Tonnage Curves, Applications in Mining Cases, Introduction to CRIRSCO-based International Reporting standards (example JORC Code).		
Literature:	M. Armstrong: “Basic Linear Geostatistics”, Springer Verlag; J. Benndorf: „Angewandte Geodatenanalyse und –Modellierung: Eine Einführung in die Geostatistik für Geowissenschaftler und Geoingenieure“, Springer Verlag; A. G. Journel, and C.J. Huijbregts: Mining Geostatistics, Academic Press; P. Goovaerts: “Geostatistics for Natural Resource Evaluation“, Oxford University Press; T. Schafmeister: “Geostatistik für die hydrogeologische Praxis“, Springer Verlag		
Types of Teaching:	S1 (SS): Lecture Geomodelling / Lectures (2 SWS) S1 (SS): Practical Geomodelling / Exercises (2 SWS)		
Pre-requisites:	**Recommendations:** Angewandte Statistik, 2021-11-22		
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 [90 min]		

	AP: Assignments and Practical Report
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [90 min] AP: Belege und Praktikumsbericht
Credit Points:	5
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA [w: 2] AP: Assignments and Practical Report [w: 1]
Workload:	The workload is 150h. It is the result of 60h attendance and 90h self-studies.

Data:	GWCGWMB. MA. Nr. 3628 / Examination number: 31722	Version: 04.07.2018	Start Year: WiSe 2018
Module Name:	**Ground Water Chemistry for GW-Management - Basics**		
(English):			
Responsible:	Hoth, Nils / Dr. Kreßner, Martin / Prof.		
Lecturer(s):	Hoth, Nils / Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
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 understand and solve basic as well as more complex water quality problems. He gains an understanding of basic practical lab work for analysis.		
Contents:	- water as universal solvent - drinking water standards / disease aspects - basics of thermodynamics in relation to Ground waters (ionic strength, activity versus concentration, saturation index) - species interactions, solubility of gases in water - redox reactions - stability diagrams - solution/ precipitation of mineral phases – equilibria to the fluid phase - hydrochemical milieu measurements (background) - Acidity, alkalinity - Kb,Ks values - and titration in general - Carbonic acid - Carbonate phases interaction - Ground Water Sampling (hydraulic and chemical criteria) - Field handling of Water Samples (Filtration, Conservation)		
Literature:	APPELO & POSTMA (1996) or (2005): Geochemistry, groundwater and pollution, Balkema.		
Types of Teaching:	S1 (WS): Basics of GW chemistry / Lectures (2 SWS) S1 (WS): practical lab courses - Basic hydrochemical lab work, basics of titration, photometry etc. / Practical Application (2 SWS)		
Pre-requisites:	**Recommendations:** Basic knowledge of chemistry and hydrogeology		
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*: written exam to GW-chemistry [90 min] AP*: reports of lab practical work * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.		
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA*: Klausur Grundwasserchemie - Grundlagen [90 min] AP*: Protokolle zu den Laborpraktika Grundwasserchemie-Grundlagen * Bei Modulen mit mehreren Prüfungsleistungen muss diese Prüfungsleistung bestanden bzw. mit mindestens "ausreichend" (4,0) bewertet sein.		
Credit Points:	6		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA*: written exam to GW-chemistry [w: 2] AP*: reports of lab practical work [w: 1]		

	* In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.
Workload:	The workload is 180h. It is the result of 60h attendance and 120h self-studies. (120 h are spent on preparation, writing the lab course reports and self study)

Data:	HYGWMB. MA. Nr. 3629 / Examination number: 31723	Version: 04.07.2018	Start Year: WiSe 2018
Module Name:	**Hydrogeology for GW-Management - Basics**		
(English):			
Responsible:	Hoth, Nils / Dr. Kreßner, Martin / Prof.		
Lecturer(s):	Hoth, Nils / Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	The student will gain general knowledge to characterise and investigate hydrogeological systems. So he will be able to solve relevant hydrogeological tasks. He will be able to select appropriate techniques for investigation and data evaluation. Furthermore he will gain knowledge around groundwater protection measures.		
Contents:	Lecture: - general understanding of subsurface flow-processes (water-saturated GW-zone and water-unsaturated “soil-zone”). - porous media behaviour of loose rock aquifers (differences of kf-value versus permeability) - fissure/ fracture driven preferential flow in hard rock bodies - methods to estimate relevant flow parameters (challenges around) - pumping test (design, performance) and evaluation - saline water intrusion (fresh-saltwater interface at coastal sites). - Ground water flow to wells and drilling of wells (well development, rehabilitation) - basic understanding of acid mine drainage generation - Well head protection zones – general GW protection - European water frame work Practical exercises: Estimation of relevant aquifer parameters (kf-values) Characterisation of water samples Sampling (low flow sampling), filtration, impact of construction materials on monitoring wells, Classification of loose rock materials hXRF-measurements as basis for qualitative characteristics of loose rock and dump/ tailings materials		
Literature:	Fetter (1993): Applied Hydrogeology. Domenico & Schwartz (1998): Physical and Chemical Hydrogeology. USGS (2004) Water Supply Paper. Sterret (2007): Groundwater and Wells. DWGW-Richtlinie W101		
Types of Teaching:	S1 (WS): Lectures (2 SWS) S1 (WS): hydrogeology - practica and exercises / Practical Application (2 SWS)		
Pre-requisites:	**Recommendations:** Basic knowledge in Geology, Applied Geosciences		
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* [90 min] AP*: Practica and exercises		

	* In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA* [90 min] AP*: Praktikum und Übungen * Bei Modulen mit mehreren Prüfungsleistungen muss diese Prüfungsleistung bestanden bzw. mit mindestens "ausreichend" (4,0) bewertet sein.
Credit Points:	6
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA* [w: 2] AP*: Practica and exercises [w: 1] * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.
Workload:	The workload is 180h. It is the result of 60h attendance and 120h self-studies. (120 h are spent on preparation for the classes, preparing the reports and self study)

Data:	Bhymet. MA. / Examination number: 23201	Version: 16.03.2021	Start Year: SoSe 2020
Module Name:	**Introduction to Biohydrometallurgy**		
(English):			
Responsible:	Hedrich, Sabrina / Prof.		
Lecturer(s):	Hedrich, Sabrina / Prof.		
Institute(s):	Institute of Biosciences		
Duration:	1 Semester(s)		
Competencies:	After successfully completing the module, the students are able to: • describe basics in microbiology and the general concept of microbial lifestyle and metabolism • balance the advantages and limitations of various biohydrometallurgical process options taught during the lecture for the winning of metals from primary and secondary resources • identify the role of different types of microorganisms in the process and how they catalyze metal recovery and interact with each other and their environment • apply the taught methods and basics to analyze given case studies and present the results in a seminar		
Contents:	1. Microbial basics, origin of life, cell structure, metabolism 2. Energy acquisition, redox reactions, microbial element cycling 3. Microbial habitats and biofilms, extremophiles 4. Biomining microorganisms, iron- and sulfur metabolizing acidophiles 5. Basics of bioleaching and biooxidation, mechanisms, metal sulfides 6. Biomining technologies, stirred tank, heap and dump bioleaching 7. Bioleaching of primary and secondary resources 8. Oxidative and reductive bioleaching, current technologies and application 9. Stirred tank bioreactor operation and control, heap bioleaching set up and control 10. Biodesulphurisation of coal 11. Biological mine water treatment and metal recovery, iron oxidizing and sulfate reducing microorganism, application examples 12. Biosorption, bioaccumulation, biosynthesis of nanomaterials 13. Analytical methods in biohydrometallurgy, mineralogy, analytical chemistry, microbiological methods, molecular biology		
Literature:	• W. Reineke & M. Schlömann: Umweltmikrobiologie, Springer Spektrum, 2015. • Michael T Madigan; Kelly S Bender; Daniel H Buckley; W Matthew Sattley; David Allan Stahl, Brock biology of microorganisms, Pearson • D. R. Lovley (Ed.): Environmental Microbe-Metal Interactions, ASM Press, 2000. • D. E. Rawlings & D. B. Johnson (Eds.): Biomining, Springer, 2007. • E. R. Donati & W. Sand (Eds.) Microbial Processing of Metal Sulfides, Springer, 2007. • L. G. Santos Sobral, D. Monteiro de Oliveira & C. E. Gomes de Souza (Eds.): Biohydrometallurgical Processes: a Practical Approach, CETEM/MCTI, 2011. • A. Schippers, F. Glombitza & W. Sand (Eds.): Geobiotechnology I. Metal-related Issues, Springer, 2014.		

	• Abhilash, B. D. Pandey & K. A. Natarajan (Eds.): Microbiology for Minerals, Metals, Materials and the Environment, CRC Press, 2015. • H. L. Ehrlich, D. K.Newman & A. Kappler: Ehrlich's Geomicrobiology, CRC Press, 2016. • R. Quatrini & D.B. Johnson: Acidophiles. Life in Extremely Acidic Environments. Caister Academic Press, 2016.
Types of Teaching:	S1 (SS): Lectures (2 SWS) S1 (SS): Exercises (1 SWS)
Pre-requisites:	**Recommendations:** Bachelor degree in natural science, mining- or metallurgy-related engineering. Basic knowledge in chemistry.
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 [90 min] AP*: Übungsaufgaben und Case study report * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [90 min] AP*: Übungsaufgaben und Case study report * Bei Modulen mit mehreren Prüfungsleistungen muss diese Prüfungsleistung bestanden bzw. mit mindestens "ausreichend" (4,0) bewertet sein.
Credit Points:	4
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA [w: 1] AP*: Übungsaufgaben und Case study report [w: 1] * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.
Workload:	The workload is 120h. It is the result of 45h attendance and 75h self-studies.

Data:	SDG. MA. / Examination number: 31730 / Examination number: 31752	Version: 06.03.2025	Start Year: WiSe 2024
Module Name:	**Introduction to Sustainable Development Goal 12 and Responsible Consumption and Production**		
(English):			
Responsible:	Bongaerts, Jan C. / Prof. Dr. Kreßner, Martin / Prof.		
Lecturer(s):			
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	The course is suitable as an introduction to the subject of Sustainable Development focusing on Responsible Consumption and Production (RCP) and is thus intended to be accessible to students of all study backgrounds. On completion of the course, students shall be able to understand Sustainable Development with a special emphasis on the UN Sustainable Development Goal 12 RCP. They will have a comprehension of the different research and development approaches which are contributing to sustainability. They will learn innovative solutions for current issues for society and industry. They will be able to explain, and analyse solutions for current global challenges.		
Contents:	Introduction to Sustainable Development with a focus on Responsible Consumption and Production. Lectures will be covered by guest lecturers (experts) from the 9 European Universities of the EURECA-PRO Alliance and external lecturers. Topics include European culture, sustainable use of resources, responsible consumption, responsible production, circular economy, waste management, material science, recycling, mining, energy transition, eco-design and social and economic aspects.		
Literature:	UN Sustainable Development Goals (https://en.unesco.org/sustainabledevelopmentgoals) Further literature will be recommended by each lecturer.		
Types of Teaching:	S1 (WS): S1 (WS) - Lecture Series on SDGs and RCP Topics / Lectures (2 SWS) / Lectures (2 SWS)		
Pre-requisites:	**Recommendations:** Recommendations: Good knowledge of English (understanding of the lectures)		
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: Written Exam [90 min] PVL: Aktive Teilnahme an den Lehrveranstaltugnen (mindest. 80%) PVL have to be satisfied before the examination.		
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA: Written Exam [90 min] PVL: Active participation in class (at least 80%) PVL müssen vor Prüfungsantritt erfüllt sein bzw. nachgewiesen werden.		
Credit Points:	3		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA: Written Exam [w: 1]		
Workload:	The workload is 90h. It is the result of 30h attendance and 60h self-studies. The workload is 90h. It is the result of 30h attendance and 60h		

	self-studies.

Data:	SUSLSE. MA. Nr. 088 / Examination number: 60217	Version: 01.01.2014	Start Year: SoSe 2014
Module Name:	**Licensing, Stakeholder Involvement and Expectation Management**		
(English):			
Responsible:	Bongaerts, Jan C. / Prof. Dr. Kreßner, Martin / Prof.		
Lecturer(s):	Bongaerts, Jan C. / Prof. Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Month(s)		
Competencies:	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. The aspects which have to be observed within such a complex process include (but are not restricted to) • legal requirements, • economic conditions, • environmental objectives and regional political aims, • communication, information management and negotiation methods. 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.		
Contents:	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.		
Literature:	John D. Leshy: The Mining Law: A Study in Perpetual Motion, Resources for the Future, ISBN: 0915707268, ISBN-13: 9780915707263, 542pp, 1987; Warren Richard Plunkett, Raymond F. Attner, Gemmy Allen:		

	Management: Meeting and Exceeding Customer Expectations, Thomson – South Western, 2005, ISBN 0324259131, 742 pp
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 zu einem 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 / Examination number: 60204	Version: 01.01.2014	Start Year: WiSe 2014
Module Name:	**Management and Finance of Mining Operations along the Life Cycle**		
(English):			
Responsible:	Bongaerts, Jan C. / Prof. Dr. Kreßner, Martin / Prof.		
Lecturer(s):	Bongaerts, Jan C. / Prof. Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Month(s)		
Competencies:	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.		
Contents:	According to the objectives, the module is structured into two separate but closely linked parts: Part A: General management • 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 ri ght people and structures Part B: Financial management • 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 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 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. 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. Presentation of small group projects and case studies forms an essential part of the module in order to train communication skills.
Literature:	Peter Attril & Eddie McLaney: Financial Accounting for decision makers, Fourth edition, Pearson education, 2004; Kenneth Merchant, Wim Van der Stede; Management Control Systems, Performance Measurement, Evaluation and Incentives, 2nd Edition, Pearson education, 2007; Rudolf Volkart: Corporate Finance
Types of Teaching:	S1 (WS): Lectures (4 d) S1 (WS): Exercises (4 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: 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] 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]
Workload:	The workload is 180h. It is the result of 64h attendance and 116h self-studies.

Data:	MASMRM. MA. Nr. 2093 / Examination number: 9900	Version: 30.06.2020	Start Year: WiSe 2020
Module Name:	**Master Thesis Sustainable Mining and Remediation Management with Colloquium**		
(English):			
Responsible:	Kreßner, Martin / Prof.		
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:	• 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) Preparation of a scientific work and paper in a colloquium (30 min oral presentation with discussion)		
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: Thesis (4 Mon)		
Pre-requisites:	**Mandatory:** Abschluss von Modulen im Umfang von 60 Leistungspunkten und Abschluss aller Pflichtmodule des 1. und 2. Semesters gemäß Studienablaufplan (Conclusion of moduls totaling 60 credit points and conclusion of all mandatory modules of the first and second semester)		
Frequency:	constantly		
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: AP*: Master thesis AP*: Defence of the work in a colloquium * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.		
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: AP*: Masterarbeit AP*: Verteidigung in einem Kolloquium * Bei Modulen mit mehreren Prüfungsleistungen muss diese Prüfungsleistung bestanden bzw. mit mindestens "ausreichend" (4,0) bewertet sein.		
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 requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.
Workload:	The workload is 600h.

Data:	SEMSMRM. MA. Nr. 2092 / Examination number: 31720	Version: 02.05.2014	Start Year: WiSe 2014
Module Name:	**Master-Seminar Sustainable Mining and Remediation Management with Colloquium**		
(English):			
Responsible:	Kreßner, Martin / Prof.		
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 form 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:	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] * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.		
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: AP*: Schriftliche Ausarbeitung AP*: Vortrag [30 min] * Bei Modulen mit mehreren Prüfungsleistungen muss diese Prüfungsleistung bestanden bzw. mit mindestens "ausreichend" (4,0) bewertet sein.		
Credit Points:	4		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): AP*: Written paper [w: 1] AP*: Oral presentation [w: 1] * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.		
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:	MWFT. MA. Nr. 3633 / Examination number: 31727	Version: 04.07.2018	Start Year: SoSe 2019
Module Name:	**Mine Water I – Formation and Treatment**		
(English):			
Responsible:	Hoth, Nils / Dr. Kreßner, Martin / Prof.		
Lecturer(s):	Hoth, Nils / Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	The student will gain general knowledge about the formation of acidic mine waters and how to investigate the detailed behaviour. Furthermore he gets knowledge about treatment strategies. So in the end he is able to choose proper measures for partial avoiding of acidic mine water formation and he can choose suitable and site specific treatment strategies		
Contents:	Lecture: - Basics of sulphide weathering - Acid Mine and Acid Rock Draiange (AMD/ ARD) generation - Relevant buffer systems - General aspects of water treatment of different mine waters - Examples of special case site studies – technology of the treatment - Primary, secondary and tertiary measures against acidification for different mine sites Exercises: - Detailed explanation of investigation strategies to characterise and balance acid mine drainage behaviour for dump and tailings bodies - Detailed explanation of water treatment systems for different mine sites - Preparing an report about investigation of a given test site. Figure out the idea and planning of a water treatment for a given special mine water composition.		
Literature:	JAMBOR, J.L.& BLOWES, D.W.: Short Course Handbook on Environmental Geochemistry of Sulfid Mine Wastes. Younger (2002): Mine water hydrogeology and geochemistry. Beale & Read (2013) Evaluating water in pit slope stability Wolkersdorfer (2013) Grubenwasserreinigung – Verfahren und Vorgehensweise		
Types of Teaching:	S1 (SS): Lectures (2 SWS) S1 (SS): Exercises (1 SWS)		
Pre-requisites:	**Recommendations:** Basic knowledge in hydrogeochemistry		
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 [90 min] PVL: Extensive exercises and homework PVL have to be satisfied before the examination.		
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [90 min] PVL: Umfangreiche Übungen und Hausaufgaben 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 45h attendance and 135h self-studies. (135 h are spent on preparation for the classes, preparing the report and with self study)

Data:	MWDTP. MA. Nr. 3634 / Examination number: 31728	Version: 04.07.2018	Start Year: WiSe 2018
Module Name:	**Mine Water II – Dewatering, Technical Devices, Projects**		
(English):			
Responsible:	Hoth, Nils / Dr. Kreßner, Martin / Prof.		
Lecturer(s):	Hoth, Nils / Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	The students will gain knowledge about inflowing waters to open cast, open pits. They are able to deal with water balances and to characterise the status of slope stabilities in relation to pore pressures. They have an understanding how the dewatering system (pumps etc.) has to be chosen in relation to the site specific situation. Furthermore they are able to build up a site specific strategy to investigate, characterise, trace the inflowing waters to open pits or underground mines hydrogeochemically.		
Contents:	Lecture: - Water balances of open casts - Dewatering aspects under consideration of pit development - Pore pressures and slope stability and slope failures - Examples of water handling systems at different mine sites - Detailed explanation of investigation strategies/ results of different projects - Water inflow balances for test sites - how to deal with data shortage - Operational cost differences related to dewatering systems - Open pit or underground mine inflow systems - hydrogeochemical investigations (trace metals, REE, isotopes, Tracers ...) Exercises: - Calculate surface run-off - Water related problems - influence to mining operation/ Impact to operational costs - Open Pit under extreme climate - groundwater and surface water inflow - Rough dewatering estimation by easy analytical solutions		
Literature:	Beale & Read (2013) Evaluating water in pit slope stability Herth $ Arndts (1995) Theorie und Praxis der Grundwasserabsenkung		
Types of Teaching:	S1 (WS): Lectures (2 SWS) S1 (WS): Exercises (1 SWS)		
Pre-requisites:	**Recommendations:** Mine Water I – Formation and Treatment, 2018-07-04		
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 [90 min] PVL: Exercises and homework PVL have to be satisfied before the examination.		
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [90 min] PVL: Übungen und Hausaufgaben 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 45h attendance and 75h self-studies. (75 h are spent on preparation for the classes, homework and with self study)

Data:	PRAKGTB. MA. Nr. 2096 / Examination number: 31721	Version: 01.05.2014	Start Year: WiSe 2014
Module Name:	**Practical Training SMRM**		
(English):			
Responsible:	Kreßner, Martin / Prof.		
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:	LICENS. MA. / Examination number: 31742	Version: 13.03.2023	Start Year: SoSe 2023
Module Name:	**Problem Based Learning on Licensing, Expectation and Stakeholder Management**		
(English):			
Responsible:	Bongaerts, Jan C. / Prof. Dr. Kreßner, Martin / Prof.		
Lecturer(s):	Bongaerts, Jan C. / Prof. Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	Students learn to understand and especially practice tools and techniques for an effective management of stakeholders in mining operations. They acquire this knowledge and best practice through an application of the PBL (Problem Based Learning) technique. They learn the various steps of the PBL (Knowing the problem scenario, Identifying facts, Identifying knowledge gap, Develop resources, Gain insights to apply knowledge, Reflecting on knowledge gained). They acquire skills to conduct research work focusing on a specific problem. They design and work out an appropriate solution for the problem at hand. They learn to engage in group work with setting and fulfilling individual tasks and coordinating the results in a joint overall output. They learn how to present their project, its method and the output. They apply PBL to a specific problem related to Responsible Consumption.		
Contents:	- Mining laws: general overview, essential elements - stakeholders "mining authorities" and licensing practical organization of licensing and inspectorate activities - stakeholders "land owners" and access of miners to their land - stakeholders "real estate owners" and forced sales to miners - stakeholders "employees and contracted parties" and health and safety management - stakeholders "damaged third parties" and rules of liability and of compensation - stakeholders "in general" and models and methods of stakeholder identification and management		
Literature:	Rod McCrea, Andrea Walton, Tom Measham: Stakeholder engagement processes for mining projects - Phase 2: Testing the effects of benefits and governance information on social acceptance of different mining activities Rod McCrea, CSIRO, Canberra, September 2018 https://www.industry.gov.au/sites/default/files/2019-02/stakeholder-engagement-processes-for-mining-final-report.pdf Helena Ranängen: Stakeholder management theory meets CSR practice in Swedish mining, in: Mineral Economics, Vol. 30 (1), 1 – 15, April 2017, Springer DOI 10.1007/s13563 016 0098 https://teaching.cornell.edu/teaching-resources/engaging-students/problem-based-learning Andrew Walker, Heather Leary, Cindy Hmelo-Silver (Eds.): Essential Readings in Problem-Based Learning: Exploring and Extending the Legacy of Howard S. Barrows, Purdue University Press, 2015 David H. Jonassen & Woei Hung: Problem-Based Learning, in: Encyclopedia of the Sciences of Learning, pp 2687–2690, Springer DOI: 10.1007/978-1-4419-1428-6_210		
Types of Teaching:	S1 (SS): In-class/ hybrid group sessions / Lectures (2 SWS)		

	S1 (SS): Online group sessions / Lectures (2 SWS) S1 (SS): Contribution team - Preparation of individual contributions to the team report / project (1 SWS) S1 (SS): Team report - Finalization of the team report / project (1 SWS)
Pre-requisites:	
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*: Presentation with Question and Answers [45 min] AP*: Term Paper * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: MP*: Kolloquium [45 min] AP*: Projektarbeit * Bei Modulen mit mehreren Prüfungsleistungen muss diese Prüfungsleistung bestanden bzw. mit mindestens "ausreichend" (4,0) bewertet sein.
Credit Points:	5
Grade:	The Grade is generated from the examination result(s) with the following weights (w): MP*: Presentation with Question and Answers [w: 3] AP*: Term Paper [w: 1] * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.
Workload:	The workload is 150h. It is the result of 90h attendance and 60h self-studies.

Data:	SUSPCM. MA. Nr. 084 / Examination number: 60216	Version: 01.01.2014	Start Year: WiSe 2014
Module Name:	**Project and Contract Management**		
(English):			
Responsible:	Bongaerts, Jan C. / Prof. Dr. Kreßner, Martin / Prof.		
Lecturer(s):	Bongaerts, Jan C. / Prof. Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	The objectives of the module are to convey principal elements of project and contract management. 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. 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.		
Contents:	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 • 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 toachieve 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.		

	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 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 • 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 tights to the use of intellectual property, dispute resolution, regulatory controls) • Contract negotiations and elements of contract administration • Cost and price analysis 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.
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 / Examination number: 34103	Version: 17.07.2025	Start Year: SoSe 2015
Module Name:	**Radioactivity**		
(English):			
Responsible:	Mischo, Helmut / Prof. Dr.-Ing.		
Lecturer(s):	Mischo, Helmut / Prof. Dr.-Ing. Günther, Franziska / Dr.		
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:	• 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:	For the award of credit points it is necessary to pass the module exam. The module exam contains: MP/KA (KA if 15 students or more) [MP minimum 30 min / KA 120 min] PVL: Project report 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 15 und mehr Teilnehmern) [MP mindestens 30 min / KA 120 min] PVL: Projektbericht 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. The latter includes industrial placement.		

Data:	BBREKL. MA. Nr. 2087 / Examination number: 31719	Version: 13.07.2014	Start Year: SoSe 2014
Module Name:	**Reclamation**		
(English):			
Responsible:	Kreßner, Martin / Prof.		
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:	- Impacts of mining and its effects - Legal requirements for permission - Scientific fundamentals of reclamation (soil, ground water balance,...) - Utilization requirements and realization in the post-mining landscaping (agriculture, forestry, waterbodies, nature protection, recreation, miscellaneous) - Concepts, 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:** Mathemathic-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.		

Data:	RESPCON. / Examination number: 31751	Version: 05.05.2025	Start Year: SoSe 2025
Module Name:	**Responsible Consumption (Problem Based Learning)**		
(English):	Responsible Consumption (Problem Based Learning)		
Responsible:	Kreßner, Martin / Prof.		
Lecturer(s):	Liu, Jiangxue / Dr. Bongaerts, Jan C. / Prof. Dr.		
Institute(s):	Institute of Mining and Special Civil Engineering		
Duration:	1 Semester(s)		
Competencies:	Students will gain an in-depth understanding of the essence and the significance of responsible consumption from both consumer and of producer perspectives. Through case studies, they will learn about the potentials of consumer to behave responsibly and the opportunities of producers to enhance these potentials. Additionally, they will explore how producers can act as enablers of responsible consumption through appropriate product design, material selection, ethical production practices, and respect for the environment.		
Contents:	Consumer economics: Introduction to consumption and decision-making models, including Neoclassical, Behavioural and Ecological economics frameworks. Impact of consumption: Examination of use of natural resources and environmental impact of consumptions. Introduction to climate economic and policies. Social and ethical impact of consumptions. Theory of responsible consumption: Exploration of the concept of responsible consumption. Introduction of the Sustainable Development Goals (SDGs). Policy inferences of consumer behaviour. Circular Economy Concepts: Introduction to the principles and practices of circular economy. Sustainability Assessment Methodologies: Overview of sustainable assessment tools such as Material Flow Analysis (MFA), Ecological Foot Print. Life Cycle Assessment (LCA). Case studies: Practical application and real-world examples of responsible consumption and production.		
Literature:	Arto O. Salonen: Responsible Consumption, in: Samuel O. Idowu, Nicholas Capaldi, Liangrong Zu, Ananda Das Gupta (Eds): Encyclopedia of Corporate Social Responsibility, Springer, 2013 Journal of Cleaner and Responsible Consumption (Elsevier Open Access) UNESCO Sustainable Development Goals (https://en.unesco.org/sustainabledevelopmentgoals)		
Types of Teaching:	S1 (SS): Lectures (2 SWS)		
Pre-requisites:			
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: AP*: Assignments AP*: Presentation with Questions and Answers * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.		
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: AP*: Fallstudien AP*: Präsentation mit Diskussion		

	* Bei Modulen mit mehreren Prüfungsleistungen muss diese Prüfungsleistung bestanden bzw. mit mindestens "ausreichend" (4,0) bewertet sein.
Credit Points:	5
Grade:	The Grade is generated from the examination result(s) with the following weights (w): AP*: Assignments [w: 2] AP*: Presentation with Questions and Answers [w: 1] * In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively.
Workload:	The workload is 150h. The workload is 150h and consists of 60h attendance time and 60h self-study and 30h preparing assignments and presentation.

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