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| Data: | RECH. MA. Nr. 3649 / Examination number: 21210 | Version: 20.03.2024 | Start Year: WiSe 2020 |
| Module Name: | **Chemical principles and sustainable technologies along the raw materials value chain** | | |
| (English): | | | |
| Responsible: | Frisch, Gero / Prof. Dr. | | |
| Lecturer(s): | Haseneder, Roland / Dr. rer. nat.<br>Höck, Michael / Prof. Dr.<br>Bertau, Martin / Prof. Dr.<br>Mischo, Helmut / Prof. Dr.-Ing.<br>Lieberwirth, Holger / Prof. Dr.-Ing.<br>Frisch, Gero / Prof. Dr.<br>Vogt, Carla / Prof. Dr.<br>Charitos, Alexandros / Prof.<br>Hedrich, Sabrina / Prof. | | |
| Institute(s): | Institute of Thermal, Environmental and Natural Products Process Engineering<br>Professor of Industrial Management, Production Management and Logistics<br>Institute of Chemical Technology<br>Institute of Mining and Special Civil Engineering<br>Institute for Mineral Processing Machines and Recycling Systems Technology<br>Institute of Inorganic Chemistry<br>Institute of Analytical Chemistry<br>Institute of Nonferrous Metallurgy and Purest Materials<br>Institute of Biosciences | | |
| Duration: | 2 Semester(s) | | |
| Competencies: | Upon completion of this module, students should be able to<br>• apply fundamental chemical concepts to modern raw materials analysis, extraction, purification, and production techniques,<br>• analyse how different disciplines and technologies must interact to design a process in the raw materials sector,<br>• propose an appropriate technology to process a given resource,<br>• discuss and design innovative solutions to current industry challenges, including aspects of circular economy and entrepreneurship. | | |
| Contents: | Theoretical and practical aspects of<br>• raw materials analysis and process analysis techniques,<br>• raw materials processing and recycling technologies, including mechanical, hydro-, pyro- and electrometallurgical methods,<br>• chemistry of minerals and ore deposits, modelling of chemical equilibria and kinetics<br>• process chain design, circular economy and process economics in the raw materials sector | | |
| Literature: | J.S. Gaffney et al., General Chemistry for Engineers, Elsevier 2018<br>D. Möller, Chemistry for Environmental Scientists, De Gruyter 2015<br>M. Bertau et al., Industrial Chemistry, Wiley, 2016<br>Kirk-Othmer et al., Chemical Technology, Wiley, 2013 | | |
| Types of Teaching: | S1 (WS): Lectures (1 SWS)<br>S2 (SS): Lectures (2 SWS)<br>S1 (WS): workshops / Exercises (1 SWS) | | |

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| | S2 (SS): workshops / Exercises (1 SWS)<br>S2 (SS): laboratory practicals / Practical Application (4 SWS)<br>S1 (WS): course work / case studies / research project (1 SWS)<br>S2 (SS): course work / case studies / research project (1 SWS)<br>S2 (SS): Excursion (1 SWS) |
| Pre-requisites: | |
| Frequency: | yearly in the winter semester |
| Requirements for Credit Points: | For the award of credit points it is necessary to pass the module exam.<br>The module exam contains:<br>KA*: written exam [180 min]<br>AP*: case studies<br>AP*: practicals<br>PVL*: fundamental chemistry workshops<br>PVL have to be satisfied before the examination.<br><br>* In modules requiring more than one exam, this exam has to be passed or completed with at least "ausreichend" (4,0), respectively. |
| Credit Points: | 13 |
| Grade: | The Grade is generated from the examination result(s) with the following weights (w):<br>KA*: written exam [w: 2]<br>AP*: case studies [w: 1]<br>AP*: practicals [w: 2]<br>PVL*: fundamental chemistry workshops [w: 0]<br><br>* 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 390h. It is the result of 180h attendance and 210h self-studies. |