

## MMS Graduate Certificate Program Policy Statement

# Minerals, Materials and Society Graduate Certificate

Adapted from online: <https://sites.udel.edu/ceoe-mms/mms-graduate-certificate/>  
Jan. 25, 2021

The ***Minerals, Materials and Society (MMS)*** graduate certificate is one of the **first of its kind in the United States** to offer a for-credit graduate program aimed at industry, government and civil society professionals working across mineral and extractive supply chains. The program approaches the topic from an interdisciplinary and industrial ecology perspective with attention to key skills needed to evaluate the environmental and social impacts of the sector. The program is designed with online offerings as well as on-campus and field course offerings.

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All interested candidates are requested to enroll in a 'gateway', self-paced, online course, ***Natural Resources for Sustainable Development***, offered to our candidates on the edX EDGE platform. Create an account in edX EDGE <http://www.edge.edx.org/>; and enroll in the SDG Academy course [https://edge.edx.org/courses/course-v1:SDGAcademyx+NR001\\_p+3T2019/about](https://edge.edx.org/courses/course-v1:SDGAcademyx+NR001_p+3T2019/about).

***NOTE: PLEASE BE SURE TO ENROLL VIA THE LINK TO edX Edge, AND NOT ON edX.ORG***

**Admitted applicants will be asked to submit their certificate of completion prior to starting MMS course work.**

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## Admission Requirements

***(Admissions will be accepted on a rolling basis)***

Geared towards mid-career professionals, applications to the Minerals, Materials and Society (MMS) graduate certificate program are evaluated on the basis of the applicant's undergraduate record, TOEFL scores (if applicable), and two letters of recommendation. ***(Please note that the GRE exam is WAIVED for this certificate.)***

All graduate applicants to the MMS certificate program should submit the following, via the UD Graduate Application web form:

- A completed graduate school [application form](#) plus application fee
  - <https://www.udel.edu/academics/colleges/grad/prospective-students/grad-admissions/>
- Transcripts of all college work
- Two (2) letters of recommendation from persons qualified to judge the applicant's potential for work in this field
- Graduate Application Essay (no minimum word count)

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## Application Steps

1. Enroll in the SDG Academy [course](#).
  1. [https://edge.edx.org/courses/course-v1:SDGAcademyx+NR001\\_p+3T2019/about](https://edge.edx.org/courses/course-v1:SDGAcademyx+NR001_p+3T2019/about)
2. Visit the UDel Graduate Applications [page](#).
  1. <https://grad.udel.edu/apply/>
3. Create an account with an email address and password. This will let you start the application process. Click on application year 2020.
4. After completing the Biographical information, click on 'Program of Study'.
5. Input *Minerals, Materials and Society* in the Search box. *Minerals, Materials and Society* should pop up in the Program of Study box.
6. Click Continue
7. Although admissions will be accepted on a rolling basis, please select the next Term of Study when you wish to begin the program.
8. Complete the next steps.
9. Under 'Test Scores' tab, **ONLY** international students for whom English is not their first language must submit the Test of English as a Foreign Language (TOEFL) score. A minimum TOEFL paper-based score of 550 is required by the University and a score of 600 is recommended by our College. **The GRE has been waived for this program, so those not submitting TOEFL scores can skip this page.**
10. Recommend tab – please upload two letters of recommendation

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## Certificate Course Requirements

### 15 Credits in Total

**Required courses. Must take all three:**

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- [GEOG 655 – Certification Systems for Sustainable Development \(1cr.\)](#)
    - **OFFERED SPRING 2021**
    - On-campus intensive (1 week) in Winter or Summer term. A focused introduction to the range of industrial and governmental certification systems which have developed to consider sustainability criteria across supply chains of products from mines to markets. Students will gain skills on compliance assurance and auditing using these systems.
  - [GEOG 669 – Minerals and Ecological Economics \(2cr.\)](#)
    - **OFFERED ONLINE STARTING FALL 2020, Tuesday & Thursday afternoons, 2:00-3:15 p.m. EST**
    - Online intensive. This course will introduce ecological economics as a trans-disciplinary framework to economic, social, and environmental problem solving applied to the field of minerals and mining industries. “Trans-disciplinary” implies a problem-orientation that draws from a diverse web of knowledge across the natural sciences, social sciences, and humanities.
  - [GEOG 687 – Sustainable Management of Risk in Industry \(3cr.\)](#)
    - **OFFERED SPRING 2021**
    - UQ online course. Course covers the principles and application of risk management methods to help industry achieve a range of objectives including operational performance, human well-being, environmental impact and stakeholder-related objectives. Details can be found here: [UQ MINE 7032 Sustainable Management of Risk in Industry](#).

**Choose one of the following Experiential Laboratories:**

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- [GEOL 613 – Analytics of Minerals for Risk Management \(2cr.\)](#)
    - A hands-on mineralogical laboratory module, this course is an on-campus intensive (1 week) offered during the Winter or Summer session. A comprehensive overview of the chemical, physical and optical properties of minerals with a particular focus on geologic formation of minerals, origin determination and sustainability issues related to sector supply chains.

**OR**

- [GEOG 665 – Ecological and Social Restoration of Mineral Landscapes \(2-3cr.\)](#)
  - **OFFERED January 2021!**
  - A field course in Australia that will consider ways of effectively developing ecological and social restoration plans after a mining operation finishes its operational cycle. Course will focus on a case of indigenous community relations.

OR

- [GEOG 684 – Innovations in Legacy Mining: Lessons from the World’s Largest Iron Ore Mine in Russia \(2-3cr.\)](#)
  - First of its kind experiential learning Atelier class. Atelier will focus on how coexistence between agriculture and mining can be better managed. Students will visit Moscow and the Kursk region and apply ecological economics approaches. **Study Abroad in Russia, applications open until November 20, 2019 for Summer 2020 course! You do NOT have to be an enrolled UD student to take this exciting module! Learn more and enroll [HERE!](#)**

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**Electives – Choose four to seven courses, depending on number of credits, to give total of 15 credits**

**Choose between UD on-campus and remote learning electives or UQ online courses**

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**UD On-campus/Remote Learning Electives:**

- [ANTH 630 – Anthropology of Development: Extractive Industry \(1cr.\)](#)
  - Provides an anthropological and critical perspective of development with special focus on the extractive industry. Commences with an overview the anthropology of development then lead into case studies on the various social dimensions of the mining industry.
- [ANTH 633 – Anthropology of Mining in Africa \(1cr.\)](#)
  - Explore the human impact of mining and mineral extraction in Africa, with the Democratic Republic of the Congo as a distinct case study.
- [ARTH 667 – SEMINAR: Art and Materiality in the Age of European Expansion, 1400-1800 \(1 to 12cr.\)](#)
  - **Offered Winter 2021**
  - Examines the arts in diverse regions of the Spanish and Portuguese empires in light of the raw materials employed in their production,

discussing not only the techniques and properties associated with each material choice, but also the ways in which such substances were sourced and traded.

- [ENEP 624 – Water Resource Management \(1 cr.\)](#)
  - Introduces and analyses various aspects of water resources management and bio-resources management. Topics include rainfall, runoff, water supply, groundwater, reservoirs, wastewater treatment and water quality agricultural water management, drought management, water conservation, agricultural production systems for food and energy, and the impacts of climate change on water resources and agriculture.
- [ENEP 667 – Seminar \(1 cr.\) – Environmental Governance](#)
  - This course examines global and national environmental governance issues spanning legal, regulatory and voluntary agreements and responsibilities of the assemblages of institutions (formal and informal) and actors that regulate and shape societal interactions with nature across spatial and temporal scales. Through institutional, resource and other theoretical lens, we will explore the challenges of governments, business and industry and their roles in the dynamics of ‘good governance’ as well as solution-oriented tools.
- [GEOG 663 – Environmental Impact of Deep-sea Mining \(2cr.\)](#)
  - Deep-sea mining is an emerging industry that could unlock previously untapped resources, but it carries environmental risks. Prospects that hold the most value are also home to species found nowhere else in the world. Students will be introduced to deep-sea mining and the affected ecosystems.
- [GEOLOG 612 – Geology of Strategic Mineral Deposits \(1cr.\)](#)
  - Geologic occurrence of strategic mineral deposits, their economic importance, domestic and global distribution, and potential for sustainability. Methods of exploration and production of critical technological, agricultural, and industrial mineral commodities
- [GEOLOG 802 – Topics in Geophysics \(1 to 3cr.\) TWO OPTIONS](#)
  - Topics in Geophysics: Conflict Diamonds – Impacts of conflict diamonds on local, national, and international societies and on the environment, updated with current activities in terms of mining in Africa.
  - Topics in Geophysics: Mineral Resources of Afghanistan – Whose got them and who needs them? A look at the mineral resources of Afghanistan.
- [MAST 647 – Current Topics in Chemical Methods in Oceanography \(1 to 3cr.\)](#)

- Principles, capabilities and limitations of analytical methods to the chemistry of marine waters and sediments. Modified to teach x-ray diffraction or electron microscopy at a fundamental level to identify minerals.
- [MAST 853 – Oceanography Seminar \(1 to 12cr.\)](#)
  - Variable topics for students. Oceanography seminar could have ‘deep sea mining’ as an example topic. A review of current oceanographic literature through student presentations.
- [CIEG 631 – Industrial Ecology Methods \(1cr\)](#)
  - This course will provide a basic introduction to key concepts and methods in the field of industrial economics with a focus on life cycle analysis and material flow analysis.
- MSEG 567 – Materials for the Electronics Sector: Supply, Innovation and Impacts
  - This course is a brief survey of the inorganic materials used in today’s electronic devices with a focus on the science, technology and policy associated with the metallurgical, purification and fabrication processes of these materials.

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### **UQ Responsible Resource Development online courses**

**Online courses will be offered by the University of Queensland’s Sustainable Minerals Institute, on a limited basis each semester. Please check back often!**

- [GEOG667029 – UQMINES 7052 \*Community Aspects of Resource Developments\* \(3 cr.\)](#)
  - **OFFERED FULLY ONLINE FALL 2020, STARTING AUGUST 3**
  - This course provides students with a thorough understanding of community issues associated with mining, oil and gas developments. It provides context and examples to demonstrate key considerations relevant to the interaction between mining and communities, and of the industry response to these issues.