Programme Information		
Programme Title	Programme Code	HECoS Code
Responsible Mining and Metals Finance	J9U8	For Registry Use Only

Award	Length of Study	Mode of Study	Entry Point(s)	Total Credits	
				ECTS	CATS
MSc	12 months	Full-Time	Annually in October	90	180
PG Diploma J9U8D	N/A	N/A	N/A	60	120
PG Certificate J9U8C	N/A	N/A	N/A	30	60
The PG Certificate and PG Diploma are exit awards and are not available for entry. You must apply to and join the MSc.					

Ownership			
Awarding Institution	Imperial College London	Faculty	Faculty of Engineering
Teaching Institution	Imperial College London	Department	Earth Science and Engineering
Associateship	Diploma of Imperial College London (DIC)	Main Location(s) of Study	South Kensington Campus
External Reference			
Relevant QAA Benchmark Statement(s) and/or other external reference points		Master's Degrees in Engineering	
FHEQ Level		Level 7	
EHEA Level		2nd Cycle	
External Accreditor(s) (if applicable)			
External Accreditor 1:	The Institute of Materials, Minerals and Mining (IOM3)		
Accreditation received:	2024	Accreditation renewal:	2030
Collaborative Provision			
Collaborative partner	Collaboration type	Agreement effective date	Agreement expiry date
N/A	N/A	N/A	N/A
Specification Details			
Programme Lead		Prof. Stephen Neethling	

Student cohorts covered by specification	2026-27 entry
Date of introduction of programme	October 06
Date of programme specification/revision	July 26

Programme Overview

The MSc Responsible Mining and Metals Finance programme will educate future resource specialists in the multidisciplinary areas of mining geology, mining project evaluation, mining project management and quantitative finance as well as the environmental and social aspects key to the mining sector. The programme will take you through a curriculum that enables a deepening of knowledge and skills associated with the mining finance sectors and their application to a range of businesses and industries. In addition, in term 3, a fieldtrip will include visits to be both active mines and mining projects to apply the knowledge and skills acquired in earlier parts of the programme. The final part of the programme will be a dissertation in which a resource project will be researched and evaluated.

This programme is run jointly by the Department of Earth Science and Engineering and Imperial College Business School. Understanding the financial risk and uncertainty that arises is a core component of the programme and needs to be treated in a quantitative way which is why the MSc degree is delivered as a combined Faculty of Engineering/Business School programme where these concepts are treated formally in the quantitative finance teaching delivered by the Business School.

Applicants to the programme often have a few years of experience in the sector and are expected to have a strong background in mathematics. Students come from a range of backgrounds including engineering, natural sciences and finance. The overall objective of the MSc programme is to ensure that you are able to critically assess, both technically and financially, metals projects that are key for the green energy transition. This requires a combination of knowledge and practical skills, which are tailored to the latest developments from the resources sector.

On completion of the programme you will have acquired a strong background in key technical and geological concepts relevant to a career in the minerals industry, and be trained in financial modelling, financial engineering and the techniques of risk modelling. You will learn about the corporate finance, equity markets, debt finance, metals markets and associated derivative market in the City of London, a global centre for mining finance, and you will be provided with an understanding of quantitative finance, accounting and strategic management within the context of technical principles that apply specifically to mineral projects.

On completion of the programme you will be in an ideal position to

- pursue careers in the technical and financial appraisal of mineral resource projects, or in the financial services and mineral industries.
- to undertake independent research projects both in industry and in a university environment.
- to transition to business leadership roles, sustainable development and engineering ethics roles.

The programme consists of 7 modules delivered over the first two terms of the academic year. In summer term, after the assessments, you will undertake a fieldtrip, a highlight of the MSc programme, to a region of active exploration, mine development and investment. This will provide first-hand experience of a variety of aspects of the minerals industry, and in the process, promote deep learning on concepts studied during the programme. Following submission of the fieldtrip report, you will undertake your individual research project for the remaining time in the programme.

The research project is chosen with the support of staff teaching on the programme during the spring term. The research project will be based on an evaluation of a resource project that is typically at the pre-feasibility/feasibility stage of development. You will be given guidance on how to identify suitable projects and on how to obtain the required data and based on this you will develop and present a research proposal. This will take place shortly after the fieldtrip report submission. It is possible for projects to be carried out partly or wholly at an external organisation.

The programme will be taught by expert staff members from the Department of Earth Science and Engineering and the Imperial College Business School who will draw on their research, business and industrial application

experience at national and international level to ensure you are provided with an opportunity to engage with a broad range of techniques and applications. You will also have the opportunity to undertake research with academics within the top-rated Earth Science and Engineering Department from the Research Excellence Framework (REF) 2021. The programme will be focused on the South Kensington Campus, predominantly within the Earth Science and Engineering department's facilities in the Royal School of Mines Building.

Learning Outcomes

On successful completion of the MSc in Responsible Mining and Metals Finance you will be able to:

1. Apply the key aspects of quantitative finance (including futures, forwards, options, Black & Scholes, gold loans, hedging, real option analysis, and the role of commodity markets)
2. Build a financial model of a resource project
3. Analyse resource company accounts
4. Calculate the uncertainty in resource estimations through the application of geostatistics and apply this to the analysis of risk in financial modelling
5. Analyse the performance of resource projects, including mining, minerals processing and subsurface engineering
6. Use financial engineering to optimise project returns using the relationship between capital structure (the balance between debt and equity) and the scale of production
7. Assess the factors that are involved in securing financing for capital-intensive extractive industry projects through equity, debt or joint ventures
8. Apply sustainability principles to the evaluation of mining projects, including environmental, social and governance considerations.
9. Analyse and solve problems using a multidisciplinary approach, applying professional judgement to balance financial assessment, technical detail and engineering design
10. Work in an interdisciplinary team to develop a realistic funding case for a resource project and present the case to industry experts
11. Conduct independent research, including developing a project proposal and research plan
12. Interpret technical, financial and scientific reports and carry out a critical evaluation of this literature
13. Produce a written dissertation which presents the aims, background, methodology, results and discussion in a coherent and concise manner

On successful completion of the PG Diploma in Responsible Mining and Metals Finance you will be able to:

1. Apply the key aspects of quantitative finance (including futures, forwards, options, Black & Scholes, gold loans, hedging, real option analysis, and the role of commodity markets)
2. Build a financial model of a resource project
3. Analyse resource company accounts
4. Calculate the uncertainty in resource estimations through the application of geostatistics and apply this to the analysis of risk in financial modelling
5. Analyse the performance of resource projects, including mining, minerals processing and subsurface engineering
6. Use financial engineering to optimise project returns using the relationship between capital structure (the balance between debt and equity) and the scale of production
7. Assess the factors that are involved in securing financing for capital-intensive extractive industry projects through equity, debt or joint ventures
8. Apply sustainability principles to the evaluation of mining projects, including environmental, social and governance considerations.
9. Analyse and solve problems using a multidisciplinary approach, applying professional judgement to balance financial assessment, technical detail and engineering design

On successful completion of the PG Certificate in Responsible Mining and Metals Finance you will be able to:

1. Apply the key aspects of quantitative finance (including futures, forwards, options, Black & Scholes, gold loans, hedging, real option analysis, and the role of commodity markets)
2. Build a financial model of a resource project
3. Analyse resource company accounts
4. Calculate the uncertainty in resource estimations through the application of geostatistics and apply this to the analysis of risk in financial modelling
5. Analyse the performance of resource projects, including mining, minerals processing and subsurface engineering

The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial degree programme. The Graduate Attributes are available at: https://www.imperial.ac.uk/about/education/our-graduates/

Entry Requirements	
Academic Requirement	Normally a 2:1 UK Bachelor's Degree with Honours (or a comparable qualification recognised by the university) in Engineering, the Physical Sciences or Economics, with a substantial Mathematics element. Appropriate experience, while not essential, would be an advantage.
Non-academic Requirements	None
English Language Requirement	Standard requirement IELTS score of 6.5 overall (minimum 6.0 in all elements)
Admissions Test/Interview	Applicants may be invited to interview. This will be predominantly to ascertain the student's mathematical background and ability where it is not obvious from their academic transcript.

The programme's competency standards documents can be found at: www.imperial.ac.uk/earth-science/prosp-students/pg-courses/

Learning & Teaching Approach

Learning and Teaching Delivery Methods

- Lectures
- Case studies
- Group work exercises
- A mining project field trip
- Individual research
- Formal presentations

All taught module content will be made available online in addition to face-to-face teaching sessions. The lectures will predominantly consist of short presentations interspersed with exercises and practical examples so that you can practise implementing the skills that you have been taught. This will be done with the support of academic staff. While taught content will be made available online, you are strongly encouraged to attend in person as discussions and peer learning is an important part of this programme.

A number of modules will involve group projects where you will collaboratively solve a challenge and present the results. Other modules will involve more substantial individual coursework exercises where you can practice and demonstrate your ability to combine the methods and skills that you have been taught in order to solve a problem.

During the field trip you will be expected to record your own observations about the projects that we will be visiting and demonstrate your ability to critically assess what you are told and shown by the companies that we will be visiting.

The final activity of the programme is the research project that you will undertake independently with support and advice from a project supervisor.

Overall Workload

Your overall workload consists of face-to-face sessions and independent learning. The following gives an indication of how much time you will need to allocate to different activities at each level of the programme. At Imperial, each ECTS credit taken equates to an expected total study time of 25 hours. Therefore, the expected total study time is 2250 (90 ECTS) hours per year.

The first 8 months of the course (October till May) will consist of formal lecturing and associated tutorials and practical sessions. As well as the formal teaching, you will also be expected to do independent study.

After the formal teaching there will be a 2 week field trip followed by a 2 week period in which the field trip report is expected to be written, and submitted at the end of that time.

The final three months of the programme will be exclusively devoted to the individual research project.

Assessment Strategy

Assessment Methods

The assessment consists of a combination of exams and coursework. All the core modules except the dissertation and field trip have formal written exams, with these exams occurring at the end of the Autumn and Spring terms.

In addition, all the modules have coursework components. These provide an opportunity for feedback prior to the formal exams, as well contributing to the summative assessment for the module, with the coursework contribution ranging between 20% and 40% depending on the module. The form that this coursework takes varies from module to module and includes written reports, calculation exercises and oral presentations.

In addition to the feedback from formal coursework, you will be provided with formative assessment of your performance in class exercise and tutorial sessions.

The Mining Management and Finance module includes the 'Syndicate Exercises'. These are a series of group projects, which are assessed based on a combination of written reports and oral presentations. In these group exercises all members of the group receive the same mark.

The field trip is assessed based on a combination of the notebook that is generated while on site based on your observations and a subsequent report in which you must synthesise their observations into a coherent structure. During the field trip there is formative assessment of the notebook to ensure that appropriate data and observations are being recorded. The summative assessment will be based 80% on the report and 20% on the notebook. The fieldtrip is a critical part of the programme and therefore attendance is compulsory.

A final dissertation will be the main basis for the summative assessment of the 3-month research project undertaken over the summer. In addition to the mark for the dissertation, there will also be a mark based on your management of the project, including your presentation of the initial project plan and your interim progress reports. This will account for 15% of the total mark, with the written dissertation accounting for the other 85%.

Academic Feedback Policy

Feedback on coursework will be provided in line with Imperial's Policy on Academic Feedback. The good practice guidelines of feedback being provided within two weeks of the submission date will be employed. You will also be given indicative marks after the January and April exam periods.

The final numerical marks will be provided by the Registry after the Board of Examiner's meeting at the end of the academic year.

Imperial's Policy on Academic Feedback and guidance on issuing provisional marks to students is available at: www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/

Re-sit Policy

Imperial's Policy on Re-sits is available at: www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/

Mitigating Circumstances Policy

Imperial's Policy on Mitigating Circumstances is available at: www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/

Additional Programme Costs

There are no additional costs. The field trip is included in the tuition fees.

Important notice: The Programme Specifications are the result of a large curriculum and pedagogy reform implemented by the Department and supported by the Learning and Teaching Strategy of Imperial College London. The modules, structure and assessments presented in this Programme Specification are correct at time of publication but might change as a result of student and staff feedback and the introduction of new or innovative approaches to teaching and learning. You will be consulted and notified in a timely manner of any changes to this document.

Programme Structure[1]					
Year 1 - FHEQ Level 7 **You will study all core and compulsory modules.**					
Code	Module Title	Core/ Compulsory/ Elective	Group	Term	Credits
BUSI70617	Mathematics for Finance	Compulsory		Autumn	7.5
BUSI70613	Investment and Portfolio Management	Compulsory		Autumn	7.5
BUSI70600	Derivatives	Compulsory		Spring	7.5
EART70192	Resource Geology and Evaluation	Compulsory		Autumn	7.5
EART70193	Mining and Minerals Processing	Compulsory		Spring	7.5
EART70194	Mining Management and Finance	Compulsory		Autumn, Spring	15
EART70195	Environmental and Social Considerations in Mining	Compulsory		Spring	7.5
EART70184	RMMF Field Trip	Core		Summer	10
EART70183	RMMF Dissertation	Core		Summer	20
				Credit Total	90

[1] **Core** modules are those which serve a fundamental role within the curriculum, and for which achievement of the credits for that module is essential for the achievement of the target award. Core modules must therefore be taken and passed in order to achieve that named award. **Compulsory** modules are those which are designated as necessary to be taken as part of the programme syllabus. Compulsory modules can be compensated. **Elective** modules are those which are in the same subject area as the field of study and are offered to students in order to offer an element of choice in the curriculum and from which students are able to select. Elective modules can be compensated.

Progression and Classification

Award and Classification for Postgraduate Students

Award of a Postgraduate Certificate (PG Cert)
To qualify for the award of a postgraduate certificate you must have a minimum of 30 credits at Level 7 from the taught modules

Award of a Postgraduate Diploma (PG Dip)
To qualify for the award of a postgraduate diploma you must have passed modules to the value of no fewer than 60 credits at Level 7 from the taught modules in the Autumn, Spring and Summer terms

1. and no more than 10 credits as a Compensated Pass;

Award of a Masters Degree
To qualify for the award of a postgraduate degree you must have:

1. accumulated credit to the value of no fewer than 90 credits at level 7;
2. and no more than 10 credits as a Compensated Pass;
3. met any specific requirements for an award as outlined in the approved programme specification for that award.

Classification of Postgraduate Taught Awards

The university sets the class of Degree that may be awarded as follows:

1. Distinction: 70.00% or above.
2. Merit: 60.00% or above but less than 70.00%.
3. Pass: 50.00% or above but less than 60.00%.

For a Masters, your classification will be determined through the Programme Overall Weighted Average and the designated dissertation or final major project module meeting the threshold for the relevant classification band.

Your degree algorithm provides an appropriate and reliable summary of your performance against the programme learning outcomes. It reflects the design, delivery, and structure of your programme without unduly over-emphasising particular aspects.

Programme Specific Regulations

As an accredited degree, students on this programme are subject to the standards set by the Engineering Council in relation to compensation: a maximum of 10 ECTS credits can be compensated across the MSc programme.

Supporting Information
The Programme Handbook is available from the department.
The Module Handbook is available from the department.
Imperial's entry requirements for postgraduate programmes can be found at: www.imperial.ac.uk/study/apply/postgraduate-taught/entry-requirements/
Imperial's Quality & Enhancement Framework is available at: www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance
Imperial's Academic and Examination Regulations can be found at: www.imperial.ac.uk/about/governance/academic-governance/regulations
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Imperial College London is regulated by the Office for Students (OfS) www.officeforstudents.org.uk/advice-and-guidance/the-register/
This document provides a definitive record of the main features of the programme and the learning outcomes that you may reasonably be expected to achieve and demonstrate if you take full advantage of the learning opportunities provided. This programme specification is primarily intended as a reference point for prospective and current students, academic and support staff involved in delivering the programme and enabling student development and achievement, for its assessment by internal and external examiners, and in subsequent monitoring and review.