Imperial College London

Programme Specification (Master's Level)

MRes Nanomaterials

This document provides a definitive record of the main features of the programme and the learning outcomes that a typical student may reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities provided. This programme specification is intended as a reference point for prospective students, current students, external examiners and academic and support staff involved in delivering the programme and enabling student development and achievement.

Programme Information				
Programme Title	Nanomaterials			
Award(s)	MRes			
Programme Code	F1Y4			
Associateship	Royal College of Science			
Awarding Institution	Imperial College London			
Teaching Institution	Imperial College London			
Faculty	Faculty of Natural Sciences			
Department	Department of Chemistry			
Main Location of Study	South Kensington and White City Campus			
Mode and Period of Study	1 academic year, full-time			
Cohort Entry Points	Annually in October			
Relevant QAA Benchmark Statement(s) and/or other external reference points	Master's Degrees in Chemistry			
Total Credits	ECTS:	90	CATS:	180
FHEQ Level	Level 7			
EHEA Level	2nd cycle			
External Accreditor(s)	None			
Specification Details				
Student cohorts covered by specification	2021-22 entry			
Person responsible for the specification	Prof. Nicholas Harrison, Course Director Prof. Saif Haque, Course Director			
Date of introduction of programme	October 2002			

Date of programme specification/revision	August 2021

Programme Overview

Nanotechnology represents a fundamental change in the way we interact with the natural world, and is set to deliver major scientific and technological advances.

The massive global investment in nanotechnology means that scientists who are trained to work effectively in an interdisciplinary environment that bridges the diverse fields of chemistry, physics, materials science, biology and engineering, will play a vital role in shaping the future.

Combining interdisciplinary teaching with cutting-edge research, this flagship course will train the next generation of nanotechnologists, and provide the background required for a career in industrial or academic research.

Learning Outcomes

The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial College degree programme. The Graduate Attributes are available at: www.imperial.ac.uk/students/academic-support/graduate-attributes

Knowledge and Understanding of:

- Core concepts in nanomaterials – semi-conductor nanostructures, nanomaterials for solar energy conversion, optical and electrical properties, nanotubes, advanced materials characterisation and theory modelling and simulation;
- Specialised concepts in nanomaterials – molecular nanobiotechnology, colloidal semiconductors, patterning techniques, photonic and optoelectronic applications, quantum theory of nanoscale systems, modelling of charge transport and recombination, modelling of colloidal systems and wetting phenomena;
- Research techniques, including information retrieval, experimental design, modelling, materials characterisation techniques, and laboratory safety;
- Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to the student's project;
- Management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, scientific publications.

Intellectual Skills:

- Analyse and solve problems in nano-materials science using an integrated multidisciplinary approach;
- Integrate and evaluate information;
- Formulate and test hypotheses using appropriate experimental design and analysis of data;
- Plan, conduct and write-up a programme of original research.

Practical Skills:

- Plan and execute safely a series of experiments;
- Use laboratory–based methods to generate data;
- Analyse experimental results and determine their strength and validity;
- Prepare technical reports;
- Give technical presentations;
- Use the scientific literature effectively;

- Use computational tools and packages.

Transferable Skills:

- Communicate effectively through oral presentations, computer processing and presentations, written reports and scientific publications;
- Apply statistical and modelling skills;
- Management skills: decision processes, objective criteria, problem definition, project design and evaluation, risk management, teamwork and coordination;
- Integrate and evaluate information from a variety of sources;
- Transfer techniques and solutions from one discipline to another;
- Use Information and Communications Technology;
- Manage resources and time;
- Learn independently with open-mindedness and critical enquiry;
- Learn effectively for the purpose of continuing professional development.

Entry Requirements	
Academic Requirement	Normally a 2.1 UK Bachelor's Degree with Honours in a relevant subject, particularly in subjects such as Chemistry, Physics, Mathematics, Materials, Biochemistry and Engineering Biochemistry (or a comparable qualification recognised by the College) .
English Language Requirement	Standard requirement IELTS score of 6.5 overall (minimum 6.0 in all elements)
The programme's competency standards document can be found at: http://www.imperial.ac.uk/chemistry/postgraduate/mres-courses/	
Learning & Teaching Strategy	
Scheduled Learning & Teaching Methods	• Lectures • Seminars • Workshops • Conference • Advanced Lectures
Project Learning Methods	• Individual research project
Assessment Strategy	
Assessment Methods	• Coursework • Written examinations • Project work • Research Proposal • Presentations • Oral presentations • Dissertation

Academic Feedback Policy
Feedback will be provided within 2 weeks for small pieces of coursework (journal clubs, poster project) and within 3 weeks for larger assessments (research proposal, bespoke courses). For lectures courses attended alongside final year UG (MSci) students, feedback will be provided at the same time as for the MSci students. In all cases, the MRes students will be provided with information on when they can expect the feedback to be provided. If there is any delay, the students will be informed.
Re-sit Policy
The College's Policy on Re-sits is available at: www.imperial.ac.uk/registry/exams/resit
Mitigating Circumstances Policy
Students may be eligible to apply for mitigation if they have suffered from serious and unforeseen circumstances during the course of their studies that have adversely affected their ability to complete an assessment task and/or their performance in a piece of assessment. The College's Policy on Mitigating Circumstances is available at: http://www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/

Assessment Dates & Deadlines	
Written Examinations	Spring & Summer
Coursework Assessments	Continuous
Project Deadlines	Summer
Practical Assessments	Autumn/Spring

Assessment Structure

Marking Scheme

Pass:

- The Pass Mark for all **postgraduate** taught programme elements is 50%.
- Students must pass all elements in order to be awarded a degree.

Merit:

- In order to be awarded a result of merit, a candidate must obtain an aggregate mark of 60% or greater.
- Where appropriate, a Board of Examiners may award a result of merit where a candidate has achieved an aggregate mark of 60% or greater across the programme as a whole AND has obtained a mark of 60% or greater in each element with the exception of one element AND has obtained a mark of 50% or greater in this latter element.

Distinction:

- In order to be awarded a result of distinction, a candidate must obtain an aggregate mark of 70% or greater.

- Where appropriate, a Board of Examiners may award a result of distinction where a candidate has achieved an aggregate mark of 70% or greater across the programme as a whole AND has obtained a mark of 70% or greater in each element with the exception of one element AND has obtained a mark of 60% or greater in this latter element.

Module Weightings		
Module	Module	% Module Weighting
Taught Module	Chemistry Core Courses (20%), Materials Characterisation Courses (5%), Advanced Journal Club (15%)	40%
Research module	Research Proposal (9%), Research Project Report (42%), Project Oral Presentation (9%). Numbers in brackets represent proportion of the overall programme credit.	60%

Taught Module
Chemistry Core Course • Chemistry of Nanomaterials (CHEM97003), 12 Lectures **Chemistry Core Courses; students choose 2 from the 3 options below;** • Plastic Electronics: from materials chemistry to device applications (CHEM97008), 12 Lectures • Renewable Energy: from solar cells to fuel cells: the chemistry of sustainable energy (CHEM97004), 12 Lectures • Membrane Biophysics (CHEM97010), 12 Lectures **Materials Characterisation Materials Department** • 24 lectures, Labs & workshops **Advanced Lectures Journal Club** • Selected academics from across the college deliver lectures focused on their own research interests.

Indicative Module List											
Code	Title	Core/ Elective	L&T Hours	Ind. Study Hours	Place-ment Hours	Total Hours	% Written Exam	% Course-work	% Practical	FHEQ Level	ECTS
	Taught Module (Includes Chemistry Core Courses, Materials Characterisation Courses, Advanced Journal Club)	CORE	87	713	0	800	40%	60%	0%	7	32
	Research Module (Includes Research Proposal, Research Project Report and Project Oral Presentation)	CORE	0	400	1050	1450	0%	100%	0%	7	58

Supporting Information
The Programme Handbook is available at: https://www.imperial.ac.uk/study/pg/chemistry/nanomaterials/
The Module Handbook is available at: https://www.imperial.ac.uk/study/pg/chemistry/nanomaterials/
The College's entry requirements for postgraduate programmes can be found at: www.imperial.ac.uk/study/pg/apply/requirements
The College's Quality & Enhancement Framework is available at: www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance
The College's Academic and Examination Regulations can be found at: https://www.imperial.ac.uk/about/governance/academic-governance/regulations
Imperial College is an independent corporation whose legal status derives from a Royal Charter granted under Letters Patent in 1907. In 2007 a Supplemental Charter and Statutes was granted by HM Queen Elizabeth II. This Supplemental Charter, which came into force on the date of the College's Centenary, 8th July 2007, established the College as a University with the name and style of "The Imperial College of Science, Technology and Medicine". http://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/charter-and-statutes/
Imperial College London is regulated by the Office for Students (OfS) https://www.officeforstudents.org.uk/