MSc in Conservation Science

Imperial College London
This unique course will give you the skills required for success in the highly competitive field of international conservation.

The key features are:

- The course is taught by a partnership including one of the world’s leading scientific universities, Imperial College London, and three of the highest profile international conservation practitioner organisations in the UK - the Royal Botanic Gardens Kew, the Institute of Zoology of the Zoological Society of London, and the Durrell Wildlife Conservation Trust, each bringing their own expertise and perspectives to the course.

- You will be immersed in the ongoing conservation work of these organisations, and will be able to choose 6 month research projects linked to their conservation programmes, ensuring that your project contributes to real-world conservation.

The course has a particular focus on:

Interactive learning, so that you learn actively as a group, and focus on current issues and research.

Developing the skills needed to make it as a conservation professional; writing proposals, managing projects, facilitating stakeholder engagement, presenting posters and talks at scientific forums.

A strong quantitative basis for conservation work, including decision theory, conservation planning, statistical computing and modelling.

Learning to collect, analyse and use both socio-economic and biological information, to give a truly interdisciplinary understanding of the theory and practice of conservation.

Not just an ability to analyse conservation issues, but how to put this understanding into action - implementing successful conservation projects.

We don't ask for specific academic qualifications in particular subjects, beyond Imperial College's minimum academic standards for an MSc - instead we are looking for highly motivated and committed people who can show either substantial field experience in a relevant area or evidence of academic ability (or both!).
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Taught course syllabus

The taught course runs for two terms (20 weeks), from October to March. It has four modules; Framework for analysis; Techniques in Conservation Science; Implementing conservation action; Case studies. The coursework is taught through seminars, workshops and discussion of the literature, based around resource packs, hence stimulating active and critical learning, rather than passive assimilation of facts.

Framework for analysis: 5 weeks

In this section, we develop a broad understanding of the interactions between biodiversity loss and human society. We analyse the biological and social processes that lead to biodiversity loss. We examine the spatio-temporal scale at which they occur, from individual decision-makers to international treaties, and from local habitat degradation to global climate change. We also look at the difficult issues surrounding conservation - who is it for? Who gains and loses from conservation action? How do we value nature and how do we make difficult trade-offs between the values held by different people?

Introduction. The current state of the environment, poverty-environment linkages, drivers of biodiversity loss, setting conservation within this scene.

Human aspects. Governance and institutions. Global and national institutions, the role of the NGO sector, international law. Conservation ethics – working overseas, people-wildlife interactions, cultural diversity, protected areas. Community-based conservation.

Economics and conservation. Macro-economic drivers of biodiversity loss, microeconomic interactions between households and resources.


Techniques in conservation science: 5 weeks

In this section, we gain the skills needed to gather and analyse data, both quantitative and qualitative. These include social science research techniques, methods for monitoring biological populations and for statistical analysis. We emphasise the skills required to use those data collected to make defensible decisions in a rigorous way, even when information is lacking. We also look at some of the new techniques that are starting to revolutionise the practice of data collection and analysis.

Sampling human populations: Participatory Rural Appraisal, questionnaire surveys, qualitative and quantitative research, economic data, analysis of social data.

Sampling biological populations: Distance sampling, mark-recapture, parameter estimation, matrix models.

Statistical Computing: Experimental design and data collection, graphical methods of data exploration, introduction to the R language, the assumptions of parametric statistical analysis, probability distributions, mathematical functions, statistical models, classical tests, regression with continuous explanatory variables, Analysis of Variance.


Making decisions: Converting data into information. Uncertainty and decision making. The precautionary principle. Decision theory.
Implementing conservation action: 3 weeks

This section looks at the practicalities of implementing conservation action. We look at how to set conservation priorities when both funding and information are limited. We discuss how conservation is funded, and develop practical skills in obtaining funding and project management. We also consider how to manage the relationships between people who are affected by conservation, so that a consensus for conservation can be built.


Facilitating conservation action. Decision making, Conflict management, Cross-cultural sensitivity, Group dynamics, Active listening, Consensus building.

Case studies in conservation: 5 weeks

In this final section, we put all the pieces together and show how conservation works in reality. The case studies not only give an insight into these particular issues, but also allow the students to evaluate the progress of conservation through the steps of information gathering, problem definition, development of intervention plans, action and then monitoring, learning and adaptive management. How are ethical, political, financial and human issues expressed in these real-life situations? What are the key biological processes, and how can we monitor conservation outcomes? We show how the general framework developed through the course applies in different situations, which will then allow students to use it for the issue of particular interest to them.

Resource exploitation. Using bushmeat and fisheries as examples of human-wildlife interaction through harvesting, and the economic and biological issues involved.

Plant conservation. A module examining the practical issues of in-situ and ex-situ conservation of plants, focussing on Kew’s conservation programmes.

Small population management. Managing small populations (particularly focussing on biological issues), based around Durrell’s conservation programme, both in situ and ex situ. The use of models - PVAs.

Invasive species. Invasive plants and animals; prediction, effects and control. Also covering disease, and particularly emerging diseases.

Protected area management. Classifying protection status, involving stakeholders, ensuring compliance, PA financing, case studies from around the world.

Debates weeks: 2 weeks

Students work in small groups with researchers at the Institute of Zoology (term 1) and Kew (term 2) to develop a presentation on a controversial topic within their research programme. On the final day, each student group presents their papers in a debate format. This week encourages collaborative interactions with researchers at these institutions, and builds a base for research project topics.
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Research Project

Each student completes a 23 week research project from April to September. The project will be drawn broadly from the areas of conservation science covered in the course. The project will be supervised by a full-time member of staff from Imperial College or one of the three partner institutions. The projects will be based at the site of the most appropriate of the four partner institutions, and may be conducted, in part or in whole, at external research institutions or agencies in the UK or overseas. In this case, students may also have an external supervisor based at the external institution. Fully desk-based projects are also available. The project is designed to give practical experience of desk-based or field research and provide the opportunity to learn a wide range of skills.

Typical research projects

- Livelihoods in an artisanal fishing community and the effect of ecotourism.
- Reconciling protected area management and sustainable development in the Indian Himalayas.
- Public attitudes toward mammal reintroductions: a Highland case study
- A spatial analysis of the drivers of livelihood and land use change in Maasailand, Tanzania
- Perceptions of natural resources and the effect of ecotourism, in Grande Riviere, Trinidad
- The status of the Saiga antelope in the Ustiurt region of western Kazakhstan
- Estimating the total economic value of coral reefs for residents of Sampela, Sulawesi.
- Habitat suitability modelling for determining important conservation areas for endemic mammals in Hispaniola.
- Measuring dependence on introduced mammals for food in the islands of Sao Tome and Principe.
- Resolving human-bear conflict in the Venezuelan Andes.
- Improving large and small mammal management in the Manas Tiger Reserve, India.
- Impact of introduced species on endemic fish in the Nosivolo region, Madagascar.
- Source-sink dynamics of a mammal invasives, the Indian mongoose, in St. Lucia.
- Non-invasive techniques using ejecta pellets for mapping Livingstone’s fruit bat distribution in the Comores.
- Do wildlife laws protect species in west and central Africa?
- Evaluating the use of camera traps to estimate animal abundance.
- Determining the extent of emergence of chytridiomycosis in British amphibians.
- The prevalence and impacts of distemper infection in Californian sea lions.
- Identifying key threat processes in the world's primates.
- Development of species recovery plans for threatened plants in Anegada, British Virgin Islands.
- Plant community analysis of forests in the Centre Hills, Montserrat.
- Assessment of the impacts of invasive plant species in Grand Cayman.

Typical external collaborators:

IUCN, Conservation International, GRASP, World Pheasant Association; Cullman & Hurt Community Wildlife Programme, Tanzania; WWF-Malaysia; Centre for the Study and Conservation of Wild Animals of Kalmykia, Russia; Institute of Zoology, Kazakhstan; Operation Wallacea; University of the West Indies; Wildlife Institute of India; Cabo Delgado Biodiversity and Tourism Project; Game Conservancy Trust, Indian NGOs; Government of Madagascar; Government of Comores; Government of Assam, and India; Grupo Jaragua (Dominican Republic); Forestry Department in St. Lucia; UK Overseas Territories Conservation Forum.

Assessment

You will be assessed via examination - two 3-hour open book exams at the end of each term (30% of marks); coursework - a poster, grant proposal, and two oral presentations with accompanying essays (20%); and a <15,000 dissertation on your research project (50%). A Pass is achieved if you obtain 50% or more on all 3 elements, and a Distinction if you obtain 70% or more on all 3 elements.
Logistics

The course is based at the Silwood Park campus of Imperial College, with a 2-week stay at Durrell in Jersey. Transport to Kew and the Institute of Zoology is provided as required.

Silwood Park is one of the academic campuses of Imperial College London, situated near Ascot in Berkshire. It has residential accommodation for students on site, and has a large graduate community of at least 90 students, many from overseas, studying for MScs and PhDs. There are also many post-docs and academic staff who are part of the Division of Biology’s Ecology and Evolution Section, the Centre for Environmental Policy and the NERC Centre for Population Biology. The centre of social life at Silwood is the bar with its associated games rooms, TV lounge and canteen. There are also sports facilities (squash, tennis, well equipped gym) with excellent swimming pools and other sports grounds and parklands close by at Windsor and Bracknell. There is a wide range of clubs, run by students for students including an Escape Club, which organizes weekends away (often in climbing or hill walking districts) and a thriving natural history club for botanizing and bird watching. Silwood is fortunate in having about 250 acres of land with natural habitats including grassland, scrubland, mature woodland and a large lake. Much of it is relatively undisturbed, providing a refuge for wildlife and opportunity for ecological study.

The Royal Botanic Gardens, Kew is a scientific and educational institution devoted to increasing knowledge and public understanding of plant and fungal diversity - how it came to be, what its current status is, how it can be conserved for future generations and how it can be used in sustainable ways for human benefit. The science and conservation departments are located over two sites. The site at Kew, declared a World Heritage Site in 2003, is home of the Herbarium, Jodrell Laboratory, ex situ facilities for plant conservation and the main Library which houses one of the finest collections of botanical books, journals and archives in the world. The Seed Conservation Department and Millennium Seed Bank Project are based at Wakehurst Place in Sussex. Both sites have excellent educational facilities.

The Durrell Wildlife Conservation Trust was founded by author and naturalist Gerald Durrell over 40 years ago with the mission to save species from extinction and it has a proven track record of doing just that. Species that have been pulled back from the brink include the Mauritius kestrel, pink pigeon, echo parakeet and Mallorcan midwife toad, and our dedicated conservationists are hard at work in threatened habitats around the world continuing the battle to protect and conserve many more. With its international headquarters in Jersey, the Trust has built up a worldwide reputation for its pioneering conservation techniques. Today, Durrell continues to develop its overseas work in new areas of the world, with a particular focus on vulnerable communities of endemic animals which make such a valuable contribution to global biodiversity.
More about our institutions:

**Imperial College**
Graduate prospectus: [http://www.imperial.ac.uk/P1212.htm](http://www.imperial.ac.uk/P1212.htm)
Silwood Park: [http://www3.imperial.ac.uk/silwoodparkcampus](http://www3.imperial.ac.uk/silwoodparkcampus)
Imperial College Conservation Science Group: [http://www.iccs.org.uk](http://www.iccs.org.uk)

**Durrell Wildlife Conservation Trust**
Main page: [http://www.durrellwildlife.org/](http://www.durrellwildlife.org/)

**Royal Botanic Gardens Kew**
Main page: [http://www.kew.org/](http://www.kew.org/)

**Institute of Zoology**
Main page: [http://www.zoo.cam.ac.uk/ioz/index.htm](http://www.zoo.cam.ac.uk/ioz/index.htm)
Marcus Rowcliffe: [http://www.zoo.cam.ac.uk/ioz/people/rowcliffe.htm](http://www.zoo.cam.ac.uk/ioz/people/rowcliffe.htm)

Contact Dr. E.J. Milner-Gulland (Coordinator) for further information: e.j.milner-gulland@imperial.ac.uk

To apply:

Download an MSc application form, at [http://www.imperial.ac.uk/P1397.htm](http://www.imperial.ac.uk/P1397.htm)