LONDON'S GLOBAL UNIVERSITY

UCL

Risk and Disaster Science MSc Space Risks Pathway

2020/21 entry

www.ucl.ac.uk/rdr/

Artists impression of space weather impact on satellites, image: ESA - Pierre Carril

RDR

UCL Institute for Risk and Disaster Reduction

Risk and Disaster Science MSc Space Risks Pathway

In an increasingly technological and globally connected world, risks to space-based communications systems and critical infrastructure are emerging threats to national security and businesses. In a programme that unites emergency response, disaster risk reduction and space technology, you will learn about satellite technology, mission design, hazards and vulnerabilities unique to outer space, disaster response, and the monitoring of hazards on Earth from outer space.

Programme themes

Hazards of Outer Space

Space weather, radiation, debris

Emerging risks and the future of disaster monitoring

Satellite Design and Operations in Space

Learn how to design and operate a satellite from the largest university space science department in the UK

Understanding Vulnerability

From fragility curves describing damage to buildings to social vulnerability of individuals and society

Quantifying Risk

What is risk and how to we measure it?

Components of risk: exposure, hazard, vulnerability

Multidisciplinary Holistic Approaches

Integrating scientific knowledge into disaster risk reduction research, policy and practice
Communicating with stakeholders

Managing Disasters

How to apply plans to manage real emergencies

Teaching and learning

Learn from world-class researchers and professionals delivering the programme through a combination of lectures, class discussions, problem-solving exercises, practicals, field trips, directed reading, student-led dialogue, and a practitioner-led real-time disaster scenario event.

Assessment is by individual and group presentations, coursework, written examinations and a research project.

TechDemo Sat
Space Science Laboratory (MSSL)

Why study at UCL?

UCL is one of the world's leading universities, regularly featuring in the top 10 in global rankings.

The **Institute for Risk and Disaster Reduction** (IRDR), leads multidisciplinary research, knowledge exchange and advanced teaching across UCL.. As a student, you will be encouraged to join our active seminar series, high-profile public discussion meetings and the networking events we host.

Part of the programme will be delivered by the Department of Space and Climate Physics (SCP), with its Mullard Space Science Laboratory (MSSL), is one of the largest space science labs in the world. It has led and participated in more than 35 satellite missions. MSSL scientists and engineers work together to produce instruments at the forefront of research.

London is one of the world's great cosmopolitan cities. It is an international hub for global finance and risk management, NGOs, and engineering consultancies. The IRDR nurtures networks across London, and beyond.

"London itself is an unparalleled breeding ground of ideas for anyone interested in research" (MSc student 2015/16).

Student and professor use the MSSL ground station to communicate with satellites

Careers

Whether you wish to start a new career in risk and disaster reduction or you already have experience we are here to support you. With an MSc in Risk and Disaster Science you will have excellent academic credibility coupled with practical and analytical skills.

We run an annual *Careers and Opportunities Forum* which offers expert and targeted advice, and hosts stalls from a range of employers and headhunters in the field of risk and disaster reduction. Our graduates are highly sought-after in the following sectors: insurance, risk management, satellite industry, data science, NGOs, government agencies, finance, consultancy and academic research.

Some career destinations of recent IRDR graduates:
Disaster Risk Management Consultant, World Bank
Project Officer, Global Risk Forum Davos
Global Engagement Fellow, Interpeace
Civil Contingencies Coordinator, UK Local Government
Project Officer, Cairo Local Government
Reinsurance Claims Management Executive AXA Global Re, Paris
Business Continuity Consultant, Arup
Business Continuity & Resilience Consultant, PwC
Space Engineering, Airbus
Space Engineering, AstroSat

Programme Structure

Modes of study: Full time: 1 year. Part time: 2 years

Students take eight taught modules and an independent research project. Students must take two or three optional modules from the Department of Space and Climate Physics.

For further information see www.ucl.ac.uk/rdr/

Degree Programme Modules

All optional modules are subject to availability and particular modules may not be possible in any given year

Five compulsory taught modules (15 credits each)

1 Integrating Science into Risk and Disaster Reduction		**2 Emergency and Crisis Planning and Management**	
Quantitive risk assessment	Risk transfer & communication	Command procedures	Warning and evacuation
3 Data Analysis and Interpretation		**4 Risk Analysis for Disaster Science**	
Statistical methods	R & GIS	Earthquake science	Statistical geophysics
5 Practice and Appraisal of Research			
Research methods	Research project design		

Three optional taught modules (15 credits each) from

SCP optional modules are marked with an aster

1 Space Systems Engineering*		**2 Space Sciences Environment and Satellite Missions***	
Systems lifecycle	Project management	Launch, orbits and propulsion	Mission planning, and operations
3 Mechanical Design of Spacecraft*		**4 Spacecraft Design - Electronic Sub-systems***	
Design considerations	Mechanical and thermal engineering	Power conditioning	Signal conversion
5 Space Data Systems and Processing*		**6 Space Instrumentation and Applications***	
Ground stations, data handling and link design	Telecoms infrastructure, Iridium, applications	Spacecraft as observation platforms	Spacecraft-environment interactions
7 Space Weather and Technological Vulnerability		**8 Business Continuity Management and Organisational**	
Satellite vulnerability	Risks to critical infrastructure	Managing operations	Supply chain disruptions

Independent project (60 credits)

The independent research project culminates in a 10,000 to 12,000 word dissertation and poster presentation. Projects may be laboratory, field, theory or modelling based and can be conducted in collaboration with external industry, international research organizations or NGO partners.

Field studies and group working

Current field visits include: the Thames Barrier and disaster management; Cambridge flood hazard; a disaster scenario exercise with a partner organization; the Blacknest Seismological Observatory; the Met Office; Southwest England for integrated group projects covering hazard mapping, vulnerability assessment, and critical infrastructure assessment, with Hinkley Point nuclear power station as an example.

IRDR Programmes:

Risk, Disaster and Resilience MSc

Risk, Disaster and Resilience MSc Management Pathway

Risk and Disaster Science MSc

Risk and Disaster Science MSc Space Risks Pathway

Risk and Disaster Reduction MRes

Risk and Disaster Reduction PhD

Admissions Contact
Rebecca Sibley
Email: irdr-enquiries@ucl.ac.uk

Postal address
Institute for Risk and Disaster Reduction
University College London
Gower Street
London WC1E 6BT
United Kingdom

IRDR

UCL Institute for Risk and Disaster Reduction

Web: www.ucl.ac.uk/rdr
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MSc Risk and Disaster Science Key information

Programme starts
September 2020

Modes and duration
Full time: 1 year Part time: 2 years

Tuition fees (2020/21)
UK/EU: £11,830 (FT) £5,975 (PT)
Overseas: £24,980 (FT) £12,470 (PT)

Scholarships
UCL offers a selection of scholarships for supporting postgraduate studies. Details of funding opportunities can be found at: www.ucl.ac.uk/scholarships. Further advice and programme-specific scholarships information can be obtained from the Masters Programmes section of the IRDR website.
Application dates

Open: November 2019 Close: 28 August 2020

Note on fees: The tuition fees shown are for the year indicated above. Fees for subsequent years may increase or otherwise vary. Further information on fee status, fee increases and the fee schedule can be viewed on the UCL Current Students website.

Entry requirements
Normally a minimum of an upper second-class UK Bachelor's degree in a relevant science discipline, engineering or mathematics, or an equivalent overseas qualification.

Mathematics requirements
Mathematical methods taken in science or engineering degrees is sufficient (Enquire if in doubt).

English language requirements
If your education has not been conducted in the English language, you will be expected to demonstrate evidence of an adequate level of English proficiency.

The English language level for this programme is: **Standard**
Further information can be found on our website.

International students
Country-specific information, including details of when UCL representatives are visiting your part of the world, can be obtained from the UCL International Students website.


Credit: Nevalenx