LONDON'S GLOBAL UNIVERSITY

UCL

Space Risk and Disaster Reduction MSc

2017/18 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

Department of Space and Climate Physics

Space Risk and Disaster Reduction MSc

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

Learn about emerging risks and the future of disaster monitoring

Understanding Vulnerability

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

Satellite Design and Operations in Space

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

Managing Disasters

How to apply plans to manage real emergencies

Multidisciplinary Holistic Approaches

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

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 and a practitioner-led real-time disaster scenario event. There is an emphasis on hands-on learning and tutorial-style dialogue between students and lecturers.

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. We have global, national and local recognition, evidenced by international attendance at our annual Academic Summit, our Annual Conference addressed by the UK Government's Chief Scientific Advisor, and our training of London Resilience's gold command. As a student, you will be encouraged to join our active seminar series, high-profile public discussion meetings and the networking events we host.

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 Space Risk and Disaster Reduction you will have excellent academic foundation 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-SCP graduates:

Disaster Risk Management Consultant, World Bank
Project Officer, Global Risk Forum Davos
Civil Contingencies Coordinator, UK Local Government
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.

A Postgraduate Diploma comprising eight taught modules can be taken full-time or part-time over two years.

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

Degree Programme Modules

Available modules and content may vary

Six compulsory taught modules (15 credits each)

1 Integrating Science into Risk and Disaster Reduction		**2 Emergency and Crisis Management**	
Risk, uncertainty & disasters	Quantitative risk assessment	Command procedures	Search and rescue
Science and policy	Communication	Logistics	Warning and evacuation
3 Space Weather Risks		**4 Space Science, Environment and Satellite Missions**	
Solar & radiation physics	Satellite vulnerability	History of space flight	Surviving in space
Risks to critical infrastructure	Forecasting & mitigation	Launch, orbits & propulsion	Mission planning, operations
5 Space Systems Engineering		**6 Research Appraisal and Proposal**	
Systems lifecycle	Project management	Formulate research question	Appraising research
Spacecraft subsystems	Communications in space	Project management	Presentation of research

Two optional taught modules (15 credits each) from

1 Natural and Anthropogenic Hazards and Vulnerability		**2 Space Instrumentation and Applications**	
Causes, severity & frequency	Forecasting limitations	Spacecraft as observation platforms	Spacecraft-environment interactions
3 Emergency and Crisis Planning		**4 Space-based Communications Systems**	
Methodology and techniques	Standards and principles	Ground stations, data handling and link design	Telecoms infrastructure, Iridium, applications
5 Earthquake Science and Seismic Risks		**6 Mechanical Design of Spacecraft**	
Statistical seismology	Satellite observation (inSAR)	Design considerations	Mechanical and thermal engineering
7 Catastrophe Risk Modelling		**8 Spacecraft Design - Electronic Sub-systems**	
Probabilistic modelling	Physical vulnerability	Power conditioning	Signal conversion
9 Research and Disaster Reduction Research Tools		**10 Global Monitoring and Security**	
Statistical methods	Hypothesis testing	Global Earth Observation Systems / GMES	Societal benefits of space observation

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 partners including industry, international research organizations or NGOs.

Field studies and group working

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

IRDR Programmes:

Risk, Disaster and Resilience MSc

Risk and Disaster Science MSc

Space Risks and Disaster Reduction MSc

Risk and Disaster Reduction MRes

Risk and Disaster Reduction PhD

Postgraduate Diploma

Admissions Contact
Dr Rosanna Smith
Phone: +44 (0)20 7679 3157
Email: irdr_enquiries@ucl.ac.uk

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

Location
Main Bloomsbury Campus, Central London
Main Wilkins Building, South Wing (2nd floor)

IRDR

UCL Institute for Risk and Disaster Reduction

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

Programme starts
September 2017

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

Tuition fees (2017/18)

UK/EU:	£9,020 (FT)	£4,480 (PT)
Overseas:	£22,400 (FT)	£10,980 (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

Application dates
Open: 3 October 2016 Close: 28 July 2017

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.

Optional qualifications: This degree is also available as a PG Diploma with fees set accordingly.

Location: Central London (Bloomsbury)

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: **Good**
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