TÜVRheinland®
Risktec

Postgraduate Programme Catalogue

Postgraduate Programmes

Postgraduate Certificate (PgCert)

1 year | 6 modules | 60 credits

The standard PgCert distance learning modules are:

- Principles of Risk Management
- Hazard Identification
- Research Methods in Risk & Safety Management
- Risk Analysis
- Health, Safety & Environment (HSE) Management Systems
- Risk Reduction & ALARP

Postgraduate Diploma (PgDip)

2 years | 12 modules | 120 credits

The standard PgDip distance learning modules are the six PgCert modules plus:

- Bowtie Risk Management
- Emergency Response & Crisis Management
- HAZOP Study
- Human Factors in Design and Operations
- Incident Investigation & Analysis
- Safety / HSE Cases

Master of Science (MSc)

3 years | 12 modules, plus dissertation | 180 credits

The MSc programme comprises the twelve PgDip modules plus an academic project (dissertation) of 15,000 words.

In partnership with LIVERPOOL JOHN MOORES UNIVERSITY

TÜVRheinland® Risktec

PgCert Modules

Principles of Risk Management

Hazard Identification

Research Methods in Risk & Safety Management

Risk Analysis

Health, Safety & Environment (HSE) Management Systems

Risk Reduction & ALARP

Principles of Risk Management

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Cross-sector

What's the purpose?

The course provides an overview of risk management in the high hazard industries. It discusses the drivers for risk management, defines some of the fundamental terminology and introduces major risk management concepts, such as risk tolerability criteria and As Low As Reasonably Practicable (ALARP). The course briefly introduces some key risk assessment techniques and the situations in which they may be used. It considers the purpose and structure of an HSE/safety case and an HSE Management System (HSE MS). The course includes case studies of some significant historical accidents and their root causes, and evaluates the importance of safety leadership and organisational culture in preventing accidents.

Who is this for?

Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?

- Drivers for risk management
- Definitions and terminology
- Elements of the risk management process
- Demonstration of ALARP
- Example tools, techniques and studies
- The HSE case (or safety case) and HSE management system
- Leadership, culture and behaviours
- Causes of major accidents

After completing the course you should be able to:

1. Deconstruct the risk management process into its constituent components
2. Contrast key risk management terms such as "hazard", "consequence" and "risk"
3. Evaluate the various drivers which cause organisations to manage risk
4. Demonstrate expertise in academic referencing (postgraduate programme only)

	Hours	Delivery methods	
		Face-to-face	Distance learning
Postgraduate	80	2 days, followed by assessment	8 weeks' duration
Risktec CPD	20	2 days, followed by assessment	12 weeks' duration
Attendance only	15	2 days	---

If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

What prior study is recommended?

Education, skills or experience equivalent to undergraduate level.

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Hazard Identification

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Cross-sector

What's the purpose?

This course provides an understanding and awareness of the tools and techniques available for hazard identification, where they can be applied and what limitations may exist. Students will be introduced to the concept of HAZID, including the HAZID team and process. A range of other hazard identification techniques will also be introduced.

Who is this for?

Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?

- Basic concepts
- Overview of hazard identification techniques
- Hazard identification through the project lifecycle
- Failure Modes and Effects Analysis (FMEA)
- Hazard and Operability (HAZOP) studies
- HAZID/checklist approach
- HAZID versus HAZOP
- Making recommendations

After completing the course you should be able to:

1. Assess the role of hazard identification in the risk management process
2. Critically review the tools and techniques available to carry out effective hazard identification at each lifecycle stage
3. Design a fit-for-purpose hazard identification study

	Hours	Delivery methods	
		Face-to-face	Distance learning
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Attendance only	15	2 days	---

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Research Methods in Risk and Safety Management

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What's the purpose?

To provide the theoretical background for conducting postgraduate project work. The course provides a valuable opportunity for graduates to acquire necessary skills and training to conduct research at postgraduate level. This includes giving the student an opportunity to develop ideas for a project or dissertation in risk and safety management.

Who is this for?

All postgraduate students.

What does it cover?

- Study skills review
- Introduction: why do research?
- Defining the research problem
- Literature search and review techniques
- Research methodologies including statistical techniques, questionnaires and interviewing
- Project analysis and design
- Ethics in research
- Project planning
- Time management
- Gantt charts
- Presentation skills

After completing the course you should be able to:

1. Communicate findings in an accepted format
2. Assess previous research completed in a subject area
3. Critically appraise research data and assimilate, integrate and discuss in a logical way
4. Demonstrate compliance with appropriate ethical standards related to any research undertaken
5. Produce an appropriate project description and specification

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Risk Analysis

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What's the purpose?

To provide a solid foundation of knowledge of risk assessment tools, with an emphasis on the concept of risk and qualitative risk assessment techniques.

Who is this for?

Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?

- Identifying and recording hazards
- The risk assessment matrix
- Risk analysis and risk reduction through project or facility lifecycle
- Significance of environmental aspects; environmental risk assessment
- Human factors in design
- Health risk assessment (HRA)
- Security risk assessment
- Business and/or commercial risk assessment
- Quantitative risk assessment (QRA) techniques
- Safety Integrity Level (SIL) assessment
- Layers of Protection Analysis (LOPA)
- External hazards, good practice in risk analysis

After completing the course you should be able to:

1. Logically deduce the most appropriate risk assessment tool or technique to be used, depending on circumstances
2. Apply certain risk assessment techniques
3. Critically review example risk assessments and techniques

	Hours	Delivery methods	
		Face-to-face	Distance learning
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Risktec CPD	20	2 days, followed by assessment	12 weeks' duration
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What prior study is recommended?

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Health, Safety and Environmental (HSE) Management Systems

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Cross-sector

What's the purpose?

A formal management system or framework can help an organisation to manage Health, Safety and the Environment (HSE). The aim of this course is to deliver an understanding of what constitutes an HSE Management System (HSE MS), and how these systems are applied in different hazardous industries. Legislative requirements and international standards for an HSE MS are also discussed. The course examines issues associated with the documentation and the human elements for the successful implementation of an HSE MS.

Who is this for?

Managers, HSE advisors and risk management practitioners.

What does it cover?

- Definition of an HSE MS
- Elements of an HSE MS
- Guidance and legislation
- Implementation aspects
- Documenting and implementing the HSE MS

After completing the course you should be able to:

1. Discuss the key factors to be considered when developing an HSE MS
2. Assess the role of HSE MSs in reducing the probability and consequences of major accidents
3. Examine issues associated with the implementation of HSE MSs

	Hours	Delivery methods	
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Risk Reduction & ALARP

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What's the purpose?

ALARP (As Low As Reasonably Practicable) is a commonly used but often misunderstood concept. The purpose of this course is to enable students to understand the hierarchy of risk reduction measures and the options for risk reduction in the project lifecycle. Students will be introduced to the concept of ALARP, practise applying it and learn how to demonstrate that risk has been reduced to ALARP levels.

Who is this for?

Project and operational managers, engineers and HSE professionals.

What does it cover?

- Risk management summary
- Hierarchy of risk reduction measures
- Risk reduction through the project lifecycle
- The ALARP concept
- Demonstrating ALARP
- Qualitative and semi-quantitative approaches
- Cost Benefit Analysis (CBA)
- Societal risk

After completing the course you should be able to:

1. Identify different options available for risk reduction
2. Decide when risk reduction measures can best be used
3. Describe the concepts of "tolerability of risk" and "As Low As Reasonably Practicable (ALARP)"
4. Apply the ALARP concept and conduct an ALARP assessment to an appropriate level of detail

	Hours	Delivery methods	
		Face-to-face	Distance learning
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PgDip Modules

Bowtie Risk Management

Emergency Response & Crisis Management

Human Factors in Design and Operations

HAZOP Study

Incident Investigation & Analysis

Safety / HSE Cases

Bowtie Risk Management

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Cross-sector

What's the purpose?

Bowtie analysis (also known as barrier diagrams) is an increasingly popular approach to help manage risk. This course introduces the bowtie methodology and examines in detail the various bowtie analysis components. The course also provides a critical review of the method's benefits, limitations and practical uses, with hands-on practice at applying the technique.

Who is this for?

Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?

- Introduction to risk assessment and bowties
- The bowtie method
- Assuring barrier integrity
- Effectiveness and ALARP for bowties
- Benefits and practical uses of bowties
- Facilitating bowtie workshops
- Bowtie software tools

After completing the course you should be able to:

1. Analyse hazard scenarios by applying the bowtie method and designing a bowtie diagram
2. Develop integrity assurance for bowtie barriers
3. Devise risk acceptance criteria for hazards in bowties

	Hours	Delivery methods	
		Face-to-face	Distance learning
Postgraduate	80	2 days, followed by assessment	8 weeks' duration
Risktec CPD	20	2 days, followed by assessment	12 weeks' duration
Attendance only	15	2 days	---

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Emergency Response and Crisis Management

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What's the purpose?

The purpose of this course is to enable students to understand and apply the principles of emergency response planning and crisis management. It considers the need for emergency and crisis response planning and an integrated approach to emergency management. Emergency organisation and procedures are also studied.

Who is this for?

Managers, supervisors and HSE professionals who may be required to develop emergency or crisis response plans or exercises.

What does it cover?

- Emergency management basics
- Emergency anticipation and assessment
- Emergency prevention and mitigation
- Emergency preparations - planning, organisation, training, documentation, mutual aid, drills & exercises, etc.
- Emergency response and recovery
- Crisis management overview

After completing the course you should be able to:

1. Define the requirements and importance of Emergency and Crisis Response Management
2. Discuss aspects of integrated emergency management
3. Generate appropriate emergency and crisis response documentation

	Hours	Delivery methods	
		Face-to-face	Distance learning
Postgraduate	80	2 days, followed by assessment	8 weeks' duration
Risktec CPD	20	2 days, followed by assessment	12 weeks' duration
Attendance only	15	2 days	---

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Human Factors in Design and Operations

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Cross-sector

What's the purpose?

The purpose of this course is to explain how an understanding of human abilities, limitations and needs can be applied to the design and assessment of tasks, equipment, systems and processes, in order to reduce human error, improve safety and increase efficiency. It also highlights how and why human errors occur, and describes the methods, tools and techniques that can be used to identify, analyse and reduce them. Key Human Factors tools and methodologies will be demonstrated through the use of real-world practical examples from high hazard industries.

Who is this for?

Managers, supervisors and HSE professionals.

What does it cover?

- Introduction to Human Factors
- Human Factors Integration (HFI)
- Human Factors support to the design lifecycle for high hazard industries
- Defining human error
- Human error and violations
- Human Reliability Analysis (HRA)

After completing the course you should be able to:

1. Analyse the role of HF in systems engineering in order to achieve safe and effective designs, systems and processes
2. Evaluate the human characteristics which influence a user's experience of the workplace environment to ensure it is comfortable, healthy, safe and effective (accounting for physical and psychological capabilities and limitations)
3. Evaluate human error types (including violation) and their potential causes
4. Appraise human reliability and performance using appropriate methods in order to develop measures to reduce the likelihood of human error

	Hours	Delivery methods	
		Face-to-face	Distance learning
Postgraduate	80	2 days, followed by assessment	8 weeks' duration
Risktec CPD	20	2 days, followed by assessment	12 weeks' duration
Attendance only	15	2 days	---

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Hazard and Operability (HAZOP) Study

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Cross-sector

What's the purpose?

To gain an understanding of the technique, application and limitations of the HAZOP study methodology, one of the most commonly used hazard identification methods. This course does not provide detailed HAZOP facilitator training but does cover the skills needed and the work that the facilitator must do as part of the HAZOP study. Students will have the opportunity to practise the technique.

Who is this for?

Project Managers, Operations Managers, Process Engineers, Operators, HSE advisors and risk management practitioners.

What does it cover?

- Introduction to risk assessment
- Basic engineering terminology
- Process safety incidents – lessons learned
- HAZOP: what, when, how, guidewords and parameters, nodding, teams, roles and responsibilities
- Recording methods, software, reporting and close-out
- Overview of the LOPA technique
- Major HAZOP studies, minor modification studies
- Common failings in HAZOPs, Limitations of HAZOPs
- Leading HAZOP teams
- Other forms of HAZOP: procedures, batch operations

After completing the course you should be able to:

1. Critically review the HAZOP technique and examples of output
2. Analyse how the HAZOP technique can be applied at the different stages of a project's lifecycle such as FEED, detailed design, revalidation and decommissioning
3. Prepare for a HAZOP workshop, determine the skills and actions necessary to lead a HAZOP and how to generate a HAZOP report

	Hours	Delivery methods	
		Face-to-face	Distance learning
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Attendance only	15	2 days	---

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What prior study is recommended?

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Incident Investigation and Analysis

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Cross-sector

What's the purpose?

This course provides an awareness and understanding of incident investigation and analysis, including why we need to investigate incidents. The stages of incident investigation are discussed: immediate actions in the event of an incident; initiating the investigation; collecting, organising and analysing data; identifying corrective and preventive actions; reporting the incident and learning from it.

Who is this for?

Managers, supervisors and HSE professionals who may be called on to participate in incident investigations.

What does it cover?

- Introduction
- Immediate actions in the event of an accident
- Planning the investigation
- Collecting data
- Data organisation/analysis
- Corrective actions
- Concluding the analysis

After completing the course you should be able to:

1. Demonstrate a thorough grounding in the underlying theories behind accident cause analysis
2. Apply the investigation and analysis process to determine the sequence of events and the causes of an incident
3. Critically analyse published incident and accident reports including the recommendations

	Hours	Delivery methods	
		Face-to-face	Distance learning
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Safety/HSE Cases

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Cross-sector

What's the purpose?

The aim of this course is to explain the purpose, content and uses of a Safety/HSE Case. Particular attention is focused on the best practical approaches to address legal, industry and company requirements. The differing types of Safety/HSE Case during the project lifecycle are discussed, as well as differences in approaches between industries. Links between the case, supporting studies and the management system are studied. Best practices for implementing and maintaining the case are also reviewed.

Who is this for?

Managers, supervisors, HSE practitioners and risk management practitioners.

What does it cover?

- Historical drivers
- Legal requirements: UK, Europe, worldwide
- Company and industry body requirements
- Differing types of case by project phase (e.g. PSR, PCSR, design, operational, decommissioning)
- Safety Case structure and approach by industry
- Bridging documents
- Links between the case and supporting studies and the case and the management system
- Documentation, management and maintenance of the Safety Case
- Roll-out and implementation
- Features of a fit-for-purpose Safety Case

After completing the course you should be able to:

1. Critically review the reasons for having Safety Cases and the role of the Safety Case
2. Justify the contents of a Safety Case
3. Discuss the key factors to be considered when planning a Safety Case

	Hours	Delivery methods	
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