

PROGRAMME SPECIFICATION – POSTGRADUATE PROGRAMMES

KEY FACTS

Programme name	MSc in Civil Engineering Structures (Nuclear Power Plants)
Award	MSc
School	School of Mathematics, Computer Science and Engineering
Department or equivalent	Civil Engineering
Programme code	PSCESN
Type of study	Full Time/Part Time
Total UK credits	180
Total ECTS	90
Partner (partnership programmes only)	N/A
Type of partnership	

PROGRAMME SUMMARY

In this programme, you will study how to design, evaluate, and analyse structural systems, with a special focus on Nuclear Power Plants. You will learn all the principles used for the design of buildings, bridges, special structures and in particular nuclear containment structures. The emphasis on nuclear structures is a response to the skill shortage reported by employers working in this sector. The UK has recently committed to a long-term nuclear new-build programme that is forecast to generate more than 40,000 jobs, yet no specialized training is available in this area. The proposed programme will therefore provide you with a degree that distinguishes you in the market. The programme is offered on a one-year full-time or two-years part time basis to allow you maximum flexibility and is backed by the Royal Academy of Engineering.

The programme aims to

1. Provide you with advanced knowledge in the field of structural engineering and design
2. Provide you with specialized knowledge in the field of nuclear science and engineering
3. Provide you with postgraduate education and training in the area of design and analysis of new-build structures, in particular nuclear power plants
4. Introduce you to current practice for assessment of the behaviour of existing structures
5. Offer you a unique degree and the skills needed to distinguish you in an open and booming market
6. Help you network with major firms involved in the field

Postgraduate Certificate

For all of you completing the Postgraduate Certificate in Civil Engineering Structures (Nuclear Power Plants) you will be able to examine the theories related to the design of the structural elements of nuclear power plants and synthesis and apply these to the design of new-build structures and the assessment of existing nuclear power plants. You will have critical insight into problems related to the design of one or more

of the main types of structural form and be able to solve these using appropriate standards/ numerical techniques. You will also use a range of techniques to undertake your scholarly work.

Postgraduate Diploma

For all of you completing the Postgraduate Diploma in Civil Engineering Structures (Nuclear Power Plants).in addition to the above you will explore advanced knowledge related to the full range of structural forms from different perspectives to broaden your expertise and skills. You will also evaluate critically current evidence for the advantages of new structural systems and materials and provide appropriate critiques of knowledge and techniques related to the selection of suitable sites for nuclear power plants, the importance of sustainable design and the selection of appropriate design methods and analysis techniques

MA /MSc

For all of you completing the MSc in Civil Engineering Structures (Nuclear Power Plants) you will demonstrate original application of knowledge to the design of the structural and foundation elements of nuclear power plants and in choice of approaches to practice. You will be engaged in research or scholarly activity that contributes new views to the sustainable design of nuclear power plants and the management of risks in the operation of these plants including waste disposal.

WHAT WILL I BE EXPECTED TO ACHIEVE?

On successful completion of this programme, you will be expected to be able to:

Knowledge and understanding:

- Demonstrate comprehensive knowledge of modern design methods for structural elements subjected to natural and man-made hazards, particularly for new-build nuclear power plants
- Evaluate the current state of practice for assessment of existing buildings and nuclear power plants
- Evaluate the advantages and structural performance of different types of nuclear reactors and critically assess safety standards and different methods of waste management
- Critically evaluate the advantages of new structural systems and materials, and emerging reactor technologies
- Demonstrate a critical appreciation of the problems of site selection including geology, infrastructure, and environmental factors

Skills:

- Develop the skills required to design, construct, implement, and manage structural systems, with a focus on nuclear power plants
- Develop skills in applying the latest codes of practice and guidelines used for structural design
- Develop skills in using state of the art software for simulation of the behaviour of complex structures

- Manage fissile processes and demonstrate the effect of these on buildings
- Develop and demonstrate the skills of risk mitigation and safety awareness applied to structural buildings
- Demonstrate the ability to evaluate the cost implications of different design procedures
- Develop the skills required to work as part of a multi-disciplinary team and to communicate with nuclear, mechanical, and materials engineers

Values and attitudes:

- Promote the use of green construction, clean energy, and sustainable design
- Promote the use of nuclear energy and discuss and resolve public concerns
- Synthesize the societal impact of the construction of new nuclear power plants
- Critically assess the societal impact of nuclear energy and evaluate the current regulations and their effect on the public perception

This programme has been developed in accordance with the Framework for Higher Education Qualifications in England, Wales, and Northern Ireland.

HOW WILL I LEARN?

The rationale for learning, teaching and assessment strategies is predicated on the modelling of an active approach to learning in education. Thus, the learning and teaching strategies for each module will encompass a range of methods which support this objective, including lectures, workshops, group work, case studies, problem-based learning, presentations, technology-supported and enhanced learning, self-reflection, peer review and supervision.

The learning and teaching approaches will require independent learning through your own reading which will be guided towards both greater understanding and critical evaluation of generic issues.

You are expected to spend 3 hours/week in lectures, and an additional 6-8 hours/week for each module in self-studying, reading, and working on assigned coursework. The staff will be available for face-to-face meetings if needed to help guide you in your study.

WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

Assessment and Assessment Criteria

Assessment Criteria are descriptions, based on the intended learning outcomes, of the skills, knowledge or attitudes that you need to demonstrate. Grade- Related Criteria are descriptions of the level of skills, knowledge or attributes that you need to demonstrate in order achieve a certain grade or mark in an assessment, providing a mechanism by which the quality of an assessment can be measured and placed within the overall set of marks. Assessment Criteria and Grade-Related Criteria will be made available to you to support you in completing assessments. These may be provided in

programme handbooks, module specifications, on the virtual learning environment or attached to a specific assessment task.

Feedback on assessment

Feedback will be provided in line with our Assessment and Feedback Policy. In particular, you will normally be provided with feedback within three weeks of the submission deadline or assessment date. This would normally include a provisional grade or mark. For end of module examinations or an equivalent significant task (e.g. an end of module project), feedback will normally be provided within three weeks. The timescale for feedback on final year projects or dissertations may be longer. The full policy can be found at:

https://www.city.ac.uk/data/assets/pdf_file/0008/68921/assessment_and_feedback_policy.pdf

Assessment Regulations

In order to pass your Programme, you should complete successfully or be exempted from the relevant modules and assessments and will therefore acquire the required number of credits.

The pass mark for each module is 50%. You need to attain a 50% mark for all assessment components.

If you fail an assessment component or a module, the following will apply:

1. Compensation: where you fail up to a total of 20 credits at first or resit attempt (15 for a Postgraduate Certificate), you may be allowed compensation if:
 - Compensation is permitted for the module involved (see the What will I Study section of the programme specification), and
 - It can be demonstrated that you have satisfied all the Learning Outcomes of the modules in the Programme, and
 - A minimum overall mark of no more than 10% below the module pass mark has been achieved in the module to be compensated, and
 - An aggregate mark of 50% has been achieved overall.

Where you are eligible for compensation at the first attempt, this will be applied in the first instance rather than offering a resit opportunity.

If you receive a compensated pass in a module you will be awarded the credit for that module. The original component marks will be retained in the record of marks and your original module mark will be used for the purpose of your Award calculation.

2. Resit: Where you are not eligible for compensation at the first attempt, you will be offered one resit attempt.

If you are successful in the resit, you will be awarded the credit for that module. The mark for each assessment component that is subject to a resit will be capped at the

pass for the module. This capped mark will be used in the calculation of the final module mark together with the original marks for the components that you passed at first attempt.

If you do not meet the pass requirements for a module and do not complete your resit by the date specified you will not progress and the Assessment Board will require that you be withdrawn from the Programme.

If you fail to meet the requirements for the Programme, the Assessment Board will consider whether you are eligible for an Exit Award, as per the table below.

If you would like to know more about the way in which assessment works at City, please see the full version of the Assessment Regulations at:
http://www.city.ac.uk/data/assets/word_doc/0003/69249/s19.doc

WHAT AWARD CAN I GET?

Master's Degree:

	HE Level	Credits	Weighting (%)
Taught	7	120	67
Dissertation	7	60	33

Class	% required
With Distinction	70
With Merit	60
Without Classification	50

Postgraduate Diploma:

	HE Level	Credits	Weighting (%)
Taught	7	120	100

Class	% required
With Distinction	70
With Merit	60
Without Classification	50

Postgraduate Certificate:

	HE Level	Credits	Weighting (%)
Taught	7	60*	100

Class	% required
With Distinction	70
With Merit	60
Without Classification	50

* Must include EPM790 & EPM791

WHAT WILL I STUDY?

There are 8 core modules to be taken, one elective module, in addition to the research skills module and the dissertation. The number and credits required to gain an award are identified in the table below. The programme summary provides specific information about the modules required.

For the following modules: EPM717, EPM711, EPM712, EPM707, EPM 720, EPM718, coursework assignments will require you to apply the theory you have learned to specialized problems relating to the field of nuclear power plants. You are required to answer these problems to satisfy the coursework assessment for these modules.

Module Title	SITS Code	Module Credits	Core/ Elective	Compensation Yes/No	Level
<i>Taught modules</i>					
Introduction to Nuclear Energy	EPM920	10	Core	No	7
Advanced Analysis and Stability of Structures	EPM717	20	Core	Yes	7
Dynamics of Structures	EPM704	15	Core	Yes	7
Design of Concrete Structures	EPM711	15	Core	Yes	7
Design of Steel and Composite Structures	EPM712	15	Core	Yes	7
Design of Nuclear Structures and Foundations	EPM921	15	Core	No	7
Finite Element Methods	EPM707	15	Core	Yes	7
Earthquake Analysis of Structures	EPM720	15	Elective	Yes	7
Analysis of Steel and Concrete Structures for Blast and Fire Exposure	EPM718	15	Elective	Yes	7
Dissertation	EPM949	60	Core	No	7

You are required to complete all the taught modules successfully before progressing to the dissertation

TO WHAT KIND OF CAREER MIGHT I GO ON?

This programme is for students interested in the structural aspects of nuclear power plants. Your career will take you to the broader field of nuclear energy. You might work as an on-site engineer or as a design office engineer, building designing or constructing new plants or evaluating and maintaining existing plants or decommissioning plants at the end of their life cycle. You could also go to the research arena conducting innovative research in the area of nuclear science at research labs or in academia.

If you would like more information on the Careers support available at City, please go to: <http://www.city.ac.uk/careers/for-students-and-recent-graduates>.

WHAT STUDY ABROAD OPTIONS ARE AVAILABLE?

The programme is currently available in the UK only

WHAT PLACEMENT OPPORTUNITIES ARE AVAILABLE?

Not appropriate to the programme

WILL I GET ANY PROFESSIONAL RECOGNITION?

This degree is accredited as meeting the requirements for Further Learning for a Chartered Engineer (CEng) for candidates who have already acquired a Accredited CEng (Partial) BEng (Hons) or an Accredited IEng (Full) BEng/BSc (Hons) undergraduate first degree.

See www.jbm.org.uk for further information.

HOW DO I ENTER THE PROGRAMME?

Qualifications: Minimum Lower Second Class (2:2) degree or equivalent overseas qualification in Civil/Mechanical/Nuclear Engineering or equivalent degree.

For those overseas applicants, whose first language is not English or their country has not been exempted from the English language requirement by the UK Home Office, they will need to provide one of the following English test qualifications:

IELTS: 6.5, including 6.5 in the writing category.

TOEFL 92 (with a minimum of 24 in Writing).

Version: 4.0

Version date: May 2020

For use from: 2020/21