

Advanced Civil and Structural Engineering MSc Programme Specification

Academic Year:	2026/27
Degree Awarding Body:	The University of Bradford
Main Location:	City Campus
Subject Benchmarks:	Engineering (Quality Assurance Agency 2015)
Qualifications Framework:	HE Qualifications of UK Degree Awarding Bodies (FHEQ: QAA 2024/2014)
Target Degree Award:	Master of Science (MSc) Advanced Civil and Structural Engineering [FHEQ Level 7]
Intermediate/exit awards:	MSc Engineering (Civil and Structural) [FHEQ Level 7] Postgraduate Diploma (PGD) Civil and Structural Engineering [FHEQ Level 7] Postgraduate Certificate (PGC) Civil and Structural Engineering [FHEQ Level 7]
Programme Admissions:	UK and international students
Programme Start Dates:	September, January
Programme Modes of Study:	12 months full-time (September start) 12 months full-time (January start)

This degree is accredited by the [Joint Board of Moderators](#) (JBM): the Institution of Civil Engineers (ICE), The Institution of Structural Engineers (IStructE), The Institution of Highway Engineers (IHE), The Chartered Institution of Highways & Transportation (CIHT) and the Permanent Way Institution (PWI) as meeting the Engineering Council (EngC) requirements for Further Learning for a Chartered Engineer (CEng) for candidates who have already acquired an Accredited CEng (Partial) BEng(Hons) or an Accredited IEng (Full) BEng or BSc (Hons) undergraduate first degree.

Please note: The University has a set of terms and conditions for all students accepting an offer to study on a course here at Bradford. This is called the Student Contract. This document sets out the Terms and Conditions which apply when you accept an offer of a place on a programme of study at the University of Bradford. [View our Student Contract for further details](#). Information about this programme and its modules has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but changes may occur given the interval between publishing and commencement of teaching. Any change which impacts the terms and conditions of an applicant's offer will be communicated to them.

Minor Modification Schedule

1. July 2025: Annual Changes for the 2025 academic year, including changes to academic regulation.
2. February 2026: Changed CSE7015-B from optional to core in Semester 1. Added CSE7018-B as an optional module in Semester 2.
3. April 2026: Annual changes for the 2026 academic year.

Introduction

Civil engineering is a strategically important profession for both developed and developing countries. With creativity and technical skills, civil engineers plan, design construct, maintain and

operate infrastructure facilities essential to modern life, ranging from bridges and highways to water and wastewater treatment facilities and buildings. Civil engineering is a broad field that spans a number of branches including subjects such as Structural Engineering, Water Resources Engineering, Environmental Engineering, Transportation Engineering and Geotechnical Engineering. As countries develop, and their population's increase, and as environmental concerns mount, civil engineering skills will be increasingly needed throughout the world. Meeting the challenges of providing housing and buildings, infrastructure to control pollution, transportation links, drinking water and energy needs, urban redevelopment and community planning are few examples of the problems civil engineers solve.

Civil engineering offers several career choices, ranging from design, construction, research, planning, teaching, to management. The branch of structural engineering is concerned with the structural design and analysis of buildings, bridges, and other structures. This involves calculating the stresses and forces that act upon or arise within a structure and designing the structure to successfully resist those forces and stresses. Resistance to wind and seismic loadings, especially performance near resonant frequencies, which affect the overall stability of a structure are major design concerns. Other factors such as durability and cost are also considered. In addition to design of new buildings, structural engineers may design a seismic retrofit for an existing structure to mitigate undesirable performance during earthquakes. Most civil and structural engineers today deal with power plants, bridges, roads, railways, structures, water supply, irrigation, the natural environment, sewer, flood control, transportation and traffic.

Civil and structural engineering aims to improve and maintain the built and natural environment with best use of resources to enhance the quality of life for present and future generations. They contribute with their knowledge to designing, building, maintaining, repair or refurbishing sustainable developments. Those entering the civil engineering field are increasingly required to continue their education long after bachelor's graduation and are required to increase their knowledge base to remain competitive. Thus, this MSc programme at the University of Bradford is designed to provide advanced civil and structural engineering education to meet the aspirations of students' needs. The programme is designed in a way to address a balanced curriculum between advanced technical and design skills, and research skills with a strong sustainability thread. Optional modules are also included to offer students more choices and meet their interests and needs in civil and structural engineering.

The University of Bradford has particular research strengths in Structural Engineering; Geotechnics; Sustainability; Water Engineering; Acoustics; and Computer Modelling and Design. We conduct this research jointly with many companies including Bersche-rolt, Transport Research Laboratory, AngloFelt Industries, Incommunities, Yorkshire Water, Castle Cement, and many others. The industrial input of our partners like Arup, is one of the strengths the course has.

Lecturers at the University of Bradford are active researchers in their fields of expertise, developing new knowledge, contributing to peer-reviewed journals and books. This research permeates to their teaching practice giving students access to world leading professionals, equipment and ideas within the University's academic themes of Innovative Engineering, Advanced Healthcare and Sustainable Societies. Each year students will engage in enquiry-based projects allowing learning through practical research. The programmes of study include research with an emphasis on application, experiential learning and real-world engagement. This will make a major contribution to students' skill sets, in the skills and attributes for enhanced employability.

[The Faculty of Management, Sciences and Engineering](#) welcomes and celebrates the diverse cultural and national backgrounds of our students. We are committed to an educational experience that is inclusive of the diversity of the students and staff, and that addresses attainment gaps within our student body, particularly those between BME and white students. The University of Bradford holds Bronze [Athena Swan Charter](#) and [Race Equality Charter](#) accreditations from [AdvanceHE](#), recognising our commitment to advancing the careers of everyone in STEM.

We also recognise that the future for engineers is one where they will be working in interdisciplinary teams to solve new, complex and evolving problems that will require innovative solutions. Students' ability to work across engineering disciplines and collaboratively with experts in other specialist fields will be crucial to creating the solutions of tomorrow. We have designed our programmes to encourage and experience interdisciplinary working, to develop breadth as well as depth of skills and knowledge, and in this way, we believe students will be ideally equipped to be successful and employable.

The Bradford Graduate

We recognise that society benefits from the talents of all, and that the development of creative, collaborative engineers, skilled in communication and teamwork is vital. Diverse engineering teams are known to be more innovative. We help students to contribute to and learn from the varied perspectives of their tutors and peers. We want to equip our graduates with the knowledge and skills to respond to the many diverse needs of our businesses and communities.

Students will have many opportunities to contribute to their Higher Education Achievement Report (HEAR) whilst with us. Students can gain HEAR accreditation for becoming student representative for their course, by becoming a student ambassador, helping with open days and applicant experience days, or by being a PAL leader. The peer assisted learning scheme or PAL is where students in stages two and three support new students of the University. The PAL scheme has been very successful, providing guidance on all aspects of being a student of Bradford. PAL leaders become mentors and role models for new students. We support people to become PAL leaders, but we also recognise their contribution through the HEAR.

Upon completion of the programme students will have the capacity for meaningful interdisciplinary interaction, leadership roles, and professional growth. With reference to teaching and learning, the Faculty of Management, Sciences and Engineering aims to produce postgraduates who aspire to challenging careers in industry, commerce and the public sector or to developing their own enterprises. Postgraduates will be able to move directly into responsible roles in employment with a minimum of additional training. It achieves this aim by:

- Providing a supportive, structured environment in which students are encouraged to develop independent learning skills.
- Developing subject knowledge and understanding, developing discipline skills and developing personal transferable skills, to enable graduates to pursue programmes of advanced study, or to move directly into responsible employment.

Students will have the capacity, potential and opportunity for professional growth to continue the path to Chartered Engineer (CEng) status. The ability of an engineer to think clearly and logically is widely appreciated by many other professions and studies at Bradford may well be a stepping stone to many alternative careers other than Engineering – a real foundation for life and for a lifetime of learning.

Programme Aims

- Provide students with the advanced theoretical knowledge, concepts and skills necessary for original thought and problem analysis related to civil and structural engineering.
- Equip students with deepened academic and technical skills necessary to integrate their knowledge and understanding to solve a range of complex engineering problems.
- Enable students to carry out independently, but under supervision, a specific research project in civil and structural engineering.
- Provide those possessing an undergraduate degree, the Further Learning educational requirements (in compliance with UK-SPEC) to permit progression to Chartered Membership of the Institution of Civil Engineers and/or the Institution of Structural Engineers and/or the Institution of Highways and Transportation, and registration with the Engineering Council (UK) as a Chartered Engineer.

Programme Learning Outcomes

On successful completion of the programme, holders of a Master of Science degree award will be able to demonstrate all of the following outcomes:

1. Evidence comprehensive understanding of relevant scientific principles of discipline specialization, applying knowledge (possibly at discipline forefront), understanding, and skills to work with (incomplete or uncertain) information, quantifying the effect of this on the design, and using theory or experiment to mitigate deficiencies.
2. Select and apply appropriate advanced modelling and analysis methods and computational tools to critically evaluate complex and multidisciplinary problems in engineering, generate (optimized) solutions, and assess their limitations, robustness, and effects of changes in design parameters.
3. Evidence advanced level knowledge and understanding of a wide range of engineering materials and components.
4. Critically evaluate current problems and/or new insights informed by the specialization forefront and apply and adapt knowledge and comprehensive understanding of design processes and methodologies in unfamiliar situations.
5. Work effectively in a team in order to meet shared objectives.
6. Evidence awareness of the need for a high level of professional and ethical conduct in engineering, evidencing business and management practices relevant to engineering and engineers.
7. Evidence understanding and critical evaluation of concepts relevant to discipline including advanced structural design, geotechnics, construction management and water engineering, some from outside engineering, and apply them effectively (including in engineering projects).
8. Integrate engineering knowledge and insight to investigate new and emerging technologies, applying professional judgements to balance risks, cost, benefits, safety, reliability and environmental impact.
9. Evidence self-direction, independent learning, and originality of thought to generate innovative designs for products, systems, components or processes to fulfil new needs.

10. Use software packages in the advanced analysis, design, evaluation, and optimisation of complex engineering systems.
11. Apply skills in problem solving, communication, information retrieval, working effectively with general IT facilities to develop, monitor and update a plan for the solution of both technical and personnel contributions to meeting organisational need.
12. Plan self-learning to improve performance as a foundation for lifelong learning/CPD, and exercise initiative and personal responsibility in professional practice, which may be as a team member or leader, evidence good negotiation, written and oral communication skills.
13. Plan, implement, monitor and adjust on an on-going basis, a self-directed individual research programme of work, evidencing collection and critical analysis of research data, use or adaptation of appropriate analysis tools to tackle unfamiliar problems (e.g. those with uncertain or incomplete data or specification), innovation, and application of relevant skills, reflection, and research methodologies in the production of an advanced technical report.

Curriculum Structure

The curriculum map shows the core and optional units for this programme, which extends over 12 months. It is made up of a taught element of 120 credits and an individual research project element of 60 credits. Please note that the curriculum may change, subject to the University's programme approval, monitoring and review procedures, as improvements are made each year. More detail, including learning outcomes, is available for each unit in the module handbooks.

The taught element is structured in the form of 20 credit modules over the 2 semesters forming the "Academic Year" of September-May. In each of Semester 1 (September) and Semester 2 (January), students study 40 core credits and choose 1 from 3 optional modules for a total of 120 credits. Students who start in January study Spring modules first.

Table 1: Advanced Civil and Structural Engineering taught modules (FHEQ Level 7)

Code	Module Title	Credit	Study Period	Selection
CSE7009-B	Advanced Geotechnics	20	Autumn (Sem1)	Core
CSE7015-B	Advanced Structural Analysis and Earthquake Engineering	20	Autumn (Sem1)	Core
COS7049-B	Statistical Applications of Industrial Big Data	20	Autumn (Sem1)	Option 1
ENB7008-B	Supply Chain Management and Production	20	Autumn (Sem1)	Option 2
CSE7014-B	Advanced Structural Design	20	Spring (Sem2)	Core
CSE7013-B	Water and Wastewater Treatment	20	Spring (Sem2)	Core
ENB7007-B	Risk Assessment and Management	20	Spring (Sem2)	Option 3
CSE7008-B	Construction Management	20	Spring (Sem2)	Option 4
CSE7018-B	Building Information Modelling	20	Spring (Sem2)	Option 5

Students will be eligible to exit with the FHEQ Level 7 award of Postgraduate Certificate if they have successfully completed 60 credits. Students will be eligible to exit with the FHEQ Level 7 award of Postgraduate Diploma if they have successfully completed at least 120 credits.

The 60 credits MSc research project is carried out throughout the year and over the summer.

Table 2: Advanced Civil and Structural Engineering research project (FHEQ Level 7)

Code	Module Title	Credit	Study Period	Selection
ENG7002-E	MSc Project	60	Full Year	Core

At the end of the programme, students will be eligible to exit with the FHEQ Level 7 Master's Degree award of MSc Engineering (Civil and Structural) if they have successfully completed at least 180 credits and achieved the award learning outcomes but not met the criteria for an accredited award.

Students will be eligible for the FHEQ Level 7 Master's Degree award of MSc Advanced Civil and Structural Engineering if they have successfully completed at least 180 credits, achieved the award learning outcomes and met the programme-specific accredited award criteria.

Learning and Teaching Strategy

The teaching and learning strategy takes into consideration the learning outcomes, the nature of the subject and the student intake, and the need for students to take greater responsibility for their own learning as they progress through the Programme.

Our strategy begins with the end in mind. We want students to become great engineers; that means great problem solvers, great team-workers with an inquisitive and curious mind. This should mean that by the end of their study with us they can move seamlessly into the world of work, academic research or become an entrepreneur.

The teaching and learning methods have been selected to engage students in developing their knowledge and understanding of engineering fundamentals, through formal learning opportunities such as lectures and tutorials, experiential learning through practical classes and lab sessions and informal and social learning through team-working in projects and competitions.

Our students will actively participate in the processes of knowledge acquisition and creation through research-enriched teaching and research-engaged learning. Study with us will include formal lectures (including those from visiting lecturers and invited speakers). Tutorials and seminars will often be in smaller groups and highly interactive. We want to develop students understanding of the vast array of opportunities open to today's professional engineer and therefore we look to incorporate aspects of real- world engineering problems and solutions where possible. To this end we make use of case studies, practical demonstrations, and provide lots of opportunities for students to design their own solutions.

We aim to connect formal and informal learning activities and environments to promote career development education and support the ethos of achieving 'more than a degree'. This will empower students to be successful in their personal lives and professional pursuits by providing integrated curricular and co-curricular learning experiences that promote their holistic development as active, enterprising citizens who contribute to the economy and their community.

As part of our focus on building a learning experience which will prepare students for the world of work our curriculum has been developed using the CDIO framework. This means that our learning strategy will be to encourage students to work in teams to Conceive potential solutions, Design new products processes or services, Implement (or model) and test those designs, and

Operate the product or solution. In line with the CDIO philosophy students will have numerous opportunities to be an active learner, to work as an engineer on real-world projects. The PG/Dip students will operate analytical instruments, under supervision, during the initial phase of their research project.

Assessment Strategy

In the same way that our teaching and learning strategy is designed to prepare students for the world of work, academic research or entrepreneurship, our assessment methods incorporate a wide range of different methods designed to meet the needs of industry, the accrediting bodies as well as prepare students for a potential academic research career.

Assessment is a key part of the learning process, it is only through challenging themselves to express what they have learned or put it to practical use, can they complete the learning journey and assess for themselves if they have understood what they have been taught and are able to apply and use those skills and knowledge. There are two forms of assessment formative and summative assessments.

Formative assessment provides an opportunity for our staff to give students feedback during their learning. This feedback is designed to help and guide their learning. All the modules will have some formative assessment, and this may be in various forms including discussions or questioning from their supervisor, tests, practical activities, et cetera. These formative activities are crucial if students are to make best use of their learning experience and they are designed to prepare students for their summative assessment.

Summative assessment is how we grade the work on a module and the details of this assessment will be available from the beginning of the module so that students understand how their grade will be determined. A main method of assessment (as is common on all professional engineering degree programmes) is by formal written examinations. Nevertheless, many of the assessments will be tailored to the most efficient ways for assessing the learning outcomes. Therefore, project work will often be assessed on the basis of the quality of the product produced as part of the project, we use practical tests to assess practical skills and written reports to show the depth of understanding of concepts and ideas.

Practical skills are often assessed via individual and group technical reports with the laboratory work linked with the taught modules. The methods of assessment of transferable skills are built in the structure of the examinations, case studies, laboratory demonstrations and project work.

Assessment, Continuation and Award Regulations

This programme follows the Assessment, Continuation and Award regulations published on the University's website for postgraduate courses ([Regulation 9](#)) with variance from the regulation as outlined below and documented in the Variance Register:

- Variance from 4.2 - the pass threshold for each of the modules for the accredited award is 50% or higher in 160 credits and a minimum mark of 40% or higher in 20 credits.
- Variance from 5.1, 5.2 & 5.3 - Students who achieve marks between 40% and 49% in up to 60 credits worth of modules will be permitted one supplementary assessment attempt in order to support continuation on the accredited MSc.

Students who do not meet the threshold outlined above, but do meet the standard requirements of Regulation 9 for Postgraduate Taught Assessment, Continuation and Award Regulations will be eligible for an MSc Engineering (Civil and Structural), which is a non-accredited award.

Admission Requirements

We are proud to be [one of the most inclusive universities in the UK](#). All our students have potential, and we believe that as many people as possible should have the chance to benefit from higher education, no matter what their background or circumstances.

We take the time to understand the background of our applicants, understand their journey to education, and make decisions based on an applicant's potential to thrive at university and beyond.

In addition to satisfying the general admissions requirements of the University of Bradford, students must have a first degree in relevant discipline; normally a Second-class undergraduate (Honours) degree or equivalent in Science, Engineering, or Technology from an accredited degree awarding body.

Those applicants seeking to use this MSc, accredited by the JBM, as Further Learning to satisfy the educational base requirements for Chartered Engineer (CEng) must also be in possession of an appropriate undergraduate accredited degree.

Applications are welcome from students with non-traditional qualifications, and/or significant personal/professional experience. Candidates who do not fulfil the normal entry requirements but have extensive industrial experience in Civil and Structural Engineering are considered on an individual basis and by interview.

International students are welcome to apply and should [check the entry requirements page for their country on our website](#) details of equivalent qualifications.

For international students, the level of English required is listed on the [University of Bradford English language requirements website](#). Exceptionally, holders of a UK degree awarded within 2 years prior to entry to the Bradford programme may be exempt from these English test requirements. International applicants who do not meet the IELTS requirement can take a [University of Bradford pre-sessional English course](#).

If applicants have prior certificated learning or professional experience which may be equivalent to parts of this programme, the University of Bradford has procedures to evaluate and recognise this learning to provide applicants with exemptions from specified modules or parts of the programme. Find more information about [recognition of prior learning decisions](#) on the University website.

People thinking of studying with the University of Bradford don't need to wait for the start of the year to contact our Disability Service. The University can arrange for anyone to talk to this team about what support is on offer at Bradford including an invitation to our Get Set Day. To contact the Disability Service please complete the [request support form](#).

Information in this document is for the contemporary recruitment cycle and was accurate at time of publication. The current tariff and accepted qualifications for entry onto the programme is published at the online course page:

<https://www.bradford.ac.uk/courses/pg/advanced-civil-and-structural-engineering/>