UNIVERSITY of BRADFORD

Faculty of Engineering and Informatics

MEng/BEng Architectural Engineering Programme Specification

https://www.bradford.ac.uk/courses/ug/architectural-engineering-meng/
https://www.bradford.ac.uk/courses/ug/architectural-engineering-beng/

Academic Year:	2023/24
Degree Awarding Body:	The University of Bradford
Target Degree Awards:	Master of Engineering (MEng) Architectural Engineering [Framework for Higher Education Qualifications (FHEQ) Level 7];
	Bachelor of Engineering (BEng) Architectural Engineering [FHEQ Level 6]
Interim/exit Awards:	MEng Engineering (Architectural) [FHEQ Level 7];
	BEng Engineering (Architectural) [FHEQ Level 6];
	Diploma of Higher Education (DipHE) Architectural Engineering [FHEQ Level 5];
	Certificate of Higher Education (CertHE) Architectural Engineering [FHEQ L4]
Programme Admission:	September
Programme Modes of Study:	4-years full time towards MEng (UCAS HK24);
	5-years full time towards MEng with placement/study abroad (UCAS HK25);
	3-years full time towards BEng (UCAS HK26);
	4-years full time towards BEng with placement/study abroad (UCAS HK27)
Subject Benchmark Statement:	Engineering (QAA 2019)

Please note: The programme is aligned with the requirements for the Joint Board of Moderators (**JBM**) which is the accrediting body for engineering degrees supported by the Institution of Civil Engineers (**ICE**), the Institution of Structural Engineers (**IStructE**), the Chartered Institute of Highways and Transportation (**CIHT**), the Institute of Highway Engineers (**IHE**) and the Permanent Way Institution (**PWI**). Students will be notified when the programme has been granted formal accreditation by any of these bodies.

Please note: This programme specification 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. Upon commencement of the programme, students will receive further detail about their course and any minor changes will be discussed and/or communicated at this point.

Minor Modifications Schedule

1. MMMM 2023: XXXX

Introduction

Architectural engineers provide essential expertise at the interface between engineering and architecture. They play a vital role in the construction industry by engineering the design of buildings and building systems with the goal of engineering high-performance sustainable and resilient buildings ensuring the health, safety, comfort, and productivity of its occupants.

An architectural engineering education at Bradford produces graduates with multi-disciplinary knowledge and practical experience in the principles of architectural design, building energy performance and civil and structural engineering. Our students receive a thorough grounding in these subject areas. We ensure that our students use the latest digital technologies and can apply numerical modelling and artificial intelligence to optimise architectural solutions. Our Architectural Programmes are the first in the UK to be partnered with the International Living Future Institute (ILFI). This ensures that students can work towards attaining the ILFI's Living Building Challenge accreditation, the most rigorous benchmark of sustainability in the built environment.

All learning at the University of Bradford is underpinned by the latest Learning, teaching, Student Experience Strategy (LTSES) in conjunction with the Universal Design for Learning initiative (UDL) ensuring that students are empowered to realise their ambitions and make a positive difference to the world. Study at Bradford provides a foundation for life which aims to develop students' appreciation of technical and managerial principles and competence in their application using a wide range of personal and professional skills. Our commitment to this integration is such that we strongly encourage students to undertake a 12-month industrial placement as an integral part of their degree studies.

The University of Bradford

The University has four key strategic objectives: Learning, Teaching & Student Experience; Research and Innovation; Equality, Diversity, and Inclusion; and Business and Community Engagement. We believe in doing research and teaching to deliver career opportunities for our students as well as for economic development and job creation.

The Faculty of Engineering and Digital Technologies strongly believes that each programme subscribes to these four objectives through the three key streams of the University vision:

- The creation of knowledge through fundamental and applied research.

- The dissemination of knowledge by teaching students from all backgrounds.

- The application of knowledge for the prosperity and wellbeing of people.

Each year students will engage in enquiry-based projects allowing learning through research. The programmes of study include research with an emphasis on application, experiential learning and real-world engagement. This makes a major contribution to students' skill sets, enhancing employability and the ability to respond to the many different needs of our businesses and communities.

We recognise that society benefits from the talents of all, and that the development of creative, collaborative graduates skilled in communication and teamwork is vital. The Faculty of Engineering and Digital Technologies welcomes and celebrates the diverse cultural and national backgrounds of our students. We are committed to an educational experience that is inclusive and one where gender and ethnicity are central elements in developing architectural solutions that address the needs of a diverse society. We do this recognising that inclusive teams are known to be more innovative. The University currently holds Bronze Athena Swan accreditation from AdvanceHE.

Students will have many opportunities to contribute to their Higher Education Achievement Report (HEAR) whilst with us. They can gain HEAR accreditation by becoming student representative for their course, by becoming a student ambassador, helping with open days and applicant experience days, or by being a Peer Assisted Learning (PAL) leader. The PAL scheme enables students in stages two and three to support students new to the University. The PAL scheme is 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 HEAR. Both Architectural Society (ArchSoc) and Civil Engineering Society (CivSoc) at the University of Bradford provide platforms and space for all students and staff to socialise, interact, share experience, and run extracurricular activities.

Learning with and as part of a research community

Our teaching is well aligned with the research expertise of members of staff. Students benefit from this expertise in later stages of the programme when undertaking their own research project work where they will be expected to display a considerable amount of initiative. We aim to produce graduates who are imaginative, innovative, versatile, and competitive. Aware of the latest research in their field, our graduates will be better able to progress rapidly to professional positions of responsibility with minimal additional training and be able to provide technical, managerial, and entrepreneurial leadership in specialist /interdisciplinary projects.

The Faculty of Engineering and Digital Technologies places emphasis on both teaching and research, believing them to be mutually dependent. Lecturers at 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 Research and Innovation Strategy 'Shaping Future Societies' and the impacts created in Health Care, the Engineered Environment and Sustainable Societies.

We encourage students to contribute to and learn from the varied perspectives of their tutors and peers. We have research strengths in Structural Engineering, Architectural Design, Heritage Structures, Materials Science, Geotechnics; Sustainability, Acoustics, and Computer Modelling. We conduct this research jointly with many companies including Bersche-rolt, Transport Research Laboratory, TexFelt Industries, Incommunities, Buro Happold, Castle Cement, and many others. The industrial input of our partners like Arup, is one of the strengths the course has.

Students will routinely present developing project work to tutors and peers for critical feedback. Students' ability to work collaboratively with other engineers and experts in other specialist fields is crucial for creating tomorrow's-built environment solutions. Each year students will be given opportunities to partake in activities beyond the University campus. These include study trips, site visits and outdoor exercises to meet specific module learning outcomes. We have designed our programmes to encourage experience of interdisciplinary working, allowing breadth, as well as depth, of skills and knowledge. In this way we believe students will be equipped to be successful and employable.

Designed for the next generation of graduates

Our programmes are designed as part of the Conceive-Design-Implement-Operate (CDIO) educational framework for producing the next generation of engineering graduates. This framework is developed by universities across the globe to ensure that student learning reflects the real world. The CDIO framework promotes working in teams in state-of-the-art studio facilities mirroring real-life design environments to solve authentic problems whilst enabling students to acquire professional and technical skills. In line with the ILFI, we have embedded sustainable development across all our programmes. Sustainable development is critical to enable the necessary zero carbon emissions targets for solutions in the built environment to be met. The Bradford graduate will have a sound understanding of the challenges and the potential for sustainable solutions in a world where the actions of human industry are creating new pressures on resources.

Our BEng graduates will also have achieved high-level communication, observation, mathematical, and interpersonal skills from the learning programme and through a team-based environment.

- They will be familiar with studio practice, experimentation, system thinking and have a solid understanding of structural design principles from working on authentic and 'live' projects.

- They will also have the appropriate contextual understanding and theoretical knowledge to design sustainable solutions to meet societal and climatic changes and needs. In the workplace this will mean that they will be able to work with construction professionals such as contractors and engineers to direct, monitor, oversee and design solutions to the new and existing structures.

- They will be able to study and evaluate construction blueprints, conduct estimates to determine cost requirements of construction materials, carry out tests to determine the structural integrity of a building, design and be able to integrate a building's heating, ventilation, air conditioning, plumbing, electrical, and lighting systems.

- They will have the knowledge to be able to select and recommend appropriate raw materials and construction components, monitor contractor activities to ensure adherence to building codes and procedures, adjust heating and lighting systems to enhance safety and efficiency and modify a building design.

In addition to the above, our MEng graduates:

- Will be capable of future leadership roles with a proven ability to deal with the complexities of the industry.

- Will be able to demonstrate originality in problem-solving and accept responsibility for their own work and personal development.

Upon graduation from either MEng or BEng, students will have the educational background and capacity for professional growth necessary to seek Chartered Engineer (CEng) status.

Graduates will have highly developed research skills and their personal tutor can help them identify postgraduate research opportunities here at Bradford. We have a long track

record of supporting and developing new companies and helping students on those first steps as an entrepreneur.

The ability of such an engineer is also widely appreciated by many other regional, national, and international professions and study at Bradford may well be a stepping-stone to an alternative career such as accountancy, teaching or law. The programme is designed to meet the accreditation requirements of the Joint Board of Moderators (JBM) thereby ensuring that the programme meets the highest international standards.

Graduates from Architectural Engineering would typically be expected to seek employment where all aspects of building design and construction including mechanical, electrical, structural drawings, calculations and other mathematical or modelling tools and notations are required. They can expect to apply practical and theoretical knowledge to the engineering design of buildings and building systems with the goal of engineering high-performance sustainable and resilient buildings ensuring the health, safety, comfort, and productivity of its occupants. Common job titles with this degree are as Architectural Engineers, Civil Engineer, Façade Engineer, Structural Engineer, Energy Modeller, Lighting Designer, Project Manager and Construction Management Project Manager. Architectural Engineering graduates might typically work for large companies like ARUP, Simpson, Gumpertz, and Heger (SGH), Affiliated Engineers, Avery Dennison, RDK Engineers, Buro Happold, AKT II.

Programme Aims
The programme is intended to:

A1. Provide graduates with a strong grounding of principles of architectural engineering, structural engineering, building energy performance, and other relevant disciplines of the built environment at both building and urban scales.

A2. Develop graduates' understanding of the design, management, and operation of resource efficient buildings by learning fundamental concepts of environmental systems, structural and geotechnical design, architectural design and communication, digital technologies with a focus on numerical modelling.

A3. Provide graduates with a sound understanding of Artificial Intelligence (AI) and other technological tools to inform design and development of sustainable buildings.

A4. Enable graduates to develop professional skills and attitudes in readiness for Industry 4.0, including:

      a. training to work in multidisciplinary teams,

      b. communicate innovative design solutions effectively in a professional environment,

      c. analyse the role of engineering ethics in design.

A5. Provide the educational base (in compliance with UK-SPEC) to permit progression to Chartered Membership of an engineering body.

Graduates of the course are eligible to apply for Chartered Membership of ICE and/or IStructE, and after graduation with several years of relevant industrial experience can apply to become a Chartered Engineer.

Programme Learning Outcomes

To be eligible for the FHEQ Level 4 award of Certificate of Higher Education, students will be able to:

1. Identify fundamental concepts, principles and theories underpinning architectural engineering with knowledge in architectural design, digital representation, surveying, engineering mathematics, materials, structures, and artificial intelligence.

2. Explain the role of Artificial Intelligence and machine learning methods and models in architectural engineering.

3. Select and use appropriate and relevant materials, equipment, tools, and processes to achieve set objectives.

4. Apply simple computational techniques to visualise and communicate solutions as well as apply underpinning digital technical skills relevant to AI systems

5. Demonstrate problem solving skills, working collaboratively, information retrieval, and effective use of general IT facilities, and communicate work to technical and non-technical audiences.

6. Exercise personal and professional responsibility, which may be as a team member, and include evidence of safe and effective workshop and lab practice.

Additionally, to be eligible for the FHEQ Level 5 award of Diploma of Higher Education, students will be able to:

7. Identify principles and theories underpinning architectural engineering discipline with advanced knowledge in environmental systems, building performance: modelling and simulations, design of steel and concrete structures, and structural mechanics, architectural design, and digital communication.

8. Apply theories and fundamentals of sustainable design including knowledge of the environmental impact of energy efficient systems on building performance and occupants' comfort.

9. Implement principles and structural Eurocodes to design structural steelwork and concrete elements.

10. Apply problem-solving skills, technical knowledge and understanding to create/adapt and evaluate design solutions that are fit for purpose (including design, construction, operation, maintenance, management, etc.).

11. Develop safe methods of construction in architectural projects, deriving solutions that consider Health and Safety, and impact of ethics, technical, environmental, regulatory, and client requirements and applied AI to projects.

12. Practice relevant practical and laboratory skills to obtain accurate data to evaluate performance and/or validate models.

13. Work effectively as a specialist within a multidisciplinary team to achieve a shared objective.

Additionally, to be eligible for the FHEQ Level 6 Degree award of Bachelor of Engineering, students will be able to:

14. Evaluate and apply subject specific knowledge in geotechnical engineering, sustainability, feasibility studies, project management, professional studies, and application of AI in complex structural and architectural design.

15. Evaluate and synthesise information and data extracted from a variety of sources independently, applying critical judgement, to build new hypotheses using alternative methodologies.

16. Select, apply, and effectively integrate knowledge of other engineering disciplines to support study and evaluation of architectural engineering solutions.

17. Apply principles of organisation and management (project management, health and safety, self-management) to achieve architectural engineering objectives

18. Evaluate and apply architectural and engineering techniques within appropriate codes of practice, industry standards, and commercial and industrial constraints.

19. Recognise the importance of professional ethics, their impact on the operation of the professions and their influence on society; conflict avoidance/dispute resolution; communities and the stakeholders with whom they have contact.

20. Critique key concepts, theories and principles underpinning architectural design of buildings within the context of construction and detailed and conceptual design.

21. Plan and implement an individual programme of work, monitoring and adjusting where appropriate on an on-going basis, utilising research skills to critically evaluate and report on technical literature and newly developed data and reflect on personal and professional development to improve own performance.

22. Work effectively and collaboratively in different roles within a team, and evidence responsibility of engineers to consider environmental and socio-economic aspects in the development of sustainable solutions.

23. Use appropriate discipline software packages in the modelling, simulation, analysis, design, and critical performance evaluation of design projects.

Additionally, to be eligible for the FHEQ Level 7 Integrated Degree Award of Master of Engineering, students will be able to:

24. Apply knowledge and understanding of advanced engineering principles underpinning architectural and structural engineering including structural analysis and earthquake engineering, parametric design, modelling and optimisation, acoustic and lighting design, construction management.

25. Implement engineering tools and research methodologies to the critical analysis of complex and multi-disciplinary problems in order to generate innovative designs and solutions.

26. Apply advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and innovative solutions that are fit for purpose for all aspects of the problem including design, production, operation, maintenance, and disposal.

27. Critically apply computer software for the purpose of problem solving, parametric design, modelling and optimisation of design solutions, producing written reports, oral presentations, and a variety of transferable skills essential to chartered engineers' education.

28. Appraise and critically evaluate different roles within an engineering team and exercise initiative and personal responsibility, which may be as a team member or leader.

Curriculum

The programme is built around a spiral curriculum model where there is a purposeful revisiting of subjects and themes throughout the course leading to a deepening of subject knowledge and understanding. The MEng/BEng Architectural Engineering curriculum is organised into modular units, studied across the "Academic Year" of September to May or discretely in a single Semester.

Stage 1

Stage 1 learning begins with a broad understanding of the subject area and the fundamental concepts, principles and theories underpinning architectural engineering. Students will gain fundamental knowledge in architectural contexts, architectural visualisation, surveying, engineering mathematics, materials, structures, and artificial intelligence. Fundamental concepts, principles and theories will be applied in Engineering Design Studio activity.

Stage 1 Modules (Level 4/CertHE)

Study Period	Code	Title	Credit	Level	Type
Academic Year	CSE4004-B	Architectural Engineering Design Studio 1	20	FHEQ 4	Core
Academic Year	CSE4007-B	Digital Architectural Communication 1	20	FHEQ 4	Core
Academic Year	OIM4012-B	Fundamentals of AI and Data Analytics	20	FHEQ 4	Core
Academic Year	ENM4004-B	Mathematical Methods and Applications	20	FHEQ 4	Core
Semester 1	ENG4007-B	Engineering Materials	20	FHEQ 4	Core
Semester 2	GAV4016-B	Machine Learning Methods and Tools	20	FHEQ 4	Core

At the end of stage 1, students will be eligible to exit with the award of Certificate of Higher Education if they have successfully completed at least 120 credits and achieved the award learning outcomes.

Stage 2

Subject specific learning intensifies in Stage 2 where it is also expected that an increased application of learning is undertaken alongside a developing autonomy. In Stage 2 students will begin to apply AI strategies and further learning about materials, building performance and environment systems in interdisciplinary design studio activities.

Stage 2 Modules (Level 5/DipHE)

Study Period	Module Code	Module Title	Module Credit	FHEQ Level	Core/ Option
ACYR	CSE5015-D	Architectural Engineering Design Studio 2	40	5	Core
ACYR	CSE5017-B	Environmental Systems in Buildings	20	5	Core
ACYR	CSE5012-B	Design of Steel and Concrete Structures	20	5	Core
SEM1	CSE5011-B	Structural Mechanics and Analysis	20	5	Core
SEM2	CSE5016-B	Building Performance: Modelling and Simulations	20	5	Core

At the end of stage 2, students will be eligible to exit with the award of Diploma of Higher Education if they have successfully completed at least 240 credits and achieved the award learning outcomes.

Stage 3

Knowledge, skills and understanding is further built upon in Stage 3 where further individual autonomy is expected as well as effective participation in team project work. Stage 3 will provide students with the ability to apply all prior learning and undertake detailed project work as an individual and in groups.

Stage 3 Modules (Level 6/BEng)

Study Period	Module Code	Module Title	Module Credit	FHEQ Level	Core/ Option
SEM1	CSE6016-B	Architectural Engineering Design Studio 3	20	6	Core
ACYR	CSE6015-B	Fundamentals of Geotechnical Engineering	20	6	Core
ACYR	CSE6021-B	Professional Studies	20	6	Core
SEM1	CSE6003-B	Feasibility Study	20	6	Core
SEM2	CSE6014-B	Architectural Engineering Research Project	20	6	Core
SEM2	CSE6010-B	Sustainability in the Built Environment	20	6	Option
SEM2	ENG6005-B	Sustainable Energy	20	6	Option
SEM2	ENB6010-B	Project Management and Six Sigma	20	6	Option

At the end of stage 3, students will be eligible to exit with the Honours Degree award of BEng Engineering (Architectural) if they have successfully completed at least 360 credits and achieved the award learning outcomes 1-23 but not met the criteria for an accredited award.

Students will be eligible for the Honours Degree award of BEng Architectural Engineering if they have successfully completed at least 360 credits and achieved the award learning outcomes 1-23 and met the programme specific accredited award regulations.

Stage 4

Students intending to progress to the MEng stage must have passed Stages 1-3 at 50% or higher overall and met the other variations to assessment regulations that apply to the MEng as detailed in the Assessment Regulations section, or must exit with one of the above awards.

In Stage 4, students will be expected to apply advanced engineering principles underpinning architectural and structural engineering and be able to implement engineering tools and research methodologies based on critical analysis and advanced problem solving. Computer software will be applied at professional level and teamwork appraised and evaluated.

Students study 80 core credits and select 2 optional modules, 1 in each Semester, providing another opportunity for specialism alongside the individual project.

Stage 4 Modules (Level 7/MEng)

Study Period	Code	Title	Credit	Level	Type
Academic Year	CSE7021-D	Advanced Architectural Engineering Research Project	40	FHEQ 7	Core
Semester 1	CSE7022-B	Parametric Design	20	FHEQ 7	Core
Semester 1	CSE7015-B	Advanced Structural Analysis and Earthquake Engineering	20	FHEQ 7	Option
Semester 1	ENM7005-B	Modelling and Optimisation	20	FHEQ 7	Option
Semester 2	CSE7020-B	Acoustic and Lighting Design	20	FHEQ 7	Core
Semester 2	CSE7008-B	Construction Management	20	FHEQ 7	Option
Semester 2	ENB7007-B	Risk Assessment and Management	20	FHEQ 7	Option

At the end of stage 4, students will be eligible to exit with the FHEQ Level 7 Integrated Master's Degree award of MEng Engineering (Architectural) if they have successfully completed 480 credits and achieved the award learning outcomes 1-28 but not met the accredited award criteria.

Students will be eligible for the FHEQ Level 7 Integrated Master's Degree award of MEng Architectural Engineering if they have successfully completed 480 credits, achieved the award learning outcomes 1-28 and met the programme specific accredited award regulations. THIS AWARD CONFERS ELIGIBILITY TO REGISTER WITH THE JOINT BOARD OF MODERATORS.

Please note: The curriculum may change, subject to the University's programme approval, monitoring and review processes.

Placement and/or Study Abroad

This programme provides the option for students to undertake a work placement or period of study abroad in the penultimate year of study (between the 3rd and 4th year of an MEng or between the 2nd and 3rd years of a BEng). Students wishing to take this option will be encouraged to register for the placement year programme. All Faculty of Engineering and Digital Technologies students are encouraged to apply for Industrial Placements (Year in industry).

Timetabled Pre-Placement lectures and Timetabled 'drop-in' sessions will be scheduled to support students throughout the pre-placement process. All placement opportunities received are made available to students on the placement route via the VLE.

Students can also access various support services organised by Career and Employability Services including one-to-one appointments, Employability Workshop/Webinar Programme, Careers Fairs and jobs/placement opportunities. Students are encouraged to take the opportunity to find their own placement.

- On successful completion of ENG5002-Z, the placement, students will be eligible for the additional award of University Diploma Industrial Studies.

- On successful completion of ENG5004-Z, the study/placement abroad experience, students will be eligible for the additional award of University Diploma Industrial Studies (International).

For further information about study abroad opportunities please refer to:
https://www.bradford.ac.uk/study/abroad/

Learning and Teaching Strategy

The BEng-MEng (Hons) programme in Architectural Engineering at the University of Bradford is designed in line with the University's Learning, Teaching and Student Experience Strategy (LTSES). The University of Bradford aims to create an inclusive learning culture and transformative university experience. This vision will be realised through the achievement of three objectives: inclusive community, inclusive curriculum and inclusive experiences. We aim to make learning accessible to all of our students regardless of starting point or individual circumstance. Students will be empowered to realise their ambitions and make a positive difference to the world. This is achieved through the highest level of inclusivity in curriculum design, learning experience activity and learning community environment to promote best practice for engagement, accessing and comprehending information and supporting student development.

The programme is, therefore, designed to produce 'fit-for-purpose' graduates, able to attain their career aspirations, and equipped with the skills necessary to operate in an increasingly digitalised construction industry. Embedding the strategic aims of LTSES, the programme and module outcomes balance subject knowledge and transferable skills. Our strategy begins with the end in mind. We want students to become great architectural

engineers who can provide creative, efficient and sustainable solutions. 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. We have a long record of supporting and developing new companies and helping students take first steps as entrepreneurs. The programme is designed so that core modules provide students with fundamental discipline skills and knowledge, and optional modules to recruit interest.

The teaching and learning methods are selected to engage students in developing their fundamental knowledge and understanding through formal learning opportunities and informal and social learning through team-working in projects and competitions. Formal learning opportunities include interactive lectures, case studies, seminars, studio workshop activities, tutorials and practical demonstrations and presentations. Most teaching activities take place face-to-face but teaching and learning methods can be adapted to include a combination of synchronous or asynchronous online lectures/tutorials and seminars (synchronous or asynchronous) and workshop events if needed. Several opportunities are provided for students to engage with industrial experts through activities such as visiting guest lectures and organised site visits. The School of Built Environment, Architecture and Creative Industries liaises closely with the professional institutions like the Institute of Structural Engineers (IStructE), Institution of Civil Engineers (ICE), Royal Institute of British Architects (RIBA) providing many networking and development opportunities for our students.

As part of our focus on building a learning experience which will prepare students for the world of work our curriculum is developed using the CDIO framework. CDIO strategies are employed in Engineering Design Studio activities where students are encouraged to work in teams to Conceive potential solutions, Design structures, 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. In each stage, students will work in a team to perform a design exercise that varies in the degree of complexity and challenge but appropriate to their stage. Our students will actively participate in the processes of knowledge acquisition and creation through research-enriched teaching and research-engaged learning.

Multiple means of engagement are used to keep students purposeful and motivated, with a sustained effort throughout the learning journey. Team-working is essential to foster collaborations and a sense of community between students. In team working students learn the importance of planning and goal setting while respecting the requirements of the programme, and the needs of others. Practical 'hands-on' architectural engineering design studio activities encourage students to explore their interests, experiment, take risk and go beyond comfort learning. Opportunities are provided for self-evaluation and reflection, so that students can learn to self-regulate. Academic skills workshops are organised during the year to provide further support, if needed, in self-regulation, persistence and the development of essential competencies. A structured assessment timetable helps students work towards fixed deadlines thereby helping students develop the necessary skills for work beyond graduation. To support accessibility, clarity and comprehension, all teaching material is provided online where possible, allowing students to customise the display of information and their learning experience. Throughout the programme, there

are many opportunities for students to design their own solutions and to express their own ideas, choosing from a variety of tools and methodologies.

The University recognises the importance of providing pastoral support, taking into consideration all aspects of our students' journeys and development. All students are allocated a personal academic tutor, with whom they meet regularly to discuss and receive guidance on their learning and development. The University also operates a wide range of support services covering areas such as disability, counselling, faith advisors and careers.

The University of Bradford is well known for attracting students from a wide variety of backgrounds, cultures, and countries. The University of Bradford encourages and supports women in technology and engineering, celebrating events such as International Women in Engineering Day. Some of the staff in the Faculty of Engineering and Digital Technologies are also Science, Technology, Engineering and Mathematics (STEM) ambassadors, who actively promote science and engineering subjects to wider audiences. Female staff and students are an integral part to the University of Bradford's Faculty of Engineering and Digital Technologies. The University has held Bronze Athena Swan accreditation on an institutional level since 2015, demonstrating our commitment to striving for gender equality.

Assessment Strategy

In the same way, our assessment strategy is highly inclusive and aligned with the University's LTSES. Assessment is a key part of the student learning process and is designed to incorporate a wide range of different methods to meet the needs of students and industry as well as the accrediting bodies. Our diverse assessment prepares students for the world of work, academic research, or entrepreneurship.

There are two forms of assessment: formative and summative. Formative assessment provides an opportunity for students to receive feedback during their learning. This promotes reflective thinking leading towards an enhanced knowledge. All the modules have some formative assessment, and this may take different forms such as discussions or questioning from their tutors, class tests, presentations, and practical activities. 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 are available from the beginning of the module so that students understand how their grade is determined.

Summative assessment is mostly by a combination of formal individual/group coursework, architectural portfolio building, presentations, demonstrations, and written examinations depending on the module. These methods of assessment not only assess subject-specific knowledge and skills, but also a suite of transferable skills that provide students with a competitive edge when they graduate.

Assessment Regulations

The standard University Undergraduate Regulations are available at the link below: www.bradford.ac.uk/regulations, however the following waivers apply to the BEng/MEng programmes:

A maximum of 20 credits can be compensated on the BEng/MEng programmes across the whole programme with a mark no lower than 30%.

BEng programme: students must achieve a minimum of 340 credits @40% or above, 20 credits @30% or above.

MEng programme: students must achieve a minimum of 460 credits @40% or above, 20 credits @30% or above, whilst maintaining a stage average of 50%.

To remain on the MEng programme, a stage progression average of 50% or above must be obtained.

The MEng is a **single classified award**. The overall MEng award average is calculated from the weighted averages of Stage 2, 3 and 4 as follows; Stage 2 10%, Stage 3 40% and Stage 4 50%.

If the MEng requirements are not met, but the requirements for a BEng are complied with, then a BEng will be awarded.

If the compensation requirements are not met but the University's regulations are complied with then a non-accredited degree will be awarded:

BEng Engineering (Architectural)

MEng Engineering (Architectural)

Admission Requirements

We take into consideration many factors when assessing your application. We do not just look at your grades, we take the time to understand your personal circumstances and make decisions based on your potential to thrive at university and beyond. Consideration of applications will be based on a combination of formal academic qualifications and/or other relevant experience.

The **minimum** entry requirements for the programme are as follows:

A typical offer to someone seeking entry through the UCAS scheme would be UCAS points 112 with Mathematics studied at A levels (minimum grade C). On completion of a UCAS form students will be invited to the School for an Open Day where they will have the opportunity to meet staff, view the facilities and discuss "the Bradford experience" with current students. Further entry requirements are as below:

· To include 64 points from 2 A levels to inc. Maths minimum grade C.

· GCSE English and Maths minimum grade C or grade 4.

· Minimum IELTS at 6.0 or the equivalent.

Please note: This information is relevant to the contemporary recruitment cycle and therefore may be different now to when this document was originally published. The current UCAS tariff for the programmes, as well as accepted equivalent qualifications, is published online at the course pages:
https://www.bradford.ac.uk/courses/ug/architectural-engineering-meng/
https://www.bradford.ac.uk/courses/ug/architectural-engineering-beng/

Access and Recognition of Prior Learning

Applications are welcome from students with non-traditional qualifications, and/or significant personal/professional experience. For such applicants, evidence of their interests and any work experience would be required and this would likely take the form of a portfolio of work and/or an interview with the programme.

The University of Bradford has always welcomed applications from disabled students. To discuss adjustments or to find out more about support and access, you may wish to contact Disability Services before you apply online: www.bradford.ac.uk/disability/before

Applications are particularly welcomed from adult learners (those aged 21+ at the start of the programme), armed forces families, carers and care leavers, estranged or orphaned learners, refugees and asylum seekers, and Romani or Traveller families. To find out more about the University of Bradford Progression Scheme, visit the webpage:
https://www.bradford.ac.uk/applicants/progression-scheme/

If applicants have prior certified learning or professional experience which may be equivalent to parts of this programme, the University has procedures to evaluate and recognise this learning in order to provide applicants with exemptions from specified modules or parts of the programme. For more details on RPL, visit the webpage:
https://www.bradford.ac.uk/teaching-quality/prior-learning/