Middlesex University

Programme specification

1. Programme title(s)

BEng Electronic Engineering

Target Award Title(s):

BEng Electronic Engineering

BEng Electronic Engineering with Foundation Year

FC Electronic Engineering

Exit Award Title(s):

DipHE Electronic Engineering

CertHE Electronic Engineering

2. Awarding institution

Middlesex University

3. Teaching institution

1 Middlesex University London, 2 Middlesex University Dubai

4. Length and mode of study

a) Length and mode:

Full-time (FT)	Semester 1	3 Years
Part-time (PT)	Semester 1	6 Years
Full-time (FT)	Semester 1	4 Years
Full-time (FT)	Semester 2	3 Years

b) Delivery method: On Campus/Blended Learning

5. Professional/Statutory/Regulatory body (if applicable)

Institution of Engineering Designers

6. Apprenticeship standard (if applicable):

N/A

7. Language of study

English

8. Will this be delivered as a Continuing Professional Development (CPD) programme?

No

9. Criteria for admission to the programme

Admission to the BEng (Hons) Electronic Engineering programme will require 112 UCAS points including 80 points from at least two science or numerate based subjects and GCSE English and Maths at grade C or above. In addition, Middlesex University general entry requirements apply as outlined in the university's regulation B2. Applicants whose first language is not English are required to achieve 6.0 in IELTS overall (with a minimum of 5.5 in each component) or an equivalent qualification recognised by Middlesex University, accommodating a diverse range of international students. The equivalence of qualifications from outside UK will be determined according to NARIC guidelines, providing a personalised assessment of international credentials. We welcome applicants with a wide variety of educational experience including A/AS levels, AVCE, BTEC National Diploma, Access Certificates, Scottish Highers, Irish Leaving Certificates (Higher Level), International Baccalaureate and a large number of equivalent home and overseas qualifications. Application from mature applicants with suitable life skills and experiences are also welcomed, highlighting our flexible admission

criteria. Recognition of Prior Learning (RPL) is permitted.

University policies supporting students with disabilities apply, as described in the University Regulations, 'Information for students with disabilities', ensuring an inclusive educational environment.

Please refer to the programme specification for the Foundation Year for criteria for admission to the BEng (Hons) Electronic Engineering with Foundation Year programme – Foundation Year in Computing and Engineering2, which is designed to provide a personalised pathway to engineering education.

The University aims to ensure that its admissions processes are fair, open and transparent and aims to admit students who, regardless of their background, demonstrate potential to successfully complete their chosen programme of study where a suitable place exists and where entry criteria are met. The University values diversity and is committed to equality in education and students are selected on the basis of their individual merits, abilities and aptitudes. The University ensures that the operation of admissions processes and application of entry criteria are untaken in compliance with the Equality Act.

We take a personalised but fair approach to how we make offers. We feel it's important that our applicants continue to aspire to achieving great results and make offers which take into account pieces of information provided to us on the application form.

10. Aims of the programme

The programme aims to:

•Develop Technical Proficiency: Equip students with a deep understanding of electronic engineering principles and practices. This foundational competence ensures graduates are future-fit, enabling

them to excel in the design, analysis, and implementation of cutting-edge electronic systems.

•Foster Innovation and Creativity: Encourage students to be ambitious and push the boundaries of technology. By fostering innovation, creativity, and critical thinking we prepare students to contribute groundbreaking ideas in the development of electronic devices and systems, offering them unique and innovative experiences.

•Integrate Ethical and Societal Considerations: Cultivate engineers who are mindful of ethical, societal, and sustainability issues in their engineering solutions. This embedded practice aligns with global challenges and the UN Sustainable Development Goals, ensuring our graduates are prepared to make impactful contributions.

•Build a Strong Foundational Knowledge: Provide a solid foundation in essential competencies such as programming and physical computing, electronics principles, and the practical application of mathematics. This ensures our graduates have a manageable number of core skills to tackle complex engineering problems.

•Specialize in Key Electronics Areas: Offer in-depth knowledge in specialized areas such as analogue electronics and digital systems design. These areas of specialization cover graduate competencies required to address real-world applications sustainably, ensuring our graduates are well-equipped for the future.

•Ensure Hands-On Experience: Through practical workshops, labs, and projects that mirror industrial practices, students gain hands-on experience. This approach leverages strategic partnerships with leading industry entities like Siemens and Festo, providing support and opportunities for innovative experiences.

•Achieve Professional Accreditation Standards: Prepare students to meet the academic requirements for partial Chartered Engineer status as recognized by the Institution of Engineering Designers (IED). This accreditation ensures our graduates are recognized for their competencies and are ready for further professional development3.

•Prepare for Diverse Career Opportunities: Our programme prepares graduates for successful careers in various sectors of electronic engineering, such as electronic design, embedded systems, and telecommunications. By conveying the different opportunities and support available, we ensure our graduates are enticing candidates capable of addressing critical societal needs and advancing technology.

11. Programme learning outcomes

Programme - Knowledge and Understanding

On completion of this programme the successful student will have a knowledge and understanding of:

1. Apply knowledge of mathematics, statistics, natural science, and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study. (AHEP4 C1)

2. Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science, and engineering principles. (AHEP4 C2)

3. Select and evaluate technical literature and other sources of information to address complex problems. (AHEP4 C4)

4. Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts. (AHEP4 C7)

5. Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct. (AHEP4 C8)

6. Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion. (AHEP4 C11)

7. Discuss the role of quality management systems and continuous improvement in the context of complex problems. (AHEP4 C14)

8. Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights. (AHEP4 C15)

9. Plan and record self-learning and development as the foundation for lifelong learning/CPD. (AHEP4 C18)

Programme - Skills

On completion of this programme the successful student will be able to:

10. Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed. (AHEP4 C3)

11. Design solutions for complex problems that meet a combination of societal, user, business and customer need as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards. (AHEP4 C5)

12. Apply an integrated or systems approach to the solution of complex problems. (AHEP4 C6)

13. Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity. (AHEP4 C9)

14. Adopt a holistic and proportionate approach to the mitigation of security risks. (AHEP4 C10)

15. Use practical laboratory and workshop skills to investigate complex problems. (AHEP4 C12)

16. Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations. (AHEP4 C13)

17. Function effectively as an individual, and as a member or leader of a team. (AHEP4 C16)

18. Communicate effectively on complex engineering matters with technical and non-technical audiences. (AHEP4 C17)

12. Learning and teaching methods

Students gain knowledge and understanding through a dynamic mix of teaching, learning, and assessment strategies, designed to actively engage them and enhance their comprehension. The educational context is enriched with staff-led interactive sessions, which delve into theoretical concepts in a multi-disciplinary context. These engaging

sessions are complemented by hands-on laboratory activities, crucial for reinforcing theoretical knowledge through practice-led experiments and simulations, allowing students to apply their learning in tangible scenarios.

To broaden their understanding, students participate in a variety of interactive activities including seminars, group tutorials, and collaborative exercises. These are crafted to foster critical thinking, problem-solving, and the application of theory to practical, real-life societal challenges, with a particular focus on sustainable development and the UN Sustainable Development Goals (SDGs). Additionally, students undertake individual and group projects, encouraging research-informed exploration and synthesis of information, thereby deepening their subject mastery.

Guided and independent study is highly promoted, complementing formal instruction. This self-directed exploration is supported by comprehensive resources such as key concept videos4 provided in advance, enhancing digital learning and offering opportunities for students to deepen their understanding, explore topics more extensively, and adopt a global perspective.

Academic advising plays a crucial role in this holistic educational approach, guiding students through their academic journey, fostering an inclusive learning environment, and highlighting opportunities for work-based learning and engagement with industry. This approach ensures that students not only gain a deep understanding of their subject but also remain well-being-focused, ready to apply their knowledge in a global context, and prepared for success in both academic and professional endeavours.

Students develop their skills within a stimulating and diverse teaching and learning framework, designed to nurture practical abilities, critical thinking, and teamwork. This dynamic setting encourages the acquisition of vital professional competencies through a blend of interactive sessions, guided learning, and academic advising.

Central to our approach are practice-led workshops that integrate multidisciplinary learning, encompassing engaging discussions, group tutorials, and hands-on laboratory work. These sessions offer an immersive experience, allowing students to apply theoretical concepts in real-world contexts, thereby enhancing their technical and analytical skills.

Seminars and laboratory exercises immerse students in experiential learning, emphasizing the application of knowledge to practical challenges and encouraging collaboration. This environment promotes active engagement and peer learning, deepening students' understanding of complex issues and fostering inclusive approaches to problem-solving.

Projects, undertaken both individually and in groups, are key to our pedagogy. They provide a platform for students to engage with comprehensive tasks that mirror industry problems, demanding creativity, critical evaluation, and strategic thinking. These projects often incorporate global and employer perspectives, highlighting the relevance of sustainable development and the application of research-informed strategies.

Utilizing state-of-the-art simulation tools and engaging in testing activities, students gain insights into the practical aspects of their field, from conceptual design to tangible outcomes, preparing them for industry-specific tasks and decision-making.

With the aid of key concept videos5 provided in advance and a strong emphasis on digital learning, we offer a well-rounded educational experience. This approach not only ensures the acquisition of theoretical knowledge but also emphasizes the development of practical skills and competencies essential for success in the global marketplace. Through work-based learning opportunities and industry engagement, we prepare students for the realities of their future careers, all while maintaining a focus on health and well-being.

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13. Employability

a) Development of graduate competencies

b) Employability development

Graduates of the BEng (Hons) Electronic Engineering programme are positioned to thrive in a wide array of career paths, benefiting from a curriculum that not only imparts technical expertise but also embeds ethical, societal, and sustainability perspectives within innovative engineering solutions. This approach prepares our students to pioneer innovative solutions with a sustainable impact.

Our alumni have carved successful careers in high-demand roles such as electronic design engineers, embedded systems engineers, control systems engineers, telecommunications engineers, and power electronics engineers. They find their professional homes across a spectrum of industries, including but not limited to aerospace, automotive, renewable energy, telecommunications, and consumer electronics, contributing to cutting-edge developments in IoT, smart grids, electric vehicles, and more.

The comprehensive educational journey, from foundational knowledge in programming, electronics, and mathematics to specialized areas like analogue and digital systems design, signal processing, and system-on-chip implementation, ensures that graduates are well-versed in the latest technological advancements and engineering practices. This foundation is further reinforced by hands-on experience gained through practical workshops, labs, and projects mirroring real-world challenges and industry standards. This blend ensures that our graduates not only possess the latest technological knowledge but also the hands-on skills demanded by employers.

Accreditation by the Institution of Engineering Designers (IED) sets a clear pathway for our graduates towards achieving Chartered Engineer (CEng) status, symbolizing their readiness to meet and uphold the highest engineering standards9. This distinction, coupled with the programme's emphasis on creativity, innovation, and critical thinking,

positions our graduates as leaders and visionaries in electronic engineering, dedicated to advancing technology and addressing global challenges in alignment with the UN Sustainable Development Goals.

Beyond immediate employment, the programme lays a solid foundation for further academic pursuits. Graduates are well-prepared to advance their expertise through specialized master's degrees or doctoral research in emerging areas such as wireless communication, robotics, and sustainable energy systems, further enhancing their career prospects and contributions to the field.

Relevant campus Careers and Employability Service continues to support our students post-graduation, aiding their transition into the workforce and providing guidance for those considering further academic pursuits. This enduring commitment ensures our graduates remain at the forefront of technological innovation and leadership in the ever-evolving landscape of electronic engineering.

Placement and work experience opportunities

Students in the TKSW mode take a placement (36 to 48 weeks) at the end of year 2. MDXworks Careers and Employability Service helps in the search for an appropriate employer and provides students with appropriate Placement. They also provide students with appropriate guidance and support in preparation for, during and after placement. The placement forms the basis for an assessed report based on the organisation. At the start of the placement, students are allocated an individual supervisor who provides support and advice for the duration of the project. Students following a TKSW placement year are supported through the process of securing a placement, which includes the legal and QAA requirements for placement learning, via tutorial support and the MDXworks Careers and Employability Service. Students who complete the placement on TKSW mode will receive an additional qualification referred to as a Diploma of Industrial Studies.

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Future careers/progression

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14. Assessment strategy

Students' knowledge and understanding is assessed by means of a wide variety of assessment techniques, each carefully chosen to align with the specific objectives of our curriculum and to cater to the diverse learning styles of our student body.

This includes a variety of interactive assignments such as presentations, formal report writing, and structured dialogues. These tasks not only assess students' understanding and ability to communicate complex ideas but also foster critical thinking and collaborative learning. Incorporating authentic assessment strategies, students engage in practical activities, problem-solving tasks, and project work that reflect real-world scenarios and industry standards. These exercises are instrumental in enabling students to confront actual problems, apply systematic problem-solving approaches, and harness innovative thinking.

Practical laboratory tasks provide a platform for students to engage in scientific inquiry, applying theoretical knowledge to experimental setups,

and interpreting data to draw meaningful conclusions.

A key component of our assessment approach is the provision of continual formative feedback, including discursive feedback that supports students' learning journeys. This varied feedback mechanism ensures students are continuously guided and supported in their learning, enhancing the authenticity and effectiveness of the assessment process.

Students’ skills are assessed by employing a diverse array of practical and analytical methods tailored to measure their proficiency and application of learned competencies.

To enhance communication skills, students are tasked with presenting technical material and expressing their insights through structured reports and project documentation. This practice not only refines their ability to present intricate data clearly and succinctly but also equips them for the demands of professional communication, including report writing and presentations.

The inclusion of authentic assessment tasks in the form of practical assignments and project work compels students to employ their skills in realistic situations. This approach ensures they are adept at converting theoretical understanding into actionable, real-world solutions.

A cornerstone of our assessment strategy is the provision of continual formative feedback, including discursive feedback, which plays a pivotal role in students' ongoing learning and development. This varied feedback mechanism supports a reflective learning process, enabling students to iteratively improve their skills and understanding throughout their educational journey.

15. Programme structure

Year 1

Year 1 Level 4 FT and PT

Code	Module Title	Credits	Type
PDE182	Practical Applications of Mathematics for Engineers 2026-27 Level 4	30	Compulsory
PDE1822	Electronic Engineering Principles and Applications 2026-27 Level 4	30	Compulsory
PDE1823	Physical Computing and Programming 2026-27 Level 4	30	Compulsory
PDE1824	Engineering Projects 2026-27 Level 4	30	Compulsory

Year 2

Year 2 Level 4 PT

Code	Module Title	Credits	Type
PDE1822	Electronic Engineering Principles and Applications 2027-28 Level 4	30	Compulsory
PDE1824	Engineering Projects 2027-28 Level 4	30	Compulsory

Year 2 Level 5 FT

PDE2114	Analogue Electronics 2027-28 Level 5	30	Compulsory
PDE2317	Design and Engineering in Context 2027-28 Level 5	30	Compulsory
PDE2112	Digital System Design 2027-28 Level 5	30	Compulsory
PDE2113	Signal Processing and Communications 2027-28 Level 5	30	Compulsory

Year 3

Year 3 Level 5 PT

Code	Module Title	Credits	Type
PDE2112	Digital System Design 2028-29 Level 5	30	Compulsory
PDE2114	Analogue Electronics 2028-29 Level 5	30	Compulsory

Year 3 Level 6 FT

Code	Module Title	Credits	Type
PDE3823	Major Project and Professional Practice 2028-29 Level 6	60	Compulsory
PDE3117	Applied AI and Systems Integration 2028-29 Level 6	30	Compulsory
PDE3115	System-on-Chip Design and Implementation 2028-29 Level 6	30	Compulsory

Year 3 Sandwich Year

Code	Module Title	Credits	Type
PDE3250	Thick Sandwich Placement 2028-29 Level 6	120	Optional

Year 4

Year 4 Level 5 PT

Code	Module Title	Credits	Type
PDE2113	Signal Processing and Communications 2029-30 Level 5	30	Compulsory
PDE2317	Design and Engineering in Context 2029-30 Level 5	30	Compulsory

Year 4 Level 6 FT

Code	Module Title	Credits	Type
PDE3823	Major Project and Professional Practice 2029-30 Level 6	60	Compulsory
PDE3117	Applied AI and Systems Integration 2029-30 Level 6	30	Compulsory
PDE3115	System-on-Chip Design and Implementation 2029-30 Level 6	30	Compulsory

Year 5

Year 5 Level 6 PT

Code	Module Title	Credits	Type
PDE3115	System-on-Chip Design and Implementation 2030-31 Level 6	30	Compulsory

PDE3117	Applied AI and Systems Integration 2030-31 Level 6	30	Compulsory

Year 6

Year 6 Level 6 PT

Code	Module Title	Credits	Type
PDE3823	Major Project and Professional Practice 2031-32 Level 6	60	Compulsory

16. Progression requirements

No PSRB requirements

Undergraduate

Level 4: Students are normally expected to pass 120 credit points to progress to level 5 full-time study or level 5 part-time study. University regulations apply.

Level 5: Students are normally expected to achieve 240 credits at levels 4 & 5 to progress to level 6. University regulations apply.

Level 6: In order to graduate with an honours degree, students must have achieved 360 credit points from core modules. To graduate with an ordinary degree, 300 credit points with a minimum of 60 credit points at Level 6. University regulations apply

Non-compensatory modules

17. Programme-specific support for learning

The Faculty's Teaching and Learning approach is used across the programme to promote learner autonomy and practice-based learning which are in line with the University's general strategy.

In support of the students' learning experience:

•All new students go through an induction programme, and some have early diagnostic numeric and literacy testing before starting their programme. Relevant campus Library and Student Support service provides workshops for those students needing additional support in these areas.

•Students are allocated a personal email account and secure online storage.

•New and existing students are given module handbooks for each module they study. Copies of all module handbooks can be found on MyLearning, a web-based online learning platform where learning materials are provided to further support learning.
•Additionally, each student will receive a free core e-book for each module they study.

•Extensive library facilities are available on all campuses. MyUniHub pages are available as learning resources.

•Students can access advice and support on a wide range of issues from the relevant campus Student Information Desk service, including Counselling & Mental Health, Welfare, Financial Support.

•The campus specific Students' Union service helps students make the most of their time at Middlesex University through student-led groups, year-round events or free, independent advice.

•Placements are supported by MDXworks Careers and Employability Services and Faculty academics; please refer to section 14 of this programme specification10.

•The campus specific Careers and Employability Services run a series of timetabled sessions looking at employability skills such as developing a professional LinkedIn profile. Students are also encouraged to engage in their drop-in sessions to support CV development etc.

•High-quality specialist network, software, and electronics laboratories equipped with industry standard software, hardware and tools as appropriate, for practice-based teaching as well as self-study. Middlesex

University is a Cisco Local Academy and Arm, Opnet and Xilinx University partners11.

•Teaching staff are available for each subject offering personal academic advice and help if needed. Staff availability for this purpose is posted outside staff office doors.

•Students are also allocated Academic Advisor for support and guidance throughout the entire duration of the Programme.

•Productive and informed support from technical staff is also available as well as support can be provided by Graduate Academic Assistants (GAAs)12 and Student Learning Assistants (SLAs).

•Formative feedback is given throughout the modules at appropriate stages and on completion of coursework.

•Research activities of academic staff feed into the teaching programme, which can provide individual students with ad-hoc opportunities to work with academics on some aspect of research.

•We promote Equality, Diversity and Inclusion through an inclusive curriculum enabling collaborative learning experiences that promote teamwork, communication, and the exchange of ideas among students from diverse backgrounds. We assign group projects, discussions, and activities that foster collaboration, peer learning, and cultural exchange.

Middlesex University encourages and supports students with disabilities. Some practical aspects of Science and Technology programmes may present challenges to students with particular disabilities. Students are encouraged to visit our campuses at any time to evaluate facilities and talk in confidence about their needs. If we know students' individual needs we will be able to provide for them more easily

18. HECOS code (Hecos | HESA)
100165: Electronic Engineering

19. Relevant QAA subject benchmarks
Engineering 2023

20. University Regulations
The programme will run in line with general University Regulations. View the full Regulations: Policies | Middlesex University.

This programme will run in line with general University Regulations.

Information on how the University's formal assessment regulations work, including details of how award classifications are determined, can be found in the University Regulations at https://www.mdx.ac.uk/about-us/policies

All modules will require that your complete an amount of coursework as part of your assessment. Coursework can include written work, such as technical reports, problem-solving exercises, case studies, laboratory logbooks, projects, dissertations, portfolios of written work etc., however it can also include non-written work such as demonstrations, presentations, viva, etc.

Level 4 modules, which do not contribute to the final classification, are awarded a Y grade (ungraded pass).

To pass a module, the overall module grade should be a minimum of 40% (with a minimum of 35% in each component). Due to professional body requirements, module compensation can only be granted for overall module marks of a minimum of 35%.

For additional assessment information and how learning outcomes are assessed please refer to the individual module narratives for this programme.

21. Reference points
The following reference points were used in designing the programme:
•The Accreditation of Higher Education Programmes (AHEP) AHEP 3 to AHEP 4 Mapping document

•Middlesex University Regulations;
•Middlesex University Learning and Quality Enhancement Handbook;
•UK Standard for Professional Engineering Competence;
•Chartered Engineer and Incorporated Engineer Standard, Engineering Council UK, 2020;
•The Accreditation of Higher Education Programmes, Engineering Council UK, 2020;
•IED Engineering Design Specific Learning Outcomes for EC (UK) Accredited Degree Programmes.
•QAA UK Quality Code for Higher Education
•QAA Framework for Higher Education Qualifications
•QAA guidelines for programme specifications
•QAA Code of Practice for the assurance of academic quality and standards in HE
•University policy on equal opportunities.

21. Methods for evaluating and improving the quality and standards of learning
Refer to Middlesex Quality processes

22. Other information
Not applicable