

AECB CarbonLite™ Retrofit Coordination course



CLRrc – Your Guide to Expertise in the PAS 2035 framework and Domestic Retrofit

The AECB CarbonLite™ Retrofit Coordination course (CLRrc) is a cutting edge advanced level e-learning course for domestic building retrofit project management and risk management. Written by a number of AECB CarbonLite and Low Energy Industry experts including Dr Sarah Price, Technical Author of the PAS 2035 update 2022.

The course has been developed to provide an in-depth knowledge of the PAS 2035 process and an introduction to our AECB Retrofit Standard, enabling graduates to easily work with and achieve these requirements. Become proficient in retrofit coordination and help effect deep and lasting change in the building design and construction industry, as we work together to achieve a zero carbon future.

Understand the PAS 2035 Retrofit Coordinator and Other Retrofit Roles

The course works alongside the PAS 2035 framework and provides individuals with the skills and knowledge required when working on projects under the PAS 2035 and PAS 2030.

It has been developed to support the PAS 2035 framework and also align with the AECB Retrofit Standard. The course will equip you and your organisation with an understanding of how to provide PAS 2035-aligned retrofit services to clients while giving individual homeowners and tenants an increased level of confidence and protection across the entire retrofit process.

This Retrofit Coordination course takes on average 105 hours of fully online, self-directed learning. The training platform allows you to clearly track your progress, easily dip in and out of your course and to go faster or slower depending on your work and other commitments, with up to a year to complete the course.

Students will be guided through the PAS 2035 process in order to gain a good working knowledge of it. As such, the learning platform guides you clearly through this. There are a variety of assessment types, including multiple choice, numerical calculations and scenario-based exercises. In order to help reinforce learning, a short assessment may follow at the end of each lesson.

You can download lesson booklets, for access to course content at times when internet connection may not be reliable, and for your own study reference. You can communicate with fellow students to

discuss learning or to post questions arising from the material on the dedicated online forum, and there is continuous access to student support for dedicated assistance with any questions arising. You can provide feedback on each lesson and module, and help inform and improve the course for future students.

The course prepares built environment professionals thoroughly for the technical challenges of retrofitting existing buildings to an excellent standard with risk assessment and avoiding unintended consequences at the forefront of the learning.



What is PAS 2035 and why is it important?

PAS 2035:2019 was sponsored by the UK Government's Department for Business, Energy and Industrial Strategy (BEIS). This is the key document in a framework of new and existing standards on how to conduct effective energy retrofits of existing buildings, it covers how to access dwellings for retrofit, identify improvement options, design and specify Energy Efficiency Measures (EEM) and monitor retrofit projects.

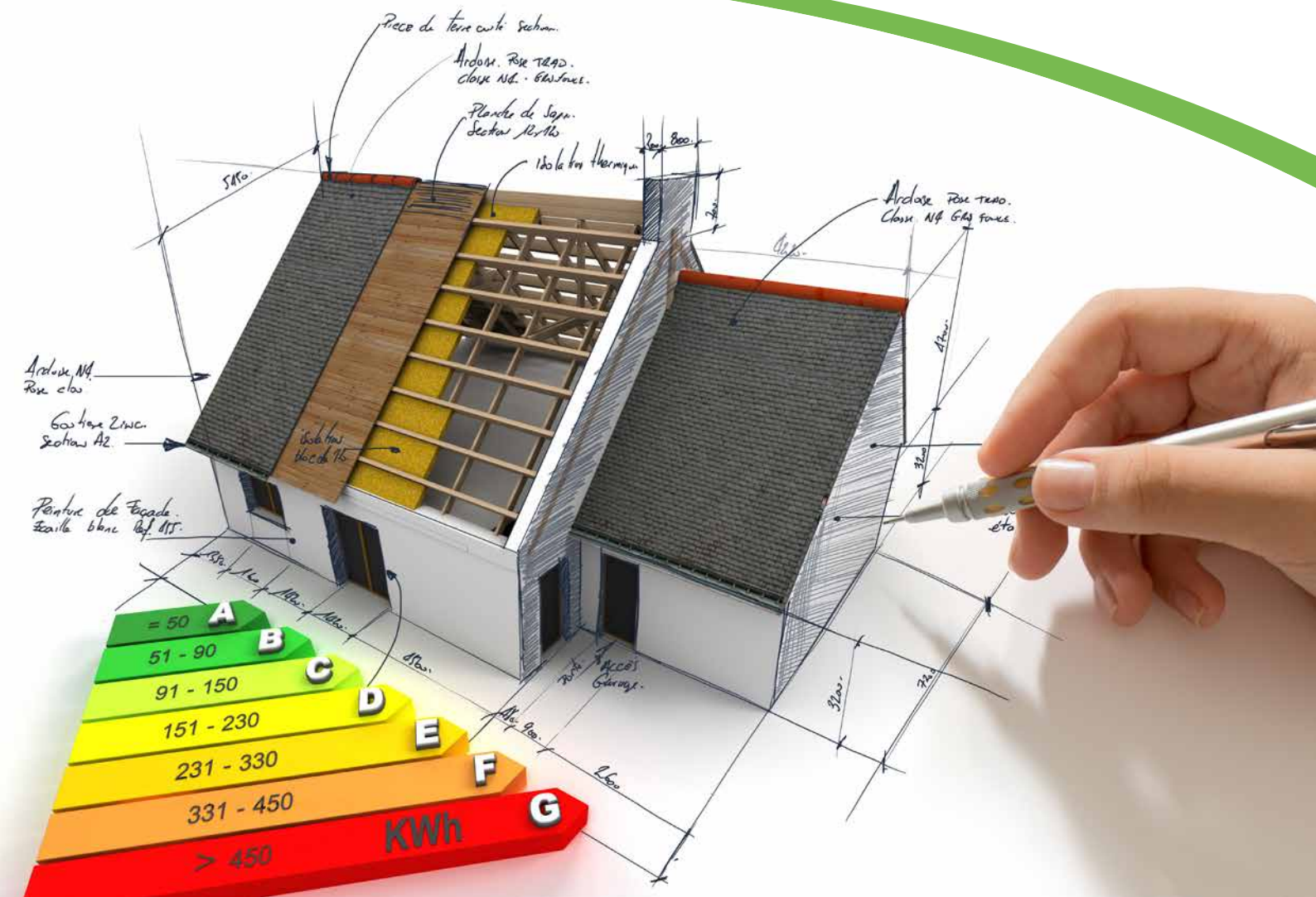
The standard drives the 'whole house approach' in-line with the AECB rhetoric and includes a 'fabric first' methodology. It defines the qualifications and responsibilities of individual retrofit roles and respective activities required prior to and post EEM installation. It includes a risk assessment process that builds incrementally robust requirements depending on what requirement path (A, B, or C) the retrofit project is assessed to fall within.

The PAS 2035 framework needs to be followed to draw down specific government funding for retrofit projects. The management of funded projects must be compliant with the PAS 2035 and its requirements.

PAS 2035 is inextricably linked to PAS 2030:2019 (for installers), the industry specification to replace PAS 2030:2017 and is the standard to which all energy efficiency installers must be certified and compliant.

The course highlights further roles within the PAS 2035 framework and the Retrofit project team, highlighting the need for all good retrofit projects, not just publicly funded ones, to follow proper risk management processes, design out any unintended consequences and to develop a whole house retrofit plan for each property regardless of what length and depth the initial retrofit may be, so as to allow all projects to start on the road to the UK's zero carbon targets. The knowledge contained within the course allows clients and professionals involved in retrofit, to develop for longer term plans and measures where a whole retrofit cannot be undertaken initially, so that projects undertaken now, don't lock in future problems, thus avoiding retrofit measures needing to be re-done later in the process.

The Technical Author for the 2022 update of the PAS 2035 document was Dr Sarah Price. Sarah is also one of the writers of our Retrofit Coordinator course.



The PAS 2035 framework and Domestic Retrofit – Why Study?



We are in a climate emergency caused by greenhouse gases (GHG's) being released into the earth's atmosphere at an unprecedented rate & volume. One area where we emit vast amounts of GHG's is simply through the space heating and the hot water demand within our own homes. In the UK, the operational CO₂ emissions from domestic buildings alone accounts for 69%, and is responsible for 18% of our entire annual national CO₂ emissions. Retrofit is at the heart of making valuable contribution to decarbonising our homes.

To achieve the 2050 targets for reducing CO₂ emissions, it is often said that 27 million UK homes need to be retrofitted at a rate of one per minute. This assumes that a deep retrofit is installed, and works effectively for at least 25 years. The reality is that poorly planned retrofit is the norm, and measures are not only piecemeal, but also often counter-productive.

This course was developed because government reports highlighted the scale of the retrofit challenge. The Hansford Report (2015) on the Solid Wall Insulation sector identified poor workmanship, little design input and inappropriate detailing amongst many other shortcomings of projects looked at.



The CLRrc course addresses the skills gap and the rapid need to meet zero carbon targets within the construction industry

The Each Home Counts Review (2016) called for urgent action to improve quality and raise standards. Both reports highlighted the need for knowledgeable experts capable of leading successful projects. There is an opportunity for AECB CarbonLite™ Retrofit-literate design professionals and consultants to meet this need, as well as delivering homes that facilitate healthier and more sustainable lifestyles for clients.

Findings of the Sixth Assessment Report from the Intergovernmental Panel on Climate Change, or IPCC, (IPCC, 2022) call for increased efforts to decarbonise. Professor Jim Skea, Co-chair of Working Group III for the IPCC has said that "Unless there are immediate and deep emissions reductions across all sectors, 1.5°C is beyond reach" if seeking to minimise global temperature rise.

Therefore, "business as usual" is no longer a viable option. The climate emergency demands that we aspire to targets of zero carbon and even carbon negative buildings.

Who Should Study?

This year-round e-learning course is aimed at professionals in the construction industry, built environment and those involved in the energy efficiency sector who need to understand how the PAS 2035 framework impacts on their projects and which key professionals within their organisations need to upskill as defined in the UK Government 'Heat and Buildings Strategy' (October 2021).

The course provides the in-depth technical detail essential to understanding low carbon retrofit and a working knowledge of the PAS 2035 process and framework. The course enables students to become confident and proficient in retrofit coordination in order to help facilitate PAS 2035 compliant projects and support the work of an accredited Retrofit Coordinator and the other roles within the process.

For those who are already familiar with retrofit and project management, this course helps to learn and apply best practice, risk management and a sustainable approach to projects, carrying this positive change forward into all projects.

This course is particularly useful to explore your path and position in the newly structured retrofit sector. It is ideal preparation if you would like to build a foundation and confidence before deciding whether to pursue accreditation as a Retrofit Coordinator via a Level 5 Diploma course.

What will you study?

The course is developed from our AECB CarbonLite™ Retrofit Foundation course, which is attune with low energy retrofit, carbon costing, promotes use of the Passive House Planning Package (PHPP) with a focus on reducing the performance gap, introduces AECB stock modeling and introduces all of the necessary PAS 2035 Retrofit roles.

The modules follow the order of the PAS 2035 stages, and we recommend you read the course in conjunction with PAS 2035 guidance document (available to purchase separately). AECB students will be able to gain access to a 50% discounted copy of the PAS 2035 guidance document.

The programme course modules are:

- Introduction to Retrofit
- Preliminary Considerations for Retrofit
- Retrofit Risk Assessment
- Dwelling Assessment
- Technical Information relevant to the Dwelling Assessment
- The Retrofit Design Stage
- Air Tightness and Ventilation
- Improving the building fabric - Floors and Roofs
- Improving the building fabric - Walls and Windows
- Improving the Building Services
- Renewable Energy Systems
- Improvement Option Evaluation and Medium Term Retrofit Plans
- Working With Installers
- Post-installation stages
- Technical information relevant to the post-installation stages



What are the basic requirements to take this course?

The course is aimed at those already familiar with retrofit and project management. Students will need



to be familiar with domestic construction techniques, able to read and understand construction drawings and specifications, be familiar with the Building Regulations and with construction health and safety regulations and practice, and have experience/ understanding of project management (e.g., management of finances, contracts and the work of contractors).

As well as having the knowledge and experience mentioned above, we suggest that any of the following background knowledge and experience may be helpful in aiding progress through the course at pace:

- Hold a professional qualification in a building-related subject (such as architecture, surveying, engineering or construction management), or a subject related to the management or supervision of construction and domestic construction projects.
- Hold a National Vocational Qualification (NVQ) at Level 3 or above in a subject related to the management or supervision of construction and domestic construction projects, along with experience of working in the building design/ construction industry.
- Have completed our AECB CarbonLite™ Retrofit Foundation (CLRf) course previously, and also be working in the building design/construction industry.

In order to undertake one of our courses you will need to **become an AECB member**. We recommend logging in to your AECB membership account ahead of applying, to make the process as smooth as possible.

If you don't currently want to become proficient in understanding the PAS 2035 Framework and the Retrofit Coordinator role, you can choose to join our UK government recognised **AECB CarbonLite™ Retrofit Foundation** course to learn holistically about the retrofit process including how to develop your understanding of heat, ventilation and moisture in existing buildings, awareness of the issues that can arise from repair and how to make informed decisions, and gain knowledge in reducing the performance gap.

COURSE CONTENT

The AECB CarbonLite™ Retrofit Coordination course (CLRrc) features 15 modules, each taking an in-depth look at the following:

Module 0: Introduction to the Retrofit Standards Framework

The main aim of this module is to provide background and context to the PAS 2035 and the wider Retrofit Standards Framework, within which the Retrofit Coordinator plays a key role.

- 0.1 The political and technical context of domestic retrofit in the UK.
- 0.2 The pattern of domestic energy use, how it varies between dwellings & how energy use in dwellings affects greenhouse gas emissions.
- 0.3 The Benefits of domestic retrofit.
- 0.4 The key risks associated with domestic retrofit.
- 0.5 Current and future retrofit standards.
- 0.6 How the Each Home Matters review, the associated Customer Charter, the Code of Conduct and the BSI retrofit standards framework are intended to work together to improve the quality of domestic retrofit.
- 0.7 The role of the Retrofit Coordinator in risk management and quality assurance.

Module 1: Introduction and Preliminary Considerations

The main aim of Module 1 is twofold: To provide an introduction to the Retrofit Coordinator role, and also to cover the "Preliminary Considerations" step of the PAS 2035 process.

1. All about the Retrofit Coordinator.
2. Preliminary considerations and getting started.
3. The key principles of low carbon retrofit.

Module 2: Retrofit Risk Assessment

The primary aim of Module 2 is to cover the "Risk Assessment" stage of the PAS 2035 process, which is a key responsibility for the Retrofit Coordinator.

- 2.1 The Retrofit Coordinator and the risk management stage.
- 2.2 Building physics – moisture risks.
- 2.3 Building physics – thermal efficiency.
- 2.4 The principles of heat gains from different sources in dwellings.
- 2.5 Heat balance.

Module 3: Dwelling Assessment

The primary aim of Module 3 is to cover the “Dwelling Assessment” stage of the PAS 2035 process, and how the Retrofit Coordinator works with the Retrofit Assessor during this stage.

- 3.1 The role of the Retrofit Coordinator at the Dwelling Assessment Stage.
- 3.2 Dwelling assessment path A.
- 3.3 Dwelling assessment path B.
- 3.4 Dwelling assessment path C.

Module 3A: Technical Information Relevant to the Dwelling Assessment

The primary aim of Module 3A is to provide technical information that is relevant to the “Dwelling Assessment” stage of the PAS 2035 process.

While Module 3 was concerned with the process that the Retrofit Coordinator and Retrofit Assessor must take to complete the Dwelling Assessment stage, Module 3A provides examples of assessment approaches that might be useful to consider, and detail around the energy models and other tools which the Assessor may use.

- 3A The energy survey and assessment process.
- 3A.1 Performance simulation models.
- 3A.2 BREDEM.
- 3A.3 SAP vs PHPP.
- 3A.4 Other information for the Dwelling Assessment.
- 3A.5 Building envelope appraisal.

Module 4: The Retrofit Design Stage

The primary aim of Module 4 is to cover the Retrofit Design stage of the PAS 2035 process, and the role of the Retrofit Coordinator in Improvement Option Evaluation and the Medium Term Whole House Plan.

- 4.1 The role of the Retrofit Coordinator at the Design Stage.
- 4.2 Retrofit Design Stage – path A process.
- 4.2 Retrofit Design Stage – path B process.
- 4.2 Retrofit Design Stage – path C process.



I'm glad that your course is launched and shaped well. I can tell it is a bit more detailed compared to others generally and addresses all the principles for the retrofit coordination process

Dr Jamal M Alabid

Module 4A: Air Tightness and Ventilation

The aims of Module 4A are:

- To emphasise the role of airtightness and ventilation, which is critical to occupants' health and to the integrity of the building fabric.
- To explain the issue of overheating.
- To review ventilation options for retrofit: their features, advantages and disadvantages.
- To review issues with mechanical ventilation with heat recovery (MVHR) in retrofit, as revealed by the Retrofit for the Future programme.
- To explain emerging techniques for improving internal air quality, including demand-controlled ventilation technology.

4A Background context.

4A.1 The purpose and role of ventilation in retrofit.

4A.2 Overheating.

4A.3 Establishing a retrofit ventilation strategy.

4A.4 Ventilation system options.

4A.5 Issues associated with MVHR in retrofit.

4A.6 Demand control ventilation.

4A.7 Other techniques for improving indoor air quality.

4A.8 Further resources – COVID 19 & ventilation and ventilation at night.

Module 4B: Improving the Building Fabric – Floors and Roofs

The primary aim of Module 4B is to look at the considerations, risks and details when improving the building fabric with regards to floors and roofs.

4B.1 The objectives and principles, strategies and standards for insulating the existing building fabric.

4B.2 The risks and consequences of thermal bridging.

4B.3 The range of available insulation materials and products.

4B.4 Best practice in insulating exposed floors.

4B.5 Best practice in insulating exposed roofs.

Module 4C: Improving the Building Fabric – Walls and Windows

The primary aim of Module 4C is to look at the considerations, risks and details when improving the building fabric with regards to walls and windows.

4C.1 Best practice in Cavity Wall Insulation (CWI).

4C.2 Solid wall insulation.

4C.3 Best practice in Internal Wall Insulation (IWI).

4C.4 Best practice in insulating solid walls: External Wall Insulation (EWI).

4C.5 Whole project examples.

4C.6 Doors and Windows.

Module 4D: Improving the Building Services

The primary aim of Module 4D is to look at the considerations, risks and details when improving the building fabric with regards to the building services.

- 4D.1 The extent of building services, their costs and effectiveness.
- 4D.2 The key issues relating to heating with mains gas.
- 4D.3 The key issues for heating in areas without mains gas.
- 4D.4 The issues involved with the supply of hot and cold water in retrofit projects.
- 4D.5 The issues involved in electric power supply for domestic retrofit projects.

Module 4E: Renewable Energy Systems

The primary aim of Module 4E is to look at the considerations, risks and details when improving the building fabric with regards to using renewable energy systems.

- 4E.1 The role of renewable energy systems in domestic retrofit.
- 4E.2 The principles of solar photovoltaic (PV) electricity generation.
- 4E.3 The principles of solar thermal heat generation and how it can be integrated with domestic hot water systems.
- 4E.4 The principles of wind power and why small-scale wind power is not appropriate for domestic retrofit.
- 4E.5 The principles of micro CHP for domestic combined heat and power generation and the best types of buildings in which to install it.
- 4E.6 The principles of Heat pumps for domestic heat generation and the best types of buildings in which to install it.
- 4E.7 Renewable energy grants and incentives.

Module 4F: Improvement Option Evaluation and Medium Term Retrofit Plans

The primary aim of Module 4F is to understand the financial costs and savings of retrofit and the effects on carbon dioxide emissions of properties; understanding the drivers, how to assess the case for retrofit such as financial returns, the sources of funding and eligibility for this, how to calculate available funding, the value of a whole-house retrofit plan and how to develop and present one.

- 4F.1 Introduction.
- 4F.2 Assessing the case for domestic retrofit (financial returns and CO₂ savings).
- 4F.3 Sources of funding, subsidies and incentives for retrofit.
- 4F.4 One-off vs incremental retrofit and the value of a Whole House Retrofit Plan.
- 4F.5 Developing a Whole House Retrofit Plan.
- 4F.6 Whole House Retrofit Plans at scale.
- 4F.7 Optional- Extra Detail: Limitations on the use of CCE and Simple Payback figures.

Module 5: Working with Installers

The primary aim of Module 5 is to cover the “Installation” stage of the PAS 2035 process, and how the Retrofit Coordinator works with the Installer during this stage.

5.1 The role of the Retrofit Coordinator in the on-site installation process.

Module 6: Post-Installation Stages

The primary aim of Module 6 is to cover the following stages of the PAS 2035 process:

- Testing and Commissioning (Clause 11)
- Handover (Clause 12 and 13)
- Monitoring and Evaluation (Clause 14)

It focuses on how the Retrofit Coordinator (RC) works with the Evaluator and others during these stages. (On some projects the RC will be the Evaluator).

- 6.1 The role of the Retrofit Coordinator in the Testing, Commissioning and Handover of retrofit projects.
- 6.2 The importance of Monitoring, Evaluation and Feedback to the improvement of domestic retrofit projects.
- 6.3 The role of the Retrofit Coordinator in managing Monitoring and Evaluation work and providing feedback.
- 6.4 The basic evaluation.
- 6.5 Intermediate and advanced monitoring.
- 6.6 Evaluation techniques.

Module 6A: Technical Information Relevant to the Post-Installation Stages

The primary aim of Module 6A is to understand the technical information relevant to the Post-Installation stages, including testing, commissioning and monitoring techniques.

- 6A.1 Testing and commissioning.
- 6A.2 Monitoring techniques.



I have found the AECB Retrofit Coordination Course an invaluable introduction to the PAS 2035 regulation and an ongoing resource in my architectural practice. All architects should have training in and an understanding of retrofit, and this course delivers expert knowledge of technical detailing with a strong reference to the underlying theory, policy and practice

Frances Crow, Architect

KEY INFORMATION

What commitment do I have to give to the learning?

In order to fully comprehend the content and benefit from the programme, the AECB advises that each learner spends at least 105 hours over the course of up to 12 months completing the course. This equates to around two hours per week on average.

- 105 hours of self-guided reading and interactive quizzes.
- Quiz tasks based on the course content, which the tutors know in great depth.
- Course price £449+VAT for members, or £399+VAT for members who are graduates of our AECB CarbonLite™ Retrofit Foundation course (2023 prices).
- There is the opportunity to renew access to the course for a further year at a time if required (currently £99+VAT).

When can I start?

You can start at any time in the year and progress at your own pace over the course of one year.

FREQUENTLY ASKED QUESTIONS (FAQs)

What if I can't commit to completing within 12 months?

Whilst we encourage candidates to complete the course within the 12-month time frame, you can easily extend access to the materials for one year by paying a 12-month renewal fee.

Is there guidance available if I get stuck on a module?

You can use the 'Contact Module Tutor' links that are available within each module, or email our training team.

Will I be able to access the CLRRc course lessons after completing the course?

Yes, after completing the course, you will have the option to retain access on an annual basis (for a modest fee). This means that as the course is updated or improved over time, you will have access to the latest, most up to date version, or you can download the module booklets as you proceed through the course.

What is the deadline for joining the course?

The course has been made flexible so you can join at any time.

What elements do I need to do at a fixed time? Or are they all flexible?

You can start the course when you wish and progress at your own speed.

Do you think I can realistically do this course while working full time?

Yes. The course can be spread over a 12-month period so that a wide range of busy people can manage it around their schedule, and there is always the option to extend.

How do I talk to others on the course?

We have a course learner discussion forum so that you can speak to your peers, ask queries about the course, modules and lessons. The forum is categorised into module threads. It allows you to share information and have discussions with your peers when on the learning platform and pose queries to your course peer group.

We also have a 'Contact Student Support' link in each module too for general learner queries, admin or learning platform related queries, and a 'Contact Module Tutor' link at the bottom of each Module for posing topic and assessment related queries for tutor guidance.

CONTACT

As an e-learning provider, we take all of our bookings online. To book, visit <https://aecb.net/aecb-retrofit-coordination-course/>

You need to be an AECB member before booking on to the course. You can become a member at www.aecb.net for as little as £39 (student/low income/retired rate) (members of the Passivhaus Trust receive a 20% discount on joining fee).

If you have further specific questions relating to the course, please email training@aecb.net

AECB CarbonLite™ Retrofit Coordination course is developed and operated by the Association for Environment Conscious Building (AECB)

Those who have completed our AECB CarbonLite™ Retrofit Foundation course are eligible for a discount from the CLRRc course fee.

*It is possible
to gain group booking discounts
e.g. if an organisation would
like to book a group of
employees onto the course.
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