

# MSc Construction Project Management

## CPM7003

### Sustainable Construction

# MODULE GUIDE

## 2022/2023

## Semester 2



Level HE7

## Contents

1. Module Overview .....	2
2. Learning and Teaching Strategy .....	2
3. Graduate Attributes .....	2
4. Module Communications .....	2
5. Module Outline .....	2
6. Indicative Content .....	3
7. Learning Outcomes and Assessments .....	3
8. Assessment Deadlines .....	4
9. Assessment Feedback .....	7
10. Module Calendar .....	7
10. Formative Assessment .....	8
11. Indicative Reading .....	8
12. Guidelines for the Preparation and Submission of Written Assessments .....	8
13. Academic Misconduct .....	10
14. General Assessment Guidelines for Written Assessments Level HE7 .....	11

## 1. Module Overview

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Office Location	G2-05/ G2-06
Drop-in Availability	face-to-face or zoom meeting
Weblink to Moodle Class	<a href="https://moodle.bolton.ac.uk/course/view.php?id=26282">https://moodle.bolton.ac.uk/course/view.php?id=26282</a>
Weblink to Module Specification	<a href="https://modules.bolton.ac.uk/CPM7003">https://modules.bolton.ac.uk/CPM7003</a>

## 2. Learning and Teaching Strategy

The module is delivered via two 1 ½ hour sessions per week, over 15 weeks. To complete the module successfully you must also allocate a substantial amount of independent study time. Most sessions comprise a formal lecture of approximately 90 minutes and a seminar.

## 3. Graduate Attributes

Graduate attributes are the personal qualities and skills which the University of Bolton community values, and which a student is expected develop during their time at the University. Graduate attributes act as a point of reference for a student's personal development and support the articulation of employability and transferable skills. The following three attributes are considered:

Resilience

Global citizenship

Effective communication

## 4. Module Communications

The Module Tutor's contact details are provided at the top of this page. You must check your University of Bolton email address and the Moodle area dedicated to this module regularly as many module communications are channelled through these media.

Your Module Tutor will normally aim to respond to your email messages within 2 full working days of receipt. However responses will be longer in holiday periods.

## 5. Module Outline

This module will involve the student in study of the concept of sustainable development and its relevance in the global context and in the appraisal of the contribution of a formalised environmental management system (EMS) to business performance. The legislative regime for the regulation of contaminated land will be evaluated and the principles and techniques of associated technology will be critically assessed. Data from a contaminated land site will be evaluated and remedial options to safeguard human health, controlled water and gaseous risk will be examined.

## 6. Indicative Content

### Indicative Content

- 1 Sustainable Development. International agreements and accords. Relevant U.K. legislation and policy which implement international agendas. Environmental, economic and social aspects of the sustainability agenda.
- 2 Sustainable Construction. Appraisal and reuse of heritage assets. Conservation philosophies and legislative control. Repairing and maintaining heritage assets. Sustainable practices in new build construction. Sustainable urban drainage systems (SuDS). Environmental management of land.
- 3 Environmental Management Practices. Whole life carbon costing, construction related. Environmental Statements in construction practice. Environmental Impact Assessments. Environmental Risk Management. The role of Environmental Management Systems in construction.

## 7. Learning Outcomes and Assessments

Learning Outcomes	Assessment
LO1: Critically appraise and apply current environmental legislation	Assessment 1 (Essay)
LO2: Critically appraise heritage assets and sustainable construction practices	Assessment 1 (Essay)
LO3: Develop a deep understanding of ecological and conservation issues	Assessment 2 (Report)
LO4: Develop a deep understanding of current environmental practices	Assessment 2 (Report)

## 8. Assessment Deadlines

Assessment item		Due Date	Weight
1	<p>Coursework: 3000 word essay plus references, bibliography and appendices.</p> <p>Discuss how BIM Impacts on sustainability of urban United Nations Educational Scientific and Cultural Organization (UNESCO) World Heritage Sites at risk and consider the intervention and mitigation at local, national, and international levels and the cause and effect that climate change had and/or will have on that.</p> <p>You should consider three world heritage sites that may be at risk of losing their status, due to environmental degradation through inappropriate development, human intervention or consumption or natural deterioration of fabric and material.</p> <p>Useful sources:</p> <p>1. <a href="https://whc.unesco.org/en/activities/883/">https://whc.unesco.org/en/activities/883/</a>  2. <a href="https://www.ucsusa.org/resources/world-heritage-and-tourism-changing-climate#.V0hpWPkrJpi">https://www.ucsusa.org/resources/world-heritage-and-tourism-changing-climate#.V0hpWPkrJpi</a>  3. <a href="#">Seekamp, E., Jo, E. Resilience and transformation of heritage sites to accommodate for loss and learning in a changing climate. Climatic Change 162, 41–55 (2020). https://doi.org/10.1007/s10584-020-02812-4</a></p> <p><u>Marking criteria</u></p>		<p>Week 10 Friday 23.04.2023</p> <p>50%</p>
	Appropriate reference to protocols, International agreements, organizations documents and relevant legislation and its application to the World Heritage Site under investigation.	25 marks	
	Analysis of the causes and effects of the environmental changes on specific sites	30 marks	
	Discuss mitigation actions/policies at local, national and international level.	30 marks	
	Evidences of reading and in-text citation of authoritative sources (i.e. peer reviewed journals, conferences, text books and technical reports), structure, presentation of information, grammar, syntax and using of Harvard referencing style.	15 marks	

## Assessment 2:

### CPM7003 Sustainable Construction Assignment Brief 2023

Assessment Number	2
Assessment Type (and weighting)	3000 Word Essay (50%)
Assessment Name	Life Cycle Assessment of three building typologies.
Assessment Submission Date	08/05/2023, 23:59

#### Learning Outcomes Assessed:

- LO3: Develop a deep understanding of ecological and conservation issues
- LO4: Develop a deep understanding of current environmental practices.

#### Assignment Brief:

- This assignment is an individual exercise, producing outputs to meet the detailed brief below.
- You can choose which country your building is located in – you must identify the location in your report using the [what3words app](#)

You are part of the design team delivering a Net Zero project. The Client wants the specified dwelling to be the most energy efficient building but does not specify the building materials, only the end goal of Net Zero status. The dwelling is detached with a footprint of 8m x 10m, is two storey and has a roof plane and pitch of your choice.

The Client is aware of the need for a 'just energy transition' and the potential impact of Sustainable Development Goal 7 – Affordable and Clean Energy.

You have been provided with all the information (on Moodle) to design a benchmark building typology using AutoCAD, SketchUp or scale rule, pencil and paper – you choose. Once designed, you must produce a report that includes the following:

- a) A benchmark (notional) building typology, with three comparison buildings.
- b) A specification of materials for each of the typologies, critically discussing your choices and the differing impacts on the typologies, the environment and occupants – you must specify between 15 and 20 materials for each typology.
- c) The orientation of the buildings, critically discussing your choices and the differing impacts on the typologies, the environment and occupants.
- d) An evaluation of how you will influence the design team to deliver this project which will involve new ways of working (with colleague resistance anticipated), new ways of thinking, new ways of procuring and new ways of scheduling.
- e) Integrate a supply chain map with your materials specification using [Batch Geo](#) or a similar programme.
- f) Integrate the supply chain map with a Gantt Chart (using MS Project) and explanatory notes in a format you would use to present at a Design Team Meeting (MS PowerPoint or similar).
- g) Perform a Life Cycle Assessment on all three typologies using the student access to [One Click LCA](#)

Well researched, annotated and presented data (the LCA, the specification, the Gantt Chart etc) can count for as much as 1500 out of the total 3000 words.

#### Marking Scheme:

##### Tasks

Task (a) A benchmark (notional) building typology, with three comparison buildings.  
15%

Task (b) A specification of materials for each of the typologies, critically discussing your choices and the differing impacts on the typologies, the environment and occupants – you must specify between 15

and 20 materials for each typology.

15%

Task (c) The orientation of the buildings, critically discussing your choices and the differing impacts on the typologies, the environment and occupants.

15%

Task (d) An evaluation of how you will influence the design team to deliver this project which will involve new ways of working (with colleague resistance anticipated), new ways of thinking, new ways of procuring and new ways of scheduling.

15%

Task (e) Integrate a supply chain map with your 15 – 20 materials specification using [Batch Geo](#) or a similar programme.

10%

Task (f) Integrate the supply chain map (with the 15 – 20 materials) with a Gantt Chart (using MS Project) showing expected delivery times and explanatory notes in a format you would use to present at a Design Team Meeting (embed as an image in the final document).

10%

Task (g) Perform a Life Cycle Assessment on all three typologies using the student access to [One Click LCA](#)

20%

## 9. Assessment Feedback

Feedback on items of assessment can be formal (such as on a signed feedback form) or informal (such as advice from a tutor in a tutorial). Feedback is therefore not just your grade or the comments written on your feedback form, it is advice you get from your tutor and sometimes your peers about how your work is progressing, how well you have done, what further actions you might take.

We recognise the value of prompt feedback on work submitted. Other than in exceptional circumstances (such as might be caused by staff illness), you can expect your assignment and examination work to be marked and feedback provided not more than 15 working days from the deadline date. However, please note that that such feedback will be provisional and unconfirmed until the Assessment Board has met and may therefore be subject to change.

Please take time you read or listen to your assessment feedback. This can be very useful in determining your strengths and key areas for development, and can therefore help you improve on future grades.

## 10. Module Calendar

Week commencing	Weeks	<b>Monday 9.30 – 10.40 and 11:00 -12:30</b> <b>13:30-15.00 and 15:30-17:00</b> <b>Tuesdays 13:30-15.00 and 15.00 – 16.30</b>
23/01/2023	1	Introduction to Module and Introduction to Sustainable Construction (Anna) Codes, Standards, and tools to assess sustainable buildings (Payam)
30/01/2023	2	Sustainable Development Goals (Anna) Introduction to BIM (Payam)
06/02/2023	3	Site Visit to University of Salford – Eco House and Barrett Z-House
13/02/2023	4	Guest lecture from Jason Challender (Environmental Sustainability & Sustainable Building Design)
20/02/2023	5	Sustainable Development Goals and the Built Environment – Intro to Life Cycle Assessment (Anna) Renewable Energy (Payam)
27/02/2023	6	Nature Based Materials and Modern Methods of Construction (Anna) Waste Management (Payam)
06/03/2023	7	Life Cycle Assessment (Anna) Sustainable Development (Payam)
13/03/2023	8	Guest Lecture – Ms. Lynda Jubb (Digital Twins and BIM4D)
20/03/2023	9	The Challenge of Urban Politics, Planning and Governance (Anna) Revision Assignment 1 (Payam)
27/03/2023	10	Guest Lecture from Dr Junfeng Geng (Environmental Science and COP27)
03/04/2023	-	<b>Easter Holiday – no classes</b>
10/04/2023	-	<b>Easter Holiday – no classes</b>
17/04/2023	11	Guest Lecture from Prof. Peter Farrell (Legislative drivers of climate change) Formative Submission Assignment 2
24/04/2023	12	What makes the built environment function? Cities as complex systems (Anna) Green Building and Environmental Green Sources of Energy and New Developments (Payam)
01/05/2023	13	Revision of Assessment 2 and How can we improve human development in cities? (Anna)
08/05/2023	14	No class – exam week Assessment 2 Submission

NB: Please note that this module calendar may be subject to change.



## 10. Formative Assessment

Formative assessment is employed to support your learning on the module, allowing you to reflect on feedback on your progress from your tutors and peers. It takes a variety of forms but does not contribute to the final module mark.

## 11. Indicative Reading

BIS (2010) Low carbon construction innovation and growth team final report Autumn 2010; available at: <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/l/10-1266-low-carbon-construction-IGT-final-report>

Earl, J. (2001) Building Conservation Philosophy. 3rd ed. Reading: College of Estate Management

English Heritage. (2011) Heritage Counts 2011 England. English Heritage

HM Treasury (2013) Infrastructure Carbon Review. November. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/260710/infrastructure\\_carbon\\_review\\_251113.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/260710/infrastructure_carbon_review_251113.pdf)

Oxley, R. (2003) Survey and Repair of Traditional Buildings. A Sustainable Approach. Shaftesbury: Donhead

Orbasli, A. (2008) Architectural Conservation. Oxford: Blackwell Publishing

Rodwell, D. (2007) Conservation and Sustainability in Historic Cities. Oxford: Blackwell Publishing

Department of Energy and Climate Change (DECC) <http://www.decc.gov.uk>

United Nations Sustainable Development: <http://www.un.org/esa/dsd/index.shtml>

U.K. legislation: <http://www.legislation.gov.uk>

English Heritage (EH) <http://www.english-heritage.org.uk/>

European Union Knowledge Network (EUKN): <http://www.eukn.org/EUKN>

Society of the Protection of Ancient Buildings (SPAB) <http://www.spab.org.uk/>

## 12. Guidelines for the Preparation and Submission of Written Assessments

1. Written assessments should be word-processed in Arial or Calibri Light font size 12. There should be double-spacing and each page should be numbered.
2. There should be a title page identifying the programme name, module title, assessment title, your student number, your marking tutor and the date of submission.
3. You should include a word-count at the end of the assessment (excluding references, figures, tables and appendices).

Where a word limit is specified, the following penalty systems applies:

- Up to 10% over the specified word length = no penalty
  - 10 – 20% over the specified indicative word length = 5 marks subtracted (but if the assessment would normally gain a pass mark, then the final mark to be no lower than the pass mark for the assessment).
  - More than 20% over the indicative word length = if the assessment would normally gain a pass mark or more, then the final mark will capped at the pass mark for the assessment.
4. All written work should be referenced using the standard University of Bolton referencing style– see: <https://www.bolton.ac.uk/library/Study-Skills/Referencing/Home.aspx>
  5. Unless otherwise notified by your Module Tutor, electronic copies of assignments should be saved as word documents and uploaded into Turnitin via the Moodle class area. If you experience problems in uploading your work, then you must send an electronic copy of your assessment to your Module Tutor via email BEFORE the due date/time.
  6. Please note that when you submit your work to Moodle, it will automatically be checked for matches against other electronic information. The individual percentage text matches may be used as evidence in an academic misconduct investigation (see Section 13).
  7. Late work will be subject to the penalties:
    - Up to 7 calendar days late = 10 marks subtracted but if the assignment would normally gain a pass mark, then the final mark to be no lower than the pass mark for the assignment.
    - More than 7 calendar days late = This will be counted as non-submission and no marks will be recorded.

Where assessments are graded Pass/Fail only, they will not be accepted beyond the deadline date for submission and will be recorded as a Fail. Students may request an extension to the original published deadline date as described below.

8. In the case of exceptional and unforeseen circumstances, an extension of up to 14 days after the assessment deadline may be granted. This must be agreed by your Programme Leader, following a discussion the Module Tutor. You should complete an Extension Request Form available from your Tutor and attach documentary evidence of your circumstances, prior to the published submission deadline.

Extensions over 14 calendar days should be requested using the Mitigating Circumstances procedure, with the exception of extensions for individual projects and artefacts which, at the discretion of the Programme Leader, may be longer than 14 days.

Requests for extensions which take a submission date past the end of the module (normally week 15) must be made using the Mitigating Circumstances procedures.

Some students with registered disabilities will be eligible for revised submission deadlines. Revised submission deadlines do not require the completion extension request paperwork.

Please note that the failure of data storage systems is not considered to be a valid reason for an extension. It is therefore important that you keep multiple copies of your work on different storage devices before submitting it.

### 13. Academic Misconduct

Academic misconduct may be defined as any attempt by a student to gain an unfair advantage in any assessment. This includes plagiarism, collusion, commissioning (contract cheating) amongst other offences. In order to avoid these types of academic misconduct, you should ensure that all your work is your own and that sources are attributed using the correct referencing techniques. You can also check originality through *Turnitin*.

Please note that penalties apply if academic misconduct is proven. See the following link for further details:

<https://www.bolton.ac.uk/about/governance/policies/student-policies/>

#### Specific Assessment Criteria for both assessments

##### **Distinction (70% and above)**

A cohesive, comprehensive and critical synthesis of the literature. Reflections will be succinct and insightful. Areas and strategies will be expertly summarised and comprehensively justified. Extensive research demonstrating use of a wide range of current secondary research sources will be evident. Presentation, referencing and English will be excellent. Extensive use of citations in text.

##### **Merit (60-69%)**

A clear and critical synthesis of the literature. Reflections will be succinct and evidenced. Areas and strategies will be well summarised and justified. Wider research demonstrating use of a good range of current secondary research sources will be evident. Presentation, referencing and English will be good. Very good use of citations in text.

##### **Pass (50%-59%)**

A critical synthesis of the literature. Areas and strategies will be clearly summarised and justified. Research demonstrating use of a range of current secondary research sources will be evident. Presentation, referencing and English will be satisfactory. Appropriate use of citations in text.

**Fail (Below 50%):** Students who do not meet the requirements of the Pass criteria will not

successfully complete the assessment activity.

#### Minimum Secondary Research Source Requirements:

**Level HE7** - It is expected that the Reference List will contain between **fifteen to twenty sources**. As a MINIMUM the Reference List should include **four refereed academic journals and five academic books**.



## 14. General Assessment Guidelines for Written Assessments Level HE7

		%	Relevance	Knowledge	Argument/Analysis	Structure	Presentation	Written English	Research/Referencing
DISTINCTION	Exceptional Quality	85-100%	Directly relevant to title/brief. Expertly addresses the assumptions of the title and/or the requirements of the brief.	Demonstrates an exceptional knowledge of theory and practice for this level. Insightfully interprets appropriate concepts and theoretical models. Demonstrates originality in conceptual understanding.	Presents an exceptional critique of key research material resulting in clear, original and illuminating conclusions. Demonstrates distinctive, insightful and creative solutions to complex problems. Produces exceptional work that makes a contribution to the development of knowledge and understanding in the subject area.	Coherently articulated and logically structured.  An appropriate format is used.	Exceptional presentational style & layout, appropriate to the type of assignment. Effective inclusion of figures, tables, plates (FTP).	Exceptionally well written answer with standard spelling and grammar. Style is clear, resourceful and academic.	Sources accurately cited in the text.  An extensive range of contemporary and relevant references cited in the reference list in the correct style.
	Excellent Quality	70-84%	Directly relevant to title/brief.  Expertly addresses the assumptions of the title and/or the requirements of the brief.	Demonstrates an excellent knowledge of theory and practice for this level. Expertly interprets appropriate concepts and theoretical models. Demonstrates originality in conceptual understanding.	Presents an excellent critique of key research material resulting in clear, original and illuminating conclusions. Demonstrates insightful and creative thinking solutions to complex problems. Produces excellent work that makes a contribution to the development of knowledge and understanding in the subject area.	Coherently articulated and logically structured.  An appropriate format is used.	Excellent presentational style & layout, appropriate to the type of assignment. Effective inclusion of figures, tables, plates (FTP).	Excellently written answer with standard spelling and grammar. Style is clear, resourceful and academic.	Sources accurately cited in the text. A wide range of contemporary and relevant references cited in the reference list in the correct style.
MERIT	Good Quality	60-69%	Directly relevant to title/brief.  Addresses the assumptions of the title and/or the requirements of the brief well.	Demonstrates a sound knowledge of theory and practice for this level. Comprehensively interprets appropriate concepts and theoretical models. Demonstrates originality in conceptual understanding.	Presents a cohesive critique of key research material resulting in clear and original conclusions. Demonstrates creative solutions to complex problems. Produces superior work that makes a contribution to the development of knowledge and understanding in the subject area.	For the most part coherently articulated and logically constructed.  An appropriate format is used.	Very good presentational style & layout, appropriate to the type of assignment. Effective inclusion of FTP.	Well written with standard spelling and grammar. Style is clear and academic.	Sources accurately cited in the text. A range of contemporary and relevant references cited in the reference list in the correct style.
PASS	Satisfactory Quality	50-59%	Generally addresses the assumptions of the title and/or the requirements of the brief.  Minor irrelevance in places.	Demonstrates an adequate knowledge of theory and practice for this level. Some minor omissions. Satisfactorily interprets some appropriate concepts and theoretical models. Demonstrates some originality in conceptual understanding.	Presents some critique of key research material resulting in original conclusions. Loss of focus in places. Demonstrates some creativity in solving complex problems. Produces satisfactory work that makes some contribution to the development of knowledge and understanding in the subject area.	Adequate attempt at articulation and logical structure.  An acceptable format is used.	The presentational style & layout is largely correct for the type of assignment.  Inclusion of FTP but lacks selectivity.	Competently written with minor lapses in spelling and grammar.  Style is legible and mainly academic.	Key contemporary and relevant academic sources are drawn upon.  Most sources are accurately cited in the text and reference list/bibliography. Minor weaknesses evident.

FAIL	Borderline Fail	45-49%	Some implications of issues explored.  Some irrelevant and/or superficial arguments.	Some omissions evident in knowledge of theory and practice at this level. Insufficient understanding of appropriate concepts and theoretical models. Demonstrates some conceptual understanding in places.	A limited amount of critique of key research material with description in places. Lacks creativity. Some original conclusions.	Limited attempt at articulation and problems with structure.  Some formatting errors.	Some weaknesses in the presentational style & layout.  Some inappropriate use of FTP.	Intermittent lapses in grammar and spelling.  Style hinders clarity in places and is not academic throughout.	Limited number of contemporary and relevant sources cited. Weaknesses in referencing technique.
	Fail	30-44%	Significant degree of irrelevance to the title and/or brief.  Issues are addressed at a superficial level and in unchallenging terms.	Demonstrates weaknesses in knowledge of theory and practice for this level. Limited understanding and application of concepts.	A basic argument is presented, but too descriptive or narrative in style. Limited originality and creativity. Conclusions are not clearly stated.	Poorly structured. Lack of articulation. Format deficient.	For the type of assignment the presentational style &/or layout is lacking.  FTP ignored in text or not used where clearly needed.	Deficiencies in spelling and grammar make reading difficult in places.  Simplistic or repetitious style impairs clarity.	Inappropriate sources and poor referencing technique.
		<30%	Relevance to the title and/or brief is intermittent or missing.  The topic is reduced to its vaguest and least challenging terms.	Demonstrates a lack of basic knowledge of either theory or practice for this level, with little evidence of conceptual understanding.	Severely limited arguments. Descriptive or narrative in style with no evidence of critique and originality or creativity. Conclusions are sparse.	Unstructured. Lack of articulation. Format deficient.	For the type of assignment the presentational style &/or layout is lacking. FTP as above.	Poorly written with numerous deficiencies in grammar, spelling, expression and style.	An absence of academic sources and poor referencing technique.