

JBM Presentation, ACED, September 2024

Recent activities and recent changes

Mapping programmes to AHEP4 (possible pitfalls)

New integrated apprenticeship

JBM Guidelines Review (climate change and AI)

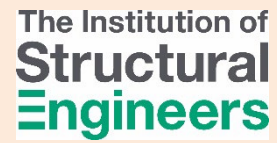
HEIs offering JBM accredited programmes in 2023

69 HEIs in UK offering JBM accredited programmes

14 HEIs overseas offering JBM accredited programmes

3 HEIs offering JBM approved programmes (including Pearson/SQA but not centres)

In 2023, the JBM carried out 19 Full visits and 5 Review visits



Recent changes

Cognitive level for AHEP4 LOs

Higher Education Institutions (HEIs) are reminded that AHEP4 has a cognitive level required for each learning outcome. For each programme, each learning outcome must be assessed at least at the stipulated threshold ISCED/EQF level.

JBM documentation (i)

The JBM submission report has recently been reviewed and revised to simplify submissions.

Section A7 Special Features has been removed

Section E3 has been updated to include a column on Drop-Outs and renamed to Degrees Awarded and Drop-Outs

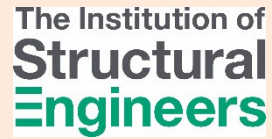
Section E4 has been removed

Appendix C has been updated to include mapping to different qualifications in a single Excel sheet with separate tabs for each qualification

Appendix D Mapping to JBM Core Subjects has been separated from Appendix C

Appendix F Student Enrolment number has been renamed to Appendix E

Appendix G Programme Completion and Drop-Out rates has been removed



JBM documentation (ii)

In the JBM submission report, HEIs are now asked to provide the names of the student liaison officers (SLO) for each professional body and a short statement on how their students are made aware of the benefits of membership of professional institutions.

JBM documentation (iii)

JBM guidance on professional qualifications policy has been updated to make it clearer as to which professional qualifications, including equivalent international qualifications, can be considered when calculating the percentage of professionally qualified staff teaching on programmes.



Some dates/issues

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Possible pitfalls – AHEP4

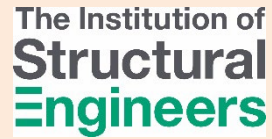
There are 18 learning outcomes.

For each programme, 100% of the relevant AHEP4 learning outcomes must be met.

		BEng (Hons) Partial CEng	Type I MSc CEng FL	Type II MSc CEng FL	MEng CEng
1	Science, <u>mathematics</u> and engineering principles	C6	M7	M7	M7
2	Problem analysis	C6	M7	M7	M7
3	Analytical tools and techniques	C6	M7	M7	M7
4	Technical literature	C6	M7	M7	M7
5	Design	C6	M7	M7	M7
6	Integrated/systems approach	C6	C6	NA	M6
7	Sustainability	C6	M7	M7	M7
8	Ethics	C6	NA	NA	M6
9	Risk	C6	NA	NA	M6
10	Security	C4	NA	NA	M4
11	Equality, <u>diversity</u> and inclusion	C6	C6	NA	M6
12	Practical and workshop skills	C6	C6	NA	M6
13	Materials, equipment, <u>technologies</u> and processes	C6	C6	NA	M6
14	Quality management	C6	C6	NA	M6
15	Engineering and project management	C6	C6	NA	M6
16	Teamwork	C5	M7	M7	M7
17	Communication	C6	M7	M7	M7
18	Lifelong learning	C4	NA	NA	M4

	Possible issues for BEng, MEng and Type I MSc programmes	BEng (Hons) Partial CEng	Type I MSc CEng FL	Type II MSc CEng FL	MEng CEng
1	Science, <u>mathematics</u> and engineering principles	C6	M7	M7	M7
2	Problem analysis	C6	M7	M7	M7
3	Analytical tools and techniques	C6	M7	M7	M7
4	Technical literature	C6	M7	M7	M7
5	Design	C6	M7	M7	M7
6	Integrated/systems approach	C6	C6	NA	M6
7	Sustainability	C6	M7	M7	M7
8	Ethics	C6	NA	NA	M6
9	Risk	C6	NA	NA	M6
10	Security	C4	NA	NA	M4
11	<u>Equality, diversity and inclusion</u>	C6	C6	NA	M6
12	Practical and workshop skills	C6	C6	NA	M6
13	Materials, equipment, <u>technologies</u> and processes	C6	C6	NA	M6
14	Quality management	C6	C6	NA	M6
15	Engineering and project management	C6	C6	NA	M6
16	Teamwork	C5	M7	M7	M7
17	Communication	C6	M7	M7	M7
18	Lifelong learning	C4	NA	NA	M4

	Possible issues for Type I and II MSc CM programmes	BEng (Hons) Partial CEng	Type I MSc CEng FL	Type II MSc CEng FL	MEng CEng
1	Science, <u>mathematics</u> and engineering principles	C6	M7	M7	M7
2	Problem analysis	C6	M7	M7	M7
3	Analytical tools and techniques	C6	M7	M7	M7
4	Technical literature	C6	M7	M7	M7
5	Design	C6	M7	M7	M7
6	Integrated/systems approach	C6	C6	NA	M6
7	Sustainability	C6	M7	M7	M7
8	Ethics	C6	NA	NA	M6
9	Risk	C6	NA	NA	M6
10	Security	C4	NA	NA	M4
11	Equality, <u>diversity</u> and inclusion	C6	C6	NA	M6
12	Practical and workshop skills	C6	C6	NA	M6
13	Materials, equipment, <u>technologies</u> and processes	C6	C6	NA	M6
14	Quality management	C6	C6	NA	M6
15	Engineering and project management	C6	C6	NA	M6
16	Teamwork	C5	M7	M7	M7
17	Communication	C6	M7	M7	M7
18	Lifelong learning	C4	NA	NA	M4



M1. Apply a comprehensive knowledge of mathematics, statistics, natural science ***and engineering principles*** to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering. (Level 7)

	Possible issues for Type I MSc programmes	BEng (Hons) Partial CEng	Type I MSc CEng FL	Type II MSc CEng FL	MEng CEng
1	Science, <u>mathematics</u> and engineering principles	C6	M7	M7	M7
2	Problem analysis	C6	M7	M7	M7
3	Analytical tools and techniques	C6	M7	M7	M7
4	Technical literature	C6	M7	M7	M7
5	Design	C6	M7	M7	M7
6	Integrated/systems approach	C6	C6	NA	M6
7	Sustainability	C6	M7	M7	M7
8	Ethics	C6	NA	NA	M6
9	Risk	C6	NA	NA	M6
10	Security	C4	NA	NA	M4
11	<u>Equality, diversity and inclusion</u>	C6	C6	NA	M6
12	Practical and workshop skills	C6	C6	NA	M6
13	<u>Materials, equipment, technologies and processes</u>	C6	C6	NA	M6
14	Quality management	C6	C6	NA	M6
15	Engineering and project management	C6	C6	NA	M6
16	Teamwork	C5	M7	M7	M7
17	Communication	C6	M7	M7	M7
18	Lifelong learning	C4	NA	NA	M4

C12. Use practical laboratory and workshop skills to investigate complex problems.

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

M3. Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed.



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Guidelines for Developing Degree Programmes	Major Research Project		Design Project	
MEng (CEng)	INDIVIDUAL	Penultimate or Final year	GROUP	Penultimate or Final year
BEng (partial CEng)	INDIVIDUAL	Penultimate or Final year	GROUP	Penultimate or Final year
BSc (IEng)			GROUP OR INDIVIDUAL	Final year

EPA is required to be 30 credits



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Sustainability (climate crisis, pollution crisis, biodiversity crisis)

The Sustainability thread requires that students must be able to (for instance):

“Carry out an embodied-carbon check on a design, and then minimise this carbon footprint while retaining the key elements of the brief”

“Be aware of the implications of climate change...
...the low- and zero-carbon agenda and how these impact on engineering design, construction and operation”

Currently...

“Requirements for sustainable development within the context of the Climate Emergency should be a central, continuous theme embedded throughout the degree programme, including design projects, dissertation projects, coursework and examinations...”

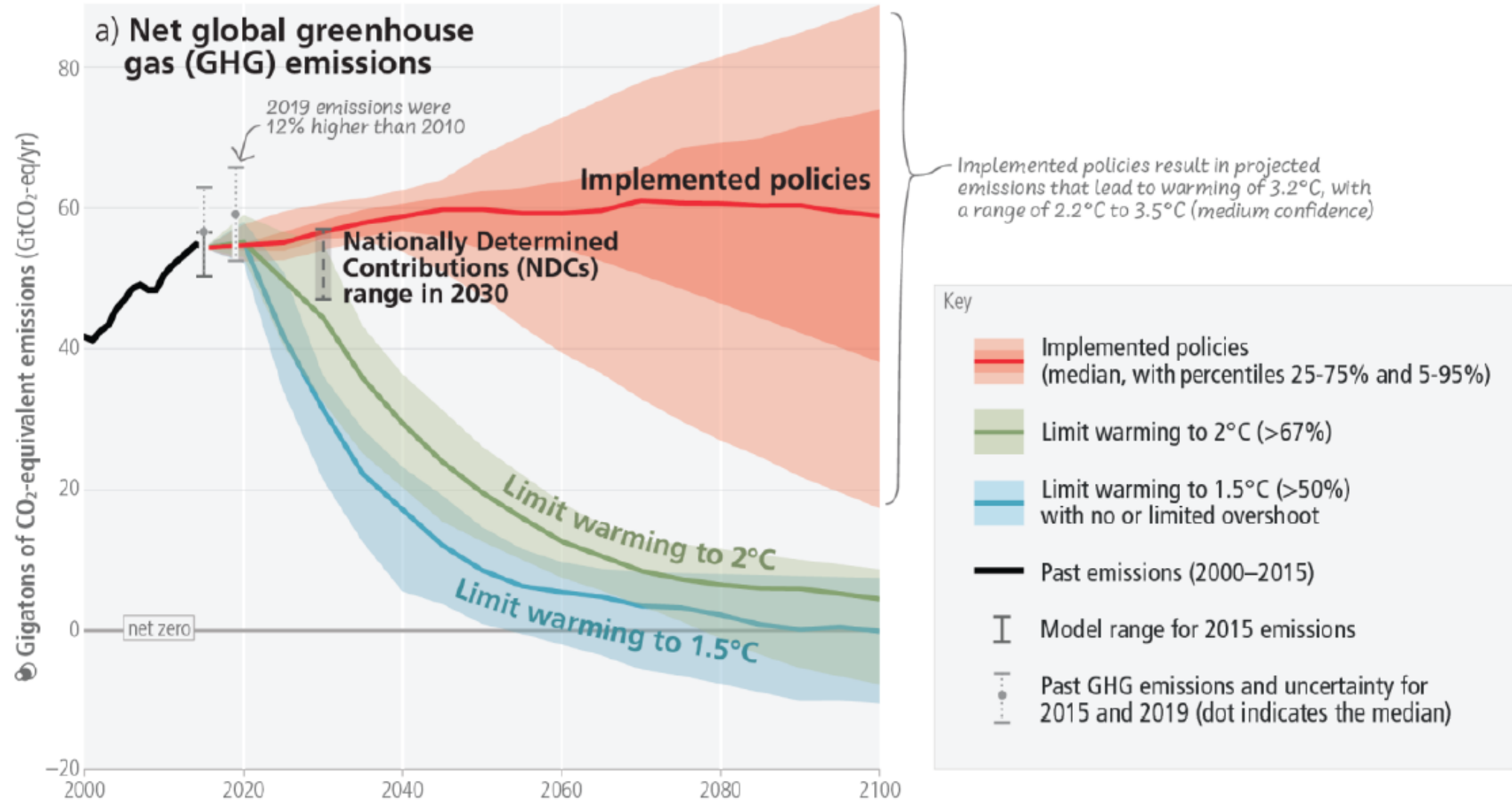
Sustainability must be

CENTRAL

to our education of engineers

Limiting warming to 1.5°C and 2°C involves rapid, deep and in most cases immediate greenhouse gas emission reductions

Net zero CO₂ and net zero GHG emissions can be achieved through strong reductions across all sectors



“Limited warming to 1.5 degrees and 2 degrees involves rapid, deep and in most cases **immediate** greenhouse gas emission reductions”

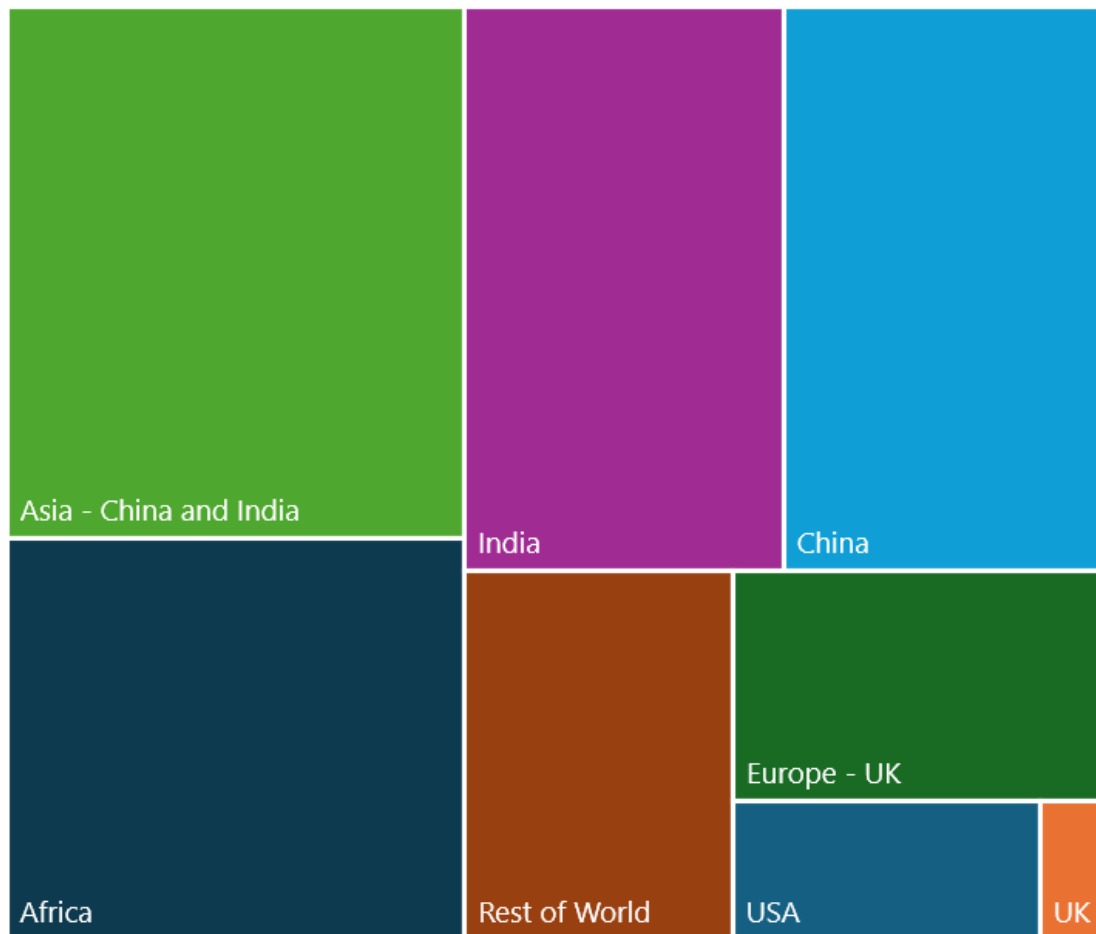
SYNTHESIS REPORT OF THE IPCC SIXTH ASSESSMENT REPORT (AR6) Summary for Policymakers
https://report.ipcc.ch/ar6syр/pdf/IPCC_AR6_SYR_SPM.pdf (Accessed 26 July 2024)

RAPID and **DEEP** cuts are required.

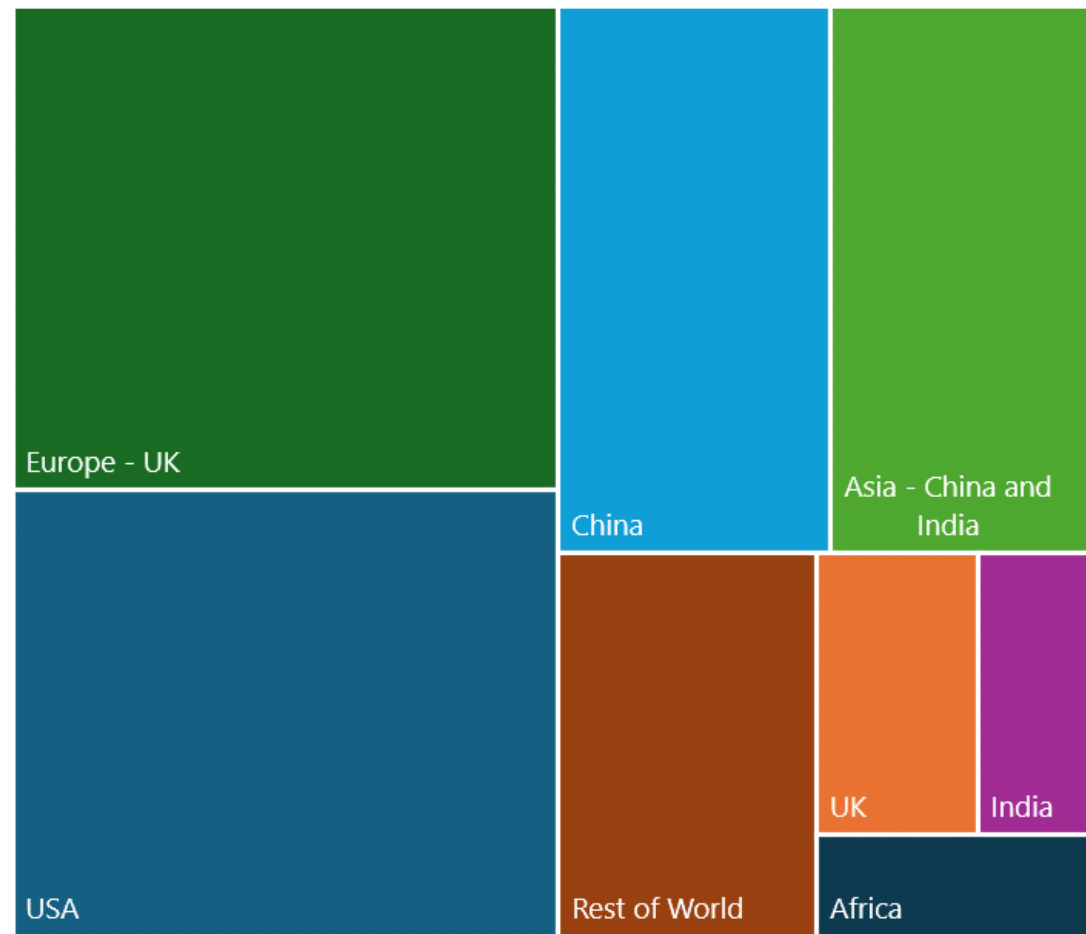
Slight reductions in carbon emissions and being a little more sustainable will not prevent higher temperatures and consequent immense suffering.



Fair Share of Cumulative CO2 Emissions



Actual Share of Cumulative CO2 Emissions





UK Civil Engineers Declare Climate & Biodiversity Emergency

We will strive to:

— Continue to raise awareness of the climate and biodiversity emergencies and the urgent need for action amongst our clients, collaborators and supply chains.

— Advocate for faster change in our industry towards regenerative design practices and a higher Governmental funding priority to support this.

— Apply, and further develop, climate and biodiversity mitigation principles as key measures of our industry's success, demonstrated through rating systems, awards, prizes and listings.



Mitigation: reduce or prevent emission of greenhouse gases

- Under current policies, the total cost of climate change damages to the UK are projected to increase from 1.1% of GDP at present to 3.3% by 2050 and 7.4% by 2100.
- Strong global mitigation action could reduce the impacts of climate change damages to the UK from 7.4% to 2.4% of GDP by 2100
- Proactive investment in adaptation measures such as coastal protection can greatly reduce the risk of climate-related damages.

<https://www.lse.ac.uk/granthaminstitute/publication/what-will-climate-change-cost-the-uk/>

Resilience (defined by DFID in “What is Resilience?”)

“The ability of countries, communities and households to manage change by maintaining or transforming living standards in the face of shocks or stresses without compromising their long term prospects”

Adaptation

...is a sub-category of resilience, usually applied to climate change. Climate change will have an impact on climate ‘shocks’, e.g. storms, but will also lead to more gradual climatic changes (climate ‘stress’). Adaptation activities aim to lessen the impacts of stresses and shocks through reducing the vulnerability of human and natural systems and enhancing resilience.

Sturgess, P.; Sparrey, R.; DFID. What is Resilience? Evidence on Demand, UK (2016) 65 pp.

<https://www.lse.ac.uk/granthaminstitute/explainers/what-is-the-difference-between-climate-change-adaptation-and-resilience/#:~:text=At%20its%20most%20basic%2C%20adaptation,a%20timely%20and%20efficient%20manner.>

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