



Sustainability in the Curriculum

- A reflection on embedding Sustainability in Higher Education courses

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LEADERS IN IDEAS AND SOLUTIONS

15min



Context



Content



Strategy



Ambition



15min



Where/when do we teach Sustainability?

- An overview of some examples at Heriot Watt University



How do we teach (& assess) it?

- A discussion of course delivery methods and assessment techniques



How did we get here?

- Professionalism, applied learning techniques, and exploratory pedagogy



... and where are we going next?

- Continuous improvement against a moving target



Heriot Watt University
- An overview of Sustainability in the Curriculum



This slide provides an overview of sustainability in the curriculum at Heriot Watt University. It features a map of the United Kingdom with Scotland, Wales, and Northern Ireland in blue, and England in pink. To the right of the map are four small images: a cityscape, a globe, a modern building, and a bridge. Below these are icons of four people. On the right side, there is a vertical banner for the 'Royal Academy of Engineering Centres of Excellence in Sustainable Building Design'. The banner includes the text 'Working as one team to demonstrate and share best practice in teaching and research.' and logos for Heriot Watt University, Loughborough University, The University of Sheffield, and the Royal Academy of Engineering. At the bottom left is the Heriot Watt University logo with the tagline '- An overview of Sustainability in the Curriculum'. At the bottom right is the Heriot Watt University logo with the tagline '.be HERIOT WATT UNIVERSITY'.

Heriot Watt University
- An overview of Sustainability in the Curriculum

Royal Academy of Engineering
Centres of Excellence in Sustainable Building Design

Working as one team to demonstrate and share best practice in teaching and research.

.be HERIOT WATT UNIVERSITY



This slide is similar to the one above but includes a row of six academic disciplines at the bottom. The disciplines are: Mathematical & Computer Sciences, Social Sciences, Energy, Geoscience, Infrastructure & Society, Engineering & Physical Sciences, Textiles & Design, and Edinburgh Business School. The 'Energy, Geoscience, Infrastructure & Society' discipline is highlighted with a dashed blue box. The rest of the slide content, including the map, images, icons, and banners, is identical to the first slide.

Heriot Watt University
- An overview of Sustainability in the Curriculum

Royal Academy of Engineering
Centres of Excellence in Sustainable Building Design

Working as one team to demonstrate and share best practice in teaching and research.

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Mathematical & Computer Sciences

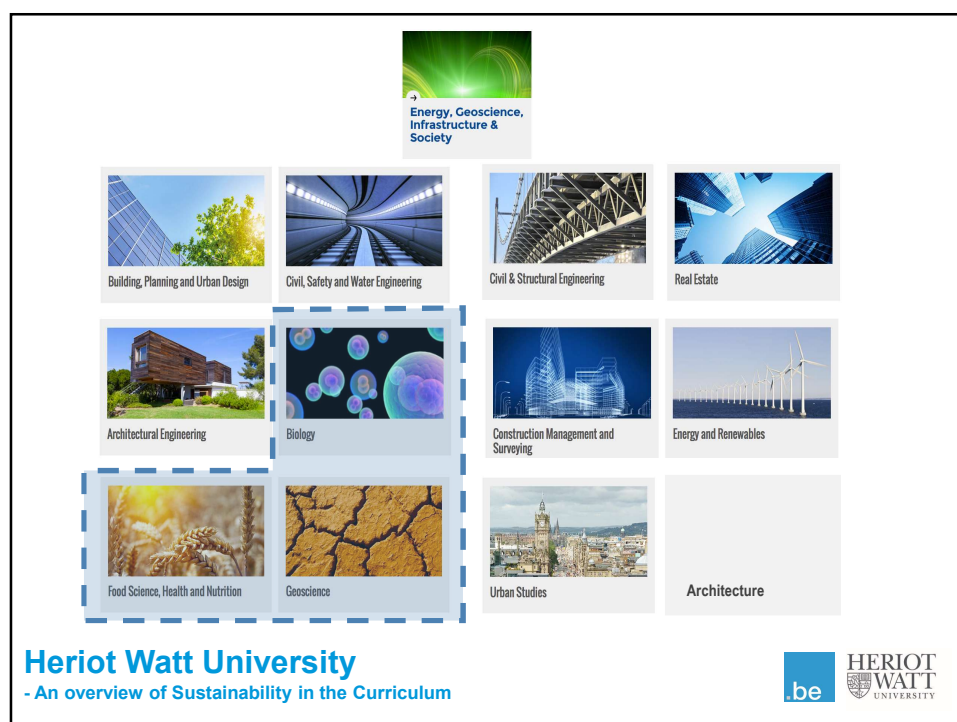
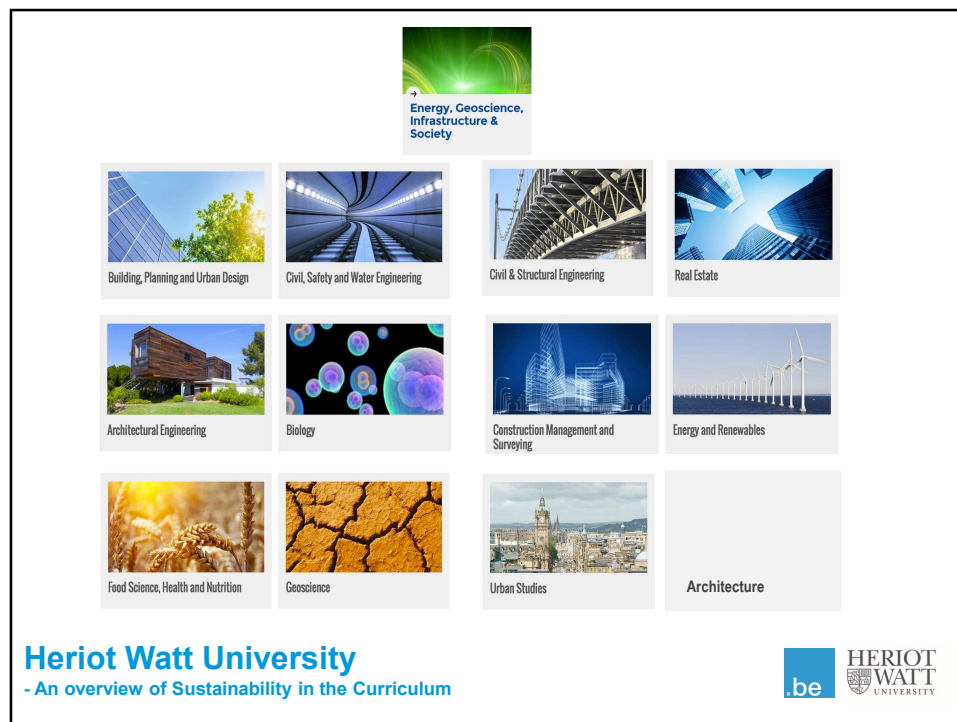
Social Sciences

Energy, Geoscience, Infrastructure & Society

Engineering & Physical Sciences

Textiles & Design

Edinburgh Business School



D21ST – ‘Sustainability for Civil Engineers’



Introducing Sustainability to the Curriculum
- Winning over the specialists



D21ST – ‘Sustainability for Civil Engineers’
D31FM – ‘Sustainability for Facilities Management’
D41US – ‘Sustainability in Urban Design’

Introducing Sustainability to the Curriculum
- Winning over the specialists



D21ST – ‘Sustainability for Civil Engineers’
D31FM – ‘Sustainability for Facilities Management’
D41US – ‘Sustainability in Urban Design’
.....
 ‘Sustainable Planning’
 ‘Sustainable Procurement’
 ‘Sustainability in Water Engineering’
 ‘Sustainable Transport Engineering’
.....

..... **This is UNSUSTAINABLE!**

Introducing Sustainability to the Curriculum
- Winning over the specialists



D21ST ‘Sustainability for Construction Professionals’
D31FM – ‘Sustainability for Facilities Management’
D41US – ‘Sustainability in Urban Design’
.....
 ‘Sustainable Planning’
 ‘Sustainable Procurement’
 ‘Sustainability in Water Engineering’
 ‘Sustainable Transport Engineering’
.....

..... This is UNSUSTAINABLE!

Introducing Sustainability to the Curriculum
- Winning over the specialists



Form P6 Heriot-Watt University – Undergraduate Programme Structure & Notes

1. Programme Code(s) (recruitment & exit awards)	2. Programme Title(s) for all awards (unabbreviated)
BSF1-OSU BSF2-OSU	BSC(Hon) Quantity Surveying BS(Ord) Quantity Surveying
3. Main Award(s) (to be recruited to)	4. Exit Awards (graduation only)
BS(Hon) BS(Ord) - 1 OU, 2XX only – Stage 3 only	BS(Ord-H), DipHE, CertHE
	5. Date of Production April 2017

6. MANDATORY COURSES

Semester / Course/BSF Award	Level	Year	Semester	Course	Stage	Prerequisites (Semester/Year)	Credits (Sem/Year)	Courses:		Credit Value	Notes									
								Please highlight any new courses and include the course description(s)												
Code Title																				
STAGE 1																				
A	X		1	1	1	030704	Construction Materials	15	15	7										
A	X		1	1	1	03717A	Construction Technology 1	15	15	7										
A	X		1	1	1	037108	Introduction to Design	15	15	7										
A	X		1	1	1	03726A	Introduction Microeconomics	15	15	7										
A	X		1	1	2	037307	Cost Control Principles	15	15	7										
A	X		1	1	2	037309	Management Practice in Construction	15	15	7										
A	X		1	1	2	04710	Introduction to the Environment	15	15	7										
A	X		1	1	2	047105	The Built Environment	15	15	7										
STAGE 2																				
A	X	X	2	1	1	03817A	Construction Technology 2	15	15	8										
A	X	X	2	1	1	03821	Commercial Law 1	15	15	8										
A	X	X	2	1	2	03820M	Surveying and Monitoring in the Built and Natural Environment	15	15	8										
A	X	X	2	1	1	038857	Building Services Technology	15	15	8										
A	X	X	2	1	2	038856	Cost Modelling and Measurement	15	15	8										
A	X	X	2	1	2	038857	Information	15	15	8										
A	X	X	2	2	1	038858	Facilities Management	15	15	8										
A	X	X	2	2	1															
OPTIONAL																				
STAGE 3																				
A	X	X	3	1	2	038960	Safety Management and Site Establishment	15	15	8										
A	X	X	3	1	2	038971	Construction Technology 3	15	15	8										
A	X	X	3	1	2	038977	Procurement and Contract	15	15	8										
A	X	X	3	1	2	039002	Design Cost Planning and Control	15	15	8										
A	X	X	3	1	2	039006	Measurement and Cost Evaluation	15	15	8										
A	X	X	3	1	2	039006	Design for Construction	15	15	8										
A	X	X	3	1	2	039006	Design for Construction	15	15	8										
A	X	X	3	1	2	039006	Design for Construction	15	15	8										
OPTIONAL																				
X																				
A	X	X	X	4	1	03900M	Cost and Value Management	15	15	10										
A	X	X	X	4	1	039000	OS Practice	15	15	10										
A	X	X	X	4	1	039001	OS Project (CMS) (S1)	15	15	10										
A	X	X	X	4	1	039002A	Dissertation (CMS) (S1)	15	15	10										
A	X	X	X	4	1	039002P	Construction Project Management	15	15	10										
A	X	X	X	4	1	039003	Innovation in Construction Practice	15	15	10										
A	X	X	X	4	1	039004	Design Project (CMS) (S2)	15	15	10										
A	X	X	X	4	1	039005	Dissertation (CMS) (S2)	15</												

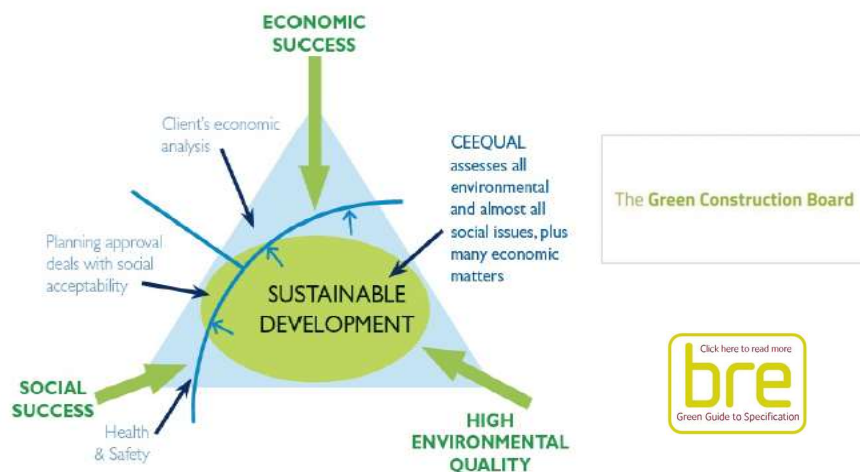
Form P6 Heriot-Watt University – Undergraduate Programme Structure & Notes									
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DPS1-GSU DPS1-GSU BSC(Nm) – 120, 200 only – Stage 1 only			BSC(Nm) Quantity Surveying BSC(Nm) Quantity Surveying BSC(Nm) – 120, 200 only – Stage 1 only						
3. Main Award(s) (to be recruited to)			4. Exit Award(s) (graduation only)			5. Date of Publication			
BSC(Nm) – 120, 200 only – Stage 1 only			BSC(Nm), BSc(Nm), BSc(Nm)			April 2017			
E. MANDATORY COURSES									
Course(s): (Please highlight any new courses and include the course description)		Credit Value		Notes					
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Examples of some learning outcomes-

- Demonstrate, with reference to their professional role, responsible action and evaluation in relation to fellow citizens, business and the environment, from local to global level.
- Prepare and develop designs for sustainable projects using a range of media, in response to a design brief.
- Be able to critically evaluate diverse and complex problems, with reference to relevant tenets of Sustainability.
- Ability to analyse and identify the most sustainable solutions to design problems in extreme climates.
- Ability to appraise low carbon and climate change legislation, and an appreciation of possible future initiatives.

Ingraining Sustainability in the Curriculum

- Embedding Sustainable Design, Procurement and Specification throughout



How is Sustainability taught and assessed?

- Embedding Sustainable Design, Procurement and Specification throughout



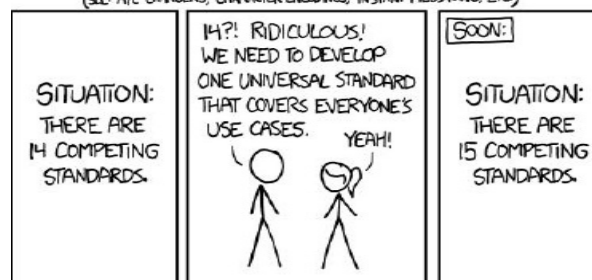


How is Sustainability taught and assessed?

- Embedding Sustainable Design, Procurement and Specification throughout



HOW STANDARDS PROLIFERATE:
(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC.)



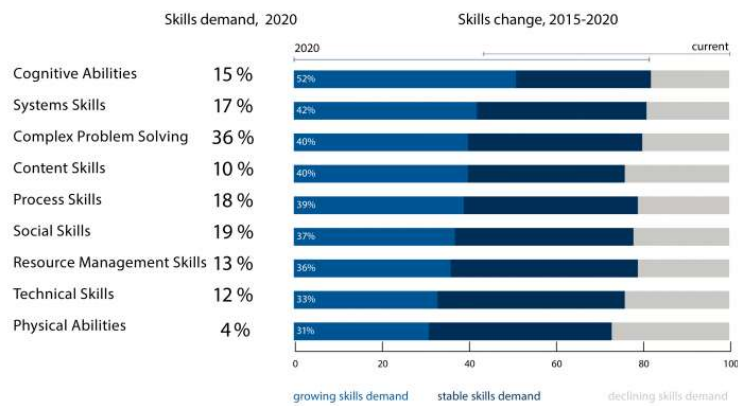
How is Sustainability taught and assessed?

- course delivery methods and assessment techniques



Change in skills demand and composition

Source: Future of Jobs Report, World Economic Forum



How is Sustainability taught and assessed?

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The Edge Report



CIOB Futures Report



RICS Futures Report

How is Sustainability taught and assessed?


- course delivery methods and assessment techniques





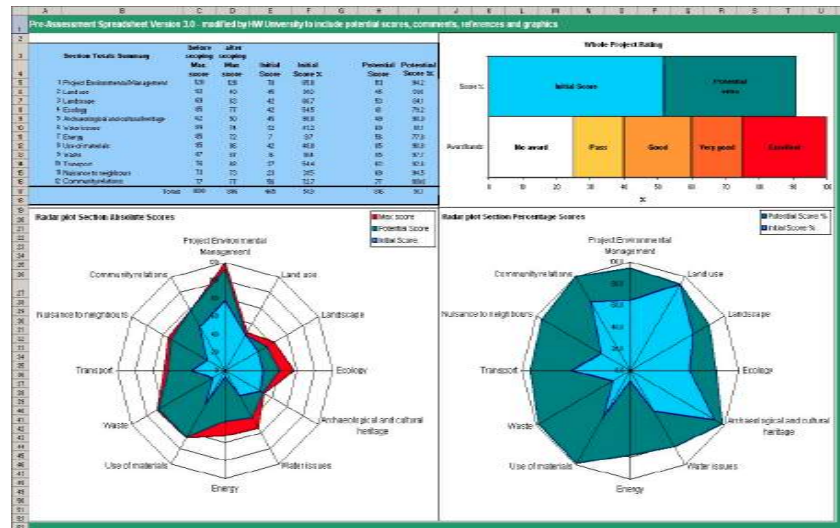
How is Sustainability taught and assessed?
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How is Sustainability taught and assessed?
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How is Sustainability taught and assessed?

- course delivery methods and assessment techniques



- Case Studies
- Hands-on Methods
- Seminars and Debates
- Open-ended briefs
- Multidisciplinary groupwork submissions
- Scenarios and role play

How is Sustainability taught and assessed?

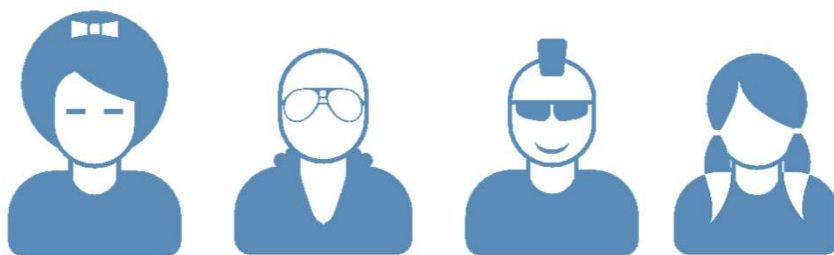
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How is Sustainability taught and assessed?

- course delivery methods and assessment techniques



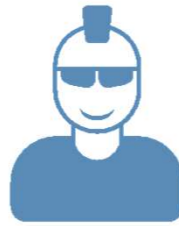
How did we get here?

- Professionalism, applied learning techniques, and exploratory pedagogy



Challenges

- Required 'Championing'
- Money as a powerful driver (for industry!)
- Industry became a strong advocate



How did we get here?

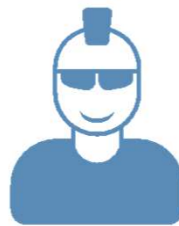
- Professionalism, applied learning techniques, and exploratory pedagogy



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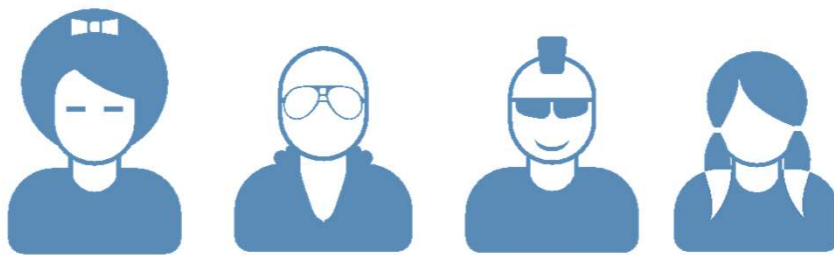
Support from the Institutions (criteria)



How did we get here?

- Professionalism, applied learning techniques, and exploratory pedagogy

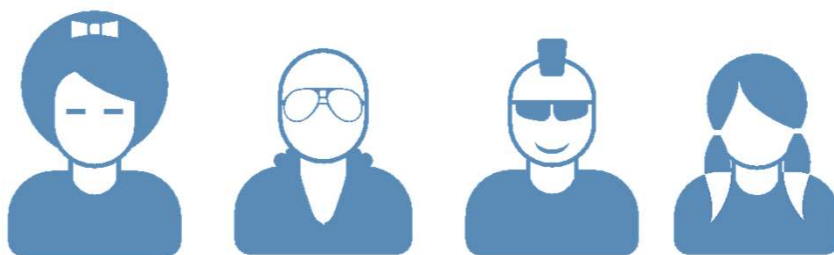




... and where are we going next?
- Continuous improvement against a moving target



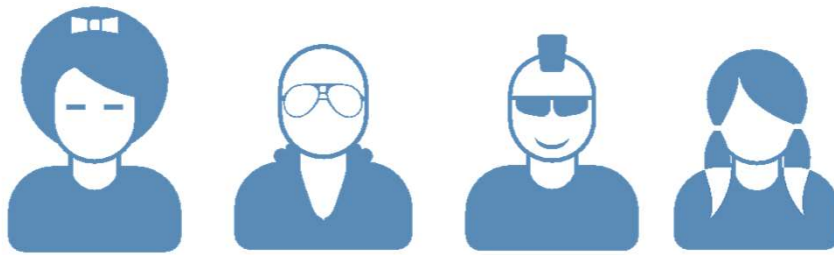
Students as our greatest advocates (and catalysts!)



... and where are we going next?
- Continuous improvement against a moving target



Continuous improvement against a moving target.



... and where are we going next?
- Continuous improvement against a moving target