Programme Information & PLOs

This document forms part of the Programme Design Document and is for use in the roll-out of the York Pedagogy to design and capture new programme statement of purpose (for applicants to the programme), programme learning outcomes, programme map and enhancement plan. Please provide information required on all three tabs of this document.

Title of the new programme – including any year abroad/ in industry variants

MSci & BSc Natural Sciences specialising in Environment

Level of qualification

Please select:	7

Please indicate if the programme is offered with any year abroad / in industry variants	**Year in Industry** Please select Y/N	Yes
	Year Abroad Please select Y/N	No

Department(s):
Where more than one department is involved, indicate the lead department

Lead Department	Natural Sciences
Other contributing Departments:	Archaeology, Biology, Chemistry, Environment

Programme leadership and programme team

Please name the programme leader and any key members of staff responsible for designing, maintaining and overseeing the programme.

Jason Levesley (Ch. BoS), Roddy Vann (Prog. Director), Camilla Speller (Arch), Bryce Beukers-Stewart (Env), Gareth Evans (Bio), Andy Parsons & Glenn Hurst (Chem)

Particular information that the UTC working group should be aware of when considering the programme documentation (e.g. challenges faced, status of the implementation of the pedagogy, need to incorporate PSRB or employer expectations)

With few exceptions the modules which make up any of the Nat Sci programmes are drawn from the corresponding contributing single subject degree programmes. Local pedagogical practices and modes of assessment are honoured in Nat Sci unless there is evidence that such practices would not be pedagogically sound. Therefore, given the nature of the Nat Sci programmes parts of this document draw liberally from, or make reference to, the corresponding documentation from the contributing departments. This documentation should therefore be considered in parallel with the corresponding proforma for the single subject degree programmes of the contributing departments.

Who has been involved in producing the programme map and enhancement plan? (please include confirmation of the extent to which colleagues from the programme team /BoS have been involved; whether student views have yet been incorporated, and also any external input, such as employer liaison board)

The people listed in 14 item have primarily being responsible for the programme map and enhancement plan. At all stages the BoS has had free access to and being invited to comment on the documentation. Student input has been fed into the YP process in a focus group, through the SSLC and via the BoS.

Purpose and learning outcomes of the programme

Statement of purpose for applicants to the programme

Please express succinctly the overall aims of the programme as an applicant facing statement for a prospectus or website. This should clarify to a prospective student why they should choose this programme, what it will provide to them and what benefits they will gain from completing it.

All Natural Science programmes at the University of York aim to produce leaders in science, technology and industry who will have the interdisciplinary knowledge and skills to succeed in complex research and business environments. You will learn how science is conducted in different disciplines, how to operate within different methodological communities, and how to apply techniques and ideas across multiple disciplines.

As a Natural Science student specialising in Environment you will spend the majority of your time studying in the Environment Department at the University of York. The natural science degree has been designed from modules that fit into the interdisciplinary ethos of Natural Sciences and will equip you with key skills to enable you to evaluate environmental problems and develop sustainable solutions. You will be trained to critically review relevant literature in a range of key environmental areas, and design and execute research both locally and more widely to address environmental problems using appropriate field, survey and laboratory methods, whilst being able to draw upon your experience of other sciences studied in your first two years. This will give a Natural Sciences Environment student a clear view of where their developing skills might be useful or where to look outside of the boundaries of a fully Environment focussed degree. By your final year of study you are well equipped to undertake an independent research project utilising our state-of-the-art research facilities. You will become proficient in using key digital learning technologies used by professional environmental scientists such as web-based literature search tools, geographical information systems and statistical packages. The degree will also allow you to develop strong group working and project leadership skills through targeted team building exercises and training.

As a student on the MSci programme you will achieve all the above, but your skills will be developed even further and to a deeper level as you undertake an extended final year research project and more advanced lecture courses that will move you towards the research frontier in Environmental Science, giving you the expertise, skills and experience necessary to pursue graduate level research in Environmental Science both within and outside academia.

Programme Learning Outcomes

Please provide six to eight statements of what a graduate of the programme can be expected to do.

Taken together, these outcomes should capture the distinctive features of the programme. They should also be outcomes for which progressive achievement through the course of the programme can be articulated, and which will therefore be reflected in the design of the whole programme.

PLO	On successful completion of the programme, graduates will be able to:
1 BSc	Debate, interpret and explain current and emerging issues in environmental science occurring at a range of scales using appropriate methods and norms, and engage critically with best evidence on the impacts and management of climate, environmental and land use change, pollution and development [Knowledgeable and Aware]
1 MSci	Debate, interpret and explain current and emerging issues in environmental science occurring at a range of scales using appropriate methods and norms, and engage critically with best evidence on the impacts and management of climate, environmental and land use change, pollution and development [Knowledgeable and Aware]
2 BSc	Obtain, synthesise and critically evaluate complex information on environmental science and related areas from a wide range of reliable sources [Independent learner]
2 MSci	Obtain, synthesise and critically evaluate information from a wide range of reliable sources, and collate this information to establish current understanding and independently identify key research questions in specialised areas of environmental science[Independent learner]
3 BSc	Cut across disciplinary boundaries to link knowledge and experience from a wide range of natural, physical and social sciences to understand the complex interactions occurring within and between natural and human environments [Interdisciplinary thinker]
3 MSci	Cut across disciplinary boundaries to link knowledge and experience from a wide range of natural, physical and social sciences, to understand the complex interactions occurring within and between natural and human environments, and the management and business sector [Interdisciplinary thinker]
4 BSc	Plan, design and execute research as an individual or as part of a team to address environmental questions and problems using critically-selected field, survey and laboratory methods at appropriate temporal and spatial scales [Creator of new knowledge]
4 MSci	Identify knowledge gaps, plan, design and execute original research as an individual or as part of a team to address current environmental questions and problems using critically-selected field, survey and laboratory methods at appropriate temporal and spatial scales [Creator of new knowledge]
5 BSc	Critically analyse and interpret quantitative data using appropriate scientific and technological information and tools such as geographical information systems (GIS) and statistical packages to draw meaningful conclusions from research in the field of environmental science [Analytical]
5 MSci	Design and undertake critical analyses and interpretation of quantitative data using appropriate scientific and technological information and tools such as geographical information systems (GIS) and statistical packages to draw meaningful conclusions from research in the field of environmental science [Analytical]

6 BSc	Effectively communicate knowledge, complex ideas and persuasive arguments to professional and non-specialist audiences using verbal, written, visual and digital media [Effective communicator]
6 MSci	Effectively communicate knowledge, complex ideas and persuasive arguments to professional and non-specialist audiences using verbal, written, visual and digital media and research publications [Effective communicator]
7 BSc	Recommend sustainable solutions to environmental problems that consider the broader social, political and environmental contexts, and the ethical implications of their application by applying knowledge, theories and approaches from environmental science and related disciplines [Problem solver]
7 MSci	Recommend sustainable solutions to environmental problems that consider the broader social, political and environmental contexts, and the ethical implications of their application by applying knowledge, theories and approaches from environmental science and related disciplines [Problem solver]
8 BSc	Work responsibly as part of a team or as a team-leader to set challenging yet attainable goals and make an important contribution to defining the way in which our environment functions, understanding how it will respond to human activities and developing sustainable solutions.
8 MSci	Work responsibly as part of a team or as a team-leader to set challenging yet attainable goals and make an important contribution to defining the way in which our environment functions, understanding how it will respond to human activities and developing sustainable solutions.

Programme Learning Outcome for year in industry (where applicable)

For programmes which lead to the title 'with a Year in Industry' – typically involving an additional year – please provide either a) amended versions of some (at least one, but not necessarily all) of the standard PLOs listed above, showing how these are changed and enhanced by the additional year in industry b) an additional PLO, if and only if it is not possible to capture a key ability developed by the year in industry by alteration of the standard PLOs.

PLO4 Plan, design and execute research as an individual or as part of a team, in academic and industrial settings, to address environmental questions and problems using critically-selected field, survey and laboratory methods at appropriate temporal and spatial scales [Creator of new knowledge]

Programme Learning Outcome for year abroad programmes (where applicable)

For programmes which lead to the title 'with a Year Abroad' – typically involving an additional year – please provide either a) amended versions of some (at least one, but not necessarily all) of the standard PLOs listed above, showing how these are changed and enhanced by the additional year abroad or b) an additional PLO, if and only if it is not possible to capture a key ability developed by the year abroad by alteration of the standard PLOs.

NA

Explanation of the choice of Programme Learning Outcomes

Please explain your rationale for choosing these PLOs in a statement that can be used for students (such as in a student handbook). Please include brief reference to:

i) Why the PLOs are considered ambitious or stretching?

To fully meet the PLOs given a student will need to meet the PLOs commensurate with those of a single subject Environmental Science student whilst studying upto two other sciences in Stages 1 & 2. This will ensure that a Nat Sci Environmental Scientist has all the expertise of a single subject student in the type of environmental science most appropriate to interdisciplinary science, all backed up by first hand experience of other sciences and how the subjects link across their respective subject boundaries.

ii) The ways in which these outcomes are distinctive or particularly advantageous to the student:

A Natural Science student who specialises in Environmental Sciences will share the many advantages of the corresponding single subject degree as articulated here; "The programme outcomes capture the key employability skills that graduates of an Environmental Science degree will be asked to demonstrate when applying for successful and rewarding careers in this field of work. By providing you with a clear pathway towards achieving these learning outcomes through Key Points Training (KPT) and plentiful opportunities to use and practice these skills you will be able to draw on specific examples of work that you have undertaken to evidence your accomplishments to potential future employers. Through interactions with external environmental and industrial organisations you will see how the skills embedded in our programme outcomes can be used in the workplace.". Further, through early programme exposure to different disciplines you will also achieve a multi-disciplinary perspective that will enhance the skill set you derive from specialising in Environmental Science in Stages 3 & 4.

iii) How the programme learning outcomes develop students' digital literacy and will make appropriate use of technology-enhanced learning (such as lecture recordings, online resources, simulations, online assessment, 'flipped classrooms' etc)?

All Natural Science student who specilaise in Environmental Sciences benefit from the embbed digitial literacy skills of the single subject degree as described; "a. Digital literacy - Through our Environmental Science degree you will develop the key digital skills needed for effective communication, finding and using reliable sources, and analysing quantitative and qualitative datasets. You will receive training in the use of the relevant digital tools such as literature search tools (e.g. Web of Science), statistical packages (e.g. SPSS, R) and Geographical Information Systems (GIS) at key points throughout your degree and be provided with opportunities to use them in a range of applications. This will ensure that when you graduate you are ready to effectively apply these tools in a work-based setting; b. Technology-enhanced learning - We have developed an online site (the KPT Skills Hub) that you can use to develop key skills, and improve and progress throughout your degree. The online Skills Hub complements the teaching you will receive during contact hours and also gives you flexibility to work on key skills development in your own time. "
An added benefit for a Natural Science student is the chance to experience further digital opportunities in other departments during Stages 1 & 2, thus furthering enhancing your skill set.

iv) How the PLOs support and enhance the students' employability (for example, opportunities for students to apply their learning in a real world setting)?
The programme's employability objectives should be informed by the University's Employability Strategy:

http://www.york.ac.uk/about/departments/support-and-admin/careers/staff/

All the Nat. Sci. programmes have been designed with employability in mind. This is not only as a factor of the design of the programmes themselves, which have had engagement with the University's employability strategy as a given since the early design phases of the programme. But also as a factor of the embedded skills that the contributing departments have built into their modules. Modules which form the bulk of the teaching on this degree programme. Many of the skills listed in the PLOs are generic and will equip the student with a highly transferrable skill set.

vi) How will students who need additional support for academic and transferable skills be identified and supported by the Department?

Students who need support will generally self identify at admission or early in the Stage 1 and standard University protocols will then be followed. If this isn't the case and a student is identified as needing extra support later in the programme then the student will discuss the matter with their personal supervisor who will advise in accordance with University guidance. Students are assigned a supervisor in one of the contributing departments and have access to a subject facilitator in both contributing departments. The student can approach their supervisor for advice in accordance with University guidelines and seek more specialist advice on a particular discipline from the subject facilitator. Module level issues are handled with the department to which the module belongs and a student can avail themselves off all feedback and quality control mechanisms that the department offers.

vii) How is teaching informed and led by research in the department/ centre/ University?

The lead department in this degree programme is the Environment department where most of your classification bearing modules will be taken. This is their statement: "We are a research-active department and share our latest research findings and methods with you through our teaching. Throughout your degree you will be actively involved in designing and undertaking research projects aimed at both understanding the world around us and solving environmental problems. All of our courses include fieldtrips that allow you to see how the theory and knowledge you have been taught in lectures apply in a range of national and international settings. Through tutorials and seminars you will gain experience in discussing cutting-edge research and develop key communication skills. Lectures are supplemented by guest speakers from the environmental think-tank the Stockholm Environment Institute (SEI), and a range of external environmental and industrial organisations, exposing you to potential areas of future employment throughout your degree. "
You will aslo benefit from early exposure to teaching in at least two other research active departments.

Stage-level progression

Please complete the table below, to summarise students' progressive development towards the achievement of PLOs, in terms of the characteristics that you expect students to demonstrate at the end of each year. This summary may be particularly helpful to students and the programme team where there is a high proportion of option modules.

Note: it is not expected that a position statement is written for each PLO, but this can be done if preferred (please add information in the 'individual statement' boxes). For a statement that applies across all PLOs in the stage fill in the 'Global statement' box.

Stage 0 (if your programme has a Foundation year, use the toggles to the left to show the hidden rows)

Stage 1							
On progression from the first year (Stage 1), students will be able to:			*Developed core learning strategies for each of the disciplines studied in Stage 1. Have been introduced to and worked with the core concepts that underpin all three disciplines. Be familiar with the foundational material and practices of each of the disciplines.*				
PLO 1		PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
Individual statements							
Stage 2							
On progression from the second year (Stage 2), students will be able to:			*The more focussed Stage 2 will have further developed the knowledge base of the student, giving them more sophisticated tools with which to address more demanding problems in their two chosen disciplines. Technical facility will be improved by exposure to more advanced concepts.*				
PLO 1		PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
Individual statements							
Stage 3							
(For Integrated Masters) On progression from the third year (Stage 3), students will be able to:			*A stage 3 student will now be a fully fledged specialist and will have satisfied all the PLOs for the BSc programme. They will be equipped to progress onto a more research focussed final stage.*				
PLO 1		PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
Individual statements							

Programme Structure

Module Structure and Summative Assessment Map

Please complete the summary table below which shows the module structure and the pattern of summative assessment through the programme.

'Option modue' can be used in place of a specific named option. If the programme requires students to select option modules from specific lists these lists should be provided in the next section.

From the drop-down select 'S' to indicate the start of the module, 'A' to indicate the timing of each distinct summative assessment point (eg. essay submission/ exam), and 'E' to indicate the end of the module (if the end of the module coincides with the summative assessment select 'EA') . It is not expected that each summative task will be listed where an overall module might be assessed cumulatively (for example weekly problem sheets).

If summative assessment by exams will be scheduled in the summer Common Assessment period (weeks 5-7) a single 'A' can be used within the shaded cells as it is understood that you will not know in which week of the CAP the examination will take place.

Stage 0 (if you have modules for Stage 0, use the toggles to the left to show the hidden rows)

Stage 1																														
Credits	Module		Autumn Term										Spring Term										Summer Term									
	Code	Title	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
20	CHE00010C	Chemistry for Natural Sciences 1	S					A		A	A		EA																			
20	CHE00012C	Chemistry for Natural Sciences 2												S			A	A	A							EA	A	A	A			
20	ARC00006C	Introduction to Archaeological Sciences												S							E		A									
10	BIO00007C	Genetics	S										EA																			
10	BIO00009C	Genetics and Evolution												S													EA	A	A			
20	BIO00004C	Molecular Biology and Biochemistry	S										A														EA	A	A			
20	ENV00002C	Ecological Principles for the Environment	S							A								A				E					A	A	A			
Stage 2																																
Credits	Module		Autumn Term										Spring Term										Summer Term									
	Code	Title	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
10	ENV00012I	Geographical Information Systems	S									EA																				
10	ENV00020I	Biogeography											S									EA										
10	ENV00001I	Ocean Management & Conservation											S									E					A	A	A			
20	ENV00024I	Ecosystems Processes	S										A					A				E					A	A	A			
10	ENV00016I	Environmental Systems Project	S				A					EA																				
20	CHE00014I	Chemistry for Natural Sciences 3	S						A			A	EA																			
20	CHE00015I	Chemistry for Natural Sciences 4												S						A			A	A			EA	A	A			
20	CHE00025I	Chemistry for Natural Sciences 5												S													EA	A	A			

20	BIO00051I	Molecular Biology, Biotechnology & Bioinformatics	S																							EA					
20	BIO00056I	Genes, Genomes, Evolution & Population	S																							EA					
20	BIO00053I	Ecology of Animals, Plants & Microbes	S																							EA					
20	ENV00019I	Environmental Geochemistry	S									A									E					A	A	A			
20	ENV00013I	Energy & the Environment	S											A							E					A	A	A			
10	ENV00002I	Climate Change											S								E										
20	ARC00018I, ARC00050I, ARC00055I, ARC00020I	World Archaeology I (Option list A)		S							E		A																		
20	ARC00005I, ARC00028I, ARC00004I	Practical Skills (Option list B)												S							EA										
20	ARC00009I, ARC00029I, ARC00013I	Team Project (Option list B)																				S			E			A			
20	ENV00003I	Earth Processes & Landforms	S																		E		A			A	A	A			

Stage 3

Credits	Module		Autumn Term										Spring Term										Summer Term									
	Code	Title	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
20	ENV00029H	Advanced Literature Review	S																			A					EA					
20	ENV00030H	Research Skills	S															EA														
20	ENV00034H	Atmosphere and Ocean Science [option]	S											A								E					A	A	A			
20	ENV00039H	Pollution Monitoring, Assessment and Control [option]	S								A										A	E					A	A	A			
20	ENV00036H	Biodiversity and Society [option]	S			A																E					A	A	A			
20	ENV00040H	Land Use Change and Management [option]	S																			E					A	A	A			
20	ENV00041H	Environmental Hazards [option]	S																	A		E					A	A	A			

20	ENV00026H	Glaciology and Volcanism in Iceland [option]	S								A	E																			
40	ENV00011H	3rd year research project	S																						EA						
10	ENV00038H	Coastal Environments [option]											S									E					A	A	A			
10	ENV00020H	Glaciers, Ice Sheets and Climate Change [option]	S									EA																			
Stage 4																															
Credits	**Module**		**Autumn Term**										**Spring Term**										**Summer Term**									
	Code	**Title**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
60	ENV00056M	Research Dissertation	S																								EA					
10	ENV00050M	Business and the Environment	S					A				EA																				
10	ENV00057M	Environmental Impact Assessment											S							A		E										
20	ENV00043M	Corporate Sustainability	S									EA																				
10	ENV00078M	Field Trip for ES	S									EA																				
10	ENV00074M	Current Research in ES	S							A		EA																				
10	ENV00069M	IPCC Science											S									E					A	A	A			
10	ENV00047M	Ecotoxicology											S							A		EA										
10	ENV00021M	Environment and Health											S								A	E										
10	ENV00005M	Environmental Governance											S									E		A								
Optional module lists If the programme requires students to select option modules from specific lists these lists should be provided below. If you need more space, use the toggles on the left to reveal ten further hidden rows.																																
Option List A		Option list B			Option List C				Option List D				Option List E					Option List F					Option List G					Option List H				

World Archaeology I & II: Mummification	Practical Skills and Team project: Biomolecular Archaeology	**For Stage 3 BSc & MSci**	**For Stage 4 of MSci**				
World Archaeology I & II: Conflict	Practical Skills and Team project: Animal Bones	One or both of ENV00039H & ENV00034H					
World Archaeology I & II: The Archaeology of South America	Practical Skills and Team project: Human Bones	If only one of ENV00039H or ENV00034H is chosen, then choose 60 credits worth of modules from the remaining options listed below. If both of these modules are chosen, then choose 40 credits worth of modules.	Either (ENV00050M & ENV00057M) or ENV00043M.				
World Archaeology I & II: The Emergence of Mediterranean civilisations	Practical Skills and Team Project: Environmental Archaeology	ENV00039H, ENV00040H, ENV00041H, ENV00026H, ENV00038H, ENV00020H	Choose two from: ENV00069M, ENV00047M, ENV00021M, ENV00005M				
new modules will be added as they are developed	Practical Skills and Team project: Experimental Archaeology						
	new modules will be added as they are developed						

Please note: you need to complete information on all three tabs of this sheet before submitting to the UTC Strategy Working Group.

You are required to submit this information for all undergraduate programme by the 31 July 2016.

Programme Map: Module Contribution to Programme Learning Outcomes

Please complete the summary table below which shows how individual modules contribute to the achievement of programme learning outcomes.

Core modules should be mapped individually. If the programme offers multiple options that contribute to exactly the same PLOs you can group these, providing a statement that articulates how all of these contribute to the achievement of the programme learning outcomes. All modules, both core and optional, should be accounted for in the map.

The table maps the contribution to programme learning outcomes made by each module, in terms of the advance in understanding/ expertise acquired or reinforced in the module, the work by which students achieve this advance and the assessments that test it. This enables the programme rationale to be understood:

· Reading the table vertically illustrates how the programme has been designed to deepen knowledge, concepts and skills progressively. It shows how the progressive achievement of PLOs is supported by formative work and evaluated by summative assessment. In turn this should help students to understand and articulate their development of transferable skills and to relate this to other resources, such as the Employability Tutorial and York Award;

· Reading the table horizontally explains how the experience of a student at a particular time includes a balance of activities appropriate to that stage, through the design of modules.

Note: it is not expected that every module contributes directly to all PLOs, but every module should advance some of them.

(Add additional rows as required)

Stage	Module		MSci Programme Learning Outcomes							
			PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8

			Debate, interpret and explain current and emerging issues in environmental science occurring on a range of scales using appropriate methods and norms, and engage critically with best evidence on the impacts and management of climate, environmental and land use change, pollution and development [Knowledgeable and Aware]	Obtain, synthesise and critically evaluate information from a wide range of reliable sources, and collate this information to establish current understanding and independently identify key research questions in specialised areas of environmental science [Independent learner]	Cut across disciplinary boundaries to link knowledge and experience from a wide range of natural, physical and social sciences, to understand the complex interactions occurring within and between natural and human environments, and the management and business sector [Interdisciplinary thinker]	Identify knowledge gaps, plan, design and execute original research as an individual or as part of a team to address current environmental questions and problems using critically-selected field, survey and laboratory methods at appropriate temporal and spatial scales [Creator of new knowledge]	Design and undertake critical analyses and interpretation of quantitative data using appropriate scientific and technological information and tools such as GIS and statistical packages to draw meaningful conclusions from research in the field of environmental science [Analytical]	Effectively communicate knowledge, complex ideas and persuasive arguments to professional and non-specialist audiences using verbal, written, visual and digital media and research publications [Effective communicator]	Recommend sustainable solutions to environmental problems that consider the broader social, political and environmental contexts, and the ethical implications of their application by applying knowledge, theories and approaches from environmental science and related disciplines [Problem solver]	Work responsibly as part of a team or as a team-leader to set challenging yet attainable goals and make an important contribution to defining the way in which our environment functions, understanding how it will respond to human activities and developing sustainable solutions
			BSc Programme Learning Outcomes							
			PLO1	**PLO2**	**PLO3**	**PLO4**	**PLO5**	**PLO6**	**PLO7**	**PLO8**

			Debate, interpret and explain current and emerging issues in environmental science occurring on a range of scales using appropriate methods and norms, and engage critically with best evidence on the impacts and management of climate, environmental and land use change, pollution and development [Knowledgeable and Aware]	Obtain, synthesise and critically evaluate complex information on environmental science and related areas from a wide range of reliable sources [Independent learner]	Cut across disciplinary boundaries to link knowledge and experience from a wide range of natural, physical and social sciences to understand the complex interactions occurring within and between natural and human environments [Interdisciplinary thinker]	Plan, design and execute research as an individual or as part of a team to address environmental questions and problems using critically-selected field, survey and laboratory methods at appropriate temporal and spatial scales [Creator of new knowledge]	Critically analyse and interpret quantitative data using appropriate scientific and technological information and tools such as geographical information systems (GIS) and statistical packages to draw meaningful conclusions from research in the field of environmental science [Analytical]	Effectively communicate knowledge, complex ideas and persuasive arguments to professional and non-specialist audiences using verbal, written, visual and digital media [Effective communicator]	Recommend sustainable solutions to environmental problems that consider the broader social, political and environmental contexts, and the ethical implications of their application by applying knowledge, theories and approaches from environmental science and related disciplines [Problem solver]	Work responsibly as part of a team or as a team-leader to set challenging yet attainable goals and make an important contribution to defining the way in which our environment functions, understanding how it will respond to human activities and developing sustainable solutions.
Stage 1	Chemistry for Natural Sciences 1	Progress towards PLO			Developing an understanding of core chemical principles of atomic structure, thermodynamics, periodicity, acids & bases, separations science & mass spectrometry and reactivity.		Development of core laboratory skills and understanding of key safety practices. Aspects of planning and experimental design.	Development of communication skills		
		By working on (and if applicable, assessed through)			Examination		Lab report	Preparing outline written reports for weekly laboratory work - formatively and summatively assessed		

Stage 1	Chemistry for Natural Sciences 2	Progress towards PLO			Developing an understanding of core chemical principles of kinetics, thermodynamics, spectroscopy, transition metals and reactivity.		Development of core laboratory skills and understanding of key safety practices. Aspects of planning and experimental design.	Development of communication skills		
		By working on (and if applicable, assessed through)			Examination		Lab report	Preparing outline written reports for weekly laboratory work - formatively and summatively assessed		
Stage 1	Introduction to Archaeological Sciences	Progress towards PLO			Students will gain an appreciation of how scientific techniques are used within archaeology to explore key issues including anthropogenic impacts and some of the potentials and limitations of these methods					

		By working on (and if applicable, assessed through)			by being introduced to a range of scientific techniques used in archaeology in lectures, learning to read scientific articles in seminar workshops and writing a journal article critique for the formative and summative assessment					
Stage 1	Genetics	Progress towards PLO							Problem solving exercises to develop understanding of genetics. Students can work individually or in groups.	
		By working on (and if applicable, assessed through)							By multiple pen + paper workshop sessions spread throughout the term. 1 hour closed exam	

Stage 1	Genetics and Evolution	Progress towards PLO		Learning and developing an understanding about the principles of genetic analysis, the evolution of genes and genomes, and an introduction to evolutionary and population genetics			Practising the principles of genetic analysis in experimental design and hypothesis testing		By practising the principles of genetic analysis, and evolutionary and population genetics in problem solving exercises.	
		By working on (and if applicable, assessed through)		Listening and engaging with lectures and reading slected chapters in textbooks. Completing a number of VLE based exercises and quizzes that test and direct student learning.. 1 hour closed exam			Practising techniques and approaches in genetic analysis in problem solving sessions		Participating in problem solving workshops and practiciing the skills required by a Geneticist in lateral thinking and problem solving. 1 hour closed exam	

Stage 1	Molecular Biology and Biochemistry	Progress towards PLO		Gaining an understanding of detailed chemistry and molecular aspects of biology starting from basic chemical building blocks of life to macromolecules and complex biological processes such as metabolism and photosynthesis.					Practicing problem-solving and basic chemistry-based calculations together with hands-on practicals in enzymes kinetics and separation of macromolecules.	
		By working on (and if applicable, assessed through)		2 x 1.5-h closed exams (Spring and Summer CAPs)					Open assessment of practical through problem solving. Formative worksheets.	
Stage 1	Ecological Principles for the Environment	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity	Practice in primary data collection	Practice in data handling and statistical analysis	**KPT training in scientific report writing**		Practice in working as a group
		By working on (and if applicable, assessed through)	Lectures and practicals on ecological theories and skills (assessed by exam)	Independent study: finding sources on ecological theories in preparation for scientific report assessments	Lectures and practicals on ecological problems and how society can manage and affect these (assessed by scientific reports)	*Lecturer-defined practicals: primary data are collected on ecology-based field studies*	*Statistics: Analysis and interpretation of ecological data (assessed in scientific report)*	Write up of scientific reports on ecological research as summative assessments		Groupwork during data collection during field practicals.

Stage 2	Chemistry for Natural Sciences 3	Progress towards PLO			Developing an understanding of advanced chemical principles of retrosynthetic analysis, solutions and mixtures, symmetry and group theory, organic synthesis with enolate equivalents, metal-ligand and metal-metal bonding, coordination chemistry and quantum mechanics.		Develop intermediate skills required for synthetic inorganic and organic chemistry including handling air and water-sensitive materials and pyrophorics. Working safely in the laboratory			

		By working on (and if applicable, assessed through)			Examination		Experiments within the Advanced synthesis practical. Safety lecture course and assessment highlights good working practice. Core and advanced laboratory skills are formatively assessed during the Skills exercise then summatively assessed on a weekly basis principally through in-lab assessments during the first half of term.			

Stage 2	Chemistry for Natural Sciences 4	Progress towards PLO			Developing an understanding of advanced chemical principles of vibrational specroscopy, excited states and photochemistry, physical organic chemistry, organometallic chemistry, photoelectron spectroscopy and molecular orbital theory and heteroaromatic chemistry.		Design and perform experiments			
		By working on (and if applicable, assessed through)			Examination		Physcial organic chemistry lab / physical chemistry labs			
Stage 2	Chemistry for Natural Sciences 5	Progress towards PLO	Development of core laboratory skills and understanding of key safety practices. Aspects of planning and experimental design.	Development of core laboratory skills and understanding of key safety practices. Aspects of planning and experimental design.	Developing an understanding of fundamental chemical principles of solid state chemistry, substitution and elimination and alkenes and alkynes.	Development of core laboratory skills and understanding of key safety practices. Aspects of planning and experimental design.	Development of core laboratory skills and understanding of key safety practices. Aspects of planning and experimental design.	Development of core laboratory skills and understanding of key safety practices. Aspects of planning and experimental design.		

		By working on (and if applicable, assessed through)	Team project work through Integrated Chemistry Practical (ICP). A mixture of mainly formative assessments (training) and selected summative assessments (proof of competence) drive the learning of key laboratory skills. Design of an experimental investigation applying analytical chemistry techniques is guided by laboratory staff and summatively assessed at the conclusion of ICP.	Team project work through Integrated Chemistry Practical (ICP). A mixture of mainly formative assessments (training) and selected summative assessments (proof of competence) drive the learning of key laboratory skills. Design of an experimental investigation applying analytical chemistry techniques is guided by laboratory staff and summatively assessed at the conclusion of ICP.	Examination	Team project work through Integrated Chemistry Practical (ICP). A mixture of mainly formative assessments (training) and selected summative assessments (proof of competence) drive the learning of key laboratory skills. Design of an experimental investigation applying analytical chemistry techniques is guided by laboratory staff and summatively assessed at the conclusion of ICP.	Team project work through Integrated Chemistry Practical (ICP). A mixture of mainly formative assessments (training) and selected summative assessments (proof of competence) drive the learning of key laboratory skills. Design of an experimental investigation applying analytical chemistry techniques is guided by laboratory staff and summatively assessed at the conclusion of ICP.			
Stage 2	Geographical Information Systems	Progress towards PLO	Develops knowledge, understanding and awareness		Develops awareness of the importance of interdisciplinarity	Develops skills in data collection and handling, and research project design	Develops data handling and analysis skills	Develops skills in written comunication		

		By working on (and if applicable, assessed through)	Undertaking a GIS project on one of three project topics (wind power; flood risk mapping; air pollution and health).Assessed in the scientific report.		Undertaking projects which call for the combination of physical science and socio-economic spatial datasest. Assessed in summative report.	Student-led project: There are many ways in which these multiple spatial datasets can be combined in carying out the project allowing new insights and knowledge to be created. Assessed in summative report.	GIS, Statistics: Designing and performing GIS analysis of diverse spatial datasets and reporting results in a summative report. Encouragement is given to perform some statistical analysis beyond the GIS work.	Written: Reporting the project work in a summative scinetific report.		
Stage 2	Biogeography	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity	Develops skills in data collection and handling, and research project design	Develops data handling and analysis skills	Develops skills in oral, written and visual comunication		Practice in working as a group
		By working on (and if applicable, assessed through)	Studying the patterns and process of temperate ecosystems. Assessed via scientific report.	Independent study: Independent background research and field observation on pattern and process of temperate ecosystems. Produce a summative field report	Bringing together a range of information from the fields of ecology, environmental management and geography in a summative report.	Designing a field/ lab project as part of a group. Defining a research question, aim and objectives, sampling strategy, collecting data in the field/ lab, analysing the data and communicating the findings.	Statistics: Analysis of collected experimental data and presented in a summative report	Written: preparing a summatively assessed scientific report		Groupwork: Working in groups to carry out field-based practicals
Stage 2	Ocean Management & Conservation	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity		Develops data handling and analysis skills		Develops awareness of environmental problems and their solutions	Develops team-working skills

		By working on (and if applicable, assessed through)	Lectures and practical on a wide range of topics of interest to ocean conservation and management (assessed by exam)	Independent study: Reading around the lectures (assessed in exam)	Discussing environmental management problems which are invariability interdisciplinary		Statistics: Practical requires data analysis and interpretation		**Studying marine conservation and management approaches and issues (assessed by exam)**	Groupwork: Lab practical offers opportunity for group work
Stage 2	Ecosystems Processes	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity	Develops skills in data collection and handling, and research project design	Develops data handling and analysis skills and experience in performing scientific calculations	Develops skills in written and oral comunication	Develops awareness of environmental problems and their solutions	Develops team-working skills
		By working on (and if applicable, assessed through)	Preparation of lectures, seminars, practicals (and reports) and exam on key ecosystem processes involving microbes, plants and soils, and their responses to human activities. Assessed by exam and scientific reports.	Independent study and in-class discussions: Literature search for summative lab reports and seminars on microbial, soil and plant ecology	Seminar preparation and discussions on current ecological topics	Student-led research projects, groups: Design of research carried out in field/lab practicals on environmental control of microbial and plant growth (group work). Assessed by scinetific reports.	Calculations: various key plant and soil variables, microbial growth rate. Statistics: Descriptive and inferential statistical analysis of data sets collected in field and lab using Excel and SPSS. Assessed in summative scientific reports.	Written: Write-up of research results as summative scientific reports; Oral: Seminar discussions and presentation	Designing and undertaking field /laboratory experiments on impacts of land use change and propose management recommendations to improve plant community development. Assessed in summative scientific report on controls on plant growth.	Group work: lab practicals and seminars

Stage 2	Environmental Systems Project	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources		Develops skills in data collection and handling, and research project design	Develops data handling and analysis skills	Devlops skills in oral and written comunication	Develops awareness of environmental problems and provides experience in critically evaluating sustainable solutions	Practice in working as a group
		By working on (and if applicable, assessed through)	Undertaking research for group project on the impacts of development on the environment (assessed in a summative verbal assessment and scientific report)	*Independent study: Literature search for project report exploring one aspect of human impacts on the environment (assessed in scientific report)*		*Student-led research projects, groups: Designing a field/ lab project as part of a group. Defining a research question, aim and objectives, sampling strategy, collecting data in the field/ lab, analysing the data and communicating the findings. Assessed in verbal presentation of a research plan.*	*Statistics: Analysis of field/lab data. Use of SPSS. Independent design of data analysis. Assessed in summative assessments: verbal presentation of a research plan and scientific report.*	*Oral: Individual presentation of a research plan; Written: Individual project write-up as a scientific report on data collected in group project. Reportincludes a technical summary for a non-specialist audience (University of York Estates).*	Students are asked to propose sustainable solutions to mitigating the impacts of development on the environment. Assessed in a summatively assessed scientific report.	Working as a group to design and perform research project

Stage 2	Molecular Biology, Biotechnology & Bioinformatics	Progress towards PLO					Understanding methods associated with transciptomics, manipulating and interpreting this type of data using bioinformatics skills.		Biological problems presented in a range of workshops with different formats where students will work alone or in different sized groups.	
		By working on (and if applicable, assessed through)					All workshops and or practicals which involve some of the transferable skills listed above		Practicals and workshops. Understanding and problem solving ability assessed in workshops. All blocks	
Stage 2	Genes, Genomes, Evolution & Population	Progress towards PLO	Core principles of evolution. Mechanisms of the change of allele frequencies. Interactions between processes. Effects on the genome, whole organisms and interacting species.			Evaluation of techniques including genomic techniques, evolutionary, population and behavioural modelling etc. and interpretation of data arising from these techniques	A major focus will be on the interpretation of data and some modelling approaches.	Discussing module related topics in workshops with peers and instructors. Participation in VLE discussion board.	Individual and group problem-solving	

		By working on (and if applicable, assessed through)	Lectures and workshops. Assessed in open exam through problem based questions and case studies, and in closed exam through problem-based questions.			workshops	Workshop on modelling selection and interpreting outcomes. Interpreting outcomes of genome wide analyses.	workshops, participation in VLE discussion forum	workshops focussing on population genetic principles, using simple models. Workshop on altruism, and workshop on macroevolution.	
Stage 2	Ecology of Animals, Plants & Microbes	Progress towards PLO	Acquire understanding of the key processes and theories that underpin function and response, across individuals and communities, of organisms within local and regional environments	Evaluate theory using observational, experimental evidence collected using basic laboratory techniques in lab practicals and field practical. Design functioning algorithm to test ecosystem and organism-appropriate hypotheses		Group work in lab and field practicals and algorithm workshop will develop their understanding of key module concepts and allow student to learn through peer assessment and instruction. Closed exam and open assessment in mid-term will focus on individual self-teaching and motivation.		Groups will present developed models with peer assessment and discussion		Design and conduct experiments to understand underlying principles governing organism behaviour and function in a range of conditions/environments
		By working on (and if applicable, assessed through)	Lectures, practicals, workshops, reading of assigned material, open assessment and exam	Lab practicals, practical workshops, algorithm workshop, closed exam, open assessment		Practicals, workshops, exam and open assessment		Algorithm workshop presentations		Lab practicals and associated workshops, algorithm workshop, field practical

Stage 2	Energy & the Environment	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity		Develops data handling and analysis skills	Develops skills in written comunication	Develops awareness of environmental problems and critically evaluating their solutions	Develops team-working skills
		By working on (and if applicable, assessed through)	Gaining knowledge on technical, social and spatial dimensions of energy systems and how these interact with environmental parameters; students also gain knowledge and experience of some of the key methodologies used in managing and protecting the environment. (assessed by exam)	Independent study: The summative coursework essay requires selection of a target country and then detailed research and analysis of country-specific energy issues and policies to determine the extent to which environmental problems influence energy policy.	Studying energy as a socio-technical system. The summative coursework essay in particular requires understanding and expression of energy as a socio-technical system.		Secondary data handling: The summative coursework essay requires analysis of country-specific energy issues and policies to determine the extent to which environmental problems influence energy policy.	Written: Preparation of argument-based summative essay	Undertaking problem-based tasks in groups across five practical sessions exploring EIA, SEA, carbon policy, energy futures, community engagement. Assessed by summative essay and exam.	Groupwork: Working as a group on problem-based tasks across five practical sessions (EIA, SEA, carbon policy, energy futures, community engagement)
Stage 2	Climate Change	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity	Develops skills in data collection and handling, and research project design	Develops skills in scientific modelling	Develops skills in written comunication	Develops awareness of environmental problems and their solutions, and provides experience in designing sustainable solutions	Practice in working as a group

		By working on (and if applicable, assessed through)	Studying the public perception, best evidence of impacts, mitigation and adaptations to climate change including recommendations for future emissions reductions in carbon.	Independent study: Scientific report is an independent piece of work that involves obtaining, synthesising and critically evaluating complex information on climate change from a wide range of reliable sources	Media seminar which involves students thinking about something other than the science of climate change and how the need to sell papers affects reporting. The scientific report involves working across disciplinary boundaries. As well as considering the scientific aspects behind climate change, students also consider the social, political and economic aspects.	Student-led research projects, groups: For a scientific report, students plan, design and execute research as an individual to address climate change using modelling software	Modelling: For a report, they use quantitative data to make recommendations for emissions control in the future. This includes carrying out a set of model runs where it is possible to generate large amounts of data, so critical evaluation of the results to provide a coherent report is key.	Written: effectively communicating knowledge, complex ideas and persuasive arguments for a summative written report. Design and write an eye-catching yet scientifically informative summative newspaper article on climate change.	A report recommending sustainable solutions to climate change considering the broader social, political and environmental contexts, and the ethical implications of their application by applying knowledge, theories and approaches from the module and wider degree	Groupwork: Work responsibly as part of a team or as a team-leader to design and write an eye catching yet scientifically informing newspaper article on climate change
Stage 2	World Archaeology I	Progress towards PLO		Students will gain a greater understanding of historical anthropogenic and natural environments by studying archaeological sites outside the U.K. on either a global or regional scale				students will practice the principles of communicating complex issues to a non-specialist audience		

		By working on (and if applicable, assessed through)		by being introduced to key issues in lectures, consolidating this knowledge through directed reading and through completion of a summative article on a chosen case study				by being provided with worked examples online and producing an article on a chosen case study for a popular magazine for the summative assessment		
Stage 2	Practical Skills	Progress towards PLO						Students will further build on criticality in their written work and recognise professional standards in report writing		
		By working on (and if applicable, assessed through)						by completing written critiques of professional reports in formative and summative assessment		
Stage 2	Team Project	Progress towards PLO				students will build on their knowledge of research design using specialist methodologies relevant to their chosen option	students will gain an understanding of the issues and biases surrounding data collection and interpretation in their chosen option			

		By working on (and if applicable, assessed through)				by matching recording and analytical methods to research aims and objectives and writing a specialist report on a dataset for the summative assessment with initial guidance during group meetings attended by staff	by gathering and recording relevant, surviving archaeological data and conducting analysis an interpretation for the summative assessment with initial guidance during group meetings with staff			
Stage 2	Earth Processes & Landforms	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources			Develops data handling and analysis skills	Develops skills in written comunication		Practice in working as a group
		By working on (and if applicable, assessed through)	Covering material and fieldtrips on coastal and past glacial environments. Field trip locations are Filey Bay (beach profiling and sediment description) and the Lake District (examine past glacial environments and interpret the landscape). Knowledge assessed by exam.	Independent study: Literature search using journals for report and additional background reading throughout the module especially in preparation for the exam			Statistics: analysis of field data for a summative report. Field based analysis of sediment	Written: write up of summatively assessed report in scientific style		Groupwork: Working as a group to collect data for individual reports

Stage 3	3rd year research project	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity	Develops skills in data collection and handling, and research project design	Develops data handling and analysis skills	Develops skills in written comunication	Develops awareness of environmental problems and their solutions, and provides experience in designing sustainable solutions	Develops team-working skills
		By working on (and if applicable, assessed through)	Undertaking in depth research on a specific environmental science topic. Assessed in dissertation.	Independent study and discussions with supervisor: independent research for dissertation project design and the interpretation of the findings. Assessed in dissertation.	Designing and undertaking an environmental science dissertation. Project design and implementation assessed by scientific report.	Independent research design: Independently design and undertake a field or laboratory study on a specific topic in environmental science. Projectdesign and implementation assessed by dissertation.	Statistics: Independently design and undertake analysis of dissertation data. Assessed by dissertation.	Written: preparing a dissertation topresent independent research findings. Report structuring, language and text assessed by dissertation.	Investigating how the environment functions and how problems can be avoided or mitigated. Assessed by dissertation.	Teamwork: working with data providers and field/laboratory coworkers to collect dissertation data.
Stage 3	Advanced Literature Review	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding and using sources to establish current understanding and identify knowledge gaps		Develops skills in identifying knowledge gaps and using them to design advanced research		Devlops skills in oral and written comunication		
		By working on (and if applicable, assessed through)	**Independent research of a specific topic, critiquing the literature to identify knowledge gaps and write the review.**	Independent study: Independently identifying relevant literature and exploring the topic in detail.		Identifying knowledge gaps and development of project aims for the final year project.		Oral, written: Communication of the literature and knowledge gaps identified in the form of an oral presentation and a written literature review.		

Stage 3	Research Skills and Statistical Methods	Progress towards PLO	Develops knowledge, understanding and awareness		Develops awareness of the importance of interdisciplinarity	Develops skills in designing advanced research	Develops skills in handling and analysing datasets using advanced approaches and software	Devlops skills in oral and written comunication		Develops team-working skills
		By working on (and if applicable, assessed through)	**Interpretation and criticality in analysing data / assessing others' data analysis using quantitative and qualitative methods**		Handling quantitative and qualitative from the fields of ecology, animal behaviour, agriculture and social science case studies	Studying the research process from research question to publication and hence while not adressed specifically, this is implicit in the research process presented.	Data handling, statistics, R: The entire module is analytical as it addresses all the key steps for research design, data collection, analysis and presentation.	Oral: Engaging in all taught sessions in frequent whole class discussions and small group discussions. Written: Lectures on report-writing, cv preparation and giving presentations. Coursework assessment which is a written report.		Help each other learn in this technical subject through class discussions during practical sessions and posting questions and helpful information on an online forum for all to see.
Stage 3	Atmosphere and Ocean Science	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity		Develops skills in scientific modelling, and experience in performing scientific calculations	Develops skills in oral and visual comunication	Develops awareness of environmental problems and their solutions	Develops team-working skills

		By working on (and if applicable, assessed through)	Studying the science of the oceans an the atmosphere, how they interact and are altered by human activities. Assessed by exam and in summative oral assessment.	Independent study and in-class discussions: Independent reading for seminar discussions and to support lectures and prepare for exam. Independent research task set at the end of each lecture. Assessed in oral presentation and exam.	Studying atmospheric and ocean science and the boundaries between them. Also discussing aspects of chemistry, physics and biology. Trip to City of York Council Air Quality Unit gives students experience of working at the coal face and applying the theory learnt in lectures. Assesesd in summative oral presentation and exam.		Calculations: Examples classes for both the ocean and atmospheric science aspects; Modelling: PC practical on clean and polluted air.	Oral: Discussion in groups during seminars, oral presentation of work in coursework assessment; Visu al, digital: Students plan a demonstration of a physical oceanography concept after consideration of relevant theory and then document the process through a short film or photographs, which form the basis of a presentation.	PC practical on clean and polluted air.	Groupwork: Working in a team to prepare material for coursework presentation.
Stage 3	Pollution Monitoring, Assessment and Control	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding and using sources	Develops awareness of the importance of interdisciplinarity	Develops skills in data collection and handling, and research project design	Develops data handling and analysis skills	Develops skills in written comunication	Develops awareness of environmental problems and their solutions, and provides experience in designing sustainable solutions	Develops team-working skills

		By working on (and if applicable, assessed through)	Students study approaches to pollution monitoring, assessment and control. Assessed in an exam.	Independent study: Independent background research in prepartion for summative scientific reports	PMAC is interdisciplinary by nature addressing aspects of policy, chemistry, biology and engineering. (assessed in exam)	Independent project: Designing an aquatic ecosystem monitoring plan. Conducting a desk-based contaminated land assessment.	Statistics: Analysis of both the field/laboratory-generated experimental data and analysis of the hypothetical data set. Assessed in summative report.	Written: Assessed summative scientific reports.	Designing an aquatic ecosystem monitoring plan. Conducting a desk-based contaminated land summative assessment.	Groupwork: Working as a group during the field/laboratory sessions.
Stage 3	Glaciology and Volcanism in Iceland	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources		Develops skills in data collection and handling, and research project design	Develops data handling and analysis skills	Develops skills in oral and written comunication		Develops team-working skills

		By working on (and if applicable, assessed through)	**Studying a range of relevant geographical topics relevant to Iceland. Assessed in oral presentations and field note-book.**	Independent study: Preparation for summative scientific paper, requiring students to explore their chosen topic in great detail and depth.		Lecturer-led research: Students must analyse and synthesise data gathered each day in the field, and present this each evening (in groups). They use GIS, statistics and a range of field-techniques. Many students go on to use GIS approaches in their independent write-up too; Student-led projects: students design their own independent project for the assessment.	Statistics: students continuously analyse and interpret data collected in the field, and to consider the significance of their findings for understanding the landscape.	Oral: Communication of findings and interpretation of data in a series of summative group presentations in Iceland; Written: in summatively assessed field-note books and in the form of a summative report write-up.		Groupwork: Field work and presentations throughtout the week are both carried out in groups.
Stage 3	Biodiversity and Society	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity	Develops skills in data collection and handling	Develops data handling and analysis skills	Develops skills in oral and visual comunication		Develops team-working skills

		By working on (and if applicable, assessed through)	**Studying links between biodiversity and society. Assessed by exam.**	Independent study and in-class discussions: reading for seminar discussions. Identification of relevant sources to support class presentation. Reading more widely around topics to support lectures and prepare for exam.	Integrating data from ecology and social sciences to better understand and manage the natural environment. Assessed by exam.	Lecturer-led practical: collecting survey data during a field practical	Statistics: practical on analysis of social sciences data.	Seminar on science communiction. Digital, visual: practical on using and creating videos for summatively assessed science communication in a written article or video; Oral: class presentations on wider reading, participation in seminars		Groupwork: Working in a team to prepare material for class presentations on wider reading. Data collection practical in small groups.
Stage 3	Environmental Hazards	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity		Develops data handling and analysis skills	Devlops skills in written comunication		
		By working on (and if applicable, assessed through)	Studying the physical processes behind natural hazards. Assessed by exam.	Independent study: Independent work for summative coursework	Considering societal impacts of mitigation strategies and perceptions of hazard risk, including in popular media. Assessed in summative coursework.		Statistics: Analysis of data to examine flooding risk. Assessed insummative report.	Written: Writing a technial report		

Stage 3	Land Use Change and Management	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity		Develops data handling and analysis skills	Devlops skills in written comunication	Develops awareness of environmental problems and their solutions, and provides experience in designing sustainable solutions	Develops team-working skills
		By working on (and if applicable, assessed through)	Independent background research and field observation on patterns and process of forests and agricultural settings and in preparation of a summatively assessed Landuse Management Plan.	Independent study: Independent background research and field observation on pattern and process of temperate ecosystems. Assessed by summative landuse management plan.	Bringing together a range of information from different fields (ecology, management, geographical sciences) in designing a summative Landuse Management Plan		Statistics: Analysis of collected experimental data	Written: Preparation of a summative scientific report assessment	Designing a summative Land Use Management Plan	Groupwork: Working in large groups to carry out field-based practicals. Also small team work within role play seminars
Stage 3	Glaciers, Ice Sheets and Climate Change	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources		Develops skills in data collection and handling	Develops data handling and analysis skills	Devlops skills in written and visual comunication		

		By working on (and if applicable, assessed through)	Remote sensing (RS) practicals and summative report write-up which requires students to interpret data in light of what we know about climate change and glacier retreat	Independent study: The RS practicals require students to download, process and intrepret data, and then to link this with the literature. They work on their own chosen glacier, and do so independently. Assessed by summative report.		Lecturer-led practicals: Students learn and apply some quite advanced RS processing approaches within a GIS. Assessed by summative report.	Data handling: Students must interpret the data they work on and analyse, and must consider the significance of their findings. Althought students are free to take their investigations in the direction of their choosing, often they link to climate change and wider glacial changes. Assessed by sumative report.	Visual: By using imagery, graphs, tables and statistics. Written: written word in summative report.		
Stage 3	Coastal Environments	Progress towards PLO	Develops knowledge, understanding and awareness	Practice in finding and using sources	Develops awareness of the importance of interdisciplinarity			Develops skills in oral comunication	Develops awareness of environmental problems and provides experience in evaluating solutions	Develops team-working skills

		By working on (and if applicable, assessed through)	Studying the physical processes operating within coastal environments at a range of temporal and spatial scales and their classification. Assessed by exam and problem-based learning connected with fieldtrip. Fieldtrip to Paull, Mappleton where students receive a talk by Coastal Officer and Skipsea.	Independent study: Literature search for PBL using journals and consultancy reports and additional reading throughout module and in preparation for the exam	Attending lectures and seminars. Application of knowledge in the field.			Oral: Discussion of ideas in PBL groups and individual and seminars using discussion questions as a guide	Stuyding how modification of the coastline has resulted from anthropogenic activity and the likely impacts of future climate change (e.g. sea-level rise and increased storminess)	Groupwork: Working as a group during PBL
Stage 4	Research Dissertation	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding, using and discussing sources	Develops awareness of the importance of interdisciplinarity	Develops skills in designing advanced research independently	Develops skills in handling and analysing datasets using advanced approaches and software	Develops skills in communicating to a professional standard	Develops awareness of environmental problems and their solutions, and provides experience in designing sustainable solutions	Develops team-working skills

		By working on (and if applicable, assessed through)	**Advanced research on a specific topic in environmental science**	Independent study and discussions with supervisor: independent research for dissertation project design and the interpretation of the findings.	Thinking across disciplines when designing and undertaking research and interpreting the findings.	Independent research design: Independently design and undertake a field or laboratory study on a specific topic in environment studies, ecology and economics	Statistics: Independently design and undertake advanced analysis of dissertation data	Written: preparation of a research publication-style dissertation and accompanying cover letter	Investigating how the environmental problems can be avoided or mitigated.	Teamwork: working with data providers and field/laboratory coworkers to collect dissertation data.
Stage 4	Business and the Environment	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding and using sources	Develops awareness of the importance of interdisciplinarity and links between academic research and the business and management sectors		Develops skills in handling and analysing datasets	Develops skills in communicating to a professional standard	Develops awareness of environmental problems and their solutions, and provides experience in designing sustainable solutions	Develops team-working skills in a professional setting
		By working on (and if applicable, assessed through)	Reading of academic journals and survey of mainstream media to understand environmental issues faced by business. Specifically working with the Portakabin group.	Independent study: Independent research for the coursework	Studying the environmental issues faced by business		Data handling and statistics: data collection and analysis for coursework	Oral: presenting to a business audience and other students the project assigned. Written: preparation of a consultancy project report.	Investigating solutions to the environmental issues faced by business.	Groupwork: Work in groups for project report

Stage 4	Environmental Impact Assessment	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding and using sources	Develops awareness of the importance of interdisciplinarity and links between academic research and the business and management sectors		Develops skills in handling and analysing datasets	Develops skills in communicating to a professional standard	Develops awareness of environmental problems and their solutions, and provides experience in designing sustainable solutions	
		By working on (and if applicable, assessed through)	Reading academic journals and survey of mainstream media on Environmental Impact Assessments. Focusses on the tools needed to combine science-based knowledge with business drivers for environment management purposes	Independent study: Independent research for the coursework	Studying the interactions between business management, environmental mangement and politics		Data handling and analysis: coursework requires data collection and analysis	Oral: classroom discussions with peers and external consultants. Written: Preparation of an Environmental Impact Assessment case study report.	A variety of industry-based case studies dealing with trans-boundary issues, implications of national level regulations to business practise in different countries, and survey and monitoring plans. Interactions with external consultants.	
Stage 4	Corporate Sustainability	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding and using sources	Develops awareness of the importance of interdisciplinarity and links between academic research and the business and management sectors		Develops skills in handling and analysing datasets	Develops skills in communicating to a professional standard	Develops awareness of environmental problems and their solutions, and provides experience in designing sustainable solutions	Develops team-working skills

		By working on (and if applicable, assessed through)	Reviewing literature and mainstream media to prepare for class discussion on corporate social responsibility and risk	Independent study and in-class discussions: Reading about the subject and watching related movies	Attending seminars and lectures that cut across various topics that come under corporate social responsibility		Data handling and statistics: Collect and analyse data for the coursework report and dissertation	Oral: Seminar presentations to the class on his/her solutions to a problem given. Written: Essay preparation for assessment.	Proposing solutions to the social issues discussed during lectures and seminars	Groupwork: Working in groups during seminars and in-class discussions
Stage 4	Field Trip for ES	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding and using sources	Develops awareness of the importance of interdisciplinarity		Develops skills in handling and analysing datasets	Develops skills in communicating to a professional standard	Develops awareness of environmental problems and their solutions	Develops team-working skills
		By working on (and if applicable, assessed through)	Studying macroinvert identification and sampling and their use as bioindicators of water quality	Independent study: interpretation of macroinvertebrat e data in terms of water quality using sources	Bringing together environmental chemistry and ecology to understand water quality using bioindicators		Calculations and statistics: Calculating bioindicators and using statistics to interpret the data	Written: preparation of journal-style report focussing on interpreting bioindicator data in terms of water quality	Studying the impacts of land use on biological water quality	Groupwork: sampling as a team in the field
Stage 4	Current Research in ES	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding, using and discussing sources			Develops skills in handling and analysing datasets	Develops skills in oral and visual comunication		Develops team-working skills
		By working on (and if applicable, assessed through)	Reviewing recent literature on environmental science topics, in-class discussions and preparation of the scientific poster.	Independent study, in-class discussions: Reviewing the literature, in-class discussions, preparation of the scientific poster.			Handling secondary data: Synthesis of published datasets to address the hypothesis being addressed in the poster.	Written: Preparation of the press release on one of the environmental science papers studied. Visual: preparation and presentation of a poster on one of the environmental science topics studied.		Groupwork: Contributing to the in-class discussions.

Stage 4	IPCC Science	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding, using and discussing sources	Develops awareness of the importance of interdisciplinarity			Develops skills in oral comunication		Develops team-working skills
		By working on (and if applicable, assessed through)	Studying the latest assessment report of the Intergovernmental Panel on Climate Change (IPCC). Lectures will cover the main chapters of the Working Group 1 report (The Physical Science Basis), supplemented by material from the Working Group 2 (Impacts, Adaptation and Vulnerability) and Working Group 3 reports (Mitigation of Climate Change).	Independent study and in-class discussions: seminar-style sessions on important recent journal articles that postdate the publication of the latest IPCC assessment report.	Thinking across disciplines to estalish current understanding of environmental change			Oral: seminar discussions		Groupwork: seminar discussions
Stage 4	Ecotoxicology	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding and using sources	Develops awareness of the importance of interdisciplinarity	Develops skills in data collection and handling	Develops skills in handling and analysing datasets	Develops skills in written comunication	Develops awareness of environmental problems and their solutions	Develops team-working skills

		By working on (and if applicable, assessed through)	Lab practicals and reading material on aspects of ecotoxicology in preparation for lectures and discussion in lectures.	Independent study: Independent research for coursework	Combining knowlegde and understanding of all disciplines linked to ecotoxicological studies generated throughout the course	Lecturer-led practicals: Performing laboratory practicals that generate primary data	Data handling and statistics: Analysing data collected during the laboratory practicals sessions	Written: Producing written scientific reports communicating the outcomes of practical sessions	Studying issues and solutions to problems surrounding ecotoxicology	Groupwork: Working in groups of two in all practical sessions
Stage 4	Environment and Health	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding and using sources	Develops awareness of the importance of interdisciplinarity	Develops skills in data collection and handling	Develops skills in handling and analysing datasets	Develops skills in oral and written comunication	Develops awareness of environmental problems and their solutions, and experience in designing sustainable solutions	
		By working on (and if applicable, assessed through)	Studying environment and health topics including preparing a research proposal. Reading material in prep. for lectures, discussion in lectures.	Independent study: reading around the subject and researching a specific topic for preparing a research proposal.	Studying aspects of environment and health which is interdisciplinary by nature. Discussing interdependencies between society, policy and scientific advances.	Independent project design: Identify knowledge gaps, plan, design and execute advanced research as an individual is part of the coursework (research proposal)	Designing data analysis: Designing and undertaking critical analyses of qualitative and quantitative data using appropriate scientific and technological information and tools to draw meaningful conclusions from research in the field of E&H is part of the coursework (research proposal)	Oral: Oral presentation of research proposal. Written: Preparation of a written research proposal (essay type).	Practical questions related to calculating dose, risk and health outcomes. Calculating health risks associated with different scenarios for waste disposal in small town, making recommendation based on E&H considerations	

Stage 4	Environmental Governance	Progress towards PLO	Develops knowledge, understanding and awareness	Develops skills in finding, using and discussing sources	Develops awareness of the importance of interdisciplinarity		Develops skills in handling and analysing datasets	Develops skills in oral and written comunication	Develops awareness of environmental problems and their solutions, and experience in designing sustainable solutions	Develops team-working skills
		By working on (and if applicable, assessed through)	Module provides an overview of the principles of governance concerning biodiversity and the environment, using in-depth case studies in terrestrial and marine environments drawn from: mechanisms for public participation in environmental policy; coastal governance; biodiversity conservation; ecosystems and public health; and the science-policy interface.	Independent study and in-class discussions: Coursework which requires selection of a specific globally-relevant ecosystem management problem, discussion of the key policy and governance challenges associated with it, and proposals for changes in governance that could help towards its resolution	Interdisciplinarity is embedded throughout the module; environmental governance requires understanding environmental, ecological, socioal, economic and political contexts. The class discussions and the essay also require this.		Use of secondary data: Class-based small group discussions evaluating research data as evidence sources to support governance decisions. Coursework essay requires analysis of alternative policy solutions.	Oral: Class-based small group discussions require communication orally. Writing: Essay requires effective communicaiton in writing.	Coursework essay asks students to evaluate different governance approaches in respect of a specific management challenge, and to propose solutions.	Groupwork: Group-based discussions require students to work together in a group to analyse data and evaluate governance options.

Programme Map: Module Contribution to Programme Learning Outcomes

The information provided in this section should make clear why the students are doing the key activities of the programme, in terms of reaching the PLOs. You should use this section to provide commentary on the programme map and how current practice effectively propels student learning. Please indicate any changes that you plan to make to the programme linked to the pedagogic principles.

This section should capture reflections on the programmes and areas for development linked to the principles of the York pedagogy. Please provide an explanation of the programme and assessment design with reference to future enhancements aligned with the pedagogic principles.

Contact with staff

Please explain how the programme's design maximises the value of students' contact time with staff (which may be face-to-face, virtual, synchronous or asynchronous), including through the use of technology-enhanced learning. An example might be giving students resources for their independent study which then enables a class to be more interactive with a greater impact on learning.

You should include:

i. An explanation of how contact with staff in the future programme will be designed to propel student learning

The vast majority of the programme is made up of modules from the Environment Department. Therefore the relevant statements made in that department's respective submissions apply here. Note is also made to refer to the Arch, Biol & Chem YP single subject documentation due to the splits in Stages 1 and 2.

ii. Changes to the existing programme that will be explored to affect this change; make references to the map to include module level change.

Some changes are expected due to the rollout of the YP in Biology & Chemistry. Environment is reviewing Stages 2, 3 & 4 later in 2017 and this will of course impact our programme. All programmes, this one included, are reviewed annually and feedback will be given to all contributing departments. Any further changes that may be necessary will naturally arise during this constant process of review.

Students' independent study and formative work

Please outline key features of how independent study and formative work has been designed to support the progressive achievement of the programme learning outcomes. (For example, the use of online resources, which may also incorporate formative feedback; opportunities for further learning from work-based placements).

You should include:

i. An explanation of how students' independent study and formative work has been designed in the future programme to propel student learning?

Again, we refer to the corresponding statements in the Arch, Biol, Chem & Environ enhancement plans for the reasons stated above.

ii. Changes to the existing programme to affect this change; make reference to the programme map to indicate module level change

Changes due roll out of the YP will be phased as they occur in the single subject rollout. Further changes will follow as Env is due to review its Stage 2, 3 & 4 structures which make up the final year of this degree programme. Any changes will be phased in as and when they happen in the single subject degrees. Reference is made to the corresponding statements in the Arch, Bio, Chem & Env enhancement plans.

Due to the nature of all our specialisation programmes and the fact that the learning and teaching in Stages 1 & 2 is spread across multiple departments, there may be bottle necks for the students in terms of assessment. Currently this is handled on a report to the BoS basis and then escalted outwards after a BoS meeting to the Departments. This is a challenge for Natural Sciences and and a definite enhancement to the programmes will be some way of monitoring and controlling these bottlenecks. Currently the YP doesn't help as its level of detail is module assessment and that we have more control over. Its the intra-module assessment. We will carry on investigating ways in which we can manage this issue effectively for our students.

One thing that we have not yet being able to do is use any NSS returns to identify issues or good practice as we have yet to have a graduating cohort. Once this data comes in then we will of course incorporate the outcomes into our annual review processes.

(c) Summative Assessment

Please outline how summative assessment within and across modules has been designed to support and evidence the progressive achievement of the programme learning outcomes. (For example, the use of different assessment methods at the 'introduction' stage compared to those used to evaluate deeper learning through the application of skills and knowledge later in the programme).

You should include:

i. An explanation of how formative and summative assessment has been designed in the future programme to propel student learning?

As in Item 5; Nat Sci honours the pedagogical practices of our contributing departments whenever possible and this is certainly the case in summative assessment. The vast majority of the programme is built on modules from the single subject diet and the assessment modes used are judged best to assess the various learning outcomes on these modules.

ii. Changes to the existing programme to affect this change; make reference to the programme map to indicate module level change

As for item 12.

The final year project is a major component of all our degrees and is a chance for our students to show not only their skills and ability in a specialisim, but also to work in their specialism on a project that is interdisciplinary. Indeed this is seen at the most natural place to assess any PLOs which emphasise interdisciplinarity. The full process of running projects is currently under review and any changes/improvements will be incorporated into the programmes.

We need to figure out how to faithfully capture the interdisciplinarity of the programme when a lot of it isn't assessed e.g.
(a) the intentional juxtaposition of modules from different departments that cover complementary/similar topics
(b) Natural Sciences hour
The latter is especially important as its a unique feature of the Nat Sci programmes.

Support with implementing programme enhancements

Support services will be able to provide guidance on enhancing programmes for example changing assessment and feedback practice, developing students' digital literacy capabilities and technology enhanced learning, employability etc. Please indicate in the space below if you would like additional guidance to implement you enhancements and what support you would require. For more information on the types of support that is available across the University please see the website:

https://www.york.ac.uk/staff/teaching/support/

Infrastructure: we look forward to the creation of a fully-functional programme & module catalogue which will enable:

- the efficient sharing of information between departments (& the ASO) e.g. module changes
- the shared usage of information for a variety of purposes (e.g. programme specs, admissions materials, student handbooks, website, ...)
- identification of issues like assessment bottlenecks & student workload

Nat Sci would like to give a particular note of thanks to David Gent, Cecillia Lowe, Katy Mann Benn & colleagues for their support when compiling this documentation and undergoing the process of making our programmes YP compliant. Their input has been invaluable.