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 Neuroscience

Level of qualification

Please select:	Level 7

Please indicate if the programme is offered with any year abroad / in industry variants	**Year in Industry** Please select Y/N	No
	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:	Biology, Chemistry, Philosophy & Psychology

Programme leadership and programme team

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

Aidan Horner (PL, Psych), David Efird (Phil), Gareth Evans (Biol), Andy Parsons & Glenn Hurst (Chem), Jason Levesley (Ch. BoS), Roddy Vann (Prog Director)

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 Neuroscience student at York, you will study the nervous system, which allows organisms to sense their environments, evaluate new information, learn and remember relationships between stimuli and respond to events. You will take modules in Biology, Chemistry, Philosophy and Psychology highlighting the rich interdisciplinary nature of the subject. As you move in-between these disciplines and learn to understand and exploit the synergies that exist between them, you develop a skill set that will equip you to work in two of York's world leading research centres, the York Neuroimaging Centre (YNiC) and the Centre for Hyperpolarization in Magnetic Resonance (CHyM). You will therefore have access to advanced neuroscience labs, imaging technologies and research teams that are constantly pushing back scientific boundaries. You will be taught by world-leading researchers who are at the forefront of their fields. The course is unique in its scope and breadth. It covers all types of neuroscience, from high-level cognitive and sensory processing in humans, through animal and cellular neuroscience down to the design and testing of new molecules for use in neuroimaging systems. A key component of the course is a foundation in philosophy that will introduce you to issues surrounding cognition and consciousness.

Therefore a successful York Neuroscience graduate will be equipped with a uniquely broad range of practical, numerical and qualitative skills to prepare you for a range of careers including research, healthcare, and the biotechnology and pharmaceutical industries.

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 that will move you towards the research frontier in Neuroscience, giving you the expertise, skills and experience necessary to pursue graduate level research in Neuroscience 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	Problem solving:Formulate, as well as tackle, open-ended problems in neuroscience by calling upon a variety of techniques, methodologies and approaches to reasoning
1 MSci	Problem solving:Formulate, as well as tackle, complex open-ended problems in neuroscience by calling upon a variety of techniques, methodologies and approaches to reasoning
2 BSc	Interdisciplinary:Work effectively in an interdisciplinary team and/or environment, drawing on concepts from biology, chemistry, psychology and philosophy.
2 MSci	Interdisciplinary:Work effectively in an interdisciplinary team and/or environment, drawing on advanced concepts from biology, chemistry, psychology and philosophy.
3 BSc	Subject knowledge: Explain and illustrate concepts in neuroscience and experimental psychology by drawing on knowledge of human neurophysiology, behaviour, perception and cognition.
3 MSci	Subject knowledge: Explain and illustrate sophisticated concepts in neuroscience and experimental psychology by drawing on in-depth knowledge of human neurophysiology, behaviour, perception and cognition.
4 BSc	Research project:Plan, execute and report on the results of experiments, projects or investigations across the neuroscience discipline, including the use of appropriate data analytical methods and knowledge of the requirements needed for formal ethical approval.
4 MSci	Research project:Plan, execute and report on the results of extended experiments, projects or investigations across the neuroscience discipline, including the use of appropriate data analytical methods and knowledge of the requirements needed for formal ethical approval. When appropriate, incorporate state-of-the-art experimental and analysis techniques into their experimental programme
5 BSc	Experiment/simulation:Use findings from empirical studies to generate hypotheses and models; incorporate these within further potential experiments and simulations.
5 MSci	Experiment/simulation:Use findings from empirical studies to generate hypotheses and models; incorporate these as further potential experiments and simulations. Where appropriate, be able to generate numerical simulations or advanced statistical tests using appropriate software packages.

6 BSc	Communication:Present complex neuroscience principles in a clear and precise manner, demonstrating a breadth of knowledge of the fundamentals of neuroscience.
6 MSci	Communication:Present complex neuroscience principles in a clear and precise manner, demonstrating a breadth of knowledge of the fundamentals of neuroscience and of the most recent literature. Where appropriate, present results of recent studies at levels suitable for dissemination at scientific conferences to audiences of neuroscience researchers
7 BSc	
7 MSci	
8 BSc	
8 MSci	

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.

NA

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?

The PLOs span a wide range of topics in the area of Neuroscience drawing from expertise in four different departments each bringing a different emphasis to the subject. Thus a York graduate will experience the panorama of the neuroscience landscape. To do so a student will be exposed to the different teaching and learning strategies of the contributing departments as well as engaging with the distinct approaches to neuroscience that this degree offers. The PLOs will both stretch a student in terms of breadth of study due to the ambitious mix of topics. But also in depth were a final year student will be expected to undertake a research level project at the frontiers of research.

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

As mentioned above and below, the neuroscience degree at York is tailored to York's neuroscience research interests. This makes the offering unique. The students will be exposed to state of the art equipment and students will be afforded the opportunity to build a resume that not only puts them at the forefront of neuroscience, but equips them for careers in disciplines cognate to neuroscience. The blend of theory and practice will create students who will be able to utilise the inherent interdisciplinary nature of their programme in post graduate life.

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)?

Digital literacy lies at the heart of neuroscience programme. There is ample scope for the student to engage with technology in all years of their programme. For example carrying out experiments in a lab based module, collecting and analysing data and finally communicating the findings in a lab report. PLOs 5 through 7 directly address these issues. But the whole programme will require students to engage with digital media through research surveys, assigned work, lab reports and the day to day business of being a student on a challenging programme like neuroscience

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 neuroscience degree was designed precisely because of the existence of two world leading research centres in the field; YNiC & CHyM. This gives students who come to York the chance to learning from and engage with the people who are pushing the research frontiers of neuroscience forward. The topics chosen for study in the programme are directly related to the research interests of the staff involved and will continue to set the agenda for the Nat Sci neuroscience programme as we move forwards with our degree programmes.

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:	*Appreciate the inter-discipilnary nature of Neuroscience through exposure to the different disciplines which make up the program and have developed the core learning stratergies needed to work across different departments, have a solid grounding in the foundations of Neuroscience, have the core experimental skills necessary to progress further in Neuroscience, begin building a skill set that will allow a student to solve problems using appropriate tools and know how to effectively communincate their findings.*

PLO 1	PLO 2	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:	*Developed further their understanding of Neuroscience, expanded upon their knowledge base, have enhanced experimental and communication skill sets allowing them to solve increasingly difficult and challenging problems in Neuroscience, have become more confident independent learners.*

PLO 1	PLO 2	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:	*At this stage a Neuroscience student will have the knowledge, skills and understanding to satisfy all the BSc PLOs and will be equipped to move forward into a more intensely research driven final year.*

PLO 1	PLO 2	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 module’ 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 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	CHE00012C	Chemistry for Natural Sciences II: Introduction to Analysis & Chemical Change	S									A										A				A						
20	CHE00010C	Chemistry for Natural Sciences I: Introduction to chemical structures and reactivity											S																			
20	BIO00004C	Molecular Biology and Biochemistry	S										A														EA					
10	BIO00011C	Cell and Developmental Biology												S								A					EA					
20	PSY00002C	Brain and Behaviour		S									A									E					A					
20	PSY00003C	Perception and Cognition		S									A	A								E					A					
10	PHI00006C	Reason and Argument B	S									EA	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**
20	CHE00014I	Chemistry for Nat Sci 3: Structure, Bonding and Reactivity	S							A		A	EA																			
30	PSY00003I	Perception & Behaviour II		S									A														A	A	A			A
30	PSY00002I	Brain & Behaviour 2		S				A	A				A														A	A	A			A
20	BIO00048I	Neuroscience	S																								EA					
Options: choose 20 credits from the following:																																
20	CHE00015I	Chemistry for Nat Sci 4: Synthesis, Spectroscopy and Photochemistry												S						A			A	A			EA	A	A			
20	BIO00011I	Cell Biology	S																								EA					
20	PHI000078I	Philosophy of Mind												S									A			E	A	A	A			
20	PHI000080I	Philosophy of Science												S									A			E	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**
40	NAT00001H	Nat Sci Interdisciplinary Project (BSc only)	S																										EA			

10	PSY00038H	Basic Principles in Neuroimaging [MSci only]		S								E	A																			
30	PSY00039H	Research design and analysis in neuroimaging [MSci only]												S								E	A									
20	BIO [new]	Advanced topics in Neuroscience	S																								EA					
20	CHEM [new]	Chemistry and Disease																														
20	PHI00046H	Language & Mind		S								E	A																			
20	PHI00018H	Consciousness		S								E	A																			
20	PSY	Advanced modules LIst A		S								E	A																			
20	PSY	Advanced moduels List B												S								E					A	A	A			

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
80	NAT00001M	Natural Sciences Extended Research Project	S																										EA			
20	PSY00047M	Topics in Cognitive Neuroscience	S									E	A																			
20	BIO00058M	Data analysis	S									EA																				

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
PSY00006H - Mind and Brain	PSY00024H - Preference and Choice: The Role of Perception, Action and Memory						
PSY00043H - Cognitive neuroscience of attention	PSY00045H - Memory & the brain						
PSY00014H - The Cognitive Psychology of Sleep	PSY00047H - Body Representations						
PSY00004H - Neuroimaging of vision	PSY00020H - Damage to the Visual Brain						

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.

All Stage 3 Biology modules are under construction and will be mapped once the content is finalised.

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

			Problem solving: Formulate, as well as tackle, complex open-ended problems in neuroscience by calling upon a variety of techniques, methodologies and approaches to reasoning	Interdisciplinary :Work effectively in an interdisciplinary team and/or environment, drawing on advanced concepts from biology, chemistry, psychology and philosophy.	Subject knowledge: Explain and illustrate sophisticated concepts in neuroscience and experimental psychology by drawing on in-depth knowledge of human neurophysiology, behaviour, perception and cognition.	Research project:Plan, execute and report on the results of extended experiments, projects or investigations across the neuroscience discipline, including the use of appropriate data analytical methods and knowledge of the requirements needed for formal ethical approval. When appropriate, incorporate state-of-the-art experimental and analysis techniques into their experimental programme	Experiment/simulation:Use findings from empirical studies to generate hypotheses and models; incorporate these as further potential experiments and simulations. Where appropriate, be able to generate numerical simulations or advanced statistical tests using appropriate software packages.	Communication :Present complex neuroscience principles in a clear and precise manner, demonstrating a breadth of knowledge of the fundamentals of neuroscience and of the most recent literature. Where appropriate, present results of recent studies at levels suitable for dissemination at scientific conferences to audiences of neuroscience researchers								
			BSc Programme Learning Outcomes													
			PLO1	**PLO2**	**PLO3**	**PLO4**	**PLO5**	**PLO6**								
			Problem solving: Formulate, as well as tackle, open-ended problems in neuroscience by calling upon a variety of techniques, methodologies and approaches to reasoning	Interdisciplinary :Work effectively in an interdisciplinary team and/or environment, drawing on concepts from biology, chemistry, psychology and philosophy.	Subject knowledge: Explain and illustrate concepts in neuroscience and experimental psychology by drawing on knowledge of human neurophysiology, behaviour, perception and cognition.	Research project:Plan, execute and report on the results of experiments, projects or investigations across the neuroscience discipline, including the use of appropriate data analytical methods and knowledge of the requirements needed for formal ethical approval.	Experiment/simulation:Use findings from empirical studies to generate hypotheses and models; incorporate these within further potential experiments and simulations.	Communication :Present complex neuroscience principles in a clear and precise manner, demonstrating a breadth of knowledge of the fundamentals of neuroscience.								

Stage 1	Chemistry for Nat Sci 1: Introduction to Chemical Structure and Reactivity	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 and commnunication of results.									
		By working on (and if applicable, assessed through)		Examination and assessed workshop			Lab report									
Stage 1	Chemistry for Nat Sci 2: Introduction to Analysis and Chemical Change	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 and commnunication of results.									
		By working on (and if applicable, assessed through)		Examination and assessed workshop			Lab report									
Stage 1	Cell & Development Biology	Progress towards PLO	Practising the design of models that explain data sets relating to cell specification and patterning in animals and plants		Acquiring knowledge on the structure, function and evolution of eukaryotic cells, including cell communication, cell specialisation and tissue patterning in multicelluar organisms.	Exposure in lectures to key experiments and approaches used in cell and developmental biology. Use of stereo and compound microscopes for observation of whole and dissected embryos. Use of histology to identify specific tissue types. Techniques for analysis of gene expression in multicelluar organisms.	Practising the design of models that explain data sets relating to cell specification and patterning in animals and plants									

		By working on (and if applicable, assessed through)	By interpreting the findings and observations from a series of experiments presented during a 3 hour workshop. Submission of a model to explain the development of a simple organism		Lectures and text book chapters and reviews. Supported by VLE-based formative tests and discussion forum. Lecturer drop-in sessions. Assessed by a 1 h closed exam.	3 h practical that involves observing and recording living and fixed embryo specimens, histological sections and gene expression visualised by in situ hybridisation. Assessed by 1 h closed exam.	Producing an example graphical model based on the findings and observations from a series of experiments during a 3 h workshop. Submission of a graphical model to explain the development of a simple organism									
Stage 1	Brain & Behaviour I	Progress towards PLO			By learning about principles of neuroscience and their importance in studying cognitive functions.		Designing, carrying out, and writing up empirical practical sessions									
		By working on (and if applicable, assessed through)			By assimilating the lectures' content and related scientific articles.		Writing up of practical, including experimental design and hypotheses, that forms part of summative assessment for module									
Stage 1	Perception & Cognition I	Progress towards PLO			By learning about fundamental facts about human cognition and sensory systems and the processes and representations involved in cognitive and perceptual processing.		Designing, carrying out, and writing up empirical practical sessions									
		By working on (and if applicable, assessed through)			By assimilating the lectures' content and related scientific articles.		Writing up of practical, including experimental design and hypotheses, that forms part of summative assessment for module									

Stage 1	Molecular Biology & Biochemistry	Progress towards PLO	Practicing problem-solving and basic chemistry-based calculations together with hands-on practicals in enzymes kinetics and separation of macromolecules.		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.		Exposure to several basic biochemical techniques (column chromatography, enzyme kinetics) through lectures and practicals.									
		By working on (and if applicable, assessed through)	Open assessment of practical through problem solving. Formative worksheets.		2 x 1.5-h closed exams (Spring and Summer CAPs)		Open assessment of practical through problem solving. Formative worksheets.									
Stage 1	Reason & Argument B	Progress towards PLO			By working to produce an essay considering the cases for and against one theory of the logical form of a particular kind of phrase, students will develop their ability to weigh arguments and lay out a case for a particular verdict			By discussing and evaluating answers to set questions in seminars, students will develop their abilities to collaborate in seeking solutions to problems								
		By working on (and if applicable, assessed through)			By working to produce an essay to a structured question, students will develop their ability to produce a structured response to a technical question											
Stage 2	Perception & Cognition II	Progress towards PLO			By learning about advanced and contemporary controversies about human cognition and the processes and representations involved in cognitive processing.		Designing, carrying out, and writing up empirical practical sessions	By synthesising the information provided during the practical into a coherent report, taking into account past feedback.								

		By working on (and if applicable, assessed through)			Lecture materials and completing post-lecture tests.		Writing up of practical, including experimental design and hypotheses, that forms part of summative assessment for module	By writing a laboratory report on the experiment run during the practical, building upon feedback from Y1, and by presenting findings from the mini-project to students and faculty.
Stage 2	Brain & Behaviour II	Progress towards PLO			By learning about how the human brain mediates higher and more complex mental functions such as attention, language, memory and action.		Designing, carrying out, and writing up empirical practical sessions	By synthesising the information provided during the practical into a coherent report, taking into account past feedback.
		By working on (and if applicable, assessed through)			By assimilating the lectures' content and related scientific articles.		Writing up of practical, including experimental design and hypotheses, that forms part of summative assessment for module	By writing a laboratory report on the experiment run during the practical, building upon feedback from Y1, and by presenting findings from the mini-project to students and faculty.
Stage 2	Philosophy of Mind	Progress towards PLO	By considering, discussing, and comparing ranges of solutions presented in lectures, seminar materials, and additional readings, and trying to develop their own ideas, students will enhance their ability to identify potential solutions by extrapolation and analogy		By studying a representative range of debates in the area addressed by the module, reading, dissecting, and discussing key texts, students will come to understand and be able to explain these debates, and apply their understanding in addressing novel problems By engaging in			
		By working on (and if applicable, assessed through)						

Stage 2	Chemistry for Nat Sci 3: Structure, Bonding and Reactivity	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 Nat Sci 4: Synthesis, Spectroscopy and Photochemistry	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 and physical chemistry experiments and reports			
Stage 2	Neuroscience [new]	Progress towards PLO	Understand how model systems and cutting edge technologies are used to improve understanding of nervous system function/dysfunction and develop novel diagnostic modalities/treatments	Group work in laboratory practical and problem solving workshops to understand processes e.g. ionic basis of electrical excitability, genetic/pathophysiological basis for key motor disorders	Acquire understanding of key elements underlying neuronal behaviour at cellular, circuit and network levels and relate these to function/pathophysiology of sensory and motor systems	Design and execute experiments to understand mechanisms underlying pain/movement disorder in Drosophila model system	Evaluate key experimental and analytical techniques underpinning understanding of sensory and motor system biology and their dysregulation in diseases, e.g. Parkinson's, ALS, FTD	
		By working on (and if applicable, assessed through)	Lectures, workshops, practical, journal club	Workshops, journal club, closed exam	Lectures, workshops, reading the course textbook, closed exam	Journal club, sensory behaviour practical, analysis workshop	Lectures, practical, workshops, closed exam	
Stage 2	Philosophy of Science [new]	Progress towards PLO	By considering, discussing, and comparing ranges of solutions presented in lectures, seminar materials, and additional readings, and trying to develop their own ideas, students will		By studying a representative range of debates in the area addressed by the module, reading, dissecting, and discussing key texts, students will come to understand and be able to explain these debates.			
		By working on (and if applicable, assessed through)						
Stage 2	Cell Biology [new]	Progress towards PLO	Integration of cell biology principles and pathophysiology. Logical thinking/crtitical analyses/ problem solving skills.	Group work in laboratory practicals and workshops to understand cell biology.	Acquire an understanding of key structural and functional elements of eukaryotic cells and relate these to cell behaviour.	Design and perform experiments to investigate mechanisms underlying cell motility.	Evaluate experimental and analytical techniques used to investigate cell biological processes in health and disease.	
		By working on (and if applicable, assessed through)	Lectures, workshops and practicals. Assessed through a closed assessment.	Workhops and practicals. Assessed through a closed assessment.	Lectures will provide knowledge on the concepts of cell biology and workshops will give applied examples. Assessed through a closed assessment.	Workshops and practicals. Assessed through a closed assessment.	Workhops and practicals. Assessed through a closed assessment.	
Stage 3	Basic Principles in Neuroimaging (MSci only)	Progress towards PLO			By exploring the most recent advances in neuroscience and the methods supporting it.			

		By working on (and if applicable, assessed through)			By comparing methods and their adequacy.			
Stage 3	Research design and analysis in neuroimaging (MSci only)	Progress towards PLO			By exploring the most recent advances in neuroscience and the methods supporting it.			
		By working on (and if applicable, assessed through)			By comparing methods and their adequacy.			
Stage 3	Nat Sci Interdisciplinary Project (BSc only)	Progress towards PLO	Designing an empirical project that utilises the variety of techniques and methodologies covered in Stages 1-2	Being embedded in a laboratory that uses an interdisciplinary approach to studying the brain. Projects may also involve working in a group of undergraduate students.		By planning and executing the research project	Planning empirical project from reading appropriate literature and generating novel hypotheses based on data from these studies	
		By working on (and if applicable, assessed through)	Writing up the empirical project, summatively assessed	Writing up the empirical project, demonstrating the interdisciplinarity of the research undertaken		By working on the project investigation and ultimately via assessment of the project plan, notebook, report & presentation	Writing up the empirical project, summatively assessed	
Stage 3	Advanced topics in Neuroscience [new]	Progress towards PLO			Understanding the mechanisms of learning and memory in different animal models at the neurological, cellular and molecular level.		Criticise and design scientific studies into learning and memory, comparing different techniques and experimental paradigms used in different animal models.	Explain how changes in synaptic transmission are linked to learning and memory.
		By working on (and if applicable, assessed through)			Lectures, VLE material and VLE discussion board, Workshops (x2) on scientific papers. Open examination based on a published scientific study		Workshops on scientific papers. Methods and data interpretation questions in open examination based on a published scientific study	Workshops on scientific papers. Data interpretation and speculative questions in open examination based on a published scientific study

Stage 3	Advanced modules: -Memory & the brain -Nature & Nurture -The Cognitive Psychology of Sleep -Preference and Choice: The Role of Perception, Action and Memory -Social and Affective Neuroscience -Neuroimaging of vision -Cognitive neuroscience of attention -Mind and Brain -Damage to the Visual Brain -Body Representations -Perception of Actions and Human Behaviour	Progress towards PLO			By learning about the latest theories and models in cognitive neuroscience, with an emphasis on key and contemporary findings in the field.			By engaging in class debates, in a leading or supporting role.								
		By working on (and if applicable, assessed through)			By assimilating target articles and comparing their implications in an exam and an essay.			By presenting and discussing cutting-edge articles individually or in group, and by receiving individual formative feedback.								
Stage 3	Consciousness	Progress towards PLO	KEY: By working on a cutting-edge topic and engaging with a tutor working on an area in which	By pursuing an exploration of a difficult topic, involving work on an extended reading list and				KEY: By tackling difficult philosophical issues, including some at the forefront of								
		By working on (and if applicable, assessed through)														
Stage 3	Language & Mind	Progress towards PLO	KEY: By working on a cutting-edge topic and engaging with a tutor working on an area in which	By pursuing an exploration of a difficult topic, involving work on an extended reading list and				KEY: By tackling difficult philosophical issues, including some at the forefront of								
		By working on (and if applicable, assessed through)														
Stage 3	Chemistry and Disease	Progress towards PLO		Develop an understanding of key aspects of medicinal chemistry and biomedicine to build an advanced, applied chemical/biochemical background.												
		By working on (and if applicable, assessed through)		Examination and assessed workshop												

Stage 4	Natural Sciences Extended Research Project	Progress towards PLO	Designing an empirical project that utilises the variety of techniques and methodologies covered in Stages 1-3	Being embedded in a laboratory that uses an interdisciplinary approach to studying the brain. Projects may also involve working in a group of undergraduate students.		By planning and executing the research project	Planning empirical project from reading appropriate literature and generating novel hypotheses based on data from these studies									
		By working on (and if applicable, assessed through)	Writing up the empirical project, summatively assessed	Writing up the empirical project, demonstrating the interdisciplinarity of the research undertaken		By working on the project investigation and ultimately via assessment of the project plan, notebook, report & presentation	Writing up the empirical project, summatively assessed									
Stage 4	Topics in Cognitive Neuroscience	Progress towards PLO			By exploring the most recent advances in neuroscience and the methods supporting it.											
		By working on (and if applicable, assessed through)			By comparing methods and their adequacy.											
Stage 4	Data analysis	Progress towards PLO	Apply the skills learned to address novel bioscience problems. Reflect on: how the skills learned could be applied in other work at all stages of research, and evaluate their impact on outputs; how the skills might be extended, and how the skills gained might be useful in life after graduation			Evaluate the usefulness of the skills learned for bioscience research at all stages from experimental design to the communication of results	Demonstrate the acquisition of skills in experimental design and data analysis									
		By working on (and if applicable, assessed through)	Reflective written assessment			Data analysis report	Data analysis report									

Programme Map: Module Contribution to Programme Learning Outcomes Neuroscience

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 departments of Biology, Chemistry, Philosophy and Psychology. Therefore the relevant statements on staff contact time and how it propels learning have already been made in these department's respective submissions. The principles therein, hold just as true in the Neuroscience programme. This exposure to 4 different departments will give the student an almost unparalleled experience of learning cultures and practice at York .

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

Changes to the existing programme have been minimal as the original programme was tightly specified and rollout of the YP in contributing departments has not had a great effect on this programme. However an imbalance in subjects has been noted. Especially in relation to Biology which is notably underrepresented given the world class research in neuroscience that the department undertakes and offers in its teaching. This is currently being looked at with a view to increasing the amount of biology available to a student. If this imbalance is to be addressed then some rather significant changes to the structure of the degree will be rolled out in the forthcoming years.

Practical classes have now been introduced into 2 different Stage 1 modules effective 2017/18. These will enhance the student's skill sets by introducing them to practical skills earlier and in context. The modules affected are 'Brain and Behaviour' and 'Perception and Cognition'. There will be 2 additional assessments and 6 additional contact hours for these students. (Approved by Psychology and Nat Sci BoS)

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?

Independent study and formative work depends on the various principles and practices of the department in which the specific module is taken. There is a wide range of different modes of assessment used in the Neuroscience programme and this is appropriate given the interdisciplinary nature of the subject. Reference is again made to the corresponding section of the individual single subject proforma for details of local enhancements that will necessarily flow into the learning experience of a Neuroscience student.

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

As stated above, there has been little change to the structure of the Neuroscience programme and this includes independent work and formative assessment. Change will be made should it be deemed necessary by the contributing department as part of their enhancement plans. Any changes will be reviewed at the Nat Sci BoS.

As Item 7.

(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 10. It should be noted that in the initial design phase of all the Nat Sci programmes a great deal of work was done with UTC to ensure an appropriate and diverse set of assessment tools was built into our programmes.

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

As in Item 12. The principles and practices are already in place and any changes that are deemed necessary wll arise during course review in the contributing departments and annual programme reviews.

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/