

MODULE APPROVAL FORM
SECTION 1 – THE MODULE SPECIFICATION

1. Module title	C6 Research project in Functional Neuroimaging and Tractography			
2. Is this module also available for Study Abroad students	Yes	No		
3. Module code For King's students For Study Abroad students if different	7PAMNNC6			
4. Subject area				
5. Credit level (tick one box only)	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input checked="" type="checkbox"/> 7
6. Credit value (tick one box only)	<input type="checkbox"/> 15	<input type="checkbox"/> 30	<input type="checkbox"/> 45	<input checked="" type="checkbox"/> 60
M Level only	<input type="checkbox"/> 20	<input type="checkbox"/> 40	<input type="checkbox"/> 90	
7. Teaching institution (if not King's College)				
8. Proposing department	Department of Forensic and Neurodevelopmental Science, Institute of Psychiatry			
9. Module organiser and contact details	Dr Marco Catani 020 3228 3064 marco.catani@kcl.ac.uk			

10. Educational aims of the module

The aim of this module is to train student to carry out a research project in neuroimaging. In combination with Module B5 Neuroimaging Research, students completing this module should be able to make an informed career choice, e.g. further postgraduate education or employment, either related to fMRI and Tractography or not.

The module is one of several research modules on the MSc Neuroscience programme, of which students must take one. This module provides students with the opportunity to work, uninterrupted, on a closely-supervised research project relevant to fMRI and tractography for approximately 20 weeks, or the equivalent in part-time study. This will enable them to use the specialist knowledge that they have acquired from the taught modules to, first, generate testable hypotheses and then, using appropriate laboratory techniques, to obtain empirical data that they can record, analyse, present and critically evaluate in a discussion resulting in conclusions that either support or refute their hypotheses.

In addition to acquiring proficiency in the specific practical skills and experimental methods used in conducting their projects, students will also acquire generic research skills. These are to;

- (i) keep a chronological log (laboratory notebook) of everything that they do and observe in the laboratory, in the order that they did it, according to GLP (good laboratory practice) standards and to behave as a member of a research team, with regard for their own safety and that of the other team members. It aims to develop their practical laboratory skills, to record raw experimental data, to develop analytical problem solving skills that enable them to analyse the data, to draw conclusions from the analysis and then to design and conduct further experiments. For students working in a clinical setting, the module also aims to instruct them about the requirements for ethical approval and research governance.

The quality of the laboratory notebook reflects the level of engagement with which the student approached their laboratory work, their level of preparation, their attention to detail, and their ability to work efficiently and to follow instructions. It is also indicative of the student's behaviour in the laboratory/clinic.

and then to;

- (ii) write a concise research report that is based on the more extensive descriptions of the methods, and the data and analyses sections that are recorded in the laboratory notebook. The report is a formal summary and discussion of the student's project work that is written in the style of a thesis, typically beginning with an Introduction, followed by a Materials and Methods section, a Results section, and finishing with a Discussion section and bibliography.

and finally to;

- (iii) prepare a scientific poster that concisely communicates their research findings to a scientist who should be able to understand and assimilate the contents of the poster in not more than 10 min, and to be able to defend their research methodologies, results and conclusions when examined orally by an examiner. These skills will have been developed through the several presentations of previously published data that students give to their class throughout the year.
Posters are a vitally important method by which scientists convey their results to a wider audience and defend their results and conclusions on a one-to-one basis to individual scientists. This module aims to provide the student with these skills.

The research project therefore provides training in practical research skills and an opportunity for students to obtain, analyse and present their own data instead of reading about, and presenting to the class, data already published in the scientific press.

11. Learning outcomes of the module (these need to take account of the generic level descriptors)

On completion of this project module, successful students will have a detailed knowledge of several neuroscience research methods and will have attained sufficient practical skills to undertake supervised research work and to contribute to the work of a research team, especially within the fields of fMRI and tractography or, to commence further post-graduate training,

There will be different learning outcomes for the different components of the research project

- (i) After writing the research report, students will have learnt how to review the published literature, so that they are able to construct a reasonably complete picture of what has been done and to select the most salient parts of the literature to present in their Background to the report and to end the section with the testable hypotheses that are most pertinent to the specific issues and questions posed by their project. The students will have learnt to write a concise Methods section that only contains the protocols that were used to obtain the data presented in the Results section and yet is sufficient to support interpretation of the data. Similarly, they will have learnt how to extract the results and analyses from the laboratory notebook that are essential to the arguments developed in the Discussion section. After completing the Discussion, students will know how to interpret their results with reference to those previously published and referred to in the Introduction,. They should then be able to discuss their findings and their impact on their hypotheses and how their work has advanced knowledge of the subject and to suggest areas for future research.
- (ii) After completing their experimental work, students will have practical experience of several specialised neuroscience research techniques that will equip them to conduct a supervised research project within their chosen research field. They will understand the requirements of Good Laboratory Practice (GLP). This is an internationally-recognised quality control and assurance system, concerned with the organisational process and the conditions under which non-clinical laboratory activities are planned, performed, monitored, recorded, archived and reported. They will have learned how to record the experimental data in an appropriate scientific style, to analyse them and then to draw conclusions leading to further experiments. Students will know that:
- the laboratory notebook is the primary form of documentation in a research laboratory and that it is an extremely important legal document;
 - it can be used to establish a patent claim, assign credit for discovery of a phenomenon, document the honesty and integrity of data for publication, and trouble-shoot problems;
 - it can be subpoenaed in litigations and examined by regulatory authorities, e.g., H.& S.E and therefore formatting rules must be complied with, and;
 - it should be sufficiently complete so that another person can exactly repeat an experiment solely from information in the laboratory notebook.
- They will also have learned how to work safely in a laboratory both with regard to their own safety and that of the other team members. Additionally, students working in a clinical setting will also become familiar with requirements for ethical approval and research governance.
- (iii) After completing the programme, students will have
- acquired the skills to make a scientific poster that quickly and effectively conveys the background, methods, results and conclusions of their own research to the informed reader and the ability to engage in a discourse with critical readers of the poster. They will have learnt how to design the poster so that it first engages the reader's attention and then persuades the reader to invest time in reading it from beginning to end, rather than reading just a single section or selected sections.
 - experience of presenting an oral communication using information extracted from the published neuroscience research to their class and to a lecturer.

12. Programme details (please list all the programmes to which the module contributes and state whether it is introductory (I), professional (P), core (Cr), compulsory (Cp), part of a core/compulsory pair (CrCp) or optional (O) for each programme. Where the module will form part of a core/compulsory pairing please state the partner module below.

Programme title	Programme code	I	P	Cr	Cp	CrCp	O
MSc Neuroscience	TMSC1PTNSC TMSC2PTNSC						O
MSc Neuroscience in Functional Neuroimaging and Tractography	Pathway/route code: TNNT						Cp

CRCP's partner Module code	Module title	Programme title	Programme code

13. Prohibited combinations (please list all the modules which cannot be taken in combination with the proposed module and to which programme this relates)

Module title	Module code	Programme
C Research project in Neuroscience	7PAMNNC1	
C1 Research project in Psychiatric Genetics	7PAMNNC1A	
C2 Research project in Addiction Biology	7PAMNNC2	
C3 Research project in Developmental Neurobiology	7PAMNNC3	
C4 Research project in Neurodegeneration	7PAMNNC4	
C5 Research project in Neuroimaging	7PAMNNC5	
C7 Research project in Cognitive Neuroscience	7PAMNNC7	

14. Pre-requisites (please list all the modules for which the proposed module is a pre-requisite)

Module title	Module code
none	
(and all the modules which are pre-requisite for the proposed module)	
Module title	Module code
A1. Fundamental Neuroscience	7PAMNNA1
A2. Fundamental Neuroscience	7PAMNNA2
A3. Fundamental Neuroscience	7PAMNNA3
and one of the following:	
B Neuroscience research	7PAMNNB1
B1 Psychiatric Genetics research	7PAMNNB1A
B2 Addiction Biology research	7PAMNNB2
B3 Developmental Neurobiology research	7PAMNNB3
B4 Neurodegeneration research	7PAMNNB4
B5 Neuroimaging research	7PAMNNB5
B6 Functional Neuroimaging and Tractography research	7PAMNNB6
B7 Cognitive neuroscience research	7PAMNNB7

15. Contact time/directed study (please indicate the **exact number of hours for each activity** to give an overall picture of the workload a student taking the module would be expected to undertake. The student should be made clear of what they can expect regarding contact time with staff, and the expectation that the programme has of its students as independent learners). Apart from placements and self-guided learning it is expected that the others are all taught sessions.

Lectures	Seminar/ tutorials	Field/lab/studio /supervised learning	Project work	Placements	Self-guided learning
			600h (incl. write up and poster preparation)		
If any of the above is related to e-learning please give details below:					

16. Assessment pattern - For King's students

Method	Number/ amount	Duration / length	Pass Mark (40 for level 4, 5 and 6; 50 for level 7)	Mandatory mark/ Qualifying mark	% of final grade of module	SI set up if different
Unseen written examinations						
Assessed coursework (please specify ie essay, project, seminar work, lab work)						
Practical examinations						
Clinical examinations						
Oral examinations						
Dissertation	1 x research report	7,500- 10,000 words	50%	50%	60%	
Other (please specify)	1 x laboratory notebook	N/A	50%	50%	20%	
	1 x poster followed by assessment of answers to questions put by the examiners	N/A	50%	50%	20%	

16. Assessment pattern - For King's students						
Other (where attendance/ completion is a requirement in order to pass but does not contribute a mark to the final grade)						
For KIS purposes, please note where the assessment falls under the following 3 categories (see guidance notes for explanation of categories):	Written		Coursework		Practical	
Reassessment opportunity: please state the reassessment pattern, see regulation A3, 20.4 – 20.6						

17. Assessment pattern - For Study Abroad students, if applicable						
Method	Number/ amount	Duration / length	Pass Mark (40 for level 4, 5 and 6; 50 for level 7)	Qualifying mark	% of final grade of module	SI set up if different
Unseen written examinations						
Assessed coursework (please specify ie essay, project, seminar work, lab work)						
Practical examinations						
Clinical examinations						
Oral examinations						
Dissertation						
Other (please specify)						
Other (where attendance/ completion is a requirement in order to pass but does not contribute a mark to the final grade)						

17. Assessment pattern - For Study Abroad students, if applicable						
Method	Number/ amount	Duration / length	Pass Mark (40 for level 4, 5 and 6; 50 for level 7)	Qualifying mark	% of final grade of module	SI set up if different
For KIS purposes, please note where the assessment falls under the following 3 categories (see guidance notes for explanation of categories):	Written		Coursework		Practical	
Reassessment opportunity: please state the reassessment pattern, see regulation A3, 20.4 – 20.6						

18. Examples of key recommended text books

Students will have access to recordings of the previous year's lectures prior to the module starting to guide their reading.

19. Useful websites

MSc Neuroscience website: <http://neuroscience.iop.kcl.ac.uk/msc>

Centre for Neuroimaging Sciences website:

<http://www.neuroimagingciences.com/>

Natbrainlab: Neuroanatomy and Tractography Laboratory:

<http://www.natbrainlab.com/>

MSc e-learning site: <http://moodle2.iop.kcl.ac.uk> (login required)

**MODULE APPROVAL FORM
SECTION 2 – SUPPLEMENTARY INFORMATION**

This section will not be relevant for all modules

1. Module name

C6 Research project in Functional Neuroimaging and Tractography

2. In cases where parts of all of the module are delivered either away from one of the College campuses and/or by a body or bodies external to the College please provide the following details

Name and address of the off-campus location and/or external body N/A

Percentage of the module delivered off-campus or by external body N/A

Nature of the involvement of external body N/A

Description of the learning resources available at the off-campus location N/A

What mechanisms will be put in place to ensure the ongoing monitoring of the delivery of the module?

Occasionally, projects are offered by external organisations. In all cases, those offering projects are known to IoP staff contributing to the programme and are usually active collaborators. External supervisors submit their project proposals through a Programme intranet. The external supervisors also receive the same supervision guidelines as internal staff.

Where students are undertaking placements/year abroad/year in employment please provide the guidance information presented to students undertaking this method of study

MODULE APPROVAL FORM
SECTION 3 – ADMINISTRATIVE INFORMATION

1. Module name

C6 Research project in Functional Neuroimaging and Tractography

2. Start date

Year	Month
Continuing	

3. Numbers (if applicable)

Maximum	N/A
Minimum	N/A

4. Availability (please indicate when the module is available and when the examination will take place – indicate if this is different for Study Abroad students)**Period of study** (dd/mm/yy – dd/mm/yy)

	From (dd/mm/yy)	To (dd/mm/yy)
Sem 1		
Sem 2		
Term 1		
Term 2		
Term 3		
Standard year		
Other	1 st Monday in April (depending on Easter)	Mid August

*NB: If module is being delivered more than once during the academic year, note the **full set** of dates that the module is available*

Examination period (Period 1 (January)/Period 2 (May)/Period 3 (Other))

Period 1 (January)	
Period 2 (May)	
Period 3 (Other – please note the month)	1 st or 2 nd Monday- Wednesday in September

NB: if module is being delivered more than once during the academic year, note which examination period relates to relevant period of study.

5. Superseded modules (please list any modules that the proposed module supersedes and indicate whether such modules have ever been taught or examined)

Module title and code	Taught	Examined
This module is unchanged but the approval form is required to list changes to other modules that affect the pathways	√	√

6. Contributing departments/divisions/Schools (please give details if the module will not be taught exclusively within the proposing department) Please note that % of contribution must be a fixed percentage not in a range (e.g. cannot be 0 – 20%)

Contributing Department/ Division/School	Nature of involvement	% contribution to teaching
It is not possible to state	Providing closely supervised	

Module approval 2012/13

<p>the departmental contributions in advance because students choose their projects after completing the taught modules. However most projects will be provided by the Department of Forensic and Neurodevelopmental Sciences.</p>	<p>research projects</p>	<p>Because students choose the field of their research project after completing the taught modules, it is not possible to state this in advance</p>
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**MODULE APPROVAL FORM
SECTION 4 – THE APPROVAL PROCESS**

1. Module name

C6 Research project in Functional Neuroimaging and Tractography

2. Initial approval/consultation at the planning stage

- | | | |
|---|---------------------------------|--------------------------------|
| (a) Will the new module require new ISS stock or facilities/systems? | Yes
<input type="checkbox"/> | No
<input type="checkbox"/> |
| (b) Will the new module require any new resources (e.g. teaching space, staff, offices, additional support from central services?) | Yes
<input type="checkbox"/> | No
<input type="checkbox"/> |
| (c) If the new module contains student activities that involve human subjects, has the appropriate ethical approval been sought and granted | Yes
<input type="checkbox"/> | No
<input type="checkbox"/> |

If Yes to (a) and/or (b) above, please attach details and signed approval from the relevant College officer

If Yes to (c) please attach confirmation of ethical approval, including the ethics approval number

3. Approval by the School Education Committee

Date module approved:

Signature of the Chair of the School Education Committee:..... Date:

(Electronic signatures are acceptable)

4. Approval for modules jointly taught by more than one School

Date module approved by the second School(s):

Signature of the Chair of the second School Education Committee(s):..... Date:.....

(Electronic signatures are acceptable)

**MODULE APPROVAL FORM
SECTION 5 – MODULE SET UP ON SI (IN SCHOOL)**

1. Module name

C6 Research project in Functional Neuroimaging and Tractography

2. School approved to set Module up on SI

Yes

No

For Quality and Academic Support Section (QAS) purposes only:

3. Information recorded on form approved by QAS?

Yes

No, sent back to School

If no, why was the form sent back to the School?

4. If the module was picked as part of a sample and checked by Information Development and Analysis, was the information recorded on SI correct?

Yes

No

If no, what information had been incorrectly inputted