



**UNIVERSITY OF
CAMBRIDGE**

Department of Psychology

NST Part II Course Guide

Part II Psychology

Part IIB Psychological and Behavioural Sciences

Part II BBS Major Subject Psychology

Course Guide and Schedule of Lectures

Academic Year 2017 - 2018

The information contained in this Course Guide is correct at the time of going to press (24/10/2017), but all matters covered are subject to change from time to time.

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Introduction

Welcome to the Department of Psychology.

Some of you may have chosen Psychology because its subject matter, the mind, remains largely mysterious and because it is rich in disputed theories. Consequently, you can strive to be original and questioning without being thought presumptuous. We will certainly encourage you to construct your own views where possible, and enjoy your contribution.

Many of you have already received some teaching in Psychology at Part IB and so will have come to appreciate something of the breadth and variety of the discipline, and this is reflected in our Part II course. This does mean that you will find yourself having to make decisions early on and throughout the course about where you are going to focus your interests. It would be unwise to make these decisions without consulting your Director of Studies or Coordinating Supervisor.

In accordance with normal practice, we list the aims and objectives of this course; you will find these on the next page.

We hope you enjoy your year with us!

Aims and Objectives of the Part II Course

Aims

The academic aims of the Part II course are as follows:

- to provide students with the conceptual tools and background knowledge required to understand developments in the sciences of mind and brain, including appreciation of the range of behavioural and physiological sources of evidence and multiple levels of theoretical analysis;
- to inculcate skills of scientific reasoning, research and reporting that are useful to both future specialists in psychology and related disciplines and professions, and to graduates who proceed to other occupations;
- to provide within the context of the Natural Sciences Tripos an education in experimental psychology and cognitive neuroscience of high quality, and to produce graduates of the calibre sought by the professional and the public services, as well as the academic teachers and researchers of the future.

An additional professional aim applies to the Part II Psychology option:

- to provide a course that, taken together with NST IB Experimental Psychology, will prepare our graduates for professional training in psychology.

Objectives

By the end of the course, students should have:

- received a training in experimental psychology and cognitive neuroscience at a level of sophistication equivalent to the nationally recognised standards for a degree in Psychology;
- further developed conceptual tools required for analysis of mind, brain and behaviour;
- extended their knowledge and understanding of selected topics to the frontiers of research;
- gained experience of psychological research and scientific reporting through the conduct and writing up of a supervised research project;
- acquired and exercised techniques of statistical analysis in common use in experimental psychology and cognitive neuroscience;
- had the opportunity to develop the skills of literature search, critical review, and extended expository writing through preparing a dissertation.

The Department

This is one of the oldest psychology departments in the country, established in 1897. In 2012 two former sub-departments of psychology merged, the Department of Experimental Psychology (on the Downing Site) and the Department of Social and Developmental Psychology (on Free School Lane), to create a unified Department of Psychology. 2013 marked the inauguration of the Psychological and Behavioural Sciences (PBS) Tripos, a new undergraduate degree that we expect to complement the NST stream. While we remain a relatively small Department as measured by the number of our University Teaching Officers, we do accommodate many post-doctoral research scientists and postgraduate research students, many of whom who serve as supervisors for lecture courses and Part II research projects.

Physically, the Department occupies three adjacent buildings on the Downing Site, and the Old Cavendish Laboratory on Free School Lane. The main Psychological Laboratory building on the Downing Site houses most of the facilities used by Part II students: our lecture theatre, our practical classroom with a Macintosh network, a well-stocked Library (and helpful Librarian), technical workshops, and the Student Common Room (containing photocopiers, snack and drinks machines, and computer access), in addition to Reception. The remaining floors contain offices and laboratories.

Immediately to the west is the Craik-Marshall building, holding the Kenneth Craik seminar room on the ground floor, and further laboratories and offices throughout the building. Immediately to the south is the William Hardy Building, of which we occupy much of the ground, second and third floors. The Department houses the University of Cambridge Behavioural and Clinical Neuroscience Institute (BCNI), funded by a consortium grant from the Medical Research Council (MRC) and Wellcome Trust. There are members of the Department also working elsewhere in Cambridge e.g. Douglas House and Addenbrooke's Hospital.

We are fortunate in having the MRC Cognition and Brain Sciences Unit (MRC-CBU) nearby in Chaucer Road, which is a major research centre for cognitive psychology and cognitive neuroscience. Some of its members provide supervisions for our Part II courses and Part II research projects. The Department also has links with the Department of Psychiatry at Addenbrooke's Hospital on Hills Road and its Autism Research Centre on Trumpington Road, and the Brain Mapping Unit in the William Hardy Building.

Department Contact Details:

Department of Psychology

University of Cambridge

Downing Site

Cambridge CB2 3EB

Tel: 01223 333550

Website: www.psychol.cam.ac.uk

Part II Course Organiser	Dr Mirjana Bozic, mb383@cam.ac.uk
Teaching Administrator	Miss Jo Simmonds jms311@cam.ac.uk
Teaching Secretary	Mrs Louise White law23@cam.ac.uk
Librarian	Ms Judith Brown, jab202@cam.ac.uk
Deputy Head of Department (Teaching)	Dr Kate Plaisted-Grant kcp1000@cam.ac.uk
Head of Department	Prof Mark Johnson mark.johnson@bbk.ac.uk

Our Part II Course: What is it and who does it?

Scientific psychology largely concerns itself with what can be objectively observed, measured and counted. It subsumes the study of abnormal behaviour insofar as it can inform us about normal behaviour, and in the hope of contributing to the development of treatments. The substantial proportion of our teaching and research focuses on normal functioning and the mechanisms underlying mental processes and the control of behaviour in animals and in human beings of all ages.

Our Part II courses allow students to study a diverse selection of the sub-fields of psychology (e.g. sensory processes, motor skill, cognition, learning and memory, language, emotions and motivation, attention and control). These topics are often investigated at several levels: in terms of their neural substrate, their functional and computational architecture, the intra-personal level of states of conscious awareness, and the inter-personal level of minds in interaction with others. It is also possible to compare behavioural capacities and nervous systems across species in order to view human psychology in evolutionary terms. Alternatively, one may focus on the development of perceptual, cognitive and social skills throughout the life span or on the causes and consequences of their malfunction in mental illness and brain damage. Psychology has a considerable overlap with disciplines such as neuroscience, psychiatry, ethology, behavioural ecology, behavioural genetics, anthropology, computer science, linguistics, philosophy and sociology.

Psychology degree courses within universities differ in terms of the aspects of the discipline that they emphasise. The Cambridge Psychology Department, located as it is within a Biological Sciences Faculty, has maintained an abiding concern with neurobiological processes.

About 70 students take the Part II course each year. Of these, some are natural scientists who have completed the NST IB Experimental Psychology course. These students have a mixture of physical science and biological science backgrounds. We also take a significant number of medical students who will have taken the core course in MVST IB Neurobiology and Human Behaviour. In addition, we share our courses with students taking Psychological and Behavioural Sciences Tripos (PBST) Part IIB, and borrow some courses from the PBST Part IIB. Finally, some lecture courses are available for students taking NST Part II Psychology, Neuroscience and Behaviour.

We endeavour to make allowances for discrepancies in academic background among our students. To this end, lectures sometimes revisit material first presented in the NST IB course. Medics are invited to attend some of our NST IB lectures, because this is an efficient way to fill gaps in knowledge. We have made allowances for this in the Part II timetable.

The NST Part II Psychology Course

Structure of the Course

The course is divided into three sections: Section A (Cognitive and Experimental Psychology), Section B (Behavioural and Cognitive Neuroscience) and Section C (Social Psychology, Developmental Psychology and Individual Differences). Each Section contains several lecture courses that range from 4 to 32 lectures in length, with all lectures taking place in the Michaelmas and Lent terms only.

At the end of this course guide, you can find details of lecture courses available for the coming academic year in each of the Sections. They are timetabled so as to ensure that it is possible to go to every course. You can therefore sample initial lectures from each course to see whether you like it. Please note that the various courses within a Section often run concurrently.

British Psychological Society Accreditation

NST Part II Psychology (Single Subject) is part of a course of study accredited by the British Psychology Society (BPS). The accredited course requires students to take NST IB Experimental Psychology and NST Part II Psychology. A bachelor degree awarded at second class and above together with a pass mark for the research project on this course allows one to apply for accredited post-graduate professional training in clinical, educational and occupational psychology without taking the BPS graduate qualifying examination. NST Part II BBS Major Subject Psychology is not part of a BPS accredited course.

Preparing for the Examinations

In the examination, students on the single-subject Part II Psychology course and NST Part II BBS major subject Psychology will sit four papers in total. Paper 1 assesses statistics, experimental design and broader understanding of conceptual and historical issues in psychology. The remaining three papers assess material from the lecture courses. Paper 2 assesses lecture courses in Section A, Paper 3 assesses courses in Section B. Your fourth Paper will be one of four Papers delivered in the Part IIB Psychology and Behavioural Sciences Tripos, each of which assesses Section C material (see PBS Marking and Classing Criteria in Exam Information section on Moodle for more specific details).

NST Part II Psychology (Single subject)

All single subject students must offer a Research Project, which must not exceed 7,000 words, excluding appendices, footnotes, and bibliography (see page 7). Students can also choose to offer an optional dissertation on any topic that particularly interests them (see page 7).

NST Part II BBS: Major Subject Psychology

If you are studying psychology within the BBS Part II, you do not submit a research project. You do, however, have to submit a dissertation on a topic of your choice. Your dissertation can either be on a topic in psychology or a topic in your Minor subject. The arrangements for doing a dissertation on a topic in psychology within the Department of Psychology are as follows: You may propose the dissertation topic, or take it from a list of possible titles that will be published at the start of the Michaelmas Term. You should approach a potential supervisor and gain their agreement to supervise you.

You must then obtain approval for the title and proposed subject of your dissertation. From the NST Part II Biological and Biomedical Sciences 2017-18 Moodle site, you must download a PDF Dissertation Title Notification Form, which you should fill in electronically (minus the supervisor signature) and upload to the Dissertation Title Notification Dropbox on the same Moodle page *by 4.00 pm on Thursday 9 November*. You must also print out a copy of this completed form, have it signed by your project supervisor, and hand in the form to Jo Simmonds in the Psychology Teaching Office *by 4.00 pm on Thursday 9 November*. Plenty of useful information about the dissertation is also available on the BBS website. The dissertation should not exceed 6,000 words in length.

BBS students may attend any of the Psychology lecture courses, although there may be clashes between some lecture courses and certain Minor subjects, and students should check the timetables carefully. A list of compatible combinations of BBS major and minor subjects can be found here: <http://www.biology.cam.ac.uk/undergrads/nst/bbs/subject-combinations>.

PBST Part IIB: PBS 10 and PBS 11

PBST Part IIB students may attend any of the Part II Psychology lecture courses. Section A courses are examined in PBS 10 and Section B courses are examined in PBS 11. PBST students may take either PBS10 or 11 or both. You will choose a selection of lecture courses from each of these sections to prepare for the examinations and we recommend that you discuss your choices with your Director of Studies or Co-ordinating supervisor (see **Supervisions**, below).

Supervisions

Technically, supervisions are the responsibility of College Directors of Studies. Not all Colleges appoint a Directors of Studies for Psychology, and for this reason the Department tries to ensure that every College has a psychologist acting at least as a 'Coordinating Supervisor'. Your Director of Studies or Coordinating Supervisor will advise you about which lecture courses to attend, the number of supervisions you should have, the optional dissertation (where relevant) and on how to prepare for the examination. It is their responsibility to arrange your supervisions. However, in practice this is often achieved directly via the lecturer and members of their research group. Part II supervisions are much less frequent than those in Part I (1 to 1.5 a week is typical) and should be based on much more substantial reading and private study on your part than in Part I.

A list of Coordinating Supervisors will be available on moodle. Please alert us if your College is not represented on this list. You should make contact with your Coordinating Supervisor as soon as possible; many will attend the drinks reception on the Induction Day.

Lecturers will announce the supervision arrangements in their first lecture or lecture handout on their courses. If you make your own supervision arrangements, you should clear these with your Coordinating Supervisor. If you experience any difficulties in finding someone to offer supervisions on a particular topic, please seek guidance from the course lecturer in the first instance, and your Coordinating Supervisor.

Research projects (NST Part II Psychology Single subject and PBST Part IIB)

Choosing a project

Students usually choose their project from those offered in a prospectus of project descriptions, issued in early summer.

The role of the student

The project provides you with an opportunity to conduct some hands-on research. Students are encouraged to make suggestions about experimental design and to conduct their own independent reading of relevant material. Some projects may require you to master new experimental techniques, and supervisors will provide you with initial guidance after which you should aim to work more independently. Although your supervisors will be available to provide guidance, you will be expected to set up and organize the experiments, collect the data and conduct the statistical analyses of data yourself. A special course is organised in the Michaelmas Term covering the statistics necessary for analysing project data. While most projects are collaborations between a pair of students (or more), you must submit an independent report of the study. A class will be available at the end of Michaelmas Term to provide guidance on how to write up the research project. A sample of successful past projects is available for inspection in the Departmental Library.

The role of the supervisor

Your supervisor will initially provide you with references for preliminary reading, and encourage you to conduct further independent library research. They will initially provide you with guidance regarding the technical aspects of the projects and will be available for consultation during the project when, and if, you should need it. They will provide guidance on the statistical analysis of the data, although you are expected to conduct the actual analyses yourself. Supervisors will be available for you to discuss **your ideas** about the structure and content of your project report before you write it up and provide guidance where needed. The format should be roughly that of a typical research paper in Psychology. The supervisor is permitted to read and comment on only one draft of the **methods and results sections** of the project. Students are discouraged from soliciting advice on their drafts from other individuals.

The Optional Dissertation (NST Part II Psychology Single subject)

For students who become particularly interested in a topic and would like to study it in depth, the option is available to write a literature review and critical commentary on an area of research *different* from that of the research project. It does, of course, involve additional work, some of which may be carried out during the Christmas vacation. If the dissertation attracts a higher mark than the lowest (second class) mark in written Papers 2, 3 or 4, then the Examiners will substitute the dissertation mark for that mark. (The dissertation mark will not substitute for a third-class or failed exam mark.) Students considering the optional dissertation are strongly recommended to identify a dissertation supervisor. Typically, a supervisor will provide pointers to the literature at the outset, comment on a *single* draft of the dissertation at the end, and answer queries in between. Single-subject Psychology Students are welcome to make use of the BBS list of dissertation titles to gauge the research interests of members of the Department.

The title of the dissertation must be submitted to the Senior Examiner for approval not later than the end of Michaelmas Term preceding the examination, **Fri 1st December 2017**. There is no form for this purpose; an email to the Senior Examiner will suffice. A title will not normally be approved if the fields of the research project and the dissertation overlap. Our working rule is that the project and dissertation would not be expected to share references other than statistical ones.

Assessment: The Tripos Examination

N.B. The exam structure was changed in 2013-2014 from previous years. The changes simplified the exam structure, and were introduced in response to student feedback. Students should bear this in mind when viewing previous exam papers, which can be found on the Moodle site.

Written Papers

There are four papers in total, and students are required to answer three questions on each paper.

Paper 1 is sub-divided into three sections, one question to be answered in each;

Section A: Statistics

Section B: Methodology and experimental design

Section C: Essay questions that address conceptual and historical issues. These require candidates to synthesize information from different branches of the subject, or to discuss the history and philosophy of psychology. In this section, you have the chance to write about one of the grand issues of cognitive and behavioural neuroscience (e.g. Are objects and concepts represented in the brain by the activities of single cells? In what sense can animals think? How far is our behaviour influenced by our evolutionary history?). A series of lectures on Conceptual and Historical Issues in Psychology are scheduled separately from the Section lecture courses, to assist in the preparation of these questions.

The remaining three papers examine the lecture material from the course.

Paper 2: Contains questions drawn from Section A: Cognitive & Experimental Psychology

Paper 3: Contains questions drawn from Section B: Behavioural & Cognitive Neuroscience

Paper 4: Contains questions relevant to the chosen Paper in PBST

Candidates taking Psychology as their major subject in **NST Part II BBS** take Papers 1, 2, 3 & 4.

The Research Project

The research project attracts 20% of the marks available in the examination. The final independent report of the Research Project must not exceed 7,000 words, excluding appendices, footnotes, and bibliography. Two copies of the final report must be submitted to the Senior Examiner c/o Reception in Psychology by 12.00 pm *on the second Thursday of the Full Easter Term (4th May, 2017)*.

The Optional Dissertation (single subject Part II Psychology only)

Two copies of the completed optional dissertation should be submitted to the Senior Examiner c/o *Reception in Psychology* by 12.00pm *on the fifth Monday of the Full Lent Term (20th February 2017) (i.e. the Monday following Reading Week)*. The dissertation should not exceed 8,000 words in length of text (excluding tables, references and footnotes).

Reading Week

In the middle of Lent term, we provide you with a 'Reading Week', 13th – 17th February 2017: a week without lectures that affords you the opportunity to catch up on reading, writing and project work. To enable us to accommodate 8-week lecture courses, we start Lent Term lectures on Monday 16th January, i.e. the day before Full Term starts, and finish them on the last day of Full Term. Please note that Section C lecture courses and one or two other courses continue during reading week.

Student Input to Teaching and Course Management

We highly value your evaluation of all aspects of our teaching, the way the course is run and the facilities we provide. With your feedback, we can develop, expand and modify our teaching provision.

Questionnaires.

At the end of each lecture course you will receive an email announcing a web-based questionnaire concerning the course. Please click on the link in the email and complete the short questionnaire, rating and commenting on various aspects of the course and associated supervisions. Please note that your reply is entirely confidential and no one can identify the author of a particular comment. However, please remember that the process is totally automatic so that the lecturer concerned will see the precise words that you have written. Numerical data and comments from these questionnaires are discussed by the Staff/Student Committee in their meetings. You will also be invited to complete a final questionnaire at the end of the year.

Staff/Student Committee.

This consists of the Deputy Head of Department (Teaching), Part II Course Director, the Part IB Course Organiser, the PBS Tripos Course Director, and student representatives from NST IB, MVST IB Option course, NST II Psychology and NST II Part II.

The main purposes of the Committee is 1) to receive feedback and questions from students which we answer and discuss and provide further comments and suggestions on our courses and Departmental arrangements for students and 2) to report these matters to all our lecturers at the next Departmental Staff meeting. The Committee normally meets in week six of Michaelmas and Lent Terms. The Secretary of the Committee is the Teaching Administrator Miss Jo Simmonds (jms311@cam.ac.uk). Anyone wishing to

have an item of business discussed should contact Miss Simmonds (ims311@cam.ac.uk) or the appropriate student representative.

Other channels. Students are encouraged to bring suggestions about the teaching or management of the Part II Course to our attention via the Head of Department, the Deputy Head of Department (Teaching), the Course Organiser or through their College Director of Studies or Coordinating Supervisor. In the Easter Term, as supervisions end, Directors of Studies, Coordinating Supervisors, and supervisors are circulated with a request to comment on our courses. This provides another route by which your reactions to our courses can influence our future provision.

Facilities for Part II students

Regardless of which Part II course involving Psychology you are enrolled on, we welcome you to use the facilities we provide for undergraduates. We would like you to feel that the Department provides a base for your Part II year.

Induction Session

On **Thursday 5th October 2017**, we will hold an Induction Afternoon to welcome new Part II students to the Department. There will be an opportunity for you to meet your Coordinating Supervisor. The afternoon will start with a welcome from the Part II Course Organiser, Dr Mirjana Bozic, and a general introduction to the Department and its staff, who will help and guide you during your year with us. The Deputy Head of Department, Dr Kate Plaisted-Grant, will give an overview of the Part II course at 2.30pm, and this will be followed by a wine reception and opportunity to meet other lecturers in the Department.

Library

Part II students enjoy 24-hour access to the Department Library, which is located on the first floor of the Psychological Laboratory. Our Librarian, Ms Judith Brown, who is on hand to help during normal working hours, is happy to provide support on literature searching and reference management.

The Library offers a quiet and comfortable place to work and stocks the reading material recommended in this guide and in lecture hand-outs. Most of the Library's books are available for loan. Books should be borrowed using the self-issue machine or loans register. There is a drop-box for book return. Laptops may be used throughout the Library, which has wireless Internet access. Drinks may be consumed in the Library.

The Library website gives further information about the Library and the services it offers, and provides links to teaching resources and to electronic resources.

Library Committee. A Part II student is asked to join this Committee, which consists of teaching officers, a graduate representative, the Secretary of the Department and the Librarian. Its main business is the selection of books and journals for the Library, and the consideration of general Library use and facilities. To volunteer to join the Committee, please talk to the Librarian.



Green Challenge

The Department of Psychology holds a Gold Green Impact award and is committed to reducing its impact on the environment by saving energy and minimizing waste. You will see throughout the department a number of recycling bins provided for paper, cardboard, plastic, cans and tins and would encourage all students to use these and to be considerate of switching off lights, reducing waste etc.



If you would like to get more involved, here's how:

- Keep up-to-date with news and opportunities by [subscribing to the Greenlines newsletter](#).
- Visit the [Environment and Energy Section's student webpage](#) to find out more about projects including Green Impact and the [Living Laboratory for Sustainability](#).
- Email environment@admin.cam.ac.uk with any questions or to find out more about any particular opportunity.
- Contact your Environment and Energy Coordinator Kayleigh Paske (kjp37@cam.ac.uk) to find out what opportunities there are to get involved in the Department, and to pass on your ideas for how the Department could be more sustainable.
- [Opportunities](#) include paid [internships](#), support running your own environmental project, and Institute of Environmental Management and Assessment (IEMA) accredited auditor training and experience through [Green Impact](#).

Scanning, Printing and Photocopying

Note that given the need to consider environmental issues and given increasing use of electronic devices by students, it has been decided that lecture handouts will no longer be printed. Module organisers should ensure that lecturers are aware that lecture handouts will need to be posted online well in advance of the lectures.

However, we do provide a scanner/printer/copier available for your use, should it be absolutely necessary. The machine is situated in the Student Computer Room, next door to the Library. The printer charges printing jobs to your Desktop Services 'Common Balance' at a cost of 7p per page. Please do try to use electronic means rather than paper. The machine can also be used to scan items and either email them or save them to a USB data stick.

Student Computer Room

Computers are available for your use in the Student Computer Room, which is situated next door to the Library. You will be provided with registration details from the Computer Officer (room 105) for an account, which will give you 2Gb file space, will allow you to use the printer and will give you access to a wired Internet connection.

The IBM SPSS statistics package is installed on four of the machines and the R statistics program is installed on the other four. All eight computers also have MATLAB and Microsoft Office. The computers are labelled to indicate which software package is available on each machine. Requests for other packages can be forwarded to the Computer Officer (computingrequests@psychol.cam.ac.uk).

You must not make copies of software on these machines, nor introduce copies of programs on to them.

Student Common Room

Located next door to the Library, the Student Common Room is a great place to relax. There is a microwave, kettle, fridge and cutlery and crockery for your use. The room also contains machines for hot and cold drinks and snacks. Lockers can be hired for a £5 deposit, refundable on return of the locker key.

Seminar Series

The Department hosts a number of seminar series, which you are very welcome to attend to extend your knowledge of current research in Psychology and Neuroscience.

The **Zangwill Club**. Held Fridays at 4.30 pm, in the Departmental Lecture Theatre. This is our general Departmental seminar series with speakers normally coming from outside the Department. Tea and cakes are served immediately before the talk at 4pm in the Nick Mackintosh Seminar Room (2nd floor).

The **Craik Club**. Held lunch times, with the venue and day of the week being variable. Local and visiting speakers on visual science, motor systems and other neurobiological topics.

The **Chaucer Club**. These seminars are held at the MRC Cognition and Brain Sciences Unit in Chaucer Road on Thursdays at 3.30 pm. The talks are usually given by visiting speakers. (<http://www.mrc-cbu.cam.ac.uk/seminar-information/chaucer-club>.)

The **Wednesday Lunchtime Seminars**. These are also held at the MRC Cognition and Brain Sciences Unit in Chaucer Road on Wednesdays at 12.30 pm. More often than not the speakers are from within Cambridge. (<http://www.mrc-cbu.cam.ac.uk/seminar-information/wednesday-lunchtime-seminars>.)

The **Behavioural and Clinical Neuroscience Seminars**. These are held lunch times at 1.00 pm, usually on Mondays, in the Kenneth Craik Room on the ground floor of the Craik-Marshall Building; space may be limited. In-house and occasional visiting speakers.

The **Social and Developmental Psychology Seminars**. The SDP Seminar Series is a bi-weekly seminar held in the Departmental Lecture Theatre (Downing Site). These are talks by invited speakers from the UK and Europe. Seminars take place on alternate Tuesdays at 1 pm, the first on Tuesday 11th October. Tea and coffee are served before this seminar for attendees from 12.30 pm onwards in the Nick Macintosh Seminar Room on the 2nd floor [KP1].

Departmental notice boards will contain details of these seminar series, and full listings of University talks are available at www.talks.cam.ac.uk.

Health and Safety in the Department

The Head of Department is responsible for health and safety provision. You should ensure that you familiarise yourself with the various fire exits and routes to them: all are clearly signed. For areas that you do not visit frequently (e.g. a supervisor's office) the members of the Department that you are visiting will be happy to show you the emergency exits if you ask. In the event of the fire alarms sounding, you should leave the building immediately by the nearest safe exit and assemble outside the Department of Geography. Do not delay to collect your belongings and do not use the lift.

If you are unfortunate enough to have an accident in the Department, a first-aider can be contacted via Reception (telephone 01223 333550). If Reception is closed, contact should be made with the security control room (telephone 01223 331818). Any accident must be reported to the Departmental Office (Room 100). In case of serious emergency, telephone **999** for the Emergency Services.

When you start work on your project, your supervisor will inform you of any health and safety rules relating to the lab in which you will be working and you must obey these. If your project involves the use of animals, there are specific health and safety rules that apply in the animal house. You will be introduced to the animal house manager, who will explain those rules.

If you have any general concerns about safety in the Department, please contact the Departmental Safety Officer, Dr Jeff Dalley (jwd20@cam.ac.uk).

Working in the Department outside 'office hours'

The Department is open from 8.45am to 5.00pm every weekday aside from closure days (bank holidays out of term time and dates announced around Christmas).

Final year undergraduates and graduate students are allowed unlimited access to the Main Building and Department Library using their University card outside the closure periods.

Access is permitted on the understanding that on entering the premises students are responsible for exercising care in relation to themselves and others who may be affected by their actions or omissions.

Students working 'out of hours' should;

- Ensure that they do not permit access to anyone from outside the Department
- Ensure that doors and windows are closed or locked as appropriate on departure
- In the event of a fire, incident or accident this should be reported immediately to the Security Section (the number is on the back of each door and below). A report should also be given to the Department as soon as is practicable.
- The Department recommends in general, that students do not work alone but if this is necessary they are advised to;
 - Notify another person (eg family/friend) of each out-of-hours visit to the Department, location, contact number and the expected time of return.
 - Carry a mobile phone.
 - Note the location of nearest fire exit and fire extinguisher.
 - Avoid engaging in any potentially hazardous activity while lone-working.
 - Note the out-of-hours emergency telephone number (Security) 01223 (3) 31818

Careers in Psychology

There will be a meeting on the afternoon of 2nd November, to provide some information about careers in psychology. There will be brief talks about careers in research, and in professional branches of psychology and about the postgraduate training required for these. You are strongly advised to give some thought to subsequent studies or employment possibilities during the year. There is more information available on the NST Part II Moodle pages.

Lecture Courses

Part II Psychology 2017- 2018

The following provides details of the lecture courses. In order to access all the information available about lectures, examinations, archived material etc, make sure you are registered on our Moodle Site. If you have difficulties registering on the site, please contact: Louise White (law23@cam.ac.uk)

1) General Courses

2) Section A - Cognitive and Experimental Psychology

3) Section B - Behavioural and Cognitive Neuroscience

4) Section C - Social Psychology, Developmental Psychology and Individual Differences

All lectures take place in the **Lecture Theatre of the Main building, Department of Psychology (Downing Site)**, unless otherwise stated. Suggestions for preliminary reading are provided with the summary of each lecture course below.

The Lecture Timetable is available on the Departmental Website:

<http://www.psychol.cam.ac.uk/undergrads/ug/nst-ii/info> and at:

<https://2017-18.timetable.cam.ac.uk/admin/>

General Courses

It is recommended that **all students** attend the following lectures:

General Introduction

Dr Kate Plaisted-Grant, Michaelmas

1 lecture

This is a general introduction to Part II Psychology, covering general issues such as Lectures, the Tripos Examination, Supervisions, Research Projects and Dissertations. It will be followed by a party to welcome all new students, where you will get the chance to meet some members of the Department.

Statistics

Dr S van der Linden and Dr B Chryst, Michaelmas

10 lectures [Part II Lecture Theatre],

4 example classes [Titan Teaching Rooms]

This course has two aims. First, to teach the theory required for quantitative analysis of a research project using a computer package; second, to prepare for the compulsory statistics component of the examination, which may require analyses to be conducted with pen, paper and hand-calculator.

The lectures cover the theory, including worked examples of exam-style questions, and practical classes allow the techniques to be practised, both by hand and using a computer.

The first half of the term on statistics will cover the basics of quantitative analysis (much of this will be revision for students who have studied part I NST or PBS 5): Exploratory Data Analysis; confidence intervals and effect size; hypothesis testing & significance; t tests; Pearson's χ^2 ; correlation; linear regression as an ANOVA model.

The final weeks of the course focus on analysis of variance: One-way analysis of variance and the multiple comparison problem; introduction to factorial ANOVA and interactions; repeated measures ANOVA ANCOVA and multiple regression. The course will focus upon the correct interpretation of ANOVA tables and related computer outputs.

Suitable Textbooks:

Gravetter, F.J., & Wallnau, L.B. (2012). *Statistics for the behavioral sciences* (9th ed.). Belmont, Calif.: Wadsworth Cengage Learning. [Earlier editions are also acceptable. Covers same material, to the same level, as this course.] *

Howell, D. (2013). *Statistical methods for psychology* (8th ed.). Belmont, Calif.: Wadsworth Cengage Learning. [Fifth or later edition may be used. Slightly more advanced, with considerably more detail, especially on ANOVA methods, than you need for this course & exam; may be a useful resource for analysing research project data.]

Statistical Planning and Analysis

Prof M P Haggard, Michaelmas, Lent

2 lectures

These two lectures supplement the Department's main teaching on design and statistics, one shortly before most data acquisition and one shortly before most data analysis for research projects. In the interests of correct deployment of concepts and terms in the report write-up, they revisit and integrate issues that may have been touched on elsewhere also. For example parametric tests are said to require a normal distribution. But in a multivariable analysis, that statement needs to be specified further if it is to be meaningful and in some applications it is not strictly true and yet the other more important requirement, that of equal-interval measurement goes largely ignored! In the November class the fundamental issues for escape from the Replication Crisis are discussed: effect size, statistical power and requisite sample size. The material is intended to be particularly useful where a dataset has been acquired with one of the traditional experimental analysis-of-variance designs, but there is a scientific aspiration to say more detailed than (e.g.) that Group A produced a higher mean than Group B. In January the issues of transformation and scaling of data, and of control by statistical adjustment are covered. Issues of confounding or generalisation arise often and it is worth knowing how to recognise them and what to do about them in analysis as well as in design. Powerful analysis packages like SPSS can be misleading in unskilled or incautious hands. The classes are more concerned with strategy: planning appropriately and correctly appreciating limitations, than with exactly how to do analyses. They emphasise the need for more good description and confidence intervals (the 'new' statistics) and less of shotgun testing of factoids

hyped as ‘hypotheses’ to escape from nullity. They acknowledge the discretionary element over the various ways a dataset may be analysed and the obligations of scientific ethics that this discretion brings.

Recommended Reading:

Cumming, G. (2012). *Understanding the new statistics: Effect sizes, confidence intervals, and meta-analysis*. London: Routledge Academic.

Abelson, R.P. (1995). *Statistics as principled argument*. Hillsdale, N.J.: Erlbaum.

1 Planning and permissible versus impermissible discretion in data analysis. The definition and components of statistical power to obtain narrow confidence intervals and so draw some conclusion. Publication bias in the literature due to small sample sizes and wishful thinking. The distinction between exploratory and confirmatory analyses. Avoiding biased methods or capitalising on chance to obtain “positive results”. A priori analysis plans and the importance of preparation and pre-requisites. Standardised Effect Size. How to consider and talk about statistical power (mostly sample size) if you don’t find a respectably significant effect. “Reformed statistics”: CIs and magnitude, rather than p-value. How to judge and express the strength of conclusion that is appropriate. Bad practices and the ‘Replication Crisis’

2 Reacting to what turns up (January). Are the pre-requisites for the planned analysis met. What (else) should you do and not do ? Some little-known limitations of categorical variables and repeated measures analysis of variance and some useful extra things to get from SPSS output. It is even possible to go beyond ANCOVA as a way of adjusting the summarised mean trends in the data and see the analysis more as a model embodying a cognitive structure or theory. The correspondence with the data may or may not be good. What do we mean by ‘good’ here and how does it relate to strength (effect sizes) of particular effects?

Writing a Research Project

Dr D Szucs, Michaelmas

1 lecture,

This class is for those who will be conducting a research project during the year. Guidance will be given on how to write up the report on your Part II Research Project. You are encouraged to ask questions if answers to them are likely to be helpful to other members of the Part II class, but questions concerning issues very specific to your own project are best directed to your project supervisor or co-ordinating supervisor.

Recommended Reading:

Sternberg, R.J., & Sternberg, K. (2010). *The psychologist’s companion: A guide to writing scientific papers for students and researchers* (5th ed.). Cambridge: Cambridge University Press.

Intervention studies and Evaluation in Psychology and Medicine

Prof M P Haggard

5 lectures Thursday afternoons 2pm from beginning of Lent Term

What works? This short course helps students prepare for Paper 1 in the Part 2 exam, and also for informed and critical citizenship in a complex society which emphasises that not just gadgets, but medicines, school curricula, welfare systems etc must all ‘work’. Except perhaps in a military context, societies beyond the post-enlightenment societies of W Europe and N America have been slow to deprecate delay, ineffectiveness, quackery etc. This is still a dimension of awareness that divides people, and one where understandings of what ‘working’ can mean may differ radically. Nevertheless, it is obvious from the increasing sophistication of interviewer questions to politicians and product promoters that evaluation ideas are penetrating the general culture and its language. The business management-speak phrase “triple bottom line” at least helps to make conventional the belief that we should consider effects on Society and Environment, not just profits and so introduces the idea of multiple outcome measurement.

'Working' mostly means working for people, and so the field of evaluation should have psychology at its centre. This course is rooted both in psychology and medicine but its inter-disciplinarity extends also to the major contribution of economics, for example in pressing the concept of cost-effectiveness as a trading ratio between two measurable dimensions.

For the psychologist with an experimental orientation, there are some contexts where a theory can be appropriately tested by an intervention design and the idea that the research could be applicable is always attractive. Here the conjecture that an intervention will actually benefit participants (so is a preliminary surrogate for wider changes to practice that might be recommended) can command extra resources. The resources allow test durations, follow-up time scale and participant numbers to increase, and so to enhance certainty; but this also requires study ethical approvals to move into a higher gear – embracing the reasonableness of the conjecture of benefit, the need for evaluating the intervention, its realism and proportionality, as well as the breadth and level of information and consent to be given.

The appeal of these ideas will seem natural to those proceeding to Medicine, because of awareness of the need for measured 'outcomes' and the acknowledged importance, despite their late arrival in professional practice, of controlled trials. The most coherent single framework for research, evaluation and application of interventions is widely applicable to psychology, but was developed within Medicine: the Evidence-Based Medicine movement (EBM) of the early 1990s. 'Evidence-based' has since become a touchstone across governmental sectors. In Medicine, the term 'evaluation' is rarely used, although it is mis-used especially in USA, as a synonym for the assessment of people/patients, where actually no value element is under scrutiny. This is all tricky because Value, a subjective concept, is usually excluded from Science. When Medicine talks about 'trials' it means evaluation, not one stimulus presentation. The most generally esteemed type of evaluation, the randomised controlled trial (RCT), is very heavily concentrated within Medicine. There is now even a bias in some quarters to demand RCTs where they are infeasible or unnecessary, which shows that blinkered and superficial box-checker thinking can occur anywhere. Nevertheless, psychology and neuroscience can learn much from the emergence of EBM, its assimilation and the difficulties it has met eg in securing agreement to trials, and including the over-zealous application of EBM.

In order to navigate these waters successfully, we need a reference framework which includes the ability to evaluate (correct usage here) studies more broadly than thinking just about possible confounders and looking at sample size. So we meet on the way the idea of evidence synthesis via evidence tables in systematic reviews and the idea of meta-analysis; these encounters should be helpful for writing literature sections of project reports. We learn why and where randomisation becomes an important issue for de-confounding. We need to understand the particular challenges which can undermine interpretation of an intervention study and so to sympathise with the cost and effort required to overcome the challenges. The course is not heavily nor chiefly methodological, although it is quite conceptual. I use examples from educational and health interventions, which are themselves of some psychological interest eg cognitive behaviour therapy (CBT) and I attempt to dissect what may be happening during the period between intervention and follow-up to produce effects, genuine or otherwise. My contribution on Subjectivity and the Placebo Effect to the CHIPS series is usually timed to fit well with the later classes in this course.

Topics covered:

1. Science as accumulation versus 'debate': weighing up evaluative evidence for and against by evidence synthesis and concluding or doing the best with imperfect evidence. Pragmatic versus explanatory trials. Detailed example of a trial of a psycho-educational intervention. The 'mediation' issue as a link between theory and practice. Effects which may be latent but grow in time.
2. The "gold standard" of the pragmatic randomised controlled trial (RCT). Where and why randomisation is necessary. Equipoise and informed consent. Other aspects of trialling methodology: blinding, inter-rater agreement, choice of outcome measure, duration of follow-up etc. (self-) selection biases: what do we say if many participants are lost to follow-up?
3. The approach to 'a literature' – a whole body of studies: RCTs and related evaluations in CBT. Synthesis of evidence: meta-analysis, systematic review and the weighting of evidence by quantity and quality. .. Bias susceptibility rating and bias minimisation. The ideas of worthwhile effect size (ES) and the 'going rate' for an intervention ES, rather than non-nullity.

4. Conflicts between results on various outcome measures, and the extent to which generic measurement handles this issue. Economic analyses, cost-effectiveness and cost-utility cut-offs.
5. Conundrums. Translation into policy via convincing recommendations: do scientific plausibility via probable mechanism and credible effect size still have a role? Attractiveness of application via breadth and importance of outcomes (generic measurement) versus the cost or opportunity-cost of change? Qualitative methods within the positivist paradigm of trialling and wider types of evaluation. Limitations to EBM and perverse consequences of the idea that RCT is a 'gold standard'.

Recommended Reading:

I am still looking for a single text or even handbook chapter that covers the breadth of this interdisciplinary material. Batches of articles are made available (Moodle) with orientation notes.

Experimental Design

Dr W Skylark, Lent

1 lecture

This session will present an overview of the fundamentals of experimental design, with a focus on preparation for the relevant component of the Part II NST examination. The session will start with presentation of key notions (dependent vs independent variables, confounding variables, ethical considerations), and continue with discussion of approaches to specific questions.

Recommended Reading:

Dunbar, G.L. (1998). *Data analysis for psychology*. London: Arnold (Ch 12).

Dyer, C. (2006). *Research in psychology: A practical guide to methods and statistics*. Oxford: Blackwell (Ch 5).

Conceptual and Historical Issues in Psychology

Co-ordinator: Dr L Cheke, various lecturers, Lent

6 lectures

The aim of these lectures is to provide some background and support to the exam questions on Paper 1, Section C, which require students to synthesize information from different branches of the subject, or to discuss the history and philosophy of psychology. The exam questions will not be drawn exclusively (or perhaps at all) from the material presented in these lectures, but the lectures will provide some examples of the major historical movements in psychology, and some of the major conceptual controversies in the subject. Questions and discussion are encouraged, and we suggest that students reserve a 1.5 hour slot for these lectures.

22nd Jan: Dr L Cheke: Introduction

29th Jan: Prof A Dickinson: Behaviourism

5th Feb: Dr T Bekinschtein: Dissociation between perceptual performance and metacognition

19th Feb: Prof M Haggard: "Subjectivity" in psychology: the practically important example of placebo effects

26th Feb Prof T Robbins: Neurochemical modulation of fronto-executive processes: Neuropsychiatric implications

5th Mar: Prof J Mollon: Gnostic Units and the cerebral bus

Section A

Cognitive and Experimental Psychology

Vision

Should the visual system be considered as one sense organ or as several? To what extent are the different attributes of the visual array - such as movement, form, colour, texture, depth - extracted by anatomically distinct channels in the visual pathway and analysed by separate cortical areas? These questions are recurrent themes in the course. The lectures consider each attribute of the image in turn, but also examine how the attributes are integrated in normal perception and dissociated in cases of brain damage. The old idea of 'two visual systems' has recently been abandoned: current evidence suggests that >25 parallel channels leave the retina, each genetically pre-specified in exquisite detail. A second theme of the lectures is that to understand the visual system we must consider how it evolved and we must analyse the tasks that face it in the natural world.

Evidence is drawn from psychophysics, neuropsychology, and molecular biology. Wherever possible, the lectures are illustrated with demonstrations.

Recommended Reading: (* suitable for reading in advance of the module):

Dowling & Dowling (2016) *Vision. How it works and what can go wrong*. MIT Press [Bland prose, but very clear and definitely authoritative]*

Frisby, J.P., & Stone, J.V. (2010). *Seeing: The computational approach to biological vision* (2nd ed.). Cambridge, Mass.: MIT Press. [Recommended introduction.]

Morgan, M.J. (2003). *The space between our ears*. London: Weidenfeld & Nicholson [reprinted in 2005 by Oxford University Press]. *

Rodieck, R.W. (1998). *The first steps in seeing*. Sunderland, Mass.: Sinauer. [Especially recommended to PNB students]

Shevell, S.K. (2003). *The science of color* (2nd ed.). Oxford: Elsevier.

Visual Cognition

Dr G Davis, Michaelmas

8 lectures

In Part IB, the vision course described how neural mechanisms in the eye and brain extract simple information about the environment. However, the visual brain's most remarkable accomplishment is its split-second transformation of this information into a representation of our environment. In this course I discuss how behavioural, scanning and single-cell recording studies have begun to reveal how this process operates. Topics include 3-D surface representation, object recognition, visual attention and the limited capacity of conscious vision.

Recommended Reading:

Palmer, S.E. (1999). *Vision science: Photons to phenomenology*. Cambridge, Mass.: MIT Press. Chapters 3 and 8.

Kimchi, R., Behrmann, M., & Olson, C.R. (Eds.). (2003). *Perceptual organization in vision: Behavioral and neural perspectives*. London: Lawrence Erlbaum.

Human Memory

Cognitive, Neural and Clinical Perspectives

Dr J Simons and colleagues, Lent

12 lectures

This set of lectures will consider evidence relating to a number of theoretical distinctions that have been proposed within human memory, covering short-term or "working" memory, and long-term episodic and semantic memory. In each case, evidence from a variety of sources will be discussed, including cognitive experiments involving healthy individuals, neuropsychological studies of patients with brain lesions, and functional neuroimaging investigations. The objective will be to achieve an understanding of the cognitive and neural mechanisms responsible for different aspects of remembering. We will also consider human memory from a clinical perspective: how well do the patterns of difficulties and strengths exhibited by patients in the memory clinic map onto the theoretical distinctions described? How do models of memory inform assessments and help make diagnoses, and can we try to help people to cope with their memory difficulties?

Recommended Reading:

Baddeley, A. (1997). *Human Memory: Theory & Practice*. Psychology Press.

Eysenck, M. & Keane, M. (2010). *Cognitive Psychology: A Student's Handbook*. Psychology Press.

Hodges, J. (2007). *Cognitive Assessment for Clinicians*. Oxford University Press.

Simons, J. S. & Spiers, H. (2003). Prefrontal and medial temporal lobe interactions in long-term memory. *Nature Reviews Neuroscience*, 4, 637-648.

Ward, J. (2010). *The Student's Guide to Cognitive Neuroscience*. Psychology Press.

Human Judgement and Decision Making

Dr W Skylark, Michaelmas

8 lectures

These lectures engage you with current debates about research in the field of psychology known as judgement and decision making (JDM), which concerns how people form judgements and preferences, and how they make choices and decisions in wide range of different settings. The multidisciplinary nature of JDM research is reflected in the lecture content – as well as covering many psychological theories, we will explore ideas from economics and cover applied research in areas such as law, finance, medicine, and clinical psychology. We will examine a variety of accounts of how, and how well, judgements and decisions are made, drawing on research conducted both in the laboratory and in everyday settings, and will discuss the implications of JDM research for improving judgements and decisions in the “real world”.

Recommended Reading:

Baron, J. (2007). *Thinking and deciding* (4th ed.). Cambridge: Cambridge University Press.

Hardman, D. (2009). *Judgment and decision making: Psychological perspectives*. Chichester, UK: Wiley (BPS Textbooks).

Hastie, R., & Dawes, R.M. (2010). *Rational choice in an uncertain world: The psychology of judgment and decision making* (2nd ed.). Thousand Oaks, CA: Sage.

Kahneman, D. (2011). *Thinking, fast and slow*. London: Allen Lane.

Newell, B.R., Lagnado, D.A., & Shanks, D.R. (2015). *Straight choices: The psychology of decision making* (2nd ed.). Hove: Psychology Press.

Language, Mind and Brain

Dr M Bozic et al, Michaelmas

16 lectures

Language is perhaps the most important human faculty that distinguishes us from all other species. Humans learn language and use it apparently effortlessly, but this masks the extraordinary complexity and richness of the language system and the mechanisms involved in its processing. This lecture course aims to discuss language evolution and acquisition, and examine the mechanisms and processes involved in producing and comprehending language in adulthood. In doing so, it combines models and experiments from experimental psycholinguistics, speech and hearing sciences and cognitive neuroscience aiming to show how cognitive models form the basis for understanding the brain systems involved in language use.

Recommended Reading (* suitable for reading in advance of the module):

Anderson, S.R., & Lightfoot, D.W. (2002). *The language organ*. Cambridge: Cambridge University Press.

Gaskell, G. (Ed.). (2007). *The Oxford handbook of psycholinguistics*. Oxford: Oxford University Press.

Goswami, U. (Ed.). (2011). *Wiley-Blackwell handbook of childhood cognitive development* (2nd ed.). Oxford: Wiley-Blackwell. Chapters by Carpenter, Waxman, Tomasello.

Pinker, S. (2000). *The language instinct*. London: Penguin.

Pisoni, D.B., & Remez, R.E. (Eds.). (2005). *The handbook of speech perception*. Malden, Mass.: Blackwell Publishing.

Learning and brain plasticity

Prof Z Kourtzi, Lent

8 lectures, 2 debates

Human behaviour adapts to the statistical structure of the environment: we can play tennis with a friend's racket, adjust to a new pair of spectacles, separate friends from foe, and critically distinguish brands of cola. This course examines the processes by which the brain adapts to effect the best responses using knowledge from past experience and the senses. We will draw on work from experimental psychology, computational modelling, human brain imaging and animal studies to address recent advances and controversies on the following topics:

- Structural and functional plasticity across the lifespan
- Early brain development and plasticity
- Perceptual inferences and decisions
- Perceptual learning: specificity vs. generalisation
- Learning to categorize and visual expertise
- Learning associations and complex skills
- Learning without a teacher: implicit, statistical learning

Recommended reading:

Gazzaniga M.S. and Mangun, G.R. (2014). *The cognitive neurosciences* (5th ed.). MIT Press

Werner S. and Chalupa L.M. & (2013). *The new visual neurosciences*. MIT Press

Auditory Perception

Dr S Flanagan, Lent

4 lectures

Introduction

In the hearing lectures we will investigate the relationships between the physical characteristics of sound as a waveform, and the sensations that we perceive. We will look at the underlying mechanisms that give the auditory system the ability to analyse and discriminate sounds. These mechanisms can be centred on the physiology of the auditory system or functional models designed to model the behaviour of the hearing system; in health and disease, across the lifespan. Attendance is encouraged as there will be listening demonstrations to supplement the lecture material.

Recommended texts

Moore B.C.J An Introduction to the Psychology of Hearing (6th Ed)

Note:

For those who do not have a background in physics I recommend you read Chapter 1, section 2: 'The Physical Characteristics of Sounds' before the first lecture.

Plack C.J. The Sense of Hearing (2nd Ed) Psychology Press

Pickles J.O. An Introduction to the Physiology of Hearing (4th Ed) Brill

Section B

Behavioural and Cognitive Neuroscience

Brain Mechanisms of Motivation

Prof J Dalley, Dr D Belin & Dr L Cheke, Michaelmas
16 Lectures

The aim of this course is to present an advanced, up-to-date and critical assessment of brain mechanisms of motivation. This course may also interest students of animal behaviour, learning theory, cognitive neuroscience, and biological aspects of abnormal psychology. The course will examine what has been discovered about the neural mechanisms underlying motivation and learning using the classical techniques of physiological psychology, including lesioning, electrical and chemical stimulation, electrophysiological recording and in vivo monitoring of transmitter release. Particular emphasis will be placed on neuropharmacological advances which have implicated the monoaminergic, cholinergic and peptidergic neurotransmission in the control of behaviour. The course initially will be organised around two main topics: the re-assessment of the role of specific neurochemical systems and the hypothalamus in motivation; and the neural substrates of reward and punishment, focusing especially on obesity and drug addiction. Detailed topics will include: hypothalamic syndromes and homeostatic mechanisms underlying behaviour; the functional organization of the striatum and corticostriatal circuitries with an emphasis on understanding the neural and psychological mechanisms underlying reward and drug addiction; stress and arousal; neural mechanisms of aversive emotional learning, and cognitive enhancing drugs in neuropsychiatry.

Recommended Reading:

Toates, F. (2011). *Biological psychology* (3rd ed.). Harlow: Prentice Hall.

Carlson, N.R. (2012). *Physiology of behavior* (11th ed.). Boston: Pearson.

Squire, L.R., et al. (Eds.). (2012). *Fundamental neuroscience* (4th ed.). San Diego: Academic Press. (Earlier versions should be consulted for more detailed chapters by Robbins & Everitt, and Koob.)

Koob, G.F., & Le Moal, M. (2006). *The neurobiology of addiction*. Amsterdam: Elsevier.

Feldman, R.S., Meyer, J.S., & Quenzer, L.F. (1997). *Principles of neuropsychopharmacology*. Sunderland, Mass.: Sinauer Associates.

Iversen, L.L., Iversen S., Bloom, F.E., & Roth R.H. (2009). *Introduction to neuropsychopharmacology* (1st ed.). New York: OUP.

Developmental Cognitive Neuroscience

Dr K Plaisted-Grant & Dr E Weisblatt, Lent
8 lectures

These lectures will consider genetic, neural and cognitive studies of development, including developmental and childhood disorders. A broad conceptual themes runs throughout the course, which concerns the ambition of current neuroscience to provide a full account of behaviour from genes to brains to cognition. Inevitably, this ambition should be pursued by considering development, both typical and atypical. Developmental disorders, if they have a genetic basis, provide a unique opportunity to explore the possible relationships between genes, protein products, neural development and cognition. We will consider whether such relationships have been uncovered in the research and if not, whether the difficulty rests with the experimental methodology, the assumptions concerning the nature and categorization of the

disorders, limited understanding of genetic effects, neural mechanisms and cognitive processes in developmental disorders, or indeed in the conceptual possibility itself that relationships between these different levels of explanation can be uncovered by scientific research.

Recommended Reading:

An excellent text book for background reading and basic principles is:

Johnson MH & De Haan (2011) *Developmental Cognitive Neuroscience* (3rd Edition). Wiley-Blackwell

Behavioural Genetics

Professor J D Mollon, Lent

5 lectures

The first lecture considers two classical sources of evidence for the heritability of behavior in normal populations: selective breeding in animals and twin studies in man. Subsequent lectures cover very recent work on the molecular genetics of personality and intelligence. Out of our total genome, a significant fraction of genes contribute to the construction, maintenance or operation of the CNS. Most of these genes are known to be polymorphic (i.e. the normal population contains different forms). Polymorphisms outside the coding regions of genes are proving to be of primary importance – i.e. cases where the protein is unchanged but the polymorphism affects when, where, or how much the gene is expressed. There were early expectations that a few individual genes – COMT, DRD4, SLC6A4 were notorious candidates – would emerge that individually accounted for much of the variance in personality and IQ within the normal population. This has not proved to be the case. However, direct estimates of the heritability of IQ from whole-genome studies give a similar value (~ 0.5) to that obtained from twin studies. For personality, in contrast, the direct estimates are much lower than those from twin studies. Also to be discussed in the lectures are the epigenetic ways in which intelligence or personality might be altered, and factors that maintain balanced polymorphisms in a population.

Recommended Reading:

Parrington, J (2015) *The Deeper Genome*.* [a very readable way to catch up with molecular biology and with recent changes to the conventional views of genes]

Knopik et al (2017). *Behavioral genetics* (7th rev. ed.). New York: Worth. [The nearest thing to a textbook for this rapidly moving field]

Brain Mechanisms of Psychosis

Prof P Fletcher, Lent

6 Lectures

The purpose of these lectures is to develop understanding of how combined computational and cognitive neuroscience approaches may offer insights to the complex changes in perception and belief that characterise psychosis. I will trace the development of some of the key theories and show how they have been tested and refined as well as identifying some of their important limitations.

Objectives

Following these six lectures, students should:

1. Understand current approaches to psychosis (notably cognitive neuropsychiatry and computational psychiatry) and how they may be a useful approach to exploring symptoms of mental illness.
2. Understand the basic principles of these approaches.

3. Understand the nature of predictive coding models of perception and inference.
4. Become familiar with some exemplary symptoms of psychotic mental illness (including movement disorder in schizophrenia, delusional misidentification syndrome and delusions of control) and understand how these complex disorders and experiences may be explored initially using the cognitive neuropsychiatric approach, which relates them to models of healthy cognitive function and to comparable neurological conditions. In the initial lectures, these will be theoretically simple ideas based on exploring isolated cognitive faculties. However, having introduced predictive coding models of perception, inference and action, new approaches will be explored offering more flexible and far-reaching perspectives on mental illness and attempting to explore whether we can capitalise on more recent developments in computational neuroscience to further our understanding of psychosis.
5. Understand the principles of one of the key tools of cognitive neuropsychiatry: functional neuroimaging.
6. Be able to evaluate the use of functional neuroimaging in mental illness, understanding its potential and its limitations.

Recommended Reading:

Background:

Carlson, N.R. (2012). *Physiology of behavior* (11th ed.). Boston: Pearson.

Nolen-Hoeksema, S. (2014). *Abnormal psychology* (6th ed.). New York: McGraw Hill.

Kring, A.M., Johnson, S.L.; with contributions from Davison, G.C. et al. (2012). *Abnormal psychology* (12th ed.). Hoboken, N.J.: Wiley. [Comes with a neurobiological health warning!]

Stahl, S.M. (2013). *Stahl's essential psychopharmacology: Neuroscientific basis and practical applications* (4th ed.). Cambridge: CUP. [Excellent overview of the neural basis and treatment of neuropsychiatric disorders.]

Cognitive Neuropsychiatry:

Frith, C.D. (1992). *The cognitive neuropsychology of schizophrenia*. Hove: Erlbaum.

[Exemplifies cognitive neuropsychiatric approach. Describes syndrome and how signs and symptoms may be understood in terms of models of healthy cognition.]

Liddle P.F. (2001). *Disordered mind and brain: The neural basis of mental symptoms*. London: Gaskell.

[Excellent reference book on neuroscientific approach. Concentrates on specific symptoms as well as on the syndromes.]

McCarthy R.A., & Warrington, E.K. (1990). *Cognitive neuropsychology: A clinical introduction*. San Diego: Academic Press.

[Fundamentals of cognitive neuropsychological approach, with clinical examples.]

Halligan, P.W., & David, A.S. (2001). *Cognitive neuropsychiatry: Towards a scientific psychopathology*. *Nature Reviews Neuroscience*, 2, 209-215.

[Concise and clear introduction, with examples.]

Uttal, W.R. (2001). *The new phrenology: The limits of localizing cognitive processes in the brain*. Cambridge, Mass.: MIT Press.

[Critical evaluation of cognitive neuroscience and functional neuroimaging in particular. Clear and useful sections on the techniques and history of the field.]

Animal and Computational Models of Memory

Prof T Bussey and colleagues, Lent

12 lectures

In this section memory is considered at several different levels of analysis, from the anatomical level to the network, cellular and molecular levels. Topics covered include: amnesia in humans and animals; theories of hippocampal function; computational models of memory; emotional memory and the amygdala; cellular-level consolidation and reconsolidation.

Recommended Reading:

Kandel, E.R. (2007). *In search of memory: The emergence of a new science of mind*. New York: W.W. Norton.

Ward, J. (2010). *The student's guide to cognitive neuroscience* (2nd ed.). Hove: Psychology Press.

Gazzaniga, M.S., Ivry, R.B., & Mangun, G.R. (2013). *Cognitive neuroscience: The biology of the mind* (4th ed.). New York: W.W. Norton and Company.

Gazzaniga, M.S. (2014). *The cognitive neurosciences* (5th ed.). Cambridge, Mass.: MIT Press (more advanced than Gazzaniga, Ivry & Mangun).

Kandel, E.R., et al. (2013). *Principles of neural science* (5th ed.). New York: McGraw-Hill.

Squire, L.R., et al. (Eds.). (2012). *Fundamental neuroscience* (4th ed.). Amsterdam: Elsevier.

Comparative Cognition

Prof N Clayton, Dr E Legg & Dr L Ostojic, Michaelmas

11 lectures

This course will cover research on animal learning and cognition. A variety of topics will be discussed ranging from spatial learning and memory to counting and folk physics, and the question of whether animals are stuck in the present or whether, like us, they are capable of mental time travel. Other themes include social learning, theory of mind, language and communication, and the nature of animal intelligence.

Recommended Reading:

General

Pearce, J.M. (2008). *Animal learning and cognition: An introduction* (3rd ed.). Hove: Psychology Press.

Shettleworth, S.J. (2010). *Cognition, evolution and behavior* (2nd ed.). Oxford: Oxford University Press.

Specialist

Tomasello, M., & Call, J. (1997). *Primate cognition*. Oxford: Oxford University Press.

Rogers, L.J., & Kaplan, G. (2004). *Comparative vertebrate cognition: Are primates superior to non-primates?* New York: Kluwer Academic/Plenum.

Section C

Social Psychology, Developmental Psychology and Individual Differences

NB You are required to pick one, and only one, of the following Papers. Each contains 32 lectures, all of which you should attend, and are given across Michaelmas and Lent terms. These Papers are borrowed from the Psychological and Behavioural Sciences Tripos. Further information on the papers can be found on the website (<http://www.pbs.tripos.cam.ac.uk/current/year3papers>) and on moodle.

Supervision Arrangements

Supervisions for each paper in Part IIB are typically organised by their respective Course Organisers. Students should expect to be contacted by their supervisor in the first few weeks of term. If you have not been contacted by the end of October you should notify the relevant Course Organiser or your Director of Studies immediately.

PBS 6: Development and Psychopathology

Course organiser: MT Sarah Foley (sf412@cam.ac.uk), LT Prof. Claire Hughes (ch288@cam.ac.uk)
32 Lectures (16 Mich; 16 Lent)

This paper provides an overview of common problems of psychopathology in childhood. In Michaelmas, the first module adopts a developmental approach considering pre and postnatal influences on child development. The second and third modules will consider internalizing problems (i.e., emotional disorders such as depression or anxiety) and externalizing problems (i.e., conduct disorder and other disruptive behaviour disorders). In Lent, we consider the influence of children's close relationships on the development of problems. In particular, students will receive an overview of research on children's relationships with parents and peers, as well as lectures on the impact of parental incarceration and bullying on child adjustment. In Lent term, students will also receive an overview of research on Autism Spectrum Disorder, a lifelong neurodevelopmental condition, and the clinical application of this research.

PBS 7: Psychology & Social Issues

Course organiser: Dr Juliet Foster (jlf1000@cam.ac.uk)
30 Lectures (16 Mich; 14 Lent)

This paper explores a range of issues that are of considerable social consequence from a social and developmental psychological perspective, such as policy issues concerning children, mental health problems, learning difficulties and the transition to parenthood. Academic research is discussed in the context of the views and concerns of policy-makers and 'users' in order to explain the value and limitations of empirically-based applied psychology.

PBS 8: Gender Development

Course organiser: Prof Melissa Hines (mh504@cam.ac.uk)

32 Lectures (16 Mich; 16 Lent)

This paper examines a range of perspectives on the causes and consequences of sex differences in human behaviour, as well as of within sex variability in gender-related behaviour. That is, not only why do males and females differ in some respects, but also why is the behaviour of some individuals more sex-typical than that of others? It also discusses clinical issues related to disorders of sex development (DSD, formerly called intersex conditions) and gender dysphoria. In understanding gender development, evidence for influences of genes and hormones, as well as the postnatal sociocultural environment, is evaluated. Sex-related characteristics that are discussed include gender identity (i.e., one's sense of self as male or female), sexual orientation, childhood sex-typed play behaviour, personality characteristics, such as empathy and aggression, cognitive abilities, such as memory, mathematics, spatial and verbal abilities, and psychiatric classifications, including depression, disorders related to eating, and autistic spectrum conditions, as well as gender dysphoria. In addition to evaluating the empirical evidence for various types of contributory factors, and attempting to integrate the findings across perspectives, the social and clinical implications of different causes of psychological difference related to sex is discussed.

PBS 9: The Family

Course organiser: Prof Susan Golombok (seg42@cam.ac.uk)

32 Lectures (16 Mich; 16 Lent)

This interdisciplinary paper draws on material from psychology and sociology as well as social anthropology, social history, law and other relevant disciplines. Psychological and sociological perspectives on family relationships, kinship and child development are examined in relation to specific topics such as motherhood, fatherhood, adolescence, marriage and divorce, single-parent and step-families, lesbian and gay families, and families created by assisted reproduction. Theories of family life are studied as well as methodologies of family research.