PN3312: Neuropharmacology

Course Details

Credits: 20
Semester: 2
Module Organiser:
Dr Gayle Doherty
ghm@st-andrews.ac.uk
Pre-requisites:
Two of: BL2301, BL2302, BL2305 OR BL2306
Anti-requisites:
BL3312
Additional module information:
Please check MMS regularly
for module updates

This module introduces students to Pharmacology, which is defined as the study of the actions of drugs. The module has a strong focus on the nervous system, which is reflected in the module name.
Pharmacology has two main branches:

- The use of drugs to investigate the physiology and biochemistry of cells, organs and whole animals
- The use of drugs to diagnose and treat diseases.

By the end of PN3312 students will have gained an understanding of how drugs work and will be familiar with pharmacological concepts and terminology. Students will also consider the drug development process and the many ways in which new therapeutics are designed and developed. The module takes an in-depth look at the use of pharmacology to modulate the function of the nervous system.
Within this module students will develop skills in scientific essay writing, analysing empirical data and the writing of laboratory reports. Training will be given in study techniques and application of statistical tests. The module is assessed by a combination of continuous assessment (40%) and a written examination (60%).

Timetable

Legend

Submission deadlines	Practical classes

Attendance is compulsory for classes in **bold**

Semester 2: Week 1

Monday 28-01-19 11.05-11.50	Bute Building Lecture Theatre D	Dr G Doherty	Introduction to PN3312
Tuesday 29-01-19 11.05-11.50	Bute Building Lecture Theatre D	Prof A Butler	History of Pharmacology
Wednesday 30-01-19 11.05-11.50	Bute Building Lecture Theatre D	Dr G Doherty	Receptor theory 1

Semester 2: Week 2

Monday 04-02-19 11.05-11.50	Bute Building Lecture Theatre D	Dr G Doherty	Receptor theory 2 and introduction to dry practical
Tuesday 05-02-19 11.05-11.50	Bute Building Lecture Theatre D	Dr M Zwart	Pharmacokinetics
Wednesday 06-02-19 11.05-11.50	**Bute Building Lecture Theatre D**	**Mrs P Miles**	**PN3312 examination skills workshop**

Semester 2: Week 3

Monday 11-02-19 17:00	MMS		Dry practical submission
Monday 11-02-19 11.05-11.50	Bute Building Lecture Theatre D	Dr G Doherty	Drug discovery and design
Tuesday 12-02-19 11.05-11.50	Bute Building Lecture Theatre D	Dr G Doherty	Testing New Therapeutics
Wednesday 13-02-19 11.05-11.50	**Bute Building Lecture Theatre D**	**Dr G Doherty**	**Tutorial discussion: continuous assignment essay**

Semester 2: Week 4

Monday 18-02-19 11.05-11.50	Bute Building Lecture Theatre D	Prof A Butler	Nitric oxide 1
Tuesday 19-02-19 11.05-11.50	Bute Building Lecture Theatre D	Prof A Butler	Nitric oxide 2
Wednesday 20-02-19 11.05-11.50	Bute Building Lecture Theatre D	Prof A Butler	Hydrogen sulphide

Semester 2: Week 5

Monday 25-02-19 11.05-11.50	Bute Building Lecture Theatre D	Prof K Sillar	Introduction to Practical 1
***Monday, Tuesday or Wednesday 25, 26 or 27-02-19 14.00-17.00**	**Bute Building Neuroscience teaching Lab: C28**	**Prof K Sillar/ Dr M Zwart**	**Practical 1: Pharmacological control of pigmentation in melanocytes**
Tuesday 26-02-19 11.05-11.50	Bute Building Lecture Theatre D	PN3312 demonstrators	Dry practical Q and A and feedback session

Semester 2: Week 6

Monday 04-03-19	MMS		Essay submission

17:00			
Tuesday 05-03-19 11.05-11.50	Bute Building Lecture Theatre D	Dr M Broadhead	Pharmacology of the enteric nervous system 1
Wednesday 06-03-19 11.05-11.50	Bute Building Lecture Theatre D	Dr Lamia Hachoumi	Pharmacology of the enteric nervous system 1

Semester 2: Week 7

Monday 11-03-19 11.05-11.50	Bute Building Lecture Theatre D	Dr W Li	Acetylcholine 1
Tuesday 12-03-19 11.05-11.50	Bute Building Lecture Theatre D	Dr W Li	Acetylcholine 2

Semester 2: Vacation: Monday 18th March – Sunday 31st March

Semester 2: Week 8

Monday 01-04-19 11.05-11.50	Bute Building Lecture Theatre D	Dr W Li	Introduction to Practical 2 (Assessed practical)
***Monday, Tuesday or Wednesday 01, 02, or 03-04-19 14.00-17.00**	**Bute Building Neuroscience teaching Lab: C28**	**Dr W Li**	**Practical 2: Pharmacology of vertebrate NMJ nicotinic ACh**

Semester 2: Week 9

Monday 08-04-19 11.05-11.50	Bute Building Lecture Theatre D	Dr M Zwart	Serotonin 1
Tuesday 09-04-19 11.05-11.50	Bute Building Lecture Theatre D	Dr M Zwart	Serotonin 2
Wednesday 10-04-19 11.05-11.50	Bute Building Lecture Theatre D	Dr D Belelli	Guest lecture: GABA

Semester 2: Week 10

Monday 15-04-19 17:00	MMS		Practical 2 lab report submission
Monday 15-04-19 11.05-11.50	Bute Building Lecture Theatre D	Prof K Sillar	Pain 1
Tuesday 16-04-19 11.05-11.50	Bute Building Lecture Theatre D	Prof K Sillar	Pain 2
Wednesday 17-04-19 11.05-11.50	**Bute Building Lecture Theatre D**	**Prof K Sillar**	**Pain workshop**

Semester 2: Week 11

Monday 22-04-19 11.05-11.50	Bute Building Lecture Theatre D	Dr M Broadhead	Central motor disorders
Tuesday 23-04-19 11.05-11.50	Bute Building Lecture Theatre D	All staff	Revision Q and A session
Wednesday 24-04-19 11.05-11.50	Bute Building Lecture Theatre D	Dr G Doherty	Past paper questions

Semester 2: Weeks 12&13: Revision weeks

Attendance regulations

Attendance is **compulsory** at the following elements of the course:

- practical classes
- tutorials
- workshops
- It is also necessary to submit continuous assessment in a timely manner

The consequences of breaching the attendance regulations will be as follows:

- Failure to attend any of these sessions will results in the issuing of an academic alert.
- Failure to attend three or more compulsory elements of the module will result in the award of 0X at module board.
- Late submission of continuous assessment that has not been excused will result in the issuing of an academic alert.
- Failure to submit two or more pieces of continuous assessment will result in the award of 0X at module board.

Students should familiarise themselves with the University's absence policy and document any absences in line with the guidance therein:
https://www.st-andrews.ac.uk/media/teaching-and-learning/policies/student_absence.pdf

Practical classes

Practical classes run in weeks 5 and 8. Each class runs on three occasions (Monday, Tuesday or Wednesday) of that week.
Students MUST sign up for a single slot in each week and attend on the day that they have signed up for. Sign up will close one week before the practical sessions and you will be sent a reminder email of your laboratory day at that point.
Students must bring laboratory coats to all practical classes. However, we appreciate that some of our visiting students may not have a lab coat and therefore have a limited number available that you may borrow.

Assessment

Coursework = 40%

Assessment:	**Dry Practical**
Due by:	Monday 11th February, 2019 at 5pm
Feedback due by:	Tuesday 26th February, 2019 at 5pm
Type:	Single MMS upload
Weight:	5%

Assessment:	**Essay**
Due by:	Monday 4th March, 2019 at 5pm
Feedback due by:	Monday 25th March, 2019 at 5pm
Type:	Single MMS upload
Weight:	15%

Assessment:	**Lab report (practical 2)**
Due by:	Monday 15th April, 2019 at 5pm
Feedback due by:	Monday 6th May, 2019 at 5pm
Type:	Single MMS upload
Weight:	20%

Examination = 60%

Section A:	**Essay**
Instructions:	Choose 1 essay topic from a choice of 2
Weight:	20%

Section B:	**Essay**
Instructions:	Choose 1 essay topic from a choice of 2
Weight:	20%

Section C:	**Quantitative and deductive question**
Instructions:	Choose 1 question from a choice of 2
Weight:	20%

Assessment regulations

All requests for extensions must go through the School of Psychology & Neuroscience teaching office https://standrewspsychology.eu.qualtrics.com/SE/?SID=SV_cOvbEFUPnpUZK3b&Q_JFE=0
Academic alerts will be issued for late submission that is not excused https://www.st-andrews.ac.uk/media/teaching-and-learning/policies/AcademicAlerts.pdf
Late penalties will be applied at the rate of one grade point per day or part thereof that an assignment is late (Policy A of the Penalties for Late Work) https://www.st-andrews.ac.uk/media/teaching-and-learning/policies/penalties.pdf
Over-length penalties will be applied at the rate of 1 mark for work that is over-length to any extent, then a further 1 mark per additional 5% over (Policy C of the Penalties for work of incorrect length). Words will be counted electronically and all aspects including text boxes will be counted unless otherwise stated.
https://www.st-andrews.ac.uk/media/teaching-and-learning/policies/penalties.pdf
Failure to submit two or more pieces of coursework before the feedback deadline will result in the award of 0X for this module.

General Information

During the course of PN3312 you may have a number of questions and questions on different aspects of the module need to be directed to different members of staff

Questions About	Contact
General teaching matters	School teaching office psych@st-andrews.ac.uk
Lecture or practical content	The lecturer who taught the material
Completing assignments	The lecturer who set the assignment
Rearranging practical days	Dr G Doherty ghm@st-andrews.ac.uk
Extensions for continuous assignments	Fill out the on-line form (details on p. 4)
Further feedback on continuous assignments	The staff member who marked the assignment
Further feedback on exams	Dr G Doherty ghm@st-andrews.ac.uk
Concerns regarding academic progress	Your adviser of studies
Anything else that is concerning you	Student services theasc@st-andrews.ac.uk

PN3312 Staff and contact details

Dr Matthew Broadhead: mjb25@st-andrews.ac.uk

Professor Anthony Butler: arb3@st-andrews.ac.uk

Dr Gayle H. Doherty: ghm@st-andrews.ac.uk

Dr Lamia Hachoumi: lh201@st-andrews.ac.uk

Dr Wenchang Li: wl21@st-andrews.ac.uk

Dr Paula Miles: pjm11@st-andrews.ac.uk

Professor Keith Sillar: kts1@st-andrews.ac.uk

Dr Maarten Zwart: mfz@st-andrews.ac.uk

Recommended Reading

Psychopharmacology – Drugs, the Brain and Behavior. Jerrold S Meyer & Linda F Quenzer, 2013 2nd Edition (Sinauer Associates 978-0-87893-510-9).

Suggested additional textbook:

Pharmacology. Rang, Dale and Ritter, 2012 7th Edition (Churchill Livingstone).

Learning Objectives

- To understand the history of pharmacology
- To understand how drugs work and interact with biological systems
- To develop an understanding of drug design and the drug development pipeline
- To understand the pharmacology of nitric oxide and hydrogen sulphide
- To develop your understanding of the following neurotransmitters and the effects of their pharmacological manipulation: acetylcholine, GABA, serotonin
- To learn how neuropharmacology is applied in key conditions: pain, central motor disorders, schizophrenia
- To deal with data sets and draw conclusions, using appropriate statistical methods where applicable
- To work with pharmacological reagents in an empirical setting and record physiological output downstream of pharmacological manipulation.
- To develop your practical laboratory skills

Transferrable skills

PN3312 will develop your skills in:

- Logical thinking and deductive reasoning
- Working both independently and as part of a team
- Analysis, interpretation and presentation of data in a manner that informs the readers of the main features of the results and convinces them of the validity of your interpretation
- Use of both primary and secondary literature to help construct coherent arguments
- Reflecting upon and learning from feedback, based on your dry practical, essay and lab report, which will benefit your future work.
- Experimental design and laboratory skills
- Exam preparation and study skills

Grade Descriptors

1st Class: Very good to excellent Honours standard

19, 20 As 17-18, except there is additional clear evidence that the student has valuable originality in perspective or exceptional depth of understanding, and/or has integrated appropriate material in addition to that presented by the question setter in the taught module.

17, 18 A very good understanding of the major issues, with a clear, well-informed and well-structured contextual framework and argument around the topic. There is an appropriate mix of theory and evidence.

Upper 2nd Class: Good Honours standard

14, 15, 16 The answer displays a good understanding of the main relevant issues. There are no major conceptual errors on key issues, but there may be minor errors. The essay is generally well written and comprehensible.

Lower 2nd Class: Adequate Honours standard.

11, 12, 13 The answer shows an understanding of the key issues and has a suitable contextual framework, but without great depth. The arguments are weakly articulated.

3rd Class: Minimal Honours standard

9, 10 Most of the key issues are addressed correctly but superficially, and without showing real understanding. Some relevant evidence and/or factual information. Poorly organized and lacking a contextual framework.

Ordinary, Pass: Not Honours standard

7 Many of the key issues are addressed, but either very superficially or with important errors and/or omissions. Little relevant evidence and few facts. Brief, or unnecessarily padded and/or very poorly organized.

Fail: Unacceptable performance: NOT CREDITWORTHY

5 Some key issues are addressed correctly, albeit superficially, but others have serious conceptual errors or are missing. Little relevant evidence and few correct facts.

3 Some relevant information is presented, but the key issues of the topic either are largely wrong or missing. Extremely superficial throughout. Little or no relevant evidence and few correct facts.

1 Contains a small amount of pharmacological or informational content, but either irrelevant, wrong, or trivial.

0 No pharmacology content at all.