Biological & Biomedical Sciences
2022-23

www.biology.cam.ac.uk/undergrads/nst/bbs
Natural Sciences Tripos
Part II
Biological and Biomedical Sciences
2022-23

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www.biology.cam.ac.uk/undergrads/nst/bbs
1. INTRODUCTION

The aim of Part II Biological and Biomedical Sciences (BBS) is to provide a rigorous and intellectually challenging biological Part II subject, for both third year Natural Scientists and Medical and Veterinary Science students. NST Part II BBS allows students to maintain some flexibility in their study at Part II, allowing them to combine courses from more than one single subject biological Part II and a choice of non-biology subjects. It requires the submission of a dissertation.

Each candidate must take a Major and a Minor subject and a dissertation. The dissertation topic may be proposed by the candidate or chosen from one offered by the relevant Department and should be of up to 6,000 words, on a subject associated with either the Major or Minor subject. The dissertation must be prepared in accordance with the guidelines issued by the Faculty Board.

Additional information about the course is available on the Faculty of Biology website at:

www.biology.cam.ac.uk/undergrads/nst/bbs
2. COURSE AIMS AND LEARNING OUTCOMES

Aims

The course aims to:

- provide an education of the highest calibre in biosciences producing graduates of the quality sought by the professions, the public service, and industry
- to provide an intellectually stimulating and challenging learning environment in which students have the opportunity to develop their skills and enthusiasms to the best of their potential
- to provide flexibility in curriculum by allowing the theory papers of a single subject Part II in approved biology-related subjects to be combined with a paper from an approved list of other biology or non-biology subjects
- to provide training in scientific principles and evaluation of research and to encourage science-writing skills through preparation of a dissertation
- to contribute to the national needs for practitioners and leaders in the sciences, medical and veterinary professions

Learning Outcomes

At the end of the course, students should have:

- an in depth understanding of the core principles, and their experimental basis, of a chosen major subject
- additional advanced understanding in a chosen minor subject
- depending on subject choices, theoretical knowledge of disciplines and techniques useful to scientific research
- experience of independent work, including study of research papers and critical analysis
- developed skills in analysis of arguments and data
- communication skills used for reasoned argument in discussing scientific investigations and texts
3. COURSE MANAGEMENT
NST Part II BBS is managed by the Biological Sciences Committee for the Faculty of Biology, with the overall Course Coordinator being a member of one of the Faculty’s departments.

The administration of the course is undertaken by Jess Joseph in the Faculty Board Office, which is located at 17 Mill Lane. If you have any administrative problems with the course, which cannot be solved within a particular department or by your College Director of Studies, please contact the Faculty Office (tel: (7)66899 or FacBiol@admin.cam.ac.uk).

In addition, Departmental Course Organisers are responsible for the detailed arrangements of the individual Major and Minor Subjects. A current list of Departmental Course Organisers, together with their contact details, are available on the Part II BBS website.

You should contact the Course Organiser for the Major/Minor Subject if you need any information about the arrangements of lectures, dissertations or examinations. Departments will provide the same infrastructure for student support, departmental access, use of facilities, and supervision arrangements as they provide for their single subject students.

4. COURSE STRUCTURE
The course has three main components

A ‘Major’ Subject, which will typically draw on the core teaching of a single Part II subject, but may draw on modules offered by more than one department. The ‘Major’ Subject will involve a minimum of 96 contact hours (excluding supervisions)

A ‘Minor’ Subject, normally provided by another department, which will involve 24-30 contact hours (excluding supervisions)

A dissertation of up to 6,000 words
5. Registration Procedure
Registration for NST Part II BBS is through the Part II Allocations Procedure as detailed on the webpage at:

https://www.natsci.tripos.cam.ac.uk/students/third/ii-subject-allocation.

You can indicate your preferred choice of major subject directly through an on-line form, specifying that you wish to take the NST Part II BBS (dissertation) route.

Some subjects have requirements or recommendations for previous subjects taken. These can be checked at: www.natsci.tripos.cam.ac.uk/subject-information/part2

The deadline for submission of choices through the online form is 20 May 2022.

6. Examinations
The maximum marks allocated for the course components are as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Subject</td>
<td>64</td>
</tr>
<tr>
<td>Minor Subject</td>
<td>16</td>
</tr>
<tr>
<td>Dissertation</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

The papers offered will normally be the same as those for the single Major Subject. For most Minor Subjects, the paper is borrowed from another Tripos. There is a separate class list for NST Part II BBS, which will be published after the single-subject class lists.

The Faculty Board’s marking criteria are available on the web at: www.biology.cam.ac.uk/exams/AllExams/marking-part-ii-dissertations/marking-diss
7. MAJOR AND MINOR SUBJECTS AND PERMISSIBLE COMBINATIONS

The Major Subjects (Papers 402-430) and the Minor Subjects (Papers 104-151) available in 2022-23 are shown on the following tables.

The permissible combinations of Major Subjects and Minor Subjects are also shown. Please note that subjects and combinations offered are subject to change—these will be detailed in the Reporter. A more detailed table of compatible subject combinations is available on the Faculty of Biology website (www.biology.cam.ac.uk/undergrads/nst/bbs/subject-combinations).

You will need to consult the Department or Reporter Lecture List for detailed timetables when they are published.

Major Subjects available in 2022-23:

<table>
<thead>
<tr>
<th>Paper</th>
<th>Major Subjects</th>
<th>Permissible Minor Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>402</td>
<td>Pathology (A&amp;B)</td>
<td>105, 107, 108, 109, 111, 113, 114, 120, 124, 126, 128, 130, 132, 134, 135, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149 and 151</td>
</tr>
<tr>
<td>403</td>
<td>Pathology (A&amp;C)</td>
<td>107, 108, 109, 111, 113, 120, 124, 126, 128, 130, 132, 140, 142, 143, 144, 145, 146, 147, 148, 149 and 151</td>
</tr>
<tr>
<td>404</td>
<td>Pathology (A&amp;D)</td>
<td>105, 107, 108, 109, 111, 113, 120, 124, 126, 128, 130, 132, 134, 135, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149 and 151</td>
</tr>
<tr>
<td>405</td>
<td>Pathology (B&amp;C)</td>
<td>104, 107, 108, 109, 111, 113, 120, 124, 126, 128, 130, 132, 138, 140, 142, 143, 144, 145, 146, 147, 148, 149 and 151</td>
</tr>
<tr>
<td>406</td>
<td>Pathology (B&amp;D)</td>
<td>104, 105, 106, 107, 108, 109, 111, 113, 120, 121, 124, 126, 128, 130, 132, 134, 135, 138, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149 and 151</td>
</tr>
<tr>
<td>407</td>
<td>Pathology (C&amp;D)</td>
<td>104, 107, 108, 109, 113, 114, 120, 124, 126, 128, 130, 132, 138, 140, 142, 143, 144, 145, 146, 147, 148, 149 and 151</td>
</tr>
<tr>
<td>408</td>
<td>Pharmacology Max 25 candidates</td>
<td>107, 108, 109, 111, 113, 114, 120, 124, 126, 127, 128, 136, 137*, 142, 143, 144, 146, 147, 149 and 151</td>
</tr>
<tr>
<td>Paper</td>
<td>Major Subjects</td>
<td>Permissible Minor Subjects</td>
</tr>
<tr>
<td>-------</td>
<td>----------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>409</td>
<td>Psychology</td>
<td>107, 128 and 136 - students may choose additional Minor Subjects that do not have lecture clashes with the Psychology modules chosen – please consult the relevant lecture timetables.</td>
</tr>
<tr>
<td>411</td>
<td>Biochemistry</td>
<td>107, 108, 114, 128 and 136</td>
</tr>
<tr>
<td>414</td>
<td>Genetics</td>
<td>107, 108, 113, 127, 128, 130, 132, 136, 140, 144, 145, 147, 148, 151 – Students to choose a minor subject that does not have lecture clashes with the Genetics modules – please consult the relevant lecture timetables.</td>
</tr>
<tr>
<td>415</td>
<td>Physiology, Development &amp; Neuroscience</td>
<td>A fifth PDN module can be taken as a Minor Subject. Students may choose Minor Subjects that do not have lecture clashes with the PDN modules chosen – please consult the relevant lecture timetables.</td>
</tr>
<tr>
<td>424</td>
<td>Pathology (B&amp;E)</td>
<td>105, 107, 108, 109, 113, 114, 120, 124, 126, 128, 130, 132, 134, 135, 139, 142, 143, 144, 145, 146, 147, 148, 149 and 151.</td>
</tr>
<tr>
<td>425</td>
<td>Pathology (C&amp;E)</td>
<td>107, 108, 109, 113, 114, 120, 124, 126, 128, 130, 132, 142, 143, 144, 145, 146, 147, 148, 149 and 151.</td>
</tr>
<tr>
<td>426</td>
<td>Pathology (D&amp;E)</td>
<td>105, 107, 108, 109, 113, 114, 120, 124, 126, 128, 130, 132, 134, 135, 139, 142, 143, 144, 145, 146, 147, 148, 149 and 151.</td>
</tr>
<tr>
<td>427</td>
<td>Zoology</td>
<td>109, 143, 149 and 151 - A fifth Zoology module can be taken as a Minor Subject. Students may choose Minor Subjects that do not have lecture clashes with the Zoology modules chosen – please consult the relevant lecture timetables.</td>
</tr>
<tr>
<td>428</td>
<td>Psychology, Neuroscience &amp; Behaviour</td>
<td>142 - Students may choose Minor Subjects that do not have lecture clashes with the PNB modules chosen – please consult the relevant lecture timetables.</td>
</tr>
<tr>
<td>Paper</td>
<td>Major Subjects</td>
<td>Permissible Minor Subjects</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>429</td>
<td>Human Evolution, Ecology and Behaviour</td>
<td>108, 120, 126, 143, 144, 146, 147 and 149 - Students may choose Minor Subjects that do not have lecture clashes with the Human Evolution modules chosen – please consult the relevant lecture timetables.</td>
</tr>
<tr>
<td>430</td>
<td>History and Philosophy of Science and Medicine</td>
<td>105, 106, 108, 109, 120, 121, 135, 136, 138, 139, 141, 143, 145, 146, 148 and 149. Students may choose Minor Subjects that do not have lecture clashes with the HPS major modules – please consult the relevant lecture timetables.</td>
</tr>
</tbody>
</table>

Further Major Subject information is available at the NST Part II BBS website at: [www.biology.cam.ac.uk/undergrads/nst/bbs/MajorSubjects](http://www.biology.cam.ac.uk/undergrads/nst/bbs/MajorSubjects)

Detailed information about permissible subject combinations is also available online at: [www.biology.cam.ac.uk/undergrads/nst/bbs/subject-combinations](http://www.biology.cam.ac.uk/undergrads/nst/bbs/subject-combinations)

* There may be clashes with optional elements of the major subject – check with the relevant Course Organiser.

Minor Subjects available in 2022-23:

<table>
<thead>
<tr>
<th>Paper</th>
<th>Minor Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>104</td>
<td>Human Evolution (Arch Paper B3) - Max 20 candidates</td>
</tr>
<tr>
<td>105</td>
<td>Human Ecology and Behaviour (Arch Paper B2) - Max 20 candidates</td>
</tr>
<tr>
<td>106</td>
<td>Neural Degeneration and Regeneration (PDN Module N5) - Max 15 candidates</td>
</tr>
<tr>
<td>107</td>
<td>Philosophy &amp; Ethics of Medicine (HPS) - Max 50 candidates</td>
</tr>
<tr>
<td>108</td>
<td>Health, Medicine, and Society (HSPS Paper Soc 13)</td>
</tr>
<tr>
<td>109</td>
<td>The Family (PBS 8) - Max 10 candidates</td>
</tr>
<tr>
<td>111</td>
<td>Central Mechanisms of Reward, Punishment and Emotion (PDN Module N6) - Max 15 candidates</td>
</tr>
<tr>
<td>113</td>
<td>Early Medicine (HPS) - Max 12 candidates</td>
</tr>
<tr>
<td>Paper</td>
<td>Minor Subjects</td>
</tr>
<tr>
<td>-------</td>
<td>----------------</td>
</tr>
<tr>
<td>114</td>
<td>Modern Medicine &amp; Biomedical Sciences (HPS) - <em>Max 12 candidates</em></td>
</tr>
<tr>
<td>120</td>
<td>Human Genetics, Genomics &amp; Systems Biology (Genetics Module 2) – <em>Max 10 candidates</em></td>
</tr>
<tr>
<td>121</td>
<td>Evolutionary Genetics &amp; Adaptation (Genetics Module 4, Zoology Module ZL5) – <em>Max 10 candidates</em></td>
</tr>
<tr>
<td>124</td>
<td>Advanced Topics in Social and Applied Psychology (PBS 7) - <em>Max 10 candidates</em></td>
</tr>
<tr>
<td>126</td>
<td>Music Psychology in Practice - <em>Max 3 candidates – candidates must demonstrate some musical knowledge to be permitted to study this option</em></td>
</tr>
<tr>
<td>127</td>
<td>Conservation Science (Zoology Module ZM2)</td>
</tr>
<tr>
<td>128</td>
<td>Bioinformatics - <em>Max 46 candidates</em></td>
</tr>
<tr>
<td>130</td>
<td>Vertebrate Evolution (Zoology Module ZM1)</td>
</tr>
<tr>
<td>132</td>
<td>Evolution and Comparative Anatomy of Mammals (Zoology Module ZL1)</td>
</tr>
<tr>
<td>134</td>
<td>From Genome to Proteome (Biochemistry) – <em>Max 10 candidates</em></td>
</tr>
<tr>
<td>135</td>
<td>Cell Cycle, Signalling and Cancer (Biochemistry) – <em>Max 10 candidates</em></td>
</tr>
<tr>
<td>136</td>
<td>Science Communication (ICE) - <em>Max 20 candidates</em></td>
</tr>
<tr>
<td>137</td>
<td>Surgical and Radiological Anatomy (PDN) - <em>Max 15 candidates</em></td>
</tr>
<tr>
<td>138</td>
<td>Developmental Neurobiology (PDN Module N1) - <em>Max 5 candidates</em></td>
</tr>
<tr>
<td>139</td>
<td>Molecular and Cellular Neuroscience (PDN Module N2) - <em>Max 5 candidates</em></td>
</tr>
<tr>
<td>140</td>
<td>Sensory Transduction (PDN Module N4) - <em>Max 5 candidates</em></td>
</tr>
<tr>
<td>141</td>
<td>Cellular Physiology (PDN Module P1) - <em>Max 5 candidates</em></td>
</tr>
<tr>
<td>Paper</td>
<td>Minor Subjects</td>
</tr>
<tr>
<td>-------</td>
<td>----------------</td>
</tr>
<tr>
<td>142</td>
<td>Development and Stem Cells (PDN Module P2) - Max 5 candidates</td>
</tr>
<tr>
<td>143</td>
<td>Systems and Clinical Physiology (PDN Module P8) - Max 5 candidates</td>
</tr>
<tr>
<td>144</td>
<td>Plant Signalling Networks in Growth and Development (Pl Sci Module PLM1) – Max 3 candidates</td>
</tr>
<tr>
<td>145</td>
<td>Microbes: Evolution, Genomes and Lifestyle (Pl Sci Module PLM2) – Max 3 candidates</td>
</tr>
<tr>
<td>146</td>
<td>Evolution and Ecosystems Dynamics (Pl Sci Module PLM3) – Max 3 candidates</td>
</tr>
<tr>
<td>147</td>
<td>Plant Genomes and Synthetic Biology (Pl Sci Module PLL1) – Max 3 candidates</td>
</tr>
<tr>
<td>148</td>
<td>Responses to Global Change (Pl Sci PLL2) – Max 3 candidates</td>
</tr>
<tr>
<td>149</td>
<td>Exploiting Plant Metabolism (Pl Sci PLL3) – Max 3 candidates</td>
</tr>
<tr>
<td>151</td>
<td>Comparative Human Biology (Arch Paper B4) – Max 20 candidates</td>
</tr>
</tbody>
</table>

ARCH: Archaeology
ICE: Institute for Continuing Education
HPS: History and Philosophy of Science
PBS: Psychology and Behavioural Sciences
PDN: Physiology, Development and Neuroscience
PHPC: Public Health and Primary Care
Pl Sci: Plant Sciences

Further Minor Subject information is available at the NST Part II BBS website at: [www.biology.cam.ac.uk/undergrads/nst/bbs/Minors](http://www.biology.cam.ac.uk/undergrads/nst/bbs/Minors)
8. COURSE DESCRIPTIONS BY DEPARTMENT

Detailed course descriptions are available on the web and in course handbooks: the following brief outline gives a basic introduction to course content for the Major Subjects.

8.1. PATHOLOGY

The Department of Pathology offers nine Major Subjects (maximum of 20 BBS places in total).

Papers 402-407 & 424-426 Pathology

Students are able to take various combinations of two single subject modules:
Module A: Cancer and Genetic Diseases
Module B: Immunology
Module C: Microbiology and Parasitology
Module D: Virology
Module E: Dynamics of Infectious Diseases

Note that the combinations of modules A and E is not possible.

BBS students will have the opportunity to present a paper or project in one or more of their Pathology options

For further information see:
www.path.cam.ac.uk/undergraduate/third_year/NST-PartII-BBS
8.2. **PHARMACOLOGY**

The Department of Pharmacology offers one Major Subject.

**Paper 408  Pharmacology**

The course provides students with the concepts and knowledge required to understand developments in pharmacology and drug discovery. Students follow the same lectures as for the single subject. In addition, there is a series of methods and skills lectures and workshops. The course typically covers:

**Systems Pharmacology:**
- Drug Discovery
- Cancer
- Metabolic diseases
- Cardiovascular diseases
- Neurotransmission and chronic pain

**Molecular and Cellular Pharmacology:**
- Receptors and ion channels
- Cellular signalling
- Controlling the cell proteome

BBS students will give a short talk on the topic of their dissertation to the Department at the end of Lent Term.

For further information see: [www.phar.cam.ac.uk/undergrads/bbs](http://www.phar.cam.ac.uk/undergrads/bbs)
8.3. PSYCHOLOGY

The Department of Psychology offers one Major Subject.

Paper 409  Psychology

Students take the same lectures and exam papers as for the single subject. The course provides 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.

The examination format is as follows:
Paper 1: Methods of Enquiry
Paper 2: Cognitive and Experimental Psychology
Paper 3: Behavioural and Cognitive Neuroscience

Papers 2, 3 and 4 contain several 8-lecture courses, with all lectures taking place in the Michaelmas and Lent terms only.

Students must have taken MVST Part IB or NST Part IB Experimental Psychology to take this Major Subject.

For further information see:
www.psychol.cam.ac.uk/undergrads/ug/nst-ii/info
8.4 BIOCHEMISTRY

The Department of Biochemistry offers one Major Subject.

**Paper 411  Biochemistry**

The course is grouped into four 24 lecture modules, one of which has a branched structure to provide internal choice. In addition there is a series of methods and skills sessions and students are expected to attend the Departmental Research Seminar Series.

Module A: Structural and Chemical Biology
Module B: From Genome to Proteome
Module C: Stem- The Dynamic Cell
   plus either:
   Branch 1- Bioenergy OR
   Branch 2- Molecular Microbiology of Infectious Disease

Module D: Cell Cycle, Signalling and Cancer

Essential Methods and Skills: These feature key methods such as bioinformatics. Also included are data handling classes using past examination papers as core material to study approaches to data analysis and interpretation. Teaching of transferable laboratory and communication skills (such as graphic illustration, record keeping, data analysis, database searching and essay and report writing) are embedded in the course. BBS students will take part in bioinformatics sessions and group supervisions where they will give presentations on their dissertation, present analysis of data and scientific papers and take part in Journal Club sessions, so developing oral presentation skills and skills in questioning others on their presentations and developing a critical approach to scientific literature.

For more information see:

[www.bioc.cam.ac.uk/teaching/third-year/biochemistry/part-ii-biochemistry](http://www.bioc.cam.ac.uk/teaching/third-year/biochemistry/part-ii-biochemistry)
8.5. **PLANT SCIENCES**

The Department of Plant Sciences offers two Major Subjects.

**Paper 412  Plant Sciences- Cellular**
This comprises the following modules:
PLM1: Plant Signalling Networks
PLM2: Microbes: Evolution, Genomes and Lifestyle
PLL1: Plant Genomes and Synthetic Biology
PLL3: Exploiting Plant Metabolism

**Paper 413  Plant Sciences- Ecological**
This comprises modules from Plant Sciences and Zoology:
PLM3: Evolution and Ecosystem Dynamics
ZM2: Conservation Science (Zoology)
PLL2: Responses to Global Change
ZL4: Applied Ecology (Zoology)

BBS students will conduct a short presentation during Lent Term.

For further information see: [www.plantsci.cam.ac.uk/teaching/plants](http://www.plantsci.cam.ac.uk/teaching/plants)
8.6. Genetics

The Department of Genetics offers one Major Subject.

**Paper 414  Genetics**

Students take all four modules offered for the single subject:
Module 1:  Genomes, Chromosomes and the Cell Cycle
Module 2:  Human Genetics, Genomics and Systems Biology
Module 3:  Developmental Genetics
Module 4:  Evolutionary Genetics and Adaptation

Modules 2 and 4 are offered as Minor Subjects to students who are not taking Major Subject Genetics.

BBS students will give a short oral presentation on their BBS dissertation subject to the rest of the Part II class at the end of the Lent Term.

For further information see:
[www.gen.cam.ac.uk/undergraduate/nst2-genetics-overview](http://www.gen.cam.ac.uk/undergraduate/nst2-genetics-overview)
8.7. PHYSIOLOGY, DEVELOPMENT AND NEUROSCIENCE

The Department of PDN offers one Major Subject.

**Paper 415  Physiology, Development and Neuroscience**

Choose any four modules from:

**Michaelmas:**
N1: Developmental Neurobiology  
N2: Molecular and Cellular Neuroscience  
N4: Sensory Transduction  
N7: Neural Circuits and Behaviour  
P1: Cellular Physiology  
P3: Fetal & Placental Physiology  
P4: Development: Patterning the Embryo  
P9: Cell Assembly and Interactions

**Lent:**
N5: Neural Degeneration and Regeneration  
N6: Central Mechanisms of Reward, Punishment and Emotion  
N9: Neuronal Plasticity, Modulation and Behaviour  
P2: Development and Stem Cells  
P5: Bioinformatics  
P6: Development: Cell Differentiation & Organogenesis  
P7: Pathophysiology of Cancer  
P8: Systems and Clinical Physiology

Students must specify to the department which 4 modules they intend to take.  
A module taken as part of a Major Subject cannot be taken as a Minor Subject.  
BBS students are able to sign up to the neuroscience workshops (in which students make presentations) and participate in the journal clubs in many of the PDN modules.

For further information see:  
[www.pdn.cam.ac.uk/undergraduate-1/part-ii-courses](http://www.pdn.cam.ac.uk/undergraduate-1/part-ii-courses)
8.8. ZOOLOGY

The Department of Zoology offers a single Major Subject made up of modules offered in the single subject, and some modules offered by Plant Sciences, Genetics, PDN and Biochemistry.

**Paper 427  Zoology**

Two modules from:
- Module ZM1: Vertebrate Evolution
- Module ZM2: Conservation Science
- Module ZM5: Evolution and Behaviour: Genes and Individuals
- Module ZM6: Cell Assembly and Interactions
- Module ZM7: From Genome to Proteome
- Module ZM8: Development: Patterning the Embryo
- Module ZM9: Developmental Neurobiology
- Plant Sciences PLM3: Evolution and Ecosystem Dynamics [Borrowed paper]

and two from:
- Module ZL1: Evolution and Comparative Anatomy of Mammals
- Module ZL2: Responses to Global Change
- Module ZL3: Evolution and Behaviour: Populations and Societies
- Module ZL4: Applied Ecology
- Module ZL5: Evolutionary Genetics and Adaptation
- Module ZL6: Development: Cell Differentiation and Organogenesis
- Module ZL7: Cell Cycle, Signalling and Cancer
- Borrowed paper: Bioinformatics

A module taken as part of a Major Subject cannot be taken as a Minor Subject.

A limited number of module combinations are not possible. Please check the timetable and see further information at:

[www.zoo.cam.ac.uk/study/NST-II-Zoology](http://www.zoo.cam.ac.uk/study/NST-II-Zoology)
8.9. Psychology, Neuroscience and Behaviour

The course offers a single Major Subject made up of modules offered by Psychology, PDN and Zoology.

**Paper 428  Psychology, Neuroscience and Behaviour**

Choose any four modules from the list below, which will be offered by the Departments of Psychology, PDN and Zoology:

N2: Molecular and Cellular Neuroscience (PDN)
N5: Neural Degeneration and Regeneration (PDN)
N6: Central Mechanisms of Reward, Punishment and Emotion (PDN)
N7: Neural Circuits and Behaviour (PDN)
N9: Neuronal Plasticity, Modulation and Behaviour (PDN)
PS2: Memory (Psychology)
PS3: Emotional Regulation and Motivation (Psychology)
ZL3: Evolution and Behaviour: Populations and Societies (Zoology)
ZM5: Evolution and Behaviour: Genes and Individuals (Zoology)

Students must choose modules from at least two departments. A module taken as part of a Major Subject cannot be taken as a Minor Subject.

In the Lent Term, a PNB Symposium takes place, during which all students present a poster of their project or dissertation to their peers and the general neuroscience community.

For further information see: [www.psychol.cam.ac.uk/undergrads/ug/nst-ii/info](http://www.psychol.cam.ac.uk/undergrads/ug/nst-ii/info)
8.10. BIOLOGICAL ANTHROPOLOGY

The Department of Archaeology offers one Major Subject:

**Paper 429  Human Evolution, Ecology and Behaviour**

Students choose two papers from the following list:

B2:  Human Ecology and Behaviour  
B3:  Human Evolution  
B4:  Comparative Human Biology

In addition, students choose further two papers from the following list:

B14:  A Technologically Dependent Lineage. One term paper.  
B17 Our Extended Family: Primate Biology and Behaviour. One term paper.

BBS students will give a talk on the topic of their dissertation, followed by questions, during Lent term

For further information see: [www.bioanth.cam.ac.uk](http://www.bioanth.cam.ac.uk)
8.11. HISTORY AND PHILOSOPHY OF SCIENCE AND MEDICINE

The Department of History and Philosophy of Science offers one Major Subject: 
**Paper 430  History and Philosophy of Science and Medicine**

Students take the following four papers:

Early Medicine  
Modern Medicine and Biomedical Sciences  
Philosophy of Science and Medicine  
Ethics of Medicine

Some of the HPS modules are offered as Minor Subjects, but only to students who are not taking Major Subject History and Philosophy of Science and Medicine.  
BBS students will give a talk on the topic of their dissertation, followed by questions, during Lent term.

For further information see: [www.hps.cam.ac.uk/study/undergraduate/bbs](http://www.hps.cam.ac.uk/study/undergraduate/bbs)
9. DISSENTATIONS

You will be required to write a dissertation on a topic related to either your Major or Minor Subject, of up to 6,000 words excluding appendices, tables, figures, footnotes and bibliography. You will be required to submit your title (chosen from a list offered by the Departmental Course Organiser or suggested by you) by Division of Michaelmas Full Term. Your title is approved by your Supervisor, the Departmental Course Organiser, and then returned to the Faculty Office for final approval by the BBS Course Coordinator, who will also establish that all students taking the course have submitted an appropriate title. Your dissertations must be submitted to the Departmental Course Organiser by the first Friday of the Easter Full Term.

The purpose of the dissertation is to give you an opportunity to produce a substantial piece of original work. It should be an extended account of a topic or question that lies broadly within the field of either your Major or Minor Subject. In producing your dissertation, you will be expected to show skills in researching primary literature, critically evaluating published information, and marshalling arguments to produce a structured critical assessment of a defined topic. Detailed guidance for both students and supervisors is available on the BBS website.

You can expect to receive a maximum of four supervisions with your Dissertation Supervisor to provide guidance on your dissertation.
10. Example Dissertation Titles

Below are examples of past dissertation titles:

- The potential uses and limitation of phage therapy (Biochemistry)
- Transcriptional signature matching strategies in computational drug discovery and repositioning. (Bioinformatics)
- How can medication adherence among patients with schizophrenia be improved? (General Practice and Primary Care Research (now Applied Clinical Research))
- A comparison of incidence of cancer in South Asian (Bangladeshi, Indian and Pakistani) populations in the UK and South Asia (Genetics)
- Medicalisation and violence against women: implications for the medical encounter (Health, Medicine and Society)
- The evolutionary origins of human female aggression (Human Evolution, Ecology and Behaviour)
- Exploring mechanisms linking the gut microbiota to depression (Pathology)
- Personalised medicine in the clinic – fantasy or reality? (Pharmacology)
- Winds of change: lessons from Clyde River in decolonisation and climate (Philosophy and Ethics of Medicine)
- What are the implications of maternal obesity on the placenta in determining pregnancy outcomes? (PDN)
- Micro-plastics in freshwater – should we care? (Plant Sciences)
- Is anorexia an obsessive compulsive disorder? (Psychology)
- Evidence for the role of immune ageing in the development of inflammatory depression (PNB)
- Outcomes after pulmonary endarterectomy: a meta-analysis (Surgical and Radiological Anatomy)
- Psychological well-being in intended parents involved in surrogacy arrangements (The Family)
- The likely impacts of predicted climate change on the biodiversity of UK rivers (Zoology)
11. STUDENT SUPPORT
The department in which you are taking your Major Subject will be designated as your “home” department. If your Major Subject comprises modules offered by more than one department, one of these departments will be assigned as your “home”; this will usually be the department in which you are doing your dissertation. As an NST Part II BBS student you will have access to the same resources and support in your home department as single subject NST Part II students.

12. GORDON WIGAN PRIZE
The Gordon Wigan Prize for Biological and Biomedical Sciences shall be awarded to the candidate who is at the top of the class list for NST Part II BBS, and achieves a First Class mark. The prize is a book token for a value of £100.
13. What our Students Say

Rachel, BBS 2017-18

Major Physiology, Development and Neuroscience

Minor Subject: General Practice and Primary Care Research (renamed to Applied Clinical Practice from 2020)

"For my third year I did the BBS course with major in Physiology, Development and Neuroscience (PDN) and minor in GP and Primary care research offered at the Primary Care unit. I really enjoyed the BBS course! Doing both major and minor subjects allows you greater breadth. My major, PDN, was very cutting edge, scientific and theoretical. But as a medic, I really appreciated the pragmatism and clinical relevance of my minor subject. BBS allowed me to do these very contrasting subjects in parallel! With BBS you write a dissertation, as opposed to a lab based project. Though your departments usually offer a notional list of titles you have the freedom and flexibility to approach essentially anyone in your department with any question and they can make it happen. For instance, I concocted a question based on a single paper which really piqued my interest and was able to approach its author to supervise me. I appreciated this freedom as I felt I was committing my time to something I really was interested in.

My minor subject in GP and primary care research was a particular highlight of my part II. In Michaelmas, we were taught by the senior academics in the Primary Care Institute in the methods used in primary care research and taught how to critique it. Then in Lent, we were placed with one of the research teams and through supervisions were able to explore many of the particular research issues in their field. Our lecturers and supervisors were approachable and enthusiastic. It opened my eyes to areas of research and careers paths within medicine I didn't know existed. And as a final bonus- there were only 4 people on the course in my year! We got to know each other really well, did multiple formals and keep up with each other now in Clinical school."
Lauren, BBS 2017-18
Major Subject: Biochemistry
Minor Subject: EnterpriseTECH

"After studying a range of topics during the first two years of Natural Sciences, BBS was a great way to specialise (studying a Biochemistry major) while studying another subject I love and want to pursue in the future (EnterpriseTECH as minor). There’s many options of topics and ways to study, so BBS subjects are definitely worth looking into when deciding on third year.

The courses are well organised timetable, logistics and assessment wise. Even though you’re studying two subjects, the workload doesn’t seem more than students just studying a single. In most BBS major subjects, you’ll do a dissertation as coursework instead of a lab project, which also makes Easter/Lent term less stressful!

Being a member of two departments is also great, and you get to work with and know a lot more students and staff. Loved my time as a BBS student, how the course let me study and has fuelled my passion for multiple topics, and how it’s opened many doors for future study and careers."