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BL3307 Evolution

(BL3307 online module handbook version 94)

Credits: 20

Semester: 1

Module Organiser
Prof Nathan Bailey
nwb3@st-andrews.ac.uk
01334 463367

Pre-requisite Modules:
Before taking this module you must pass BL2303 or pass BL2307

Anti-requisite Modules:

Post-requisite Modules:

Additional Module Information:
Please check MMS regularly for additional module information

image: The power of evolution: A male peacock spider (Maratus volans) with psychedelic spider painting on his back to attract females. Photo by Jurgen Otto.

This module examines how evolutionary processes cause the extraordinary patterns of biological variation we observe on planet Earth, and the approaches that modern research programmes use to study this. Topics include: adaptation, molecular variation and phylogenetics; the evolution of sex; genetics of continuous traits; evolutionary developmental biology; population genetics; speciation, and evolutionary genomics. Practicals will involve computer simulations to investigate a range of evolutionary phenomena, plus use of molecular markers to examine population structure and speciation.

BL3307View content for BL3307 (2023/4) in the Module Management System (MMS)

View the current Biology Online Module Catalogue for BL3307

BL3307View BL3307 (2023/4) in the University of St Andrews Module Catalogue

Contents:

BL3307: Timetable

Legend (not all modules have every event type):

lecture	tutorial	workshop	practical	other

Semester 1: Week 1

DATE & TIME	VENUE	STAFF	EVENT
Monday 11-09-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L1: **Introduction: contemporary evolution** 2023-4_BL3307_L1
Tuesday 12-09-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**tbd** -	Lecture L2: **Flipped lecture** 2023-4_BL3307_L2
Wednesday 13-09-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L3: **Background to assignment** 2023-4_BL3307_L3

Semester 1: Week 2

DATE & TIME	VENUE	STAFF	EVENT
Monday 18-09-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L4: **Adaptation** 2023-4_BL3307_L4
Tuesday 19-09-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L5: **Selection** 2023-4_BL3307_L5
Wednesday 20-09-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L6: **Polymorphism** 2023-4_BL3307_L6
Wednesday 20-09-2023 17:00 to 17:00	Other	**Prof Nathan Bailey** -	Other O1: **DUE DATE: Project topic** 2023-4_BL3307_O1 via email

Semester 1: Week 3

DATE & TIME	VENUE	STAFF	EVENT
Monday 25-09-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Mike Ritchie** -	Lecture L7: **Natural selection, linkage, & epistasis** 2023-4_BL3307_L7
Tuesday 26-09-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Mike Ritchie** -	Lecture L8: **Adaptive landscapes** 2023-4_BL3307_L8
Wednesday 27-09-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Mike Ritchie** -	Lecture L9: **Genetic revolutions** 2023-4_BL3307_L9

Semester 1: Week 4

DATE & TIME	VENUE	STAFF	EVENT
Monday 02-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Carolin Kosiol** -	Lecture L10: **Phylogenetics & selection I** 2023-4_BL3307_L10
Tuesday 03-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Carolin Kosiol** -	Lecture L11: **Phylogenetics & selection II** 2023-4_BL3307_L11
Wednesday 04-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Carolin Kosiol** -	Lecture L12: **Phylogenetics & selection III** 2023-4_BL3307_L12
Friday 06-10-2023 09:00 to 11:00	Bute Building Bute PC room / online	**Dr Carolin Kosiol** -	Practical P1: **Phylogenetics & selection (session 1)** 2023-4_BL3307_P1
Friday 06-10-2023 12:00 to 14:00	Bute Building Bute PC room / online	**Dr Carolin Kosiol** -	Practical P2: **Phylogenetics & selection (session 2)** 2023-4_BL3307_P2

Semester 1: Week 5

DATE & TIME	VENUE	STAFF	EVENT
Monday 09-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Andy Gardner** -	Lecture L13: **Price equation** 2023-4_BL3307_L13
Tuesday 10-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Andy Gardner** -	Lecture L14: **Kin selection** 2023-4_BL3307_L14
Wednesday 11-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Andy Gardner** -	Lecture L15: **Multilevel selection** 2023-4_BL3307_L15

Semester 1: Week 7

DATE & TIME	VENUE	STAFF	EVENT
Monday 23-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Miguel Barbosa** -	Lecture L16: **Community ecology** 2023-4_BL3307_L16
Tuesday 24-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Miguel Barbosa** -	Lecture L17: **Contemporary evolution** 2023-4_BL3307_L17
Wednesday 25-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Miguel Barbosa** -	Lecture L18: **Case studies** 2023-4_BL3307_L18
Wednesday 25-10-2023 17:00 to 17:00	Online	-	Other O2: **DUE DATE: Practical 1 report** 2023-4_BL3307_O2 Submit via Turnitin

Semester 1: Week 8

DATE & TIME	VENUE	STAFF	EVENT
Monday 30-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Michael Morrissey** -	Lecture L19: **Single locus model** 2023-4_BL3307_L19
Tuesday 31-10-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Michael Morrissey** -	Lecture L20: **Infinitesimal model** 2023-4_BL3307_L20
Wednesday 01-11-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Michael Morrissey** -	Lecture L21: **The breeder.s equation** 2023-4_BL3307_L21
Thursday 02-11-2023 09:00 to 11:00	Bute Building Bute PC room / online	**Dr Michael Morrissey** -	Practical P3: **QG practical (session 1)** 2023-4_BL3307_P3
Thursday 02-11-2023 12:00 to 14:00	Bute Building Bute PC room / online	**Dr Michael Morrissey** -	Practical P4: **QG practical (session 2)** 2023-4_BL3307_P4

Semester 1: Week 9

DATE & TIME	VENUE	STAFF	EVENT
Monday 06-11-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Michael Morrissey** -	Lecture L22: **Wild evolution** 2023-4_BL3307_L22
Tuesday 07-11-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L23: **Phenotypic plasticity** 2023-4_BL3307_L23
Wednesday 08-11-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L24: **EvoDevo** 2023-4_BL3307_L24
Wednesday 08-11-2023 17:00 to 17:00	Online	-	Other O3: **DUE DATE: Practical 2 write-up** 2023-4_BL3307_O3 Submit via Turnitin

Semester 1: Week 10

DATE & TIME	VENUE	STAFF	EVENT
Monday 13-11-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L25: **Evolution of behaviour** 2023-4_BL3307_L25
Tuesday 14-11-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L26: **Adaptation genomics I** 2023-4_BL3307_L26
Wednesday 15-11-2023 11:00 to 12:00	Bute Building Lecture Theatre D	-	Lecture L27: **Adaptation genomics II** 2023-4_BL3307_L27

Semester 1: Week 11

DATE & TIME	VENUE	STAFF	EVENT
Monday 20-11-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L28: **Project judging** 2023-4_BL3307_L28
Monday 20-11-2023 11:00 to 11:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Other O4: **DUE DATE: Final project** 2023-4_BL3307_O4 In person or submitted via MMS if online
Tuesday 21-11-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Dr Mauricio Gonzalez Forero** -	Lecture L29: **Brain evolution: history and controversies** 2023-4_BL3307_L29
Wednesday 22-11-2023 11:00 to 12:00	Bute Building Lecture Theatre D	**Prof Nathan Bailey** -	Lecture L30: **Review and Q & A** 2023-4_BL3307_L30

BL3307: Reading List

BL3307Click for BL3307 reading list

BL3307: Assessment

3-hour Written Examination = 50%, Coursework = 50%

BL3307View coursework assessment details for BL3307 (2023/4) in MMS

The following related information applies to all Biology modules:

School of Biology Marking Criteria:	SeeÂ JH booklet info (st-andrews.ac.uk)Â
Late submission of continuous assessment work:	All late submissions of coursework that do not require electronic submission should be made via the Biology Teaching Office, Level 2, BMS Building, North Haugh.
Exam details:	See School of Biology UG Handbook JH booklet info (st-andrews.ac.uk)Â : All Biology exams will be conducted online for 2022-23.
Exam timetable:	See Timetables - Exams - University of St Andrews (st-andrews.ac.uk)Â
Expected attendance:	SeeÂ JH booklet info (st-andrews.ac.uk) Â for detailed attendance requirements.
Good Academic Practice & Avoiding Academic Misconduct:	SeeÂ JH booklet info (st-andrews.ac.uk)
University Student Handbook:	University Student Handbook
School and University regulations in the School and University Undergraduate Handbook relating to absence reporting, penalties and rules for late submission of work, extensions for coursework, return of coursework, S-coding, good academic practice and Academic Alerts.:	JH booklet info (st-andrews.ac.uk) University Student Handbook

Who to ask

(Information in this section applies to all Biology Modules)

Before contacting staff, students should check the content of the Biology Undergraduate Handbook, the module handbook and specific task instructions.

Questions about	**Contact**
General teaching matters	Biology Teaching Office (bioteach@st-andrews.ac.uk)
Rescheduled or cancelled events	Check your University email
Lecture or practical content	The lecturer who presented the material
Completing assessed practical assignments	The lecturer who set the assignment
Completing assessments	Module Organiser (Prof Nathan Bailey nwb3@st-andrews.ac.uk)
Marking on continuous assessment	The Demonstrator or Module Organiser (Prof Nathan Bailey nwb3@st-andrews.ac.uk)
Marking on exams	Module Organiser (Prof Nathan Bailey nwb3@st-andrews.ac.uk)
Rearranging practical days	Module Organiser (Prof Nathan Bailey nwb3@st-andrews.ac.uk)
Absence and/or extensions	Module Organiser (Prof Nathan Bailey nwb3@st-andrews.ac.uk) **and** the Biology Teaching Office (bioteach@st-andrews.ac.uk)
Difficulties with academic progress which impact more than one module:	Year Coordinator See School of Biology UG Handbook for list: JH booklet info (st-andrews.ac.uk)
Overall performance, progress or future directions:	Advisor of Studies
Disability:	Disability Coordinator (biodisabilities@st-andrews.ac.uk)
For advice and support on any issue e.g. academic, financial, international, personal or health matters, or if you are unsure of who to go to for help:	Advice & Support Centre Address: 79 North Street, St Andrews Email: theasc@st-andrews.ac.uk Web: https://www.standrews.ac.uk/ask-a-question/ Tel: 01334 462020
University assistance with urgent matters out of office hours:	Tel: 01334 476161 Web: https://www.st-andrews.ac.uk/students/advice/counselling/incrisis/

Biology Teaching Office:

We are happy to hear from you about teaching matters. The School of Biology Teaching Office is open Monday to Friday 09.00 - 13.00 and 14.00 - 17.00. School of Biology staff will respond to your emails during these hours. Our team will provide a response to you within three working days.

Biology Teaching Office (Level 2), University of St Andrews, Biomolecular Sciences Building, North Haugh, St Andrews, Fife KY16 9ST

Email: bioteach@st-andrews.ac.uk

Tel: 01334 46 3602 or 3566

BL3307: Contributing Staff

Prof Nathan Bailey **(Module Organiser)**	Professor	nwb3@st-andrews.ac.uk
Prof Nathan Bailey (Module Organiser)	Professor	nwb3@st-andrews.ac.uk
Dr Miguel Barbosa	Lecturer in Marine Biology	mb334@st-andrews.ac.uk
Prof Andy Gardner	Professor of Biology	ag243@st-andrews.ac.uk
Dr Mauricio Gonzalez Forero	Research Fellow	mgf3@st-andrews.ac.uk
Dr Carolin Kosiol	Reader	ck202@st-andrews.ac.uk
Dr Michael Morrissey	Research Fellow	mbm5@st-andrews.ac.uk
Prof Mike Ritchie	Professor	mgr@st-andrews.ac.uk

BL3307: Learning Outcomes

Students completing module BL3307 successfully should be able to:

- Understand the basic processes of population genetics underlying evolutionary change.
- Understand the genetic basis of continuous variation and its importance in population differentiation and speciation.
- Know how to analyze molecular variation for examining genetic diversity and population structure.
- Understand how evolution occurs at the molecular level.
- Develop skills for quantitative analysis of evolutionary change.
- Acquire experience of working independently and together in groups.
- Develop skills for scientific exploration and discovery.

BL3307: Acquired Skills

Practical Skills

- Mendelian genetics

Transferable Skills

- "Full" practical write-up (Intro, Methods, Results, Discussion)
- "Short" practical write-up (e.g. completed worksheet)
- Short essay (1000-2000 words)
- Critically evaluating sources/information
- Finding information on the web
- Finding literature
- Referencing
- Computer programming
- Problem-solving questions
- Calculations/equations
- Descriptive statistics
- Likelihood
- Non-linear fit
- Other mathematical models
- Produce tables
- Use Excel
- Use other data analysis software
- Use R or R Studio
- Working in pairs/small groups

Policies

(Information in this section applies to all Biology Modules)

- The procedures and regulations followed by the School of Biology are outlined in the University Handbook and in the School of Biology UG handbookÂ Â JH booklet info (st-andrews.ac.uk)Â
- All coursework associated with the module must be completed and submitted by its due date.
- Specific School regulations relating to absence reporting, penalties and rules for late submission of work, extensions for coursework, return of coursework, S-coding, Good Academic Practice and Academic Alert are stated in the School of Biology UG hand bookÂ JH booklet info (st-andrews.ac.uk)Â Â and students are required to carefully read these regulations.
- Students are also referred to the University Handbook, available at: http://www.st-andrews.ac.uk/studenthandbook/