pdf created: 24/04/2024 20:02:04

# **BL4210 Practical Skills for Molecular Biology** and Biochemistry

(BL4210 online module handbook version 103)

Credits: 15

Semester: 1

### **Module Organiser**

Dr Michael M Nevels mmn3@st-andrews.ac.uk 01334 463375

#### **Pre-requisite Modules:**

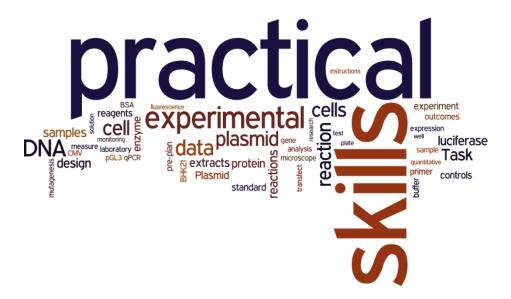
Permission of Biology Honours Adviser required

#### **Anti-requisite Modules:**

#### **Post-requisite Modules:**

### **Additional Module** Information:

for additional module information



Practical skills are the core of research in biochemistry and molecular biology. This module is designed to prepare students for laboratory <u>Please check MMS regularly</u> research projects in internationally competitive research. The module is designed to foster skills such as experimental design, core practical skills, data analysis and excellent record keeping. Each practical requires some prior theoretical familiarity. Emphasis is placed upon experimental design - notably anticipation of experimental outcomes and the choice of appropriate experimental controls. This planning phase is followed by execution of the experiment and analyses of the data.

BL4210View content for BL4210 (2023/4) in the Module Management System (MMS)

View the current Biology Online Module Catalogue for BL4210

BL4210View BL4210 (2023/4) in the University of St Andrews Module Catalogue

# **Contents:**

- Cover
- Contents
- Timetable
- Reading List
- Assessment
- Who To Ask
- Contributing Staff
- Learning Outcomes
- Acquired Skills
- Policies

# **BL4210: Timetable**

**Legend** (not all modules have every event type):

Semester 1: Week 1  Monday 11-09-2023		ll modules have every eve	ent type):	_	
DATE & TIME VENUE STAFF EVENT  Monday Medical and Biological Sciences Building 1-09-2023 14:00 to 15:00 13:00 18:00 103:0	lecture t	utorial workshop	practical other		
Monday   1-09-2023   1-09-20	Semester 1: Week 1				
1-0-9-2023   Bidding   Dr. Simon Young   Practical P1: Bioinformatics Practical I   1-0-0-10-10-10-10-10-10-10-10-10-10-10-1	DATE & TIME	VENUE	STAFF	EVENT	
14-09 to 17-00  Friday 15-09-2023 14-00 to 17-00  Semester 1: Week 4  DATE & TIME	11-09-2023	Building	<u>Dr Michael M Nevels</u> -	Mutagenesis & qPCR Pre-plan Advice	
205a/b Teaching Lab 14:00 to 17:00 205a/b Teaching Lab 205a/b Teac	14-09-2023		Dr Simon Young		
DATE & TIME VENUE STAFF EVENT  Monday 02-10-2023 Biomolecular Sciences Building 02-10-2023 Biomolecular Sciences Building 02-10-2023 Biomolecular Sciences Building 03-10-2023 Biomolecular Sciences Building 03-10-2023 Biomolecular Sciences Building 03-10-2023 Biomolecular Sciences Building 05-10-2023 Biomolecular Sciences Building 13-10-2023 RMO1 Seminar Room  Dr Michael M Nevels Practical P2: Mutagenesis & qPCR Practical 12-2023 Practical 205a/b Teaching Lab Practical P2: Mutagenesis & qPCR Practical 12-2023 Practical 205a/b Teaching Lab Practical P3: Mutagenesis & qPCR Practical 12-2023 Practical 205a/b Teaching Lab Practical P3: Mutagenesis & qPCR Practical 12-2023 Practical P3: Mutagenesis & qPCR Practical P4: Mutagenesis & qPCR Practical 12-2023 Practical P3: Mutagenesis & qPCR Practical P4: Mutagenesis & qPCR Practical P5: Mutagenesis & qPCR P4: Mutagene	15-09-2023		Dr Simon Young		
Monday 02-10-2023 RM001 Seminar Room  Dr Michael M Nevels - Discussion   Practical Advice Dractical Parameters & qPCR Pre-plan Discussion   Practical Advice Dractical Parameters & qPCR Pre-plan Discussion   Practical Advice Dractical Parameters & qPCR Pre-plan Discussion   Practical Advice Dractical Parameters & qPCR Practical 205b Teaching Lab  Dr Michael M Nevels - Practical Parameters & qPCR Practical Parameters & q	Semester 1: Week 4				
Discussion   Practical Advice   Practical Advice   Practical Advice   Practical Advice   Practical Psi Mutagenesis & qPCR   Practical   Practical Psi Mutagenesis & qPCR   Practical   Practical Psi Mutagenesis & qPCR   Practical   Pr	DATE & TIME	VENUE	STAFF	EVENT	
Date   Time   Date   Time   Date	02-10-2023		Dr Michael M Nevels	Discussion   Practical Advice	
Date	03-10-2023		Dr Michael M Nevels	Practical	
Data Collation   Data Analysis Advice	05-10-2023		Dr Michael M Nevels	Practical	
DATE & TIME VENUE STAFF EVENT  Friday 13-10-2023 RM001 Seminar Room  Semester 1: Week 9  DATE & TIME VENUE STAFF EVENT  Monday 06-11-2023 RM001 Seminar Room  Dr Michael M Nevels 2023-4, BL4210_L3  Semester 1: Week 9  DATE & TIME VENUE STAFF EVENT  Monday 06-11-2023 RM001 Seminar Room  Tuesday 07-11-2023 10:00 to 15:00  Thursday 09-11-2023 10:00 to 13:00  Thursday 09-11-2023 10:00 to 17:00  Biomolecular Sciences Building 205a/b Teaching Lab  Dr Michael M Nevels 2023-4, BL4210_L3  Practical P5: Cell Transfection Practical 2023-4, BL4210_F5  Practical P5: Cell Transfection Practical 2023-4, BL4210_F5  Tuesday 205a/b Teaching Lab  Thursday 09-11-2023 10:00 to 17:00  Friday Biomolecular Sciences Building 205a/b Teaching Lab  Biomolecular Sciences Building 205a/b Teaching Lab  Tuesday 205a/b Te	06-10-2023	Building		Data Collation   Data Analysis Advice	
Biomolecular Sciences Building 13-10-2023 14:00 to 15:00	Semester 1: Week 5				
13-10-2023 14:00 to 15:00  RM001 Seminar Room  - Advice 2023-4_BL4210_L3  Semester 1: Week 9  DATE & TIME VENUE STAFF EVENT  Monday 06-11-2023 14:00 to 15:00  Tuesday 07-11-2023 10:00 to 13:00  Thursday 09-11-2023 10:00 to 17:00  Biomolecular Sciences Building 205a/b Teaching Lab  Dr Michael M Nevels - Discussion   Practical Advice 2023-4_BL4210_L4  Practical P5: Cell Transfection Practical 2023-4_BL4210_B  Practical P6: Cell Transfection Practical 2023-4_BL4210_B  Practical P6: Cell Transfection Practical 2023-4_BL4210_B  Tuesday 09-11-2023 10:00 to 17:00  Biomolecular Sciences Building 205a/b Teaching Lab  Dr Michael M Nevels - Practical P6: Cell Transfection Practical 2023-4_BL4210_B  Tuesday 09-11-2023 10:00 to 17:00  Friday Biomolecular Sciences Building 1	DATE & TIME	VENUE	STAFF	EVENT	
Monday 06-11-2023 14:00 to 15:00  Biomolecular Sciences Building 07-11-2023 10:00 to 13:00  Thursday 09-11-2023 10:00 to 17:00  Biomolecular Sciences Building 205a/b Teaching Lab  Dr Michael M Nevels -  Dr Michael M Nevels -  Practical P5: Cell Transfection Practical 2023-4_BL4210_P5  Practical P5: Cell Transfection Practical 2023-4_BL4210_P5  Practical P6: Cell Transfection Practical 2023-4_BL4210_P5  Tutorial T2: Cell Transfection Class Data Collation   Data Analysis Advice	13-10-2023		Dr Michael M Nevels	Advice	
Monday 06-11-2023 14:00 to 15:00  Biomolecular Sciences Building 07-11-2023 10:00 to 13:00  Thursday 09-11-2023 10:00 to 17:00  Biomolecular Sciences Building 07-11-2023 10:00 to 17:00  Biomolecular Sciences Building 07-11-2023 10:00 to 17:00  Biomolecular Sciences Building 09-11-2023 10:00 to 17:00  Biomolecular Sciences Building 10-Michael M Nevels -  Practical P5: Cell Transfection Practical 2023-4_BL4210_P5  Practical P6: Cell Transfection Practical 2023-4_BL4210_P5  Tutorial T2: Cell Transfection Class Data Corbett Miss Inês Ferreira  Collation   Data Analysis Advice	Semester 1: Week 9				
14:00 to 15:00  RM001 Seminar Room 14:00 to 15:00  RM001 Seminar Room 14:00 to 15:00  RM001 Seminar Room 14:00 to 15:00  Discussion   Practical Advice 2023-4_BL4210_L4  Practical P5: Cell Transfection Practical 2023-4_BL4210_P5  Practical P5: Cell Transfection Practical 2023-4_BL4210_P5  Practical P6: Cell Transfection Practical 2023-4_BL4210_P5  Practical P6: Cell Transfection Practical 2023-4_BL4210_P6  Practical P6: Cell Transfection Practical 2023-4_BL4210_P6  Tutorial T2: Cell Transfection Class Data Collation   Data Analysis Advice	DATE & TIME	VENUE	STAFF	EVENT	
07-11-2023 10:00 to 13:00  Thursday 09-11-2023 10:00 to 17:00  Friday 10-11-2023 RM001 Seminar Room  Procedure Sciences Building April 10-11-2023  Dr. Michael M. Nevels -  Practical P6: Cell Transfection Practical 2023-4_8L4210_P6  Tutorial T2: Cell Transfection Class Data Collation   Data Analysis Advice	06-11-2023	<u> </u>	Dr Michael M Nevels	Discussion   Practical Advice	
09-11-2023 10:00 to 17:00  Friday Biomolecular Sciences Building 10-11-2023 RM001 Seminar Room  Biomolecular Sciences Building 10-11-2023 RM001 Seminar Room  Corbett Miss Inês Ferreira  Collation   Data Analysis Advice	07-11-2023		Dr Michael M Nevels -		
10-11-2023 RM001 Seminar Room Miss InÃas Ferreira Collation   Data Analysis Advice	09-11-2023		Dr Michael M Nevels		
	10-11-2023			Collation   Data Analysis Advice	

## **BL4210: Reading List**

BL4210Click for BL4210 reading list

### **BL4210: Assessment**

Coursework = 100%

BL4210View coursework assessment details for BL4210 (2023/4) in MMS

The following related information applies to all Biology modules:

School of Biology Marking Criteria: See JH booklet info (st-andrews.ac.uk)Â

Late submission of continuous All late submissions of coursework that do not require assessment work:

electronic submission should be made via the Biology Teaching Office, Level 2, BMS Building, North Haugh.

Exam details: See School of Biology UG Handbook IH booklet info (st-

andrews.ac.uk)Â: All Biology exams will be conducted

online for 2022-23.

See Timetables - Exams - University of St Andrews (st-Exam timetable:

andrews.ac.uk)Â

See JH booklet info (st-andrews.ac.uk) Â for detailed Expected attendance:

attendance requirements.

See JH booklet info (st-andrews.ac.uk)

Good Academic Practice & Avoiding

Academic Misconduct:

University Student Handbook: **University Student Handbook** 

School and University regulations in the <u>IH booklet info (st-andrews.ac.uk)</u>

School and University Undergraduate **University Student Handbook** 

Handbook relating to absence

reporting, penalties and rules for late submission of work, extensions for coursework, return of coursework, Scoding, good academic practice and

Academic Alerts.:

### 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 ( <u>bioteach@st-andrews.ac.uk</u> )	
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 ( <u>Dr Michael M Nevels mmn3@st-andrews.ac.uk</u> )	
Marking on continuous assessment	The Demonstrator or Module Organiser ( <u>Dr Michael M Nevels mmn3@st-andrews.ac.uk</u> )	
Marking on exams	Module Organiser ( <u>Dr Michael M Nevels</u> <u>mmn3@st-andrews.ac.uk</u> )	
Rearranging practical days	Module Organiser ( <u>Dr Michael M Nevels mmn3@st-andrews.ac.uk</u> )	
Absence and/or extensions	Module Organiser ( <u>Dr Michael M Nevels mmn3@st-andrews.ac.uk</u> ) <b>and</b> the Biology Teaching Office ( <u>bioteach@st-andrews.ac.uk</u> )	
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: <a href="mailto:theasc@st-andrews.ac.uk">theasc@st-andrews.ac.uk</a> Web: <a href="https://www.standrews.ac.uk/ask-a-question/">https://www.standrews.ac.uk/ask-a-question/</a> 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

# **BL4210: Contributing Staff**

**Dr Michael M Nevels** (Module Organiser)

Jason Corbett

Miss InÃas Ferreira

Dr Michael M Nevels
(Module Organiser)

**Dr Simon Young** 

Reader in Virology

Postgraduate Student Postgraduate Student

Reader in Virology

Associate Lecturer (Education focused)

mmn3@st-andrews.ac.uk

jwc7@st-andrews.ac.uk
iaf1@st-andrews.ac.uk

mmn3@st-andrews.ac.uk

say2@st-andrews.ac.uk

# **BL4210: Learning Outcomes**

Students completing module BL4210 successfully should be able to:

- Probe databases for relevant information and use bioinformatics tools in biochemistry and molecular biology research projects
- Design experimental protocols, incorporate appropriate negative/positive experimental controls and anticipate likely experimental outcomes
- Carry out key modern biochemistry and molecular biology experiments and create clear and complete research records
- Analyse and interpret experimental data, compare results and draw valid conclusions
- Write clear and logical scientific prose

### **BL4210: Acquired Skills**

#### **Practical Skills**

- Biomolecule isolation/characterisation
- Buffers
- Database interogation
- DNA isolation
- Enzyme assay
- Handling mammalian cells
- Handling microbes
- Image analysis
- Image processing
- Pipetting
- Polymerase Chain Reaction (PCR)
- Protein quantitation
- Transformation

### **Transferable Skills**

- "Full" practical write-up (Intro, Methods, Results, Discussion)
- Critically evaluating sources/information
- Finding information on the web
- Referencing
- Searching databases
- Lab safety awareness
- Reflective analysis
- Calculations/equations
- Concentrations
- Data analysis
- Data analysis (depending on project)
- Data presentation
- Descriptive statistics
- Dilutions
- Distinguish different types of data
- Draw a line of best fit
- Linear regression
- Produce graphs/figures
- Produce tables
- SI units
- Use Excel
- Volumes
- Lab or field notebook
- Designing experiments
- Generate class dataset
- 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 <u>University</u> <u>Handbook</u> and in the School of Biology UG handbook Â <u>JH booklet info (st-andrews.ac.uk)Â</u>
- 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 book JH booklet info (standrews.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/