



# **BIOS226 Computational Biology and Bioinformatics**

## **Week 1 - Welcome and Module Overview**

Dr. Robert Treharne

# Welcome to BIOS226

- Computational biology and bioinformatics are about turning biological data into insight
- You will work with real datasets and learn how to justify analytical choices
- We focus on practical skills: data handling, analysis, interpretation, and communication
- The module builds toward an individual case study presentation

# Learning Objectives

By completing this module and its assessments, you should be able to:

- Explain how genomics, transcriptomics, or proteomics data are generated and what biological questions they can address
- Prepare and quality-check real biological datasets using appropriate preprocessing steps
- Select and justify suitable analytical approaches for a given biological question
- Create and interpret clear, informative visualisations of high-dimensional biological data
- Interpret results in a biological context, recognising assumptions and limitations
- Communicate your analysis clearly and professionally

# Teaching Team

- Natasha Savage (NS) - module organiser
- Robert Treharne (RT) - module lead, supervised learning, case study support
- Stephen Chapman (SC) - data formats, databases, and annotation
- Robert Morris (RM) - QC, statistics, visualisation, genomics, and transcriptomics

# How Sessions Will Run

- Weekly lecture: context and background
- Workshops: 2 x 2-hour guided, hands-on; build portfolio evidence
- Use University PCs and participate actively
- Support is during workshops only; work independently outside

# Content

## Recent announcements

-  Welcome to BIOS226 – Computational Biology and Bioinformatics!  
Welcome to BIOS226 – Computational Biology and Bioinformatics. My colleagues and I are looking forward to workin...

Posted on:  
23 Jan 2026, 10:44

## 202526-BIOS226 - Bioinformatics and Computational Biology

### BIOS226 - Computational Biology and Bioinformatics

#### [17 Timetable](#)

Weekly schedule of lectures, workshops, deadlines.

#### [General Information](#)

Assessment details, contacts and study support.

#### [Topic 1](#)

Introduction to the module and getting started with R.

# Timetable at a Glance (Part 1)

## Part 1 - Foundations

- Week 1: Introduction and R primer (RT)
- Week 2: Biological data formats, databases, and annotation (SC)
- Week 3: Quality control, normalisation, and essential statistics (RM)
- Week 4: Visualisation and dimensionality reduction (RM)
- Week 5: Supervised learning and model evaluation (RT)
- Week 6 — w/c 02/03/2026 — Assessment week (no BIOS226 assessment this week)

# Timetable at a Glance (Part 2)

## Part 2 - Applications

- Week 7: Genomics, variant data, and GWAS (RM)
- Week 8: Transcriptomics and differential expression (RM)
- Easter break: no teaching w/c 23/03, 30/03, 06/04
- Week 9: Proteomics, metabolomics, and KEGG pathway analysis (SC)
- Week 10: Case study topic selection and pipeline development (RT)
- Week 11: Case study workshop and preparation
- Week 12: Case study completion and module wrap-up



# Attendance Expectations

- Attendance at lectures and workshops is expected
- Workshops are where skills are practiced and supported
- If you miss a session, catch up using the slides and workbook tasks
- Let the teaching team know early if you have ongoing attendance issues
- There are no attendance codes - paper-based register only

# Assessment Overview

- Two components:
  - Portfolio (60% of the module mark)
  - Case study presentation (40% of the module mark)
- Deadlines: Portfolio final submission Week 10; Case study Week 12

# Portfolio (60%) - What is it?

- A curated record of your weekly work
- Workbook templates for each week
- Activities and questions to complete
- Work should be documented and submitted to Canvas weekly
- Text based Viva required for week 5
- In-person Viva week 10

## Portfolio (60%) - Mark Breakdown

The portfolio assesses your practical work across the semester. The viva verifies your understanding of that work.

Component	What is assessed	Portfolio weighting	Module weighting
Workbook	Weekly workbooks demonstrating correct methods, accurate analysis, clear figures and outputs, and a reproducible workflow	70%	42%
Viva	15-minute in-person viva (Week 10) verifying understanding of submitted workbook work	30%	18%

# Viva Practice!

- AutoViva is an online text-based viva tool that helps you practice explaining your work.
- Use it regularly, at least once a week.
- Download your transcripts and include them in your portfolio as evidence.

# Case Study Presentation (40%) - What is it?

- Individual, conference-style academic presentation
- Delivered to your peers and teaching team
- Based on one substantial biological dataset
- Dataset chosen from a provided range (e.g. genomics, transcriptomics, proteomics)
- Focus is on reasoning and decision-making, not perfect results
- You are assessed on how you think with data, not on producing flawless outputs

# Format, Timing, and Expectations

Format and timing:

- 10 min presentation + 5 min questions
- Delivered during Week 12 workshops
- Preparation supported in Weeks 10 to 11 workshops
- Academic, technical, professional tone expected

# How is Case Study Assessed?

Area	What is assessed	Presentation %	Module %
Data handling	Cleaning, preprocessing, reproducibility	20	8
Analysis	Choice and application of techniques	25	10
Visualisation	Clarity and appropriateness of figures	15	6
Interpretation	Biological meaning and limitations	25	10
Presentation	Structure, clarity, questions	10	4
Timing	Within time limits	5	2
<b>Total</b>		<b>100</b>	<b>40</b>



# Use of Generative AI (GAI)

You may use GAI to:

- Plan structure
- Improve clarity and presentation flow

You remain responsible for:

- Analytical decisions
- Interpretation and accuracy
- Demonstrating understanding

GAI is a support tool, not a substitute for analysis.

