Course Texts

While you are not required to purchase any books for this course, your lecturers may recommend reference texts to further revise or explore the topic of a given lecture. Most of these books can be accessed through the Oxford Library System, SOLO (https://solo.bodleian.ox.ac.uk/), or in some cases your College Library. If you do not have access to a book, you can contact your College Librarian and request a copy (or copies) be added to your College Library's collection.

Maths, Statistics, and Chemistry resources

At the end of this document, we include some maths, statistics, and chemistry resources that may be useful for those who did not study Maths or Chemistry at A-level. This guidance includes the concepts from those fields that are relevant to the Biology Course, and how you can use the recommended resources to revise. The 4-week Orientation period is an ideal time for this revision.

Books and other resources that will help you engage with the First-Year Biology Course

To keep you thinking about biology in all of its fascinating complexity, we have put together a list of books recommended by the faculty (as well as a few videos and podcasts) that touch on the three topic streams that make up the first-year course. Please note that you are not required to read all of these texts, but reading one or two that look interesting or useful to you will help expand and deepen your biological knowledge. We emphasise that this list in not exhaustive, and that many great titles exist – so do feel free to read anything that you think looks interesting!

Many of these books are available through the Oxford Library System (search SOLO) or via the public Oxfordshire County Library.

Recommended Books (Do not attempt to read them all!)

Oxford University Press produce a series called *Very Short Introductions*. Many of these are very good, but the level of detail varies. Of particular use for our course are:
- The Animal Kingdom (Peter Holland)
- Plants (Timothy Walker)
- Sexual Selection (Marlene Zuk & Leigh Simmons)
- Ecology (Jaboury Ghazoul)
- Molecular Biology (Aysha Divan & Janice Royds)
- The History of Life (Michael Benton)

Theme 1: Building a phenotype
- The Epigenetics Revolution and/or Junk DNA (Nessa Carey)
- The Gene: an intimate history (Siddharta Mukherjee)
- The Immortal life of Henrietta Lacks (Rebecca Skloot)
- The Emperor of all maladies (Siddharta Mukherjee)
- What is Life? (Paul Nurse)
- Transformer - the deep chemistry of life and death (Nick Lane)

Theme 2: The Diversity of Life
- I Contain Multitudes (Ed Yong)
- Endless Forms most Beautiful (Sean Carroll)
- How to Clone a Mammoth (Beth Shapiro)
- Bugs in the System (May Berenbaum)

Theme 3: Ecology & Evolution
- The Ancestor's Tale (Richard Dawkins)
- Why Evolution is True (J Coyne)
- Guns, Germs & Steel (Jared Diamond)
- Wilding (Isabella Tree)

Podcasts/Videos
- Back Garden Biology (Lindsay Turnbull): https://podcasts.ox.ac.uk/series/back-garden-biology
- Big Biology: https://www.bigbiology.org/
- The Ologies Podcast: https://www.alieward.com/ologies-by-topic

Links to the titles above and other recommended reading for the MBiol course can be found in ORLO [Oxford Reading Lists Online] here.

Maths and Chemistry Resources

We include here some maths and chemistry resources that may be useful for those who do not have a maths or chemistry A-level. The Biology course will require *familiarity* with the concepts mentioned below; if you can understand and explain the basic ideas, you will be able to follow what is discussed on the course. Thus, you do not need to work through pages of exercises, but of course a little practice on each topic will greatly assist learning.

Some of the materials listed below for the review of maths, statistics and chemistry can be found here.

Maths

Key concepts

Students should be familiar with the following basic mathematical concepts that are covered in A-level mathematics:

- Partial fractions
- Logs and exponentials
- Simple differentiations: linear functions, powers, sums

In addition, students will be expected to be able to perform simple algebraic manipulations including manipulating algebraic fractions, such as those required at GCSE. Students who have not taken Maths A-level would be wise to revise these manipulations.

Resources

The recommended text is **Bostock and Chandler *Mathematics – The Core Course for A-level*.** There are various editions, starting in 1978. In 1994, the same text was published under the title ***Core Maths Advanced Level*,** and continuing until 2013.

Many of the College Libraries contain a copy of this text, and there are other copies in the wider Oxford Library System (search SOLO). You can find a cheap copy on Amazon (<£10), but we recommend that rather than buying a copy yourself, you contact your College Librarian to ask if they can buy a copy for the college library (they are always happy to get requests!)

The version does not matter as the same content is covered; the relevant chapters of some of the most commonly found editions are as follows:

The 1981 edition:

- Revision of basic algebraic manipulations, including fractions: Chapter 1 ('Algebraic Relationships')
- Partial Fractions – Chapter 1 ('Algebraic Relationships')
- Logs and exponentials – Chapters 2 and 3 ('Algebraic Topics'; 'Functions')
- Simple differentiations – linear functions, powers, sums – Chapter 5 ('Differentiation 1')

1994 and 2013 editions include other content, so information is presented in a different order:

- Revision of basic algebraic manipulations, including fractions: Chapter 1 ('Algebra 1')
- Partial Fractions – Chapter 30 ('Algebra 2')
- Logs and exponentials – Chapters 2 and 17 ('Surds, Indices, and Logaritms'; 'Exponential and Logarithmic Functions')
- Simple differentiations – linear functions, powers, sums – Chapter 13 ('Differentiation 1')

Statistics

Key concepts

- Simple statistics -- mean, median, mode; standard deviation, variance, inter-quartile range
- Basic probability
- Adding and multiplying probabilities
- Binomial distribution
- Normal distribution (including standardising)

Resources

The recommended text is **Bostock and Chandler *Modular Mathematics – Statistics 1 Module C*, from 1995.**

Many of the College Libraries contain a copy of this text, and there are other copies in the wider Oxford Library System (search SOLO). You can find a cheap copy on Amazon (<£10), but we recommend that rather than buying a copy yourself, you contact your College Librarian to ask if they can buy a copy for the college library (they are always happy to get requests!)

Chemistry

Key concepts

All students will need to know the following basic chemistry concepts that are covered in A-level chemistry:

- Atoms, atomic structure, electron orbitals
- Bonding (ionic, polar, covalent)
- Chemical formulae and molecular diagrams
- Redox chemistry
- Acids and bases
- The concept of moles and molarity

Resources

Start by watching the video tutorials that can be found at:

1. https://sciencemusicvideos.com/basic-chemistry-tutorials/
2. https://sciencemusicvideos.com/ap-biology/carbon-and-functional-groups/

Then use Seneca Learning's 'Foundations in Chemistry' course for to revise the key concepts and to test your knowledge
https://app.senecalearning.com/classroom/course/d40348f4-579a-4f76-b2a8-12c562e9b836/section/b7c08d8e-7d74-4d9d-8949-95a5cbde6819/session

This will provide all the chemistry knowledge you need to prepare yourself for the first year of the Biology degree course. But if you want to go into more detail, the following textbook is a good reference:

Ritchie & Gent, *A Level Chemistry for OCR Year 1 and AS,* 2015 Oxford University Press.

Many of the College Libraries contain a copy of this text, and there are other copies in the wider Oxford Library System (search SOLO). You can find a cheap copy on Amazon (<£10), but we recommend that rather than buying a copy yourself, you contact your College Librarian to ask if they can buy a copy for the college library (they are always happy to get requests!)