IGCSE Biology

Introduction

Welcome to your IGCSE Biology course. This introduction will serve as a guide to what you can expect from the course, and it will show you how to plan your study of this course effectively. Take your time to read this Introduction thoroughly before you start the lessons.

The course is designed to prepare students for examination in the **Edexcel IGCSE Biology specification** (**4BI1**), which was examined for the first time in May/June 2019.

Contents of the Introduction

Oxford Open Learning

The Course

The lessons are planned so that all the material and preparation required for the final examination papers is in the following five course modules:

Module 1: Cells and Organisms
Module 2: Plant and Animal Physiology A
Module 3: Plant and Animal Physiology B
Module 4: Inheritance
Module 5: Ecology and Food Production

It is advisable that you do the modules in order, as the content has been written to enable you to develop your knowledge and skills as you progress through the lessons.

The course is designed to develop (1) a broad understanding of biological facts, concepts and principles (2) skills in biological investigation and (3) an ability to evaluate the benefits and drawbacks of modern scientific developments.

In combination with other suitable IGCSE entry subjects the course is an ideal preparation for those who wish to go on to study Biology, or other biological subjects, at AS or A-level.

The course is designed to be accessible to students who may have only a limited previous background in science. If you have some background in Biology then you should find that some of the lessons build upon things that you have met before in your earlier studies.

The practical work described at various places in this course is to help to develop your skills for the practical-based components of the theory exams. You should try to carry out this work yourself; if you can undertake some of it at home, or have the opportunity to perform supervised laboratory work in the course of your studies, this will be a great help. Three of the lessons are devoted to the development of practical skills, and there is a very useful Appendix at the back of the textbook to help you further.

NB. The exam will include written questions on practical-based study, so you should make sure that you have studied these lessons carefully and have carried out some of the experiments yourself.

Lesson Contents and Textbook References

Biology IGCSE **Module 1: Cells and Organisms**		
Lesson	*Title*	*Textbook Reference: page numbers*
1	Cells, Organisms, and the Variety of Life	2-6, 18-22, 25-30
2	Movement of Substances into and out of Cells **TMA A**	16-18, 152-158
3	Investigative Skills A: Design	303, 305-307
4	Respiration and Enzymes **TMA B**	6-15
5	Investigative Skills B: Carrying Out	303-304

Module 2: Plant and Animal Physiology A		
Lesson	*Title*	*Textbook Reference: page numbers*
6	Human Nutrition **TMA C**	52-66
7	Investigative Skills C: Interpreting	304-305
8	Photosynthesis **TMA D**	135-147
9	Transport in Plants and Animals	70-80, 158-163
10	Gas Exchange in Plants and Animals **TMA E**	39-49, 139-142

Module 3: Plant and Animal Physiology B		
Lesson	*Title*	*Textbook Reference: page numbers*
11	Homeostasis and Excretion	104-115
12	The Human Nervous System **TMA F**	84-94
13	Hormones in Plants and Animals	98-102, 168-172
14	Human Reproduction **TMA G**	118-126
15	Reproduction in Plants	174-179
Module 4: Inheritance		

Lesson	*Title*	*Textbook Reference: page numbers*
16	Chromosomes, Genes and DNA **TMA H**	226-237
17	Cell Division	240-246
18	Genes and Inheritance **TMA I**	249-257
19	Natural and Artificial Selection	261-266, 268-272
20	Genetic Engineering and Cloning **TMA J**	272-274, 285-286, 289-298

Module 5: Ecology and Food Production		
Lesson	*Title*	*Textbook Reference: page numbers*
21	Ecosystems	187-200
22	Human Impact on the Environment **TMA K**	204-206, 211-218
23	Food Production **TMA L : Mock Exam (1)** **TMA M: Mock Exam (2)**	206-211, 281-286

Textbook

The textbook that is referred to throughout this course is:

Philip Bradfield and Steve Potter, *Edexcel International GCSE (9-1) Biology Student Book* (2017, Pearson Education, ISBN: 978 0 435185 08 4)

You will need to use a copy of this textbook throughout the course; you can buy a copy through the Oxford Open Learning website. It is referred to in every lesson and provides excellent coverage of the material. By using the textbook and the course you will have very full coverage of all the material. The book has an accompanying eBook, so you also use it in digital form.

You should not need other books throughout the course but you may like to look in other biology books from time to time. If you feel that you would like to use a revision guide before the exam, ask your tutor which one they recommend.

Tiering and IGCSE Examination Entry

Science IGCSE examinations are not divided into different entry tiers.

Twig Resources

We hope that students of this course will also take the opportunity to learn from the wealth of Twig resources to which this course is linked. Twig have produced more than a thousand educational films, particularly for science, maths and geography and these complement the lesson materials here to enhance the learning experience.

To view the films, you will need an e-mail account, internet access and a password, supplied to you on enrolment. As you work through the lessons, you will come across Twig-links quite regularly, looking like this:

Log on to Twig and look at the film titled: **Deforestation**

www.ool.co.uk/1257ud

Discover how the destruction of the rainforest impacts ecosystems, and begins a cycle that contributes to global warming.

To reach the film, you would either type the URL into your web-browser (here www.ool.co.uk/1257ud) or search the Twig site (www.twig-world.co.uk) for 'Deforestation'. Having watched it, you return to the lesson.

Access to these resources is offered on the following terms:

1. OOL is not responsible for the content of the Twig films or for the technology which transmits them.
2. The films may not be accessible at certain times.
3. OOL cannot be responsible for any technical difficulties students may have in viewing the films and cannot advise on any software or hardware issues.
4. Access is limited in any case to the period until the student's expected exam date.

5. Students are responsible for remembering their own usernames and passwords. Please note: once assigned, a username *cannot* be changed. Passwords can be.

6. Passwords are supplied for the use of the named student only and should not be passed on to any third parties under any circumstances – because each password is unique it will be apparent if it is used on numerous machines.

7. The films are of greater or lesser relevance and it is probable that some parts of many of the films will be too "advanced" for your needs, include ideas you have not yet covered, or introduce information that is not required for the Edexcel specification.

8. If you find that a film is not helpful or interesting, stop watching it! It is possible to study the course successfully without watching *any* of the films. Remember that this is bonus material only, adding depth and context to the course, and this pack forms the spine of the learning material. But each film we have selected should make studying that little bit easier and more enjoyable.

9. Alongside each film, the Twig site offers various additional resources. You can download a transcript of the film, take a quiz or even an advanced quiz. These are optional extras if you have time and inclination.

Other Internet Resources

In most lessons of the course other internet sites are also given which have been carefully selected to provide additional activities. Some of these have been designated as "Extension" activities.

These internet sites are an important tool to help your understanding of your Biology course, and you should make every effort to view at least the ones not designated as Extension.

If you do not have an internet connection at home, consider building in regular trips to a library or internet café as part of your study schedule.

Please bear in mind that internet addresses change regularly so we cannot guarantee that all addresses listed in the course will remain current.

The Structure within each Lesson: How to Study

Front Page

The front page of each lesson shows:

- The title.
- **Aims** for the lesson. These set out the position that you should reach after working through the lesson; keep these in mind while reading the lesson material. Paper 2 examines all of these aims, but Paper 1 does not examine the aims picked out in **bold** print. Often the Paper 2 material is integrated with Paper 1 material in the same lesson section and cannot be separately identified in the course notes. You should refer to the lesson aims in **bold** to identify the Paper 2 content.
- **Context**. This shows how the lesson relates to the Specification (4BI1).
- **Reading**. The individual textbook references for each lesson. This is important additional reading to accompany the course.

Lesson Notes

There then follow the notes; these are an outline of the subject material to be studied in the lesson. Read the notes carefully several times and carry out the activities until you feel that you have understood the broad outline of the theory involved, and then tackle the reading references.

The textbook deals with some topics in greater detail, and, as with the notes, you will probably need to read the passages several times. The textbook also contains relevant questions, and at revision time you may want to return to these to further test your knowledge.

At the end of each lesson there is a list of new technical words whose meanings you should now know. These are the words picked out in **bold** in the body of the lesson. There is also a summary to which you can add your own comments.

Activities, SATs and TMAs

Activities are placed in the notes at the relevant point. They are indicated as follows:

Activity 7	Find out your own breathing rate per minute. How does this compare to the results shown above.
	

The pencil symbol indicates that you should make your own notes in the space provided.

Towards the end of each lesson, you will find **Key Words**, a **Summary** and **What You Need to Know** sections. It is vital that you revise these sections before you attempt each assignment and they will form a big part of your revision at the end of the course.

Self-Assessment Tests

Every lesson is concluded with either a Self-Assessment Question or a Tutor-Marked Assignment. Only tackle these when you feel that you have fully mastered the material in the lesson.

If it is a Self-Assessment Question, first try to check your answers by referring back to the lesson, and then compare your answers with those given right at the end of the lesson.

Tutor-Marked Assignments

After every two lessons there is a Tutor-Marked Assignment (TMA). These are in IGCSE examination style and will thoroughly check your understanding of the previous two lessons. You should send your answers to your tutor, who will return your marked script, together with a set of suggested answers.

Revision and Exam Planning

Do **not** leave all your revision until the end of the course! You will need to revise thoroughly for your examination, but frequent revision throughout the course is **essential**. Plan your revision sensibly, and re-read as you feel necessary, if your knowledge is beginning to fade.

The last two TMAs in the course (TMA L and TMA M) are a mock exam of two papers, following closely the format of the exam itself. You are recommended to study the online practice exam and mark scheme (see the section Past Papers below) before attempting this TMA and sending it to your tutor. It is also a good idea to restrict yourself to the time specified for the exam, so you have practice writing under time pressure.

Checking the Specification

As you know, this course has been written to cover the contents of the **Edexcel Specification 4BI1** which is available to download at www.ool/co.uk/0010bi.

To see this you will need Adobe Acrobat reader on your computer which you can download freely at:

http://get.adobe.com/uk/reader

In the specification, you should look in particular at:

- The Qualification Content
- The Assessment Objectives

You should check your specification periodically throughout the course, so bookmark the Edexcel IGCSE Biology homepage.

The Edexcel International General Certificate of Secondary Education (IGCSE) in Biology is designed for use in independent schools and colleges, and is the same as the Certificate course offered for English state schools. It is part of a suite of IGCSEs in Science offered by Edexcel. The course gives students the opportunity to experience biology within the context of their general education.

The Edexcel IGCSE in Biology enables students to:

- acquire knowledge and understanding of biological facts, concepts and principles;

- develop an appreciation of the significance of biological facts, concepts and principles and the skills needed for their use in new and changing situations;

- appreciate the importance of accurate experimental work to scientific method and reporting;
- form hypotheses and design experiments to test them;

- sustain and develop an enjoyment of, and interest in, the study of living organisms;

- evaluate, in terms of their biological knowledge and understanding, the benefits and drawbacks of scientific and technological developments, including those related to social, environmental and economic issues.

Key Features and Benefits of the Edexcel Specification

The IGCSE in Biology:

- includes aspects of science appropriate for the 21st century
- has straightforward linear assessment
- assesses investigative skills through examination.
- provides a sound foundation for progression to AS and A-level examinations in Biology or other biological disciplines

The Edexcel IGCSE Biology homepage can be accessed by following the Biology link from www.ool.co.uk/0011bi.

There are no forbidden combinations, so you can do Biology *and* Human Biology.

The Examination

The examination you will sit consists of two papers. There is no separate practical exam and no practical coursework component; testing of practical skills is built into both of the theory papers. It is likely that you will need to give written answers to practical-based questions.

Biology Paper 1 Paper code: 4BI1/1B

This is a two-hour examination paper. The total number of marks is 110, 61% of the overall total. The paper examines all of the Specification content *except* those items printed in **bold**, and all of the assessment objectives.

Biology Paper 2 Paper code: 4BI1/2B

This is a 75-minute examination paper. The total number of marks is 70, 39% of the overall total. This paper examines all of the Specification content, including those items printed in **bold** and all of the assessment objectives.

The IGCSE qualification will be graded on a nine-grade scale from 9-1, where 9 is the highest. Students whose level of achievement is below the minimum standard for Grade 1 will receive an unclassified U. Where unclassified is received it will not be recorded on the certificate.

In both papers there will be a range of compulsory short-answer, structured questions, which are ramped to ensure accessibility for less-able students, as well as to stretch more-able students.

In both papers, students may be required to perform calculations, draw graphs and describe, explain and interpret biological phenomena. Some of the question content will be unfamiliar to students; these questions are designed to assess data-handling skills and the ability to apply biological principles to unfamiliar information. Questions targeted at grades highest grades will include questions designed to test knowledge, understanding and skills at a higher level, including some questions requiring longer prose answers.

Calculators can be used in all of these papers.

You will find some sample assessment materials on the Edexcel website. These show you what to expect in your exam, so make sure you look at them and work through the sample questions. You can find this material at www.ool.co.uk/0013bi. (Click on the link "Biology", and then follow the link to your specification and the materials associated with it.)

If you do not have access to the Internet, it is possible to buy a paper copy from Edexcel. The contact details are:

Edexcel Publications
Adamsway
Mansfield
Notts NG18 4FN
Tel: 01623 467 467
Email: publication.orders@edexcel.com

Special Arrangements for 2022 Exam Candidates (only)

Because of the disruption to learning caused by the pandemic and to make exams in 2022 less daunting, students will be told in advance some of the topic areas that will be included on the exam papers, helping them to manage their exam preparation. This information will be issued by Edexcel in the spring term to help students to focus their revision time.

However, the DfE have confirmed that if the impact of the pandemic worsens, this could be issued earlier in the academic year. So please keep an eye on the Edexcel website! If and when this advance information is released, you will be informed and you may find it helpful to discuss your own personal revision process with your tutor.

Past Papers

At the time of writing, past exam papers for the 4BI0 specification are available for download from the Edexcel website at www.ool.co.uk/0014bi.

You can also use these as exam practice. You may send up to two past papers to your tutor for marking, but only after you have successfully completed all the other assignments in your course.

A mock examination that is marked by your tutor is provided as part of this course.

Your Tutor

You have a lot of resources to help you in your studies; your course file, your textbook, internet resources and your tutor. You should make good use of your tutor to help you with any difficulties that you may have during the course especially at the start.

And finally... very good luck with your studies!

Philip West