

BTEC Level 3 Nationals in Applied Science – Edexcel 500/6725/4

Entry Criteria

Students will be expected to achieve 5 GCSE passes grades A*-C including a minimum of grades CC in Double award Science or Distinction in level 2 BTEC Science together with a grade C in Maths and English.

Subject Content

Assessment: There is regular assessment to determine progress in accordance with the school policy

Year 1

Unit 1 [R/502/5536]: Fundamentals of Science

The aim of this unit is to enable learners to develop the practical techniques necessary to pursue a career as a laboratory technician. Learners will investigate the quantities necessary in chemical reactions, the structure and functions of cells, the calorific value of different fuels and develop skills in communicating scientific information.

This unit is assessed by means of a written coursework consisting of the following assignments:

Assignment 1 – Volumetric Analysis Made Easy (P1, P2, M1, D1)

Assignment 2 – Training for Work (P3, P4, P5, M2, D2)

Assignment 3 – Energy for All (P6, P7, M3, D3)

Assignment 4 – Communicating Scientific Information (P8, P9, M4, D4)

Unit 2 [H/502/5539]: Working in the Science Industry

The aim of this unit is to enable learners to gain the knowledge and skills that an employee in the science industry needs to be an effective, efficient and safe member of a team. Learners will know communication practices, how laboratories are designed, how information is stored in laboratory information management (LIMS) and how to work safely in a scientific workplace.

This unit is assessed by means of a written coursework consisting of the following assignments:

Assignment 1 – Work in the Science Industry (P1, P2, M1, M2, D1)

Assignment 2 – Designing a Laboratory (P3, M3, D2)

Assignment 3 – Data Storage (P4, M4, D3)

Assignment 4 – Legislation in the Laboratory (P5, M5, D4)

Unit 4 [M/502/5544]: Scientific Practical Techniques

The aim of this unit is to enable learners to use a range of practical techniques used in science such as the analysis of substances, the separation of substances and the use of instruments/sensors. The variety of techniques in the content allows the unit to be tailored to reflect the focus of different areas of study, eg forensic science, biology, chemistry, physics, electronics and environmental science

This unit is assessed by means of a written coursework consisting of the following assignments:

Assignment 1 – Quantitative Analysis (P1, M1, D1) Stage 1

Assignment 1 – Qualitative Analysis (P1, M1, D1) Stage 2

Assignment 2 – Separating and Estimating Purity (P2, P3, M2, D2)

Assignment 3 – Selecting and Using Instruments/Sensors to Test Materials (P4, M3, D3)

<p>Year 2 Unit 11 [F/502/5550]: Physiology of Human Body Systems</p> <p>The aim of this unit is to enable learners to investigate some of the organ systems of the human body and how they work together. Learners will have an opportunity to use appropriate tests to investigate the cardiovascular, respiratory, digestive and lymphatic systems and the organisation of cells and tissues.</p>	<p>This unit is assessed by means of a written coursework consisting of the following assignments</p> <p>Assignment 1: Levels of Organisation of the Human Body (P1, P2, M1, D1) Assignment 2: Physiology of the Cardiovascular System (P3, M2, D2) Assignment 3: Physiology of the Respiratory System (P4, M3, D2) Assignment 4: Nutritional Content of Foodstuffs (P5, P6, M4, D2) Assignment 5: The Lymphatic System (P7, M5, D3)</p>
<p>Unit 12 [J/502/5551]: Physiology of Human Regulation and Reproduction</p> <p>The aim of this unit is to enable learners to understand of the physiology of human regulation and reproduction. Learners will cover the regulation of body fluids, how the nervous system functions, homeostasis and the human reproductive system.</p>	<p>This unit is assessed by means of a written coursework consisting of the following assignments</p> <p>Assignment 1 – Re-absorption in the Kidney and Associated Abnormalities (P1, M1) Assignment 2 – Maintenance of Bodily Fluids under Different Conditions (P2, D1) Assignment 3 – The Role of the Nervous System and Reflex Arcs in the Body (P3, M2) Assignment 4 – The Structure and Function of the Endocrine System in the Body (P4, M3, D2) Assignment 5 – Homeostatic Mechanisms and Malfunctions Leading to Disorders (P5, M4, D3) Assignment 6 – Primary and Secondary Sex Organs (P6) Assignment 7 – The Role of the Reproductive System in Fertility and Menstruation (P7, M5, D4)</p>
<p>Unit 20 [F/502/5564]: Medical Physics Techniques</p> <p>The aim of this unit is to enable learners to develop, through a practical vocational skills approach, an understanding of the important fundamental physics concepts behind medical physics techniques such as x-rays, ultrasounds, diagnostic imaging and magnetic resonance imaging (MRI) and radiotherapy. Learners will also understand the importance of radiation safety.</p>	<p>This unit is assessed by means of a written coursework consisting of the following assignments</p> <p>Assignment 1: Practical Investigations of Radioactivity (P1, P2, M1, D1) Assignment 2: Raising Awareness of the Uses of Radiopharmaceuticals With a Gamma Camera in Medical Diagnosis (P3, P4, M2, D2) Assignment 3: An Introduction to How an MRI Scanner Works (P5, M3, D3) Assignment 4: Risks and Benefits of Using Radiation With Patients (P6, M4, D4)</p>
<p>Expectations</p> <p>Students are expected to undertake a minimum of 5 hours of Applied science homework per week. In addition to this they are expected to read around the subject in advance of the lesson. Details of the learning outcomes are in their Study Guides with references to their text books. Students are expected to make accurate notes and complete assignments regularly. Students who are struggling with the course content are expected to approach their teacher and/or academic tutor in this subject for extra support. They must also have the correct stationary and a calculator for every lesson.</p>	

Recommended Reference Books

Foale S, Hocking S, Llewellyn R, Musa I, Patrick E, Rhodes P and Sorensen J – *BTEC Level 3 in Applied Science Student Book* (Pearson, 2010) ISBN 9781846906800

Adams S and Allday J – *Advanced Physics* (Oxford University Press, 2000) ISBN 9780199146802

Ciccotti F and Kelly D – *Physics AS* (Collins Educational, 2000) ISBN 9780003277555

Fullick A and Fullick P – *Chemistry: Evaluation Pack* (Heinemann Educational Secondary Division, 2000) ISBN 9780435570965

Fullick A – *Heinemann Advanced Science: Biology* (Heinemann Educational Secondary Division, 2000) ISBN 9780435570958

Fullick P – *Heinemann Advanced Science: Physics* (Heinemann Educational Secondary Division, 2000) ISBN 9780435570972

Thompson A, Lainchbury A and Stephens J – *Advanced Practical Chemistry, 2nd Edition*

Useful websites

www.akzonobel.com Akzonobel (formally the ICI Company)

www.bbc.co.uk/learning BBC learning

www.cellsalive.com CELLS alive

www.nln.ac.uk National Learning Network resources

www.rsc.org The Royal Society of Chemistry

Careers Information

A level 3 in BTEC is a prerequisite to certain degree courses, in particular the Science field. It can lead to further study in a wide range of areas including, Biology, Genetics, Biotechnology, Microbiology, Environmental Science, in addition to numerous other scientific and non-scientific disciplines e.g. teaching, nursing, etc.