

# **Advance Subsidiary Level**

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## Accounting

### Textbooks:

- Cambridge International AS and A Level Accounting by –Harold Randall and David Hopkins
- Advanced Accounting M.M Khan(Vol-1)/Hanif Mukharzee
- Management Accounting (Garison/A.C Shukla/Basu & Dass/Yousuf Ali)

<b>Quarter One</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>The accounting system</b>	<ul style="list-style-type: none"> <li>• Double-entry bookkeeping cash transactions</li> <li>• Double entry bookkeeping: credit transactions</li> <li>• Books of prime (or original) entry</li> <li>• Balancing accounts</li> <li>• The classification of accounts and division of the ledger</li> <li>• The trial balance</li> <li>• Accounting principles or concepts</li> <li>• Preparation of financial statement</li> <li>• Capital and revenue expenditure (work sheet based)</li> </ul>	Chapter 1,2,3,4,5,6,7,8,9
<b>Adjustment to Financial statement and Reconciliation &amp; verification</b>	<ul style="list-style-type: none"> <li>• Accruals and prepayments (the matching concept)</li> <li>• Provision for depreciation of non-current assets</li> <li>• Bad and doubtful debts</li> <li>• Bank reconciliation statements</li> <li>• Control accounts</li> </ul>	Chapter - 10,11,12,13,14

<b>Quarter Two</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Reconciliation &amp; verification</b>  <b>Adjustment to Financial statement</b>  <b>Partner ship</b>  <b>Analysis and communication of Accounting</b>  <b>Cost and management Accounting</b>	<ul style="list-style-type: none"> <li>• Error and suspense</li> <li>• Inventory</li> <li>• Sole trader</li> <li>• Incomplete records</li> <li>• Partnership admission, retirements, dissolution (good will)</li> <li>• Ratio/ interpretation and analysis</li> <li>• Marginal costing</li> </ul>	Chapter - 15,16,20,21,22,28,33

<b>Quarter Three</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Limited company</b>  <b>Traditional costing</b>  <b>Cost volume analysis</b>  <b>Application of accounting of business planning</b>	<ul style="list-style-type: none"> <li>• Cash flow (changes of equity)</li> <li>• Limited company</li> <li>• Absorption costing</li> <li>• Marginal costing</li> <li>• Job, unit, batch costing</li> <li>• Budget (the application of accounting to business planning)</li> </ul>	Chapter- 23,24,30,31,33,34

# **Biology**

## **Textbooks:**

- A Coursebook for Biology 4<sup>th</sup> Edition

<b>Quarter 1</b>		
<b>Unit Title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Cell Structure</b>	<ul style="list-style-type: none"><li>• The microscope in cell studies</li><li>• Cells as the basic unit of living organisms</li></ul>	Chapter-1 Cell Structure
<b>Biological molecules</b>	<ul style="list-style-type: none"><li>• Testing for biological molecules</li><li>• Carbohydrates and Lipids</li><li>• Proteins and water</li></ul>	Chapter-2 Biological molecules
<b>Enzymes</b>	<ul style="list-style-type: none"><li>• Mode of action of enzymes</li><li>• Factors that affect enzyme action</li></ul>	Chapter-3 Enzymes
<b>Cell membranes and transport</b>	<ul style="list-style-type: none"><li>• Fluid mosaic membranes</li><li>• Movement of substances into and out of cells</li></ul>	Chapter-4 Cell membranes and transport

<b>Quarter Two</b>		
<b>Unit Title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>The mitotic cell cycle</b>	<ul style="list-style-type: none"><li>• Replication and division of nuclei and cells</li><li>• Chromosome behavior in Mitosis</li></ul>	Chapter 5. The mitotic cell cycle
<b>Nucleic acids and protein synthesis</b>	<ul style="list-style-type: none"><li>• Structure and replication of DNA</li><li>• Protein synthesis</li></ul>	Chapter 6. Nucleic acids and protein synthesis
<b>Transport in plants</b>	<ul style="list-style-type: none"><li>• Structure of transport tissues</li><li>• Transport mechanisms</li></ul>	Chapter 7. Transport in plants

<b>Quarter Three</b>		
<b>Unit Title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Transport in mammals</b>	<ul style="list-style-type: none"><li>• The circulatory system</li><li>• The heart</li></ul>	Chapter 8. Transport in mammals
<b>Gas exchange and smoking</b>	<ul style="list-style-type: none"><li>• The gas exchange system</li><li>• Smoking</li></ul>	Chapter 9. Gas exchange and smoking
<b>Infectious disease</b>	<ul style="list-style-type: none"><li>• Infectious diseases</li><li>• Antibiotics</li></ul>	Chapter 10. Infectious disease
<b>Immunity</b>	<ul style="list-style-type: none"><li>• The immune system</li><li>• Antibodies and vaccination</li></ul>	Chapter 11. Immunity

## **Recommended reference books:**

- Understanding Biology- by Kent

## Business Studies

Quarter One		
Unit Title	Content	Textbook
<b>Business and its environment</b>	<ul style="list-style-type: none"> <li>• Enterprise</li> <li>• Business structure</li> <li>• Size of business</li> <li>• Business objectives</li> <li>• Stakeholders in a business</li> </ul>	Cambridge International AS and A Level Business by Peter Stimpson and Alastair Farquharson
<b>People in organisations</b>	<ul style="list-style-type: none"> <li>• Management and leadership</li> <li>• Motivation</li> <li>• Human resource management</li> </ul>	

Quarter Two		
Unit Title	Content	Textbook
<b>Marketing</b>	<ul style="list-style-type: none"> <li>• What is marketing?</li> <li>• Market research</li> <li>• The marketing mix</li> </ul>	Cambridge International AS and A Level Business by Peter Stimpson and Alastair Farquharson
<b>Operations and project management</b>	<ul style="list-style-type: none"> <li>• The nature of operations</li> <li>• Operations planning</li> <li>• Inventory management</li> </ul>	

Quarter Three		
Unit Title	Content	Textbook
<b>Finance and accounting</b>	<ul style="list-style-type: none"> <li>• The need for business finance</li> <li>• Sources of finance</li> <li>• Costs</li> <li>• Accounting fundamentals</li> <li>• Forecasting cash flows and managing working capital</li> </ul>	Cambridge International AS and A Level Business by Peter Stimpson and Alastair Farquharson

# Chemistry

Quarter One		
Unit title	Content	Chapter (Textbook)
<b>Atoms, molecules and stoichiometry</b>	<ul style="list-style-type: none"> <li>• Relative masses of atoms and molecules</li> <li>• The mole, the Avogadro constant</li> <li>• The determination of relative atomic masses, <math>A_r</math>, and relative molecular masses, <math>M_r</math>, from mass spectra</li> <li>• The calculation of empirical and molecular formulae</li> <li>• Reacting masses and volumes (of solutions and gases)</li> </ul>	<p>Chemistry Course book</p> <p>Longman A Level Chemistry</p>
<b>Atomic structure</b>	<ul style="list-style-type: none"> <li>• The nucleus of the atom: neutrons and protons, isotopes, proton and nucleon numbers</li> <li>• Electrons: electronic energy levels, ionisation energies, atomic orbitals, extranuclear structure</li> </ul>	
<b>Chemical bonding</b>	<ul style="list-style-type: none"> <li>• Ionic (electrovalent) bonding</li> <li>• Covalent bonding and co-ordinate (dative covalent) bonding                             <ul style="list-style-type: none"> <li>○ The shapes of simple molecules</li> <li>○ Bond energies, bond lengths and bond polarities</li> </ul> </li> <li>• Intermolecular forces, including hydrogen bonding</li> <li>• Metallic bonding</li> <li>• Bonding and physical properties</li> </ul>	
<b>States of matter</b>	<ul style="list-style-type: none"> <li>• The gaseous state:                             <ul style="list-style-type: none"> <li>○ Ideal gas behaviour and deviations from it</li> <li>○ <math>pV = nRT</math> and its use in determining a value for <math>M_r</math></li> </ul> </li> <li>• The liquid state The kinetic concept of the liquid state and simple kinetic-molecular descriptions of changes of state</li> <li>• The solid state Lattice structures</li> </ul>	
<b>Chemical energetics</b>	<ol style="list-style-type: none"> <li>1. Enthalpy changes: <math>\Delta H</math> of formation, combustion, hydration, solution, neutralisation and atomisation; bond energy; lattice energy; electron affinity</li> <li>2. Hess' Law,</li> </ol>	

Quarter Two		
Unit title	Content	Chapter (Textbook)
<b>Atoms, molecules and stoichiometry</b>	<ul style="list-style-type: none"> <li>• Relative masses of atoms and molecules</li> <li>• The mole, the Avogadro constant</li> <li>• The determination of relative atomic masses, <math>A_r</math>, and relative molecular masses, <math>M_r</math>, from mass spectra</li> <li>• The calculation of empirical and molecular formulae</li> <li>• Reacting masses and volumes (of solutions and gases)</li> </ul>	<p>Chemistry Course book</p> <p>Longman A Level Chemistry</p>
<b>Atomic structure</b>	<ul style="list-style-type: none"> <li>• The nucleus of the atom: neutrons and protons, isotopes, proton and nucleon numbers</li> <li>• Electrons: electronic energy levels, ionization energies, atomic orbitals, extra nuclear structure</li> </ul>	
<b>Chemical bonding</b>	<ul style="list-style-type: none"> <li>• Ionic (electrovalent) bonding</li> </ul>	

	<ul style="list-style-type: none"> <li>• Covalent bonding and co-ordinate (dative covalent) bonding <ul style="list-style-type: none"> <li>○ The shapes of simple molecules</li> <li>○ Bond energies, bond lengths and bond polarities</li> </ul> </li> <li>• Intermolecular forces, including hydrogen bonding</li> <li>• Metallic bonding</li> <li>• Bonding and physical properties</li> </ul>	
<b>States of matter</b>	<ul style="list-style-type: none"> <li>• The gaseous state: <ul style="list-style-type: none"> <li>○ Ideal gas behaviour and deviations from it</li> <li>○ <math>pV = nRT</math> and its use in determining a value for <math>M_r</math></li> </ul> </li> <li>• The liquid state The kinetic concept of the liquid state and simple kinetic-molecular descriptions of changes of state</li> <li>• The solid state Lattice structures</li> </ul>	
<b>Chemical energetics</b>	<ul style="list-style-type: none"> <li>• Enthalpy changes: <math>\Delta H</math> of formation, combustion, hydration, solution, neutralization and atomization; bond energy; lattice energy; electron affinity</li> <li>• Hess' Law,</li> </ul>	

<b>Quarter Three</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Reaction kinetics</b>	<ul style="list-style-type: none"> <li>• Simple rate equations; orders of reaction; rate constants</li> <li>• Effect of temperature on rate constants; the concept of activation energy</li> </ul>	
<b>The Periodic Table: chemical periodicity</b>	<ul style="list-style-type: none"> <li>• Periodicity of physical properties of the elements: variation with proton number across the third period (sodium to argon) of: <ul style="list-style-type: none"> <li>○ atomic radius and ionic radius</li> <li>○ melting point</li> <li>○ electrical conductivity</li> <li>○ ionisation energy</li> </ul> </li> <li>• Periodicity of chemical properties of the elements in the third period <ul style="list-style-type: none"> <li>○ Reaction of the elements with oxygen, chlorine and water</li> <li>○ Variation in oxidation number of the oxides (sodium to sulfur only) and of the chlorides (sodium to phosphorus only)</li> <li>○ Reactions of these oxides and chlorides with water</li> <li>○ Acid/base behavior of these oxides and the corresponding hydroxides</li> </ul> </li> </ul>	Chemistry Course book  Longman A Level Chemistry
<b>Group II</b>	<ul style="list-style-type: none"> <li>• Similarities and trends in the properties of the Group II metals magnesium to barium and their compounds</li> <li>• Some uses of Group II compounds</li> </ul>	
<b>Group VII</b>	<ul style="list-style-type: none"> <li>• Characteristic physical properties</li> <li>• The relative reactivity of the elements as oxidizing agents</li> <li>• Some reactions of the halide ions</li> <li>• The manufacture of chlorine</li> </ul>	

	<ul style="list-style-type: none"> <li>• The reactions of chlorine with aqueous sodium hydroxide</li> <li>• The important uses of the halogens and of halogen compounds</li> </ul>	
<b>Electrochemistry</b>	<ul style="list-style-type: none"> <li>• Redox processes: electron transfer and changes in oxidation number (oxidation state)</li> <li>• Industrial uses of electrolysis</li> </ul>	
<b>Equilibria</b>	<ul style="list-style-type: none"> <li>• Chemical equilibria: reversible reactions; dynamic equilibrium <ul style="list-style-type: none"> <li>○ Factors affecting chemical equilibria</li> <li>○ Equilibrium constants</li> <li>○ The Haber process; the Contact process</li> </ul> </li> <li>• Ionic equilibria <ul style="list-style-type: none"> <li>○ Brønsted-Lowry theory of acids and bases</li> </ul> </li> </ul>	

## Computer Science

<b>Quarter One</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Information representation</b>  <b>Communication and Internet technologies</b>  <b>Hardware</b>	<ul style="list-style-type: none"> <li>• Number representation</li> <li>• Images</li> <li>• Sound</li> <li>• Video</li> <li>• Compression techniques</li> <li>• Networks</li> <li>• IP addressing</li> <li>• Client- and server-side scripting</li> <li>• Input, output and storage devices</li> <li>• Main memory</li> <li>• Logic gates and logic circuits</li> </ul>	<p>Cambridge International AS and A Level Computing Coursebook by Chris Leadbetter, Roger Blackford, Tony Piper.</p> <p>Cambridge International AS and A Level Computer Science Coursebook by Tony Piper</p>
<b>Algorithm design and problem solving</b>	<ul style="list-style-type: none"> <li>• Algorithms</li> <li>• Structure chart</li> <li>• Corrective maintenance</li> <li>• Adaptive maintenance</li> </ul>	

<b>Quarter Two</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Processor fundamentals</b>  <b>Security, privacy and data integrity</b>  <b>Ethics and ownership</b>	<ul style="list-style-type: none"> <li>• CPU architecture</li> <li>• The fetch-execute cycle</li> <li>• The processor's instruction set</li> <li>• Assembly language</li> <li>• Data security</li> <li>• Data integrity</li> <li>• Ethics and the computing professional</li> <li>• Ownership of software and data</li> </ul>	<p>Cambridge International AS and A Level Computing Coursebook by Chris Leadbetter, Roger Blackford, Tony Piper.</p> <p>Cambridge International AS and A Level Computer Science Coursebook by Tony Piper</p>
<b>Data representation</b>  <b>Programming</b>	<ul style="list-style-type: none"> <li>• Data types</li> <li>• Arrays</li> <li>• Programming basics</li> <li>• Transferable skills</li> <li>• Selection</li> <li>• Iteration</li> <li>• Built-in functions</li> <li>• Structured programming</li> </ul>	



<b>Quarter Three</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Database and data modeling System software</b>	<ul style="list-style-type: none"> <li>• Database Management Systems (DBMS)</li> <li>• Relational database modelling</li> <li>• Data Definition Language (DDL) and Data Manipulation Language (DML)</li> <li>• Operating system</li> <li>• Utility programs</li> <li>• Library programs</li> <li>• Language translators</li> </ul>	Cambridge International AS and A Level Computing Coursebook by Chris Leadbetter, Roger Blackford, Tony Piper.
<b>Data representation Programming Software development</b>	<ul style="list-style-type: none"> <li>• Files</li> <li>• Programming basics</li> <li>• Transferable skills</li> <li>• Selection</li> <li>• Iteration</li> <li>• Built-in functions</li> <li>• Structured programming</li> <li>• Programming</li> <li>• Program testing</li> <li>• Testing strategies</li> </ul>	Cambridge International AS and A Level Computer Science Coursebook by Tony Piper

## Economics

<b>Quarter One</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Basic economic ideas and resource allocation</b>	<ul style="list-style-type: none"> <li>• Scarcity, choice and opportunity cost</li> <li>• Positive and normative statements</li> <li>• Factors of production</li> <li>• Resource allocation in different economic systems and issues of transition</li> <li>• Production possibility curves</li> <li>• Money</li> <li>• Classification of goods and services</li> </ul>	Reading: Cambridge International AS and A Level Economics Coursebook with CD-ROM by Colin Bamford, Susan Grant <b>Units-1</b>
<b>The price system and the micro economy</b>	<ul style="list-style-type: none"> <li>• Demand and supply curves</li> <li>• Price elasticity, income elasticity and cross-elasticities of demand</li> <li>• Price elasticity of supply</li> <li>• Interaction of demand and supply &amp; Market equilibrium and disequilibrium</li> <li>• Consumer and producer surplus</li> </ul>	<b>Reading:</b> Cambridge International AS and A Level Economics Coursebook with CD-ROM by Colin Bamford, Susan Grant  <b>Units-2</b>
<b>Government microeconomic intervention</b>	<ul style="list-style-type: none"> <li>• Maximum and minimum prices</li> <li>• Taxes (direct and indirect)</li> <li>• Subsidies</li> <li>• Transfer payments</li> <li>• Direct provision of goods and services</li> <li>• Nationalisation and privatisation</li> </ul>	<b>Reading:</b> Cambridge International AS and A Level Economics Coursebook with CD-ROM by Colin Bamford, Susan Grant  <b>Units-3</b>

<b>Quarter Two</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>The macro economy</b>	<ul style="list-style-type: none"> <li>• Aggregate Demand (AD) and Aggregate Supply (AS) analysis</li> <li>• Inflation</li> <li>• Balance of payments</li> <li>• Exchange rates</li> <li>• Marshall-Lerner and J curve analysis</li> <li>• The terms of trade</li> <li>• Principles of absolute and comparative advantage</li> <li>• Protectionism</li> </ul>	Cambridge O Level Economics Student's Book (Cambridge International Examinations) Paperback – 17 Apr 2014 by Susan Grant (Author)  <b>Units-23-41</b>
<b>Government microeconomic intervention</b>	<ul style="list-style-type: none"> <li>• Maximum and minimum prices</li> <li>• Taxes (direct and indirect)</li> <li>• Subsidies</li> <li>• Transfer payments</li> <li>• Direct provision of goods and services</li> <li>• Nationalisation and privatisation</li> </ul>	Reading: Cambridge International AS and A Level Economics Coursebook with CD-ROM By Colin Bamford, Susan Grant  <b>Units-3</b>

**Reading:** Cambridge O Level Economics Student's Book (Cambridge International Examinations) Paperback – 17 Apr 2014 by Susan Grant (Author)

## Law

<b>Quarter One</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Paper-1</b>	Introduction, what is Precedent? Application of the Precedent/how the precedent works, Advantages & disadvantages of the Precedent, Conclusion.	Doctrine of Precedent
	Introduction, composition of the Jury system, Advantages & disadvantages of the Jury system, Conclusion.	Jury System
	Introduction, main problems of the Civil Justice System, Lord Woolf's Reform of the Civil Justice System, Impact of the Reform, Conclusion.	Alternative Methods of Dispute Resolution (ADR)
	Introduction, history of the Equity, Development of the Equity Law, relationship between Common Law and Equity	Common Law and Equity

<b>Quarter Two</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Paper-2</b>	Introduction, what is Statutory Interpretation, what is the approach of Judges to interpret the statute, different rules of Statutory Interpretation, defects different rules of Statutory Interpretation, conclusion.	Statutory Interpretation
	Introduction, discussion and application of the Police and Criminal Evidence Act 1984, conclusion.	Criminal Process (PACE 1984)
	Introduction, Principles of sentencing, Different methods of sentencing, conclusion.	Sentencing Principles and Sections of Courts

<b>Quarter Three</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Paper-1</b>	Introduction Human Rights, history of the development of Human Rights, creation of EU, incorporation of the Convention rights into the UK's domestic law, Conclusion.	Human Rights
	Introduction, main problems the old appointment process, impact of the Constitutional Reform Act 2005, conclusion.	Judiciary
	Introduction, what is the Crown Prosecution Service, role and duties of the Crown Prosecution Service, Conclusion.	Crown Prosecution Service
	Introduction, who is the Lord Chancellor, role and duties of the Lord Chancellor,	Lord Chancellor

### **Recommended reference books:**

- English Legal system- Steve Wilson, Rebeca Mitchell, Tony Storey, Natalie Wortley (2011), 2nd Edition
- The English Legal Process- Terence Inman, 2011, 13th Edition
- The English Legal System- Kate Malleson & Richard Moules (2010), 4th Edition

# Physics

## Textbooks:

- Cambridge International As and A level Physics Coursebook, David Sang, Graham Jones 2<sup>nd</sup> Edition
- International A/As level Physics, Chris Mee, Mike Crundell

<b>Quarter One</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Physical quantities and units</b>	<ul style="list-style-type: none"> <li>• Physical quantities</li> <li>• SI units</li> <li>• Scalars and vectors</li> </ul>	Chapter 1 (International A/As level Physics)
<b>Measurement techniques</b>	<ul style="list-style-type: none"> <li>• Measurements</li> <li>• Errors and uncertainties</li> </ul>	Chapter 2 (International A/As level Physics)
<b>Kinematics</b>	<ul style="list-style-type: none"> <li>• Equations of motion</li> </ul>	Chapter 1 & 2 (Course book)
<b>Dynamics</b>	<ul style="list-style-type: none"> <li>• Momentum and Newton's laws of motion</li> <li>• Non-uniform motion</li> <li>• Linear momentum and its conservation</li> </ul>	Chapter 3 & 6 (Course book)

<b>Quarter Two</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Forces, density and pressure</b>	<ul style="list-style-type: none"> <li>• Types of force</li> <li>• Turning effects of forces</li> <li>• Equilibrium of forces</li> <li>• Density and pressure</li> </ul>	Chapter 4 & 7 (Coursebook)
<b>Work, energy and power</b>	<ul style="list-style-type: none"> <li>• Energy conversion and conservation</li> <li>• Work and efficiency</li> <li>• Potential energy and kinetic energy</li> <li>• Power</li> </ul>	Chapter 5 (Coursebook)
<b>Deformation of solids</b>	<ul style="list-style-type: none"> <li>• Stress and strain</li> <li>• Elastic and plastic behavior</li> </ul>	Chapter 7 (Coursebook)
<b>Waves</b>	<ul style="list-style-type: none"> <li>• Progressive waves</li> <li>• Transverse and longitudinal waves</li> <li>• Determination of frequency and wavelength of sound waves</li> <li>• Doppler effect</li> <li>• Electromagnetic spectrum</li> </ul>	Chapter 13 (Coursebook)

<b>Quarter Three</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Superposition</b>	<ul style="list-style-type: none"> <li>• Stationary waves</li> <li>• Diffraction</li> <li>• Interference, two source Interference</li> <li>• Diffraction gratings</li> </ul>	Chapter 14 & 15 (Coursebook)
<b>Electric fields</b>	<ul style="list-style-type: none"> <li>• Concept of an electric field</li> <li>• Uniform electric fields</li> </ul>	Chapter 8 (Coursebook)
<b>Current of electricity</b>	<ul style="list-style-type: none"> <li>• Electric current</li> <li>• Potential difference and power</li> <li>• Resistance and resistivity</li> </ul>	Chapter 9 (Coursebook)
<b>D.C. circuits</b>	<ul style="list-style-type: none"> <li>• Practical circuits</li> <li>• Kirchoff's laws</li> <li>• Potential dividers</li> </ul>	Chapter 10 & 12 (Coursebook)
<b>Particle and nuclear physics</b>	<ul style="list-style-type: none"> <li>• Atoms, nuclei and radiation</li> <li>• Fundamental particles</li> </ul>	Chapter 16 (Coursebook)

## Pure Mathematics

**Textbooks:**

- Advanced level Mathematics **Pure Mathematics 1** By Hugh Neill and Douglas Quadling

<b>Quarter One</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Coordinates, points &amp; lines</b>	<ul style="list-style-type: none"> <li>• distance</li> <li>• mid points,</li> <li>• Straight line equations</li> <li>• gradient</li> </ul>	Chapter 1
<b>Surds &amp; indices</b>	<ul style="list-style-type: none"> <li>• rule of indices</li> <li>• Properties of surds</li> <li>• Zero, negative &amp; fractional indices</li> </ul>	Chapter 2
<b>Functions &amp; Graphs</b>	<ul style="list-style-type: none"> <li>• Range &amp; domain</li> <li>• Sketch</li> </ul>	Chapter 3
<b>Combining &amp; Inverting Functions</b>	<ul style="list-style-type: none"> <li>• Composite</li> <li>• Sequence as function</li> </ul>	Chapter 11
<b>Quadratics</b>	<ul style="list-style-type: none"> <li>• Completing square</li> <li>• discriminant</li> </ul>	Chapter 4
<b>Inequalities</b>	<ul style="list-style-type: none"> <li>• linear</li> <li>• quadratic</li> </ul>	Chapter 5
<b>Differentiation</b>	<ul style="list-style-type: none"> <li>• gradient of points &amp; curve</li> <li>• equation of tangents &amp; normal</li> </ul>	Chapter 6
<b>Application of Differentiation</b>	<ul style="list-style-type: none"> <li>• increasing &amp; decreasing</li> <li>• maximum &amp; minimum</li> <li>• rate of change</li> </ul>	Chapter 7
<b>Extending Differentiation</b>	<ul style="list-style-type: none"> <li>• differentiating <math>(ax + b)^n</math></li> <li>• Chain rule</li> </ul>	Chapter 12

Quarter Two		
Unit title	Content	Chapter (Textbook)
<b>Sequence</b>	<ul style="list-style-type: none"> <li>Arithmetic Progression</li> </ul>	Chapter 8
<b>Geometric sequence</b>	<ul style="list-style-type: none"> <li>nth term</li> <li>sum</li> <li>convergent sequence</li> </ul>	Chapter 14
<b>Binomial theorem</b>	<ul style="list-style-type: none"> <li>theorem</li> </ul>	Chapter 9
<b>Trigonometry</b>	<ul style="list-style-type: none"> <li>solution</li> <li>graphs</li> <li>proofs</li> </ul>	Chapter 10
<b>Vectors</b>	<ul style="list-style-type: none"> <li>translation of plane</li> <li>unit vector</li> <li>3D</li> <li>Magnitude &amp; scalar product</li> </ul>	Chapter 13
<b>Second derivatives</b>	<ul style="list-style-type: none"> <li>Sketch</li> <li>Maximum &amp; minimum</li> </ul>	Chapter 15
<b>Integration</b>	<ul style="list-style-type: none"> <li>Indefinite &amp; definite integral</li> <li>areas</li> </ul>	Chapter 16
<b>Volume of revolution</b>	<ul style="list-style-type: none"> <li>revolution in <math>x</math> &amp; <math>y</math> axis</li> </ul>	Chapter 17
<b>Radians</b>	<ul style="list-style-type: none"> <li>arc length</li> <li>sector area</li> </ul>	Chapter 18

# Mechanics 1

**Textbooks:**

- Advanced level Mathematics **Mechanics 1** By Douglas Quadling

<b>Quarter One</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Vector &amp; acceleration</b>	<ul style="list-style-type: none"> <li>• Displacement, Velocity &amp; acceleration graph</li> <li>• Formula of motion</li> </ul>	Chapter 1
<b>Force &amp; motion</b>	<ul style="list-style-type: none"> <li>• Newton's 1<sup>st</sup> &amp; 2<sup>nd</sup> law</li> <li>• Types of forces</li> </ul>	Chapter 2
<b>Vertical Motion</b>	<ul style="list-style-type: none"> <li>• Weight</li> <li>• Normal contact force</li> </ul>	Chapter 3
<b>Resolving force</b>	<ul style="list-style-type: none"> <li>• Horizontal , Vertical &amp; angle forces</li> </ul>	Chapter 4
<b>Friction</b>	<ul style="list-style-type: none"> <li>• Limiting frictions</li> <li>• Practical problems</li> </ul>	Chapter 5
<b>Motion due to gravity</b>	<ul style="list-style-type: none"> <li>• Upward &amp; downward projection</li> <li>• Motion on a sloping plane</li> <li>• Vertical motion with air resistance</li> </ul>	Chapter 6

<b>Quarter Two</b>		
<b>Unit title</b>	<b>Content</b>	<b>Chapter (Textbook)</b>
<b>Newton's 3<sup>rd</sup> Law</b>	<ul style="list-style-type: none"> <li>• Force in pairs</li> <li>• Pulleys</li> </ul>	Chapter 7
<b>Work, energy &amp; Power</b>	<ul style="list-style-type: none"> <li>• Equations</li> </ul>	Chapter 8
<b>Potential energy</b>	<ul style="list-style-type: none"> <li>• Conservative and non-conservative force &amp; energy</li> </ul>	Chapter 9
<b>Force as a vector quantity</b>	<ul style="list-style-type: none"> <li>• Combining forces</li> <li>• Equilibrium</li> </ul>	Chapter 10
<b>General motion in straight line</b>	<ul style="list-style-type: none"> <li>• displacement, velocity &amp; acceleration</li> <li>• integration &amp; differentiation of motion</li> </ul>	Chapter 11