



Work Program

Senior Physics

2007 Syllabus

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1. COURSE ORGANISATION

Course Organisation and Assessment Plan (page 4) indicating:

- the sequence and time allocation in hours of the context-based units of work (minimum 55 hours per semester, including assessment)
- relationship between work units, the key concepts and key ideas covered in each context
- a summary of Aviation High's assessment program indicating the following:
 - the tasks used to gather information about students' achievement (numbered for easy identification)
 - the task types (EEI, ERT, SA)
 - EEI'S to be performed in class time and a 1000 word report to be completed in out of class time.
 - SA'S are to be under supervised condition of 1 to 2 hour duration and may include one or more of the following:
 - Short items
 - Practical exercises
 - Paragraph responses
 - Responses to stimulus material
 - ERT'S are to be researched in class time and out of class time over a period of 4 weeks.
 - Reports are to be entirely personal.
 - Teacher monitoring will occur.
 - the timing and conditions (duration, supervision details, etc.) for each task

The course is essentially sequential and developmental such that the concepts and ideas covered early in the course are revisited and further developed in subsequent units. This increasing scope and depth is indicated in the key concepts ideas listed in the course overview below.

YEAR 11	UNIT TITLE	WEEKS (HOURS)	KEY CONCEPTS	KEY IDEAS	GENERAL OBJECTIVES	ASSESSMENT		
						DESCRIPTION	CONDITIONS	
SEM 1 (55h)	1. PEOPLE AND MOVEMENT	6 Weeks (21 h)	F1, F2, F3 M1, M2	F1.1, F1.2, F1.3, F1.4 F2.1, F2.2, F2.3, F2.4 F3.1, F3.2, F3.3, F3.4 M1.1, M1.2, M1.3, M1.4 M2.1, M2.2, M2.5	KCU IP EC	1	SA 1 ½ hours on the unit "people and movement"	Response to unseen stimulus. Supervised exam conditions. No access to notes It may include : Analysis and evaluation of data, text and diagrams, application of algorithms to form justified conclusions/recommendations.
	2 PRINCIPLES OF FLIGHT (AEROSPACE)	4 Weeks (13 h)	F1, F2, F3 M1, M2	F1.1, F1.2, F1.3, F1.4 F2.1, F2.2, F2.3, F2.4 F3.1, F3.2, F3.3, F3.4 M1.1, M1.2, M1.3, M1.4 M2.1, M2.2, M2.5	KCU IP EC	2	EI An 800 - 1000 word discussion based on an aspect of the aerodynamics of a model aircraft.	Approximately 4 weeks allowed for student to complete the investigation. Students may work in pairs/groups to perform and record data. Students will be required to maintain a journal to be submitted with final draft. Teacher monitoring at appropriate intervals. Student reports be entirely personal.
	3A PROPULSION (AEROSPACE)	6 Weeks (21 h)	F1, F2, F3 M1, M2	F1.1, F1.2, F1.3, F1.4 F2.1, F2.2, F2.3, F2.4 F3.1, F3.2, F3.3, F3.4 M1.1, M1.2, M1.3, M1.4 M2.1, M2.2, M2.5	KCU IP EC	3	SA 1 ½ hours on the units 1, 2 and 3A.	Supervised exam conditions. No access to notes It may include : Multi-choice, single word responses, questions requiring short paragraph writing, graphs, tables diagrams, and application of algorithms.
SEM 2 (55h)	4. HEAT and ENGINES	8 Weeks (28 h)	E1, E2, E3 M2 F4	E1.1, E1.4, E1.6 E2.1, E2.2, E2.3, E2.4, E2.5 E3.1, E3.2, E3.4 M2.3 F4.1, F4.2	KCU IP EC	4	ERT Analyse various aerospace engines to justify recommendations. (800 - 1000 Words)	Approximately four weeks to research and present a report one type of aerospace engine. Teacher monitoring at appropriate intervals. Student reports be entirely personal.
	3B. PROPULSION (AEROSPACE)	8 Weeks (27 h)	F1, F2, F3 F4 E1, E2, E3 M1,M2	F 1.1, F 1.2, F 1.3, F 1.4 F 2.1 F 2.2, F 2.3, F 2.4 F 3.1, F 3.2, F3.3, F 3.4 F4.1, F4.2 E1.1, E1.2, E 1.3, E 1.5, E 1.6 E 2.1, E 2.2, E 2.3, E2.4, E 2.5 M 1.1, M1.2, M1.3, M1.4 M2.1, M2.2, M2.3, M2.5	KCU IP EC	5	SA 1 ½ hours on the unit "people and movement", and 'aerospace"	Supervised exam conditions. No access to notes. It may include : Multi-choice, single word responses, questions requiring short and extended paragraph writing, graphs, tables, diagrams, and application of algorithms.

YEAR 12	UNIT TITLE	WEEKS (HOURS)	KEY CONCEPTS	KEY IDEAS	GENERAL OBJECTIVES	ASSESSMENT		
						DESCRIPTION	CONDITIONS	
SEM 3 (55 h)	5a. MAKING ELECTRONS WORK	6 weeks (21 h)	F1, F2, F3, E1, E2, E3 M1, M2.	F1.1, F1.2, F1.3, F1.4. F2.1, F2.2, F2.3, F2.4 F3.1, F3.2, F3.3, E1.1, E1.2, E1.3,E1.5, E1.6 E2.1, E2.2, E2.3, E2.5 E3.1, E3.2, E3.3, E3.4, E3.5 M1.1, M1.2, M1.3, M1.4 M2.1, M2.2, M2.3, M2.4	KCU IP EC	6	SA 2 hours on "making electrons work"	Response to unseen stimulus. Supervised conditions. No access to notes It may include : Analysis and evaluation of data, text and diagrams, application of algorithms to form justified conclusions/recommendations.
	5b. MAKING ELECTRONS WORK	4 weeks (14 h)	F1, F2, F3, E1, E2, E3 M1, M2.	F1.1, F1.2, F1.3, F1.4. F2.1, F2.2, F2.3, F2.4 F3.1, F3.2, F3.3, E1.1, E1.2, E1.3,E1.5, E1.6 E2.1, E2.2, E2.3, E2.5 E3.1, E3.2, E3.3, E3.4, E3.5 M1.1, M1.2, M1.3, M1.4 M2.1, M2.2, M2.3, M2.4	KCU IP EC	7	EEl The EEl report should be about 1000 – 1500 words and based on the current contexts to date or an area of interest negotiated by the student.	Approximately 4 weeks allowed. Teacher monitoring. Student journal required. Data collection may be pair/group based. Students must submit individual reports.
	6. LIVING WITH MAGNETISM	6 weeks (20 h)	F1, F2, F3. E1, E2, E3. M1, M2.	F1.1, F1.2, F1.3, F1.4. F2.1, F2.2, F2.3, F2.4. F3.1, F3.2, F3.3. E1.1, E1.2, E1.3, E1.5. E2.1, E2.2, E2.3, E2.5, E3.1, E3.2, E3.3, E3.4, E3.5 M1.1, M1.2, M1.3, M1.4. M2.1, M2.2, M2.3, M2.4, M2.5	KCU IP EC	8	SA 2 hours. Units included: Living with magnetism Making electrons work People and movement	Supervised. No notes allowed. They may include : Multi-choice, single word responses, questions requiring short paragraph writing, graphs, tables, diagrams, and application of algorithms.

SEM 4 (55 h)	7a THE ATOMIC AGE	4 Weeks (14 h)	F1, F2,F4 E1, E2,E3. M2,	F1.1-F1.4, F2.1-F2.4, F4.3, F4.4 E1.1, E1.2, E1.6, E2.6, E3.1 – 3.4, M2.3	KCU IP EC	9	ERT Research the operation of one of various aspects of nuclear energy. 1000 – 1500 words.	Four weeks to research and present a report on nuclear energy Teacher monitoring at appropriate intervals. Student reports to be entirely personal.
	8. WAVES AND OPTICS IN THE REAL WORLD	4 Weeks (14h)	E1, E2, E3. M2, M3	E1.1, E1.2, E1.3, E1.4, E1.6 E2.1, E2.2, E2.5. E3.1, E3.2, E3.4. M3.1	KCU IP EC	10	SA 2 hours Units include: Waves and Optics in the Real World Newton vs Planck vs Einstein	Supervised in two parts each of one hour duration. No notes allowed. They may include : Multi-choice, single word responses, questions requiring short and extended paragraph writing, graphs, tables, diagrams, and application of algorithms.
	9. NEWTON VS PLANCK VS EINSTEIN	4 Weeks (14 h)	F1, F2, F3. E1, E2, E3. M1, M2, M3.	F1.1.1, F1.3. F2.1, F2.2, F2.3, F2.4. F3.1, F3.2, F3.3. E1.1, E1.2, E1.3, E1.5, E1.6. E2.1, E2.2, E2.5. E3.1, E3.2, E3.3, E3.4, M1.3, M2.3 M3.1, M3.2.				
	7b THE ATOMIC AGE	4 weeks (13 h)	F1 F3 E1,E2,E3 M1,M2,M3	F1.1, F1.2 F3.1 E1.1, E1.5, E1.6 E2.5 E3.3 M1.4, M2.3 M3.1	KCU IP EC	11	SA 2 hours on atomic structure	Supervised conditions. No access to notes. It may include : Multi-choice, single word responses, questions requiring short and extended paragraph writing, graphs, tables, diagrams, and application of algorithms.

3. CONTEXTS and Units

The following section contains an outline of two of Aviation High's contextualized units, showing:

- name of unit
- the time in hours
- a brief overview of the context
- main focus areas
- the key ideas (using codes from the syllabus and earlier in the work program)
- examples of learning experiences offered to students
- resources available in school
- assessment items

Sequence

Year 11:

UNIT	CONTEXT
1	PEOPLE AND MOVEMENT
2	PRINCIPLES OF FLIGHT
3	PROPULSION
4	HEAT AND ENGINES

Year 12:

UNIT	CONTEXT
5	MAKING ELECTRONS WORK
6	LIVING WITH MAGNETISM
7	THE ATOMIC AGE
8	WAVES AND OPTICS IN THE REAL WORLD
9	NEWTON vs PLANCK vs EINSTEIN

CONTEXT 2: PRINCIPLES OF FLIGHT

Context: The movement of people and goods is all pervasive in the modern world. The study of planes and rockets is the focus of this unit and will give students the opportunity to develop and contextualise previous studies of force and motion.

Time: 22 HOURS

FOCUS	KEY CONCEPTS	OBJECTIVES Upon completion of this context the student will be given the opportunity to:	ASSESSMENT TASK	LEARNING EXPERIENCES
PRINCIPLES OF FLIGHT (AEROSPACE)	F1 F2 F3 M1 M2	<ul style="list-style-type: none"> *Collect, translate, recall, explain, analyse and organise information on aerospace. *Communicate and critically evaluate ideas and information on aerospace. *Plan, refine and organise activities on model aircraft. * Analyse complex and unseen graphical representations of data. * Construction, experimentation and analysis of data on model aircraft. *Work with others. *Solve simple and challenging problems involving flight. <p>Students will be given the chance to apply their knowledge gained in unit two to many aspects of aviation i.e. the concepts and ideas involving : Measurement, motion, force impulse and momentum.</p> <p>Students will further enhance their knowledge and understanding by investigating:</p> <ul style="list-style-type: none"> * the aerodynamics and forces on aircraft * stability controls and manoeuvring of aircraft * transonic, hypersonic and supersonic travel 	EEI	<p>Extensive laboratory activities and experiments on motion and force. Collaborative learning, planning and organising of activities. Use of Technology e.g. use of wind tunnel and associated electronic equipment. Solving problems individually and as a member of a group or team. Model building Experiments on various aspects of flight including the construction and modification of various physical features of model aircraft to testing their affect on its aerodynamics.</p>

CONTEXT 5: MAKING ELECTRONS WORK

Context: We all live in an electric world where we use electrical energy for our everyday needs. A study of everyday electrical appliances and the electrical principles upon which they work is the focus of this unit.

Time 35 Hours

FOCUS	KEY CONCEPTS	OBJECTIVES Upon completion of this context the student will be given the opportunity to:	ASSESSMENT TASK	LEARNING EXPERIENCES The following are some of the learning experiences within this context
Electrostatics, Current electricity and electronics (39 hours)	F1 F2 F3 E1 E2 E3 M1 M2	<p>*Collect, translate, recall, explain, integrate, analyse, critically evaluate, integrate and organise information on electrical phenomena.</p> <p>*Communicate, reflect upon, refine, clarify and discriminate between ideas and information on static and current electricity as well as electronics.</p> <p>*Design, plan, validate and organise activities on electrical experiments.</p> <p>*Analyse complex and unseen graphical representation of data.</p> <p>*Work with others.</p> <p>*Translate, elucidate and solve challenging problems involving electricity.</p> <p>In particular students will be given the chance to develop the general objectives in their study of: Elementary charges, Coulomb's Law, electric fields, electric potential energy, electric potential, Electric work and power, capacitors and reactance, semi-conductors and transistors and amplifiers.</p> <p>Most of the above will be hands on and contextualised by applying, at appropriate moments, the theory and principles learnt to everyday electrical instruments and home appliances.</p> <p>Students will further contextualise this unit by performing a substantial EEI on an electrical apparatus. e.g. electrical cells, capacitors etc.</p>	SA and EEI	Teacher exposition and questioning. Collaborative learning, Planning and organising activities. Use of technology including: Electrical circuits Analogue and digital measuring instruments Computers Electrical generators Electronic equipment eg diodes, transistors etc. Laboratory activities and experiments. Assignment work. Critique on DVD's and Video observations Collection and collation of secondary information


6. EXAMPLE OF A STUDENT PROFILE

This is a summary of assessment tasks included in a student's Verification Folio.

The folio is a collection of individual instruments, and is to be judged as a whole, rather than as the sum of its parts. Although the total folio must demonstrate a student's achievements in all three general objectives (KCU, IP, EC), the emphasis on each criterion, will vary from instrument to instrument. An on-balance judgment must be made about the student's achievement in each criterion of the exit standards.

It is not an appropriate practice to 'add-up' or aggregate grades to arrive at an overall judgment about the level of student achievement within each criterion. An on-balance judgment will be made in each criterion based on each student's responses to the assessment instruments. This judgment is informed and validated by matching the student's responses to the standards associated with the exit criteria (Senior Syllabus physics 2007, p30-31).

Student achievement on individual tasks is for feedback purposes only and informs record keeping on the student record card. Decisions regarding interim and exit levels of achievement will be made on the folio of evidence and the extent to which it reflects the exit standards.

Year	2014-2015					
Subject	PHYSICS					
Teacher						
Student		Student number				
		Criteria			Overall	
Assessment		KCU	IP	EC		
Sem 1	1. SA					
	2. EEI					
	3. SA					
Sem 2	4. ERT					
	5. SA					
	Monitoring					
Sem 3	6. SA					
	7. EEI					
	8. SA					
Sem 4	9. ERT					
	10. SA					
	Verification					
	11. SA					
	Exit					