

2021 National Revised ATP: Grade 12– Term 1: Electrical Technology: Electronics

TERM 1 (45 days)	Week 1: 27-29 Jan (3)	Week 2: 01-05 Feb (5)	Week 3: 08-12 Feb (5)	Week 4: 15-19 Feb (5)	Week 5: 22-26 Feb (5)	Week 6: 1-5 March (5)	Week 7: 8- 12 March (5)	8: 15-19 Mar (5)	9: 23-26 Mar (4)	10:- 29-31 March (3)	
CAPS Topics	Safety (Generic)	RLC	RLC	RLC	RLC	Semi-conductor Devices	Semi-conductor Devices	Semi-conductor Devices	Remediation PAT finalisation, Revision	Assignment	
Topics /Concepts, Skills and Values	First Aid HIV/Aids Awareness OHS act Machine specific safety measures	Effect of alternating current on R, L and C components in series and parallel circuits	<ul style="list-style-type: none"> Inductive Reactance $X = 2\pi fL$ Capacitive Reactance 	<ul style="list-style-type: none"> Impedance Power Phase angle Power factor Phasor and wave representation Resonance Q factor & Bandwidth 	Calculations <ul style="list-style-type: none"> Series and parallel combination circuits containing ONE resistor, ONE capacitor and ONE inductor Frequency changes Phasor and wave representation Resonance Phasor diagram 	The Field Effect Transistor <ul style="list-style-type: none"> Basic construction, symbols, operation, characteristics Types of FET (NFET, JFET, MOSFET) Characteristic curves & typical operating voltages, Application as a switch Application as an amplifier 	Uni-junction and Darlington Transistor <ul style="list-style-type: none"> Basic construction, symbols, functional operation, characteristics Characteristic curves & typical operating voltages Application as a switch Application as saw tooth generator Application as an amplifier 	Semi-conductor Devices	<ul style="list-style-type: none"> 		
Requisite pre-knowledge	Introduction of the OHS Act, Electrical Machinery Regulations	The effect of AC on RLC series circuits					Introduction to Semiconductor and solid-state devices				
Resources (other than textbook) to enhance learning	OHS act - Safety signs in workshop First aid training manuals	Educational videos and IT related resources. Old question papers	Educational videos and IT related resources. Old question papers	Educational videos and IT related resources. Old question papers	Educational videos and IT related resources. Old question papers	RLC simulation "spook Box"	Educational videos and IT related resources. Old question papers	Educational videos and IT related resources. Old question papers. FET and Darlington simulations	Educational videos and IT related resources. Old question papers	Educational videos and IT related resources. Old question papers	
Assessment	Informal Assessment: Remediation	(Classwork / Case studies / Worksheets / Homework / Theory and Practical etc.)									

	SBA (Formal)	<p style="text-align: center;">Assignment PAT Simulations 1 completed</p> <p>The legislation governing workplaces in relation to COVID – 19 is the Occupational Health and Safety Act, Act 85 of 1993, as amended, read with the Hazardous Biological Agents Regulations. Section 8 (1) of the Occupational Health and Safety (OHS) Act, Act 85 of 1993, -</p> <p>Safe work practices are types of administrative controls that include procedures for safe and proper work used to reduce the duration, frequency, or intensity of exposure to a hazard. Examples of safe work practices for SARS-CoV-2 include. Requiring regular hand washing or using of alcohol-based hand rubs. Learners and teachers should always wash hands when they are visibly soiled and after removing any PPE. Keep safe distances and wear a mask at all times.</p> <p>See the document on the workshop safety measures</p>
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2021 National Revised ATP: Grade 12– Term 2: Electrical Technology: Electronics

TERM 2 (51 days)	Week1: 13-16 Apr (4)	Week2: 1 9-23 Apr (5)	Week3: 26-30 Apr (4)	Week4: 03-07 May (5)	Week5: 10-14 May (5)	Week6: 17-21 May (5)	Week 7: 24-28May (5)	Week 9: 07-11 June (5)	Week 10 0-11: 14-25 June (9 day)	
CAPS Topics	Switching Circuits	Switching Circuits	Switching Circuits	Switching Circuits	Switching Circuits	Switching Circuits	Amplifiers	Remediation, PAT consolidation and Revision	Practical simulation	
Topics /Concepts, Skills and Values	Principle of Operation of Switching Circuits using Operational Amplifiers and Timers <ul style="list-style-type: none"> • Multi-vibrators ▣ Bistable Multi-vibrator • Circuit diagram and operation • Measurement of input and output waveforms 	Mono-stable Multi-vibrator <ul style="list-style-type: none"> ▣ Circuit diagram and operation ▣ Measurement of input and output waveforms. Practical: Construct a Mono-stable Amplifier on a breadboard using a 741 Op-Amp / 555 Timer and LEDs Astable Multi-vibrator <ul style="list-style-type: none"> ▣ Circuit diagram and operation ▣ Measurement of input and output waveforms. 	Practical: Construct an Astable Amplifier on a breadboard using a 741 Op-Amp /555 Timer and show output using LEDs and the Oscilloscope Schmidt Trigger <ul style="list-style-type: none"> ▣ Circuit diagram and operation ▣ Display the input waveform in relation to the output waveform on the Oscilloscope 	Practical: Construct a Schmidt Trigger on a breadboard using a 741 Op-Amp Comparator and Summing Amplifier <ul style="list-style-type: none"> ▣ Circuit diagram and operation ▣ Display the input waveform in relation to the output waveform on the Oscilloscope. Calculations, etc. 	Practical: Construct a comparator on a breadboard using a 741 Op-Amp Practical: Construct a summing amplifier on a breadboard using a 741 Op-Amp	Differentiator and Integrator <ul style="list-style-type: none"> ▣ Circuit diagram and operation ▣ Display the input waveform in relation to the output waveform on the Oscilloscope ▣ Influence of time constant on the output waveform 	Amplifier Theory <ul style="list-style-type: none"> • Determination of a typical load line by means of Ohm's Law (Revision) • Basic concept of class A, B and C amplifiers AB • Principles of negative feedback / the Decibel and Log 			
Requisite pre-knowledge	Electronic components and how they work							Operating principal of the transistor as an amplifier		
Resources (other than textbook) to enhance learning	Educational videos and IT related resources. Old question papers	Educational videos and IT related resources. Old question papers. 741 Op Amp and 555 IC simulations	Educational videos and IT related resources. Old question papers. 741 Op Amp and 555 IC simulations	Educational videos and IT related resources. Old question papers.	Educational videos and IT related resources. Old question papers.	Educational videos and IT related resources. Old question papers. 741 Op Amp and 555 IC simulations	Educational videos and IT related resources. Old question papers.	Educational videos and IT related resources. Old question papers.		
Assessment	Informal Assessment: Remediation	(Classwork / Case studies / Worksheets / Homework / Theory and Practical etc.)								
	SBA (Formal)	<p style="text-align: center;">Practical Simulation PAT Simulations 2 completed</p> <p>The legislation governing workplaces in relation to COVID – 19 is the Occupational Health and Safety Act, Act 85 of 1993, as amended, read with the Hazardous Biological Agents Regulations. Section 8 (1) of the Occupational Health and Safety (OHS) Act, Act 85 of 1993, - Safe work practices are types of administrative controls that include procedures for safe and proper work used to reduce the duration, frequency, or intensity of exposure to a hazard. Examples of safe work practices for SARS-CoV-2 include. Requiring regular hand washing or using of alcohol-based hand rubs. Learners and teachers should always wash hands when they are visibly soiled and after removing any PPE. Keep safe distances and wear a mask at all times. See the document on the workshop safety measures</p>								

2021 National Revised ATP: Grade 12– Term 3: Electrical Technology: Electronics

TERM 3 (52 days)		Week1: 13-16 Jul (4)	Week 2: 19-23 Jul (5)	Week3: 26-30 Jul (5)	Week 4: 02-06 Aug (5)	Week 5: 10-13 Aug (4)	6: 16-20 Aug (5)	7: 23-27 Aug (5)	8: 30 Aug- 3 Sept (5)	9: 06-10 Sept (5)	10 13-17Sept (9)	11 20-23Sept (9)	
CAPS Topics		Amplifiers	Amplifiers	Amplifiers	Amplifiers	Amplifiers	Amplifiers	Practicals	Practicals		Preparatory Examinations	Preparatory Examinations	
Topics /Concepts, Skills and Values		Resistor Capacitor Coupled Amplifier (NPN Transistor) • Basic operation • Circuit diagram & practical • Input and output curves • Frequency Response curve • Gain & loss in decibel calculations	Transformer Coupled Amplifier (NPN Transistor) • Basic operation • Circuit diagram • Input and output curves • Frequency Response curve	Push Pull Amplifier (NPN / PNP Transistor) • Basic operation • Circuit diagram & practical • Input and output curves • Frequency	Response curve • Gain & loss in decibel calculations • Typical biasing	Radio Frequency Amplifier • Basic operation • Circuit diagram • Input and output curves	• Frequency Response curve • Typical biasing Practical: Construct a simple RF Amplifier	PAT Project					
Requisite pre-knowledge		Operating principal of the transistor as an amplifier											
Resources (other than textbook) to enhance learning		Educational videos and IT related resources. Old question papers.	Educational videos and IT related resources. Old question papers.	Educational videos and IT related resources. Old question papers.	Educational videos and IT related resources. Old question papers.	Educational videos and IT related resources. Old question papers.							
Assessment	Informal Assessment: Remediation												
	SBA (Formal)												

2021 National ATP: Grade 12– Term 4: Electrical Technology: Electronics

TERM 4 (47days)		1: 05-08 Oct (4)	2: 11-15 Oct (5)	3: 18-22 Oct (5)	4: 25-29 Oct (5)	5: 01-05 Nov (5)	6: 08-12 November (5)	7: 15-19 Nov (5)	8: 22-26 Nov (5)	9: 29 Nov – 3 Dec (5)	10- 06-08 Dec (3)
CAPS Topics		Amplifiers	Amplifiers	Amplifiers	Amplifiers	Final PAT moderation and Revision		Examination	Examination	Examination	Examination
Topics /Concepts, Skills and Values		Hartley Oscillator (NPN or FET Transistor) • Basic operation • Circuit diagram • Output waveform • Tank Circuit	Colpitts Oscillator (NPN or FET Transistor) • Basic operation • Circuit diagram • Output waveform • Tank Circuit	RC Phase Shift Oscillator (NPN or FET Transistor) • Basic operation • Circuit diagram • Output waveform • Tank Circuit	Practical: Construct an RC Phase Shift Oscillator on a breadboard and show the output wave on an oscilloscope						
Requisite pre-knowledge		Operating principal of the transistor as an amplifier									
Resources (other than textbook) to enhance learning		Educational videos and IT related resources. Old question papers.	Educational videos and IT related resources. Old question papers.	Educational videos and IT related resources. Old question papers.							
Assessment	Informal Assessment: Remediation	(Classwork / Case studies / Worksheets / Homework / Theory and Practical etc.)									
	SBA (Formal)	Final Examination									