SUBJECT GUIDE:
Solve Problems in Low Voltage D.C. Circuits

National ID		Unit of Competency (UoC) Name	
UEENEEE104A		Solve Problems in Low Voltage D.C. Circuits	

For additional information – see Training.gov.au link

Year and Semester:	2019
Prerequisites:	• **UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace** •
eLearn:	Hptt//:wired4imagination.com
Teacher Name(s) and Contact Details:	Ken Meyer ☎0419226478 💻 Kenneth.meyer55@gmail.com

Subject Summary:

This unit covers determining correct operation of single source d.c. series, parallel and series-parallel circuits and providing solutions as they apply to various electrotechnology work functions. It encompasses working safely, problem solving procedures, including the use of voltage, current and resistance measuring devices, providing solutions derived from measurements and calculations to predictable problems in single and multiple path circuits.

Assessment:

You will need to complete the following assessment items to be successful in this subject/s. Further details regarding assessment items will be provided by your teacher.

No	Assessment Name – brief description of assessment	Dates
KA1	**Practice Knowledge Assessment #1 Topics 1 to 7.** **Information for Students**: You may have two (2) attempts for this assessment. If your first attempt is not successful, your teacher will discuss your results with you and will arrange a second attempt.. If your second attempt is not successful, you will be required to re-enrol in this unit. Only one re-assessment attempt will be granted for each assessment item. **Time Allowed:** 3 Hours **Materials Provided:** Working out paper **Assessment Range and Conditions:** The Assessment will be conducted during regular class time in a 4 hour block. All work must be the students own work. Textbook "Electrical trade principles", clean equation sheet. Student must supply their own calculator, pens pencils and drawing equipment. Student **may not use** or have access to: smart phone, unit practical workbook, personal notes. Student must provide their own device for all on-line assessments. **Assessment Criteria:** To achieve a Satisfactory result, your assessor will be looking for your ability to demonstrate the key skills/tasks/knowledge detailed in the Assessment Task to industry standard. A result of 100% in every topic is a Satisfactory Result. This is a limited open book assessment. *Books you may use and you must provide are: Textbook, and Clean Equation Sheet.* *You must also provide all pens, pencils, drawing equipment and a calculator.*	Session 8
KA2	**Practice Knowledge Assessment #2 Topics 8 to 15** **Information for Students**: You may have two (2) attempts for this assessment. If your first attempt is not successful, your teacher will discuss your results with you and will arrange a second attempt.. If your second attempt is not successful, you will be required to re-enrol in this unit. Only one re-assessment attempt will be granted for each assessment item. **Time Allowed:** 3 Hours **Materials Provided:** Working out paper **Assessment Range and Conditions:** The Assessment will be conducted during regular class time in a 4 hour block. All work must be the students own work. Textbook "Electrical trade principles", clean equation sheet. Student must supply their own calculator, pens pencils and drawing equipment. Student **may not use** or have access to: smart phone, unit practical workbook, personal notes. Student must provide their own device for all on-line assessments. **Assessment Criteria:** To achieve a Satisfactory result, your assessor will be looking for your ability to demonstrate the key skills/tasks/knowledge detailed in the Assessment Task to industry standard. A result of 100% in every topic is a Satisfactory Result. This is a limited open book assessment. *Books you may use and you must provide are: Textbook, and Clean Equation Sheet.* *You must also provide all pens, pencils, drawing equipment and a calculator.*	Session 16

What you will need:

To be successful in this subject you must have all the following resources:

- Drawing Set (Compass (large Span), protractor, 30mm ruler), four colours of pens or pencils. (Black, Red, Blue, Green)
- Scientific Calculator (Preference Casio FX82, FX100, or FX991)
- Graph paper (5mm). You will need a large amount of this. Suggest you purchase a full pad.
- Multimeter (CAT III or IV) optional.
- Bring your own device (BOD) is required for this unit. All knowledge assessment are web-based and much of the content in the form of Video and Audio podcasts. You must bring your own device to all lessons.
- For this subject requires the following texts to be purchased including or similar to the following learning resources: Please note that all Audio Podcasts and Videos are based in these texts.
  - Phillips, P, Electrical Principles, Cengage Learning, Second Edition These learning resources are generally available from the book shop.
  - Direct Current Circuits Learner Workbook, NSW TAFE – Product code 5632, Training and Education Support Industry Skills Unit, Meadowbank, NSW TAFE.
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Schedule:

To be successful in this subject you must engage in a range of activities. It is recommended that, in addition to scheduled classes, you will require between 1-1.5 hours per week for additional learning. You will need the textbook "**Electrical Principles 3rd Ed**", by Peter Philips. All podcasts and Video lessons are based on this textbook. You will also be required to have the student practical workbook. Also required are a notebook, graph paper (5mm2) and at least 4 colours of pens or pencils, 30cm ruler, Protector, large reach (span) compass. Failure to come to class without the appropriate tools is tantamount to turning up the job site without your toolbox! Failure to have all the resources listed above by the second week of semester will result in your employer being notified and you should return to work.

Please see your class timetable for further dates, times and classrooms (if applicable).

Session (Date optional)	**What's on this session**
1	DC Lab Passport (How to use DC measuring equipment and training aids). Connecting Series and Parallel AC circuits. Learning how to learn in Electrotechnology. Cognitive Toolbox. Student must purchase textbook, Workbook, graph paper, drawing instruments etc. 
2	Textbook Chapter 1 (page 2) should be reviewed prior to class, via Video, Reading or Podcast. DC Lesson #1 The Electric Circuit (Parts 1.0 -1.12) • Electrical Industry • Safety • Voltage, Current, Resistance • Circuit diagrams, Open Closed. • Making measurements
3	Textbook Chapter 2 (page 25) should be reviewed prior to class, via Video, Reading or Podcast. Lesson #2 Voltage sources and effects of current (Parts 2.1 – 2.3) • Producing a voltage • Effects of an electric current • Protection from the effects of an electric current
4	Textbook Chapter 3 (page 359) should be reviewed prior to class, via Video, Reading or Podcast. Lesson # 3 Ohms Law (Parts 3.1- 3.5) • Ohms Law • Metric prefixes • Engineering notation • Using engineering notation
5	Textbook Chapter 4 (page 64) should be reviewed prior to class, via Video, Reading or Podcast. Lesson # 4 Electrical Power (Parts 4.1-4.6) • Energy and work • Power : Electrical power • Power and Ohms Law • Power in relation to Voltage, Current and resistance

6	Textbook Chapter 5 (page 89) should be reviewed prior to class, via Video, Reading or Podcast. Lesson #5 Resistance and Resistors. (Part 5.1 – 5.4) • Factors affecting resistance • Resistors • Resistor colour codes • Measuring resistance
7	**Knowledge Assessment 1 (Topics 1 – 7 inc.)** **Information for Students**: You may have two (2) attempts for this assessment. • If your first attempt is not successful, your teacher will discuss your results with you and will arrange a second attempt. As part of the second attempt all relevant topic quizzes must be complete with 100% achieved before the re-sit. • If your second attempt is not successful, you will be required to re-enrol in this unit. • Only one re-assessment attempt will be granted for each assessment item. **Time Allowed:** 3 Hours **Materials Provided:** Working out paper, One sheet per question, must have students name and question number! Must be handed back to the teachers at the end of the assessment **Assessment Range and Conditions:** • The Assessment will be conducted during regular class time in a 4 hour block. • All work must be the students own work • Student must supply their own calculator, pens pencils and drawing equipment. • Equation sheet **Assessment Criteria:** To achieve a Satisfactory result, your assessor will be looking for your ability to demonstrate the key skills/tasks/knowledge detailed in the Assessment Task to industry standard. Textbook "Electrical trade principles", internet access, equation sheet. Student must supply their own calculator, pens pencils and drawing equipment. Student **may not use** or have access to: smart phone, unit workbook, personal notes. • A result of 100% or in every topic is a Satisfactory Result
8	Textbook Chapter 6 (page 109) should be reviewed prior to class, via Video, Reading or Podcast. Lesson #6 Series Circuits (Parts 6.1 – 6.7) • The series circuit • Current is a series circuit • Voltage and Kirchhoff's law • Power • Faults
9	Textbook Chapter 7 (page 126) should be reviewed prior to class, via Video, Reading or Podcast. Lesson #7 Parallel Circuits (Parts 7.1-7.8) • The parallel circuit • Voltage & Current • Resistance • Power • Faults

XXXXXXX	**Term Break (Two weeks!)**
10	Textbook Chapter 8 (page 144) should be reviewed prior to class, via Video, Reading or Podcast. Lesson #8 Series-Parallel Circuits (Parts 8.1-*4) • Resistance • Ohms Law • Power
11	Textbook Chapter 9 (page 158) should be reviewed prior to class, via Video, Reading or Podcast. Lesson #9 Basic meters.(Parts 9.1-9.8) • Digital and Analogue movements • The Ammeter • The voltmeter • The Ohmmeter • Multi-meters
12	Textbook Chapter 10 (page 189) should be reviewed prior to class, via Video, Reading or Podcast. Lesson #10 Capacitance (Part 10.1 =10.10) (ES Topic 13) • Electrostatics • Factors affecting capacitance • Types of capacitors • Capacitor in parallel • Capacitors in series • The RC or Time Constant circuit
13	*Revision General*

14	**Knowledge Assessment 2 (Topics 9 – 15 inc.)** **Information for Students**: You may have two (2) attempts for this assessment. • If your first attempt is not successful, your teacher will discuss your results with you and will arrange a second attempt. As part of the second attempt all relevant topic quizzes must be complete with 100% achieved before the re-sit. • If your second attempt is not successful, you will be required to re-enrol in this unit. • Only one re-assessment attempt will be granted for each assessment item. **Time Allowed:** 3 Hours **Materials Provided:** Working out paper, One sheet per question, must have students name and question number! Must be handed back to the teachers at the end of the assessment **Assessment Range and Conditions:** • The Assessment will be conducted during regular class time in a 4 hour block. • All work must be the students own work • Student must supply their own calculator, pens pencils and drawing equipment. • Equation sheet **Assessment Criteria:** To achieve a Satisfactory result, your assessor will be looking for your ability to demonstrate the key skills/tasks/knowledge detailed in the Assessment Task to industry standard. Student may have a copy of Textbook "Electrical trade principles", internet access, equation sheet. Student must supply their own calculator, pens pencils and drawing equipment. Student **may not use** or have access to: smart phone, unit workbook, personal notes or Energy Space content. • A result of 100% in every topic is a Satisfactory Result
16	**Finalisation of Unit and Outstanding Assessments.** All students are to attend class unless notified by the teacher.

Knowledge Assessment Summary by Topics (Energy Space)

Knowledge Assessment #1 T1 - 7	**Knowledge Assessment #2 T8 – T15**
T1 : Q1 – Q4 (Basic concepts)	T8 : Q36 - Q39 (Series Circuits)
T2 : Q5 – Q7 (Basic circuits)	T9 : Q40 – Q44 (Parallel Circuits)
T3 : Q8 – Q14 (Ohms Law)	T10 : Q45 – Q49 (Series - Parallel)
T4 : Q15 – Q20 (Electrical Power)	T11 : Q50 – Q54 (Factors affecting resistance)
T5 : Q21 – Q25 (Effects of electrical current)	T12 : Q55 – Q58 (Affect of meters in circuits)
T6 : Q26 – Q30 (Sources of EMF and Energy conversion)	T13 : Q59 – Q65 (Resistance measurement)
T7 : Q31– Q35 (Resistance and Resistors)	T14 : Q66 – Q69 (Capacitance)
	T15 : Q70 – Q72 (Capacitors in series & Parallel)

Additional Information: