

# A-1

## A-1 Technical Training

### HNC in Electrical Engineering

By

### Distance Learning

A-1 Technical Training  
Logis-Tech Associates  
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Scotland

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Dear Student,

Welcome to A-1 Technical Training. Hoping you find this HNC course a worthwhile, beneficial, learning experience. We are endeavouring to make this course as straightforward as possible and indeed preparing you for the HND/degree course later on in the future. This will be your ultimate goal.

Your tutor for this programme is:

**Tutor:**

**Hugo Gallagher**

**Address:**

**A-1 Technical Training  
Logis-Tech Associates  
140 Boyd Street  
Crosshill  
Glasgow  
G42 8TP  
Scotland**

**Contact Details:**

**Tel No: 0141 423 6911  
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Email: [hugo@logis-tech.co.uk](mailto:hugo@logis-tech.co.uk)**

**Payments:**

Payments for future units/modules can be made in three ways:

- (i) cheque made payable to A-1 Technical Training.
- (ii) A BACs transfer can also be arranged or
- (iii) via credit card through [www.paypal.co.uk](http://www.paypal.co.uk) {a secure web site for accepting credit card details}.

For this method go to the main page of [www.logis-tech.co.uk](http://www.logis-tech.co.uk) and scroll down to the bottom of the page to the PayPal banner. Click on this banner, register and then enter your details.

# A-1

# TECHNICAL TRAINING

## *Learning Provider of Technological Solutions*

### Study Guide

Dear Student,

On initial inspection, of your teaching material/book. You may feel. Oh my! It is an awful lot of learning/reading. Do not be put of by this. Everyone has to go through the same. Take you time and you will progress.

Everyone has different ways/techniques for learning. Some listen to the radio, others watch TV, some start up self- study groups. I myself used to prefer silence.

If I was to start reading this material, I could bet you by page 15, I would be dropping off to sleep. I would then go away and make myself a cup of tea. I would come back to the notes and say to myself, “I don’t remember a single thing that I just read.” I better start at the beginning again.

I would start reading again and by page 25, I would, once again, be starting to drift off to sleep. I would then go away for another cup of tea/coffee. On my return, I would say to myself, “I remember very little of the last 25 pages that I read. I will never get through this, at this rate.

### **Until I used this Study Method.**

I read the first page slowly and then I ask the question. What is the objective? What is important? I then write down on a blank sheet of paper a few lines of the important points. A good paragraph is about average. Summarise in your own words if you can. I then move on to page 2 and do the same, and so on. One of the advantages is you rarely have to do repeat reading over and over.

I find this method very useful. It keeps your concentration for a lot longer and breaks up just reading all the time. When you come to do your Supportive Assignments, you usually can find the answers quickly and you might even be able to answer some of the questions directly from your shorten versions of the notes.

Set yourself an hour or two-hour spell and you might surprise yourself how quickly and easily you go through the material. Remember, it is good practise, to do one Supportive Assignment at a time.

You of course might have a better, suited technique. I just thought I would tell you of one of mine that I use.

Open learning can be quite a lonesome learning experience, when you do not be involved in a classroom environment so feel free to email me as you wish. I will try to come back to you as soon as possible.

Hope all of the above is a little bit of help to you.

Regards,

*Hugo Gallagher*

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140 Boyd Street, Crosshill, Glasgow, G42 8TP**

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## Course Contents - HNC - Electrical Engineering – G7TA 15

### Mandatory Units ( 9.0 credits required ):

Communication: Practical Skills	D77G 34	1
Mathematics for Engineering 1: {Electronics and Electrical }	DG4H 33	1
Three Phase Systems	DN47 34	1
Electricity Power Systems	DN3W 34	1
Electrical Machine Principles	DN4J 34	2
Electrical Safety	DN4L 34	1
Single Phase A.C. Circuits	DG54 34	1
Application of Electrical & Electronic Instruments	DN48 33	1

### Optional Units (2.0 credits required):

Electrical Networks and Resonance	DG3G 34	1
Mathematics for Engineering 2	DG4L 34	1

\*Other subjects will be included at a later date

### Graded Unit (1.0 credit)

Electrical Engineering Graded Unit 1 Exam	DN3V 34	1
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## **How is a HNC in Electrical Engineering achieved by Distance Learning**

The first step is that the candidate/student seeks a suitable industrial supervisor. The industrial supervisor may be his/her Line Manager/Training Manager or another person who is in a responsible technical/managerial position. The industrial supervisor does not necessarily have to work for the same employer as the student.

The main role of the industrial supervisor is basically to arrange/organize overseeing of **the invigilation** of the end of unit Test Papers.

## **Definition of Role of Industrial Supervisor overseeing HNC candidates**

The industrial supervisor may be the intended candidates Line Manager/Training Manager or a an other who is in a responsible technical/managerial capacity/position. It is not a requirement that the industrial supervisor works for the same company as the candidate.

The main role of the industrial supervisor is to arrange/organize overseeing **the invigilation** of the end of units Tests.

The purpose of this document is to give authority to a suitably qualified and experienced person to act as a supervisor for a candidate undertaking an assessed course of study. A supervisor acting in this capacity is standing as guarantor that the performance criteria claimed by the candidate have been fully satisfied.

In order to act as an industrial supervisor several points should be noted:

1. The candidate should brief the supervisor on the activities concerned/performance criteria.
2. The supervisor should liaise with the candidate's tutor/assessor regarding the extent of their role.
3. The function of the supervisor is to verify and report that the candidate has completed the activities in accordance with the prescribed standards.
4. The supervisor must personally vouch for the authenticity of the evidence and is not at liberty to accept the statement of a third party.
6. Any tangible evidence generated should be passed to the A-1 Technical Training centre and retained by them for verification purposes.
7. The candidate and supervisor should not be related.
8. When the candidate's completes the end of unit Tests. They are then sent to A-1 Technical Training, as well as the Supervisor's Authorisation form.

If any assistance is required in this matter, please contact the candidate's regular tutor/assessor, or A-1 Technical Training at the following address:

HN Course Manager  
A-1 Technical Training  
Logis-Tech associates  
140 Boyd Street  
Crosshill  
Glasgow  
G42 8TP  
UK

Tel No: 0141 423 6911

**Industrial Supervisor Authority [ISA Form]**

*Please read guidance notes on the definition of a Industrial Supervisor before entering details*

**Industrial Supervisor Details:**

Name:.....

Address:.....  
.....  
.....

Company: .....  
.....  
..... Tel No: .....

Position/Post: .....

Brief details of qualifications and work experience:

Signature:

Date:

\*\*\*\*\*

**Candidates Details**

Name:.....

Address:.....  
.....  
.....

Company: .....  
.....  
..... Tel No: .....

\*\*\*\*\*

**Authorisation** (For A-1 Technical Training use only)

Authorised by:

Signature:

Date:

\*\*\*\*\*

**Note:**

A copy of this Industrial Supervisor's authority must be sent to A-1 Technical Training **before** the student begins the relevant sections of the unit, in order that authorisation to act in this capacity can be granted.

## **A typical HNC in Electrical Engineering Programme:**

### **(1) Mathematics for Engineering 1: (DG4H 33 – 1 credit)**

The student receives directed reading material and at the end of relevant sections/chapters there is a Supportive Exercise. A Supportive Exercise consists of a number of questions, which the student must answer/complete and submit to his/her tutor for marking. There is on average three/four supportive exercises for each module/credit.

Once the student has completed all of the supportive exercises and has had feedback from his/her tutor. The student should now be in a position and more than capable/ready to sit the Test Papers of the module.

The A-1 tutor then sends the Test Paper/s to the students Industrial Supervisor, who then organises/oversees/invigilation of the test/s. The students answered script paper plus test paper is then returned by the industrial supervisor to A-1 Technical Training for marking.

For the module “Mathematics 1” there are 3 Supportive Assignments and three test papers; Paper A, Paper B and Paper C. The student has 45 minutes for Paper A, 30 minutes for paper B and 30 minutes for paper C. The student can sit all 3 papers separately or all at the same time/sitting and has 1 hour 45 minutes to complete all. When the student has passed the test an authentication interview will then take place to finalise the module.

### **(2) Single Phase A.C. Circuits: (DG54 34 – 1 credit)**

The student receives directed reading material and at the end of relevant sections/chapters there is a Supportive Exercise. A Supportive Exercise consists of a number of questions, which the student must answer/complete and submit to his/her tutor for marking. There is on average four supportive exercises for each module/credit.

Once the student has completed the four supportive exercises and has had feedback from his/her tutor. The student should now be in a position and more than capable/ready to sit the end of unit Test Papers of the module.

The A-1 tutor then sends the Test Paper/s to the students Industrial Supervisor, who then organises/oversees/invigilation of the test/s. The students answered script paper plus test paper is then returned by the industrial supervisor to A-1 Technical Training for marking.

For the module “Single Phase A.C.Circuits” there are 4 Supportive Assignments and only one Test Paper and the student has 1 hour 30 minutes to complete this test. When the student has passed the test an authentication interview will then take place to finalise the module.



### **(3) Electrical Networks and Resonance: (DG3G 34 – 1 credit)**

The student receives directed reading material and at the end of relevant sections/chapters there is a Supportive Exercise. A Supportive Exercise consists of a number of questions, which the student must answer/complete and submit to his/her tutor for marking. There is on average four supportive exercises for each module/credit.

Once the student has completed the four supportive exercises and has had feedback from his/her tutor. The student should now be in a position and more than capable/ready to sit the Test Papers of the module.

The tutor then sends the Test Paper/s to the students Industrial Supervisor, who then organises/oversees/invigilation of the test/s. The students answered script paper and test paper is then returned by the industrial supervisor to A-1 Technical Training for marking.

For the module “Electrical Networks and Resonance” there are 4 Supportive Assignments and only one test paper, which the student has 1 hour 30 minutes to complete. When the student has passed the test an authentication interview will then take place to finalise the module.

### **(4) Three Phase Systems: (DN47 34 – 1 credit)**

The student receives directed reading material and at the end of relevant sections/chapters there is a Supportive Exercise. A Supportive Exercise consists of a number of questions, which the student must answer/complete and submit to his/her tutor for marking. There is on average four supportive exercises for each module/credit.

Once the student has completed the four supportive exercises and has had feedback from his/her tutor. The student should now be in a position and more than capable/ready to sit the Test Papers of the module.

The tutor then sends the Test Paper/s to the students Industrial Supervisor, who then organises/oversees/invigilation of the test/s. The students answered script paper and test paper is then returned by the industrial supervisor to A-1 Technical Training for marking.

For the module “Three Phase Systems” there are 4 Supportive Assignments and only one test paper and the student has 1 hour 30 minutes to complete. When the student has passed the test an authentication interview will then take place to finalise the module.

### **(5) Electrical Machine Principles: (DN4J 34 – 2 credits)**

The student receives directed reading material and at the end of relevant sections/chapters there is a Supportive Exercise. A Supportive Exercise consists of a number of questions, which the student must answer/complete and submit to his/her tutor for marking. There is on average four supportive exercises for each module/credit.

Once the student has completed the eight supportive exercises and has had feedback from his/her tutor. The student should now be in a position and more than capable/ready to sit the Test Papers of the module.

The tutor then sends the Test Paper/s to the students Industrial Supervisor, who then organises/oversees/invigilation of the test/s. The students answered script paper and test paper is then returned by the industrial supervisor to A-1 Technical Training for marking.

For the double module “Electrical Machine Principles” there is 8 Supportive Exercises and two test papers; For Paper A the student has 2 hour to complete and for Paper B the student has another 2 hour to complete. When the student has passed the test an authentication interview will then take place to finalise the module.

### **(7) Mathematics for Engineering 2: (DG4L 34 – 1 credit)**

The student receives directed reading material and at the end of relevant sections/chapters there is a Supportive Exercise. A Supportive Exercise consists of a number of questions, which the student must answer/complete and submit to his/her tutor for marking. There is on average four supportive exercises for each module/credit.

Once the student has completed the four supportive exercises and has had feedback from his/her tutor. The student should now be in a position and more than capable/ready to sit the Test Papers of the module.

The tutor then sends the Test Paper/s to the students Industrial Supervisor, who then organises/oversees/invigilation of the test/s. The students answered script paper and test paper is then returned by the industrial supervisor to A-1 Technical Training for marking.

For the module “Mathematics 2” there is 4 Supportive Assignments and two test papers; Paper A and Paper B. The student has 30 minutes for Paper A and 1 hour for paper B. The student can sit both papers at the same time/sitting and has 1 hour 30 minutes to complete both test papers. When the student has passed the test an authentication interview will then take place to finalise the module.

### **(8) Electrical Safety: (DN4L 34 – 1 credit)**

The student receives directed reading material and at the end of relevant sections/chapters there is a Supportive Exercise. A Supportive Exercise consists of a number of questions, which the student must answer/complete and submit to his/her tutor for marking. There is on average four supportive exercises for each module/credit.

Once the student has completed the four supportive exercises and has had feedback from his/her tutor. The student should now be in a position and more than capable/ready to sit the Test Papers of the module.

The tutor then sends the Test Paper/s to the students Industrial Supervisor, who then organises/oversees/invigilation of the test/s. The students answered script paper and test paper is then returned by the industrial supervisor to A-1 Technical Training for marking.

For the module “Electrical Safety” there is two test papers; Paper A and Paper B. The student has 1 hour 30 minutes for Paper A, and 1 hour 30 minutes for paper B. The student can, if they wish, sit both papers at the same time/sitting and has 3 hours to complete both. When the student has passed the test an authentication interview will then take place to finalise the module.

### **(9) Electricity Power Systems: (DN3W 34 – 1 credit)**

The student receives directed reading material and at the end of relevant sections/chapters there is a Supportive Exercise. A Supportive Exercise consists of a number of questions, which the student must answer/complete and submit to his/her tutor for marking. There is on average four supportive exercises for each module/credit.

Once the student has completed the four supportive exercises and has had feedback from his/her tutor. The student should now be in a position and more than capable/ready to sit the Test Papers of the module.

The tutor then sends the Test Paper/s to the students Industrial Supervisor, who then organises/oversees/invigilation of the test/s. The students answered paper is then returned by the industrial supervisor to A-1 Technical Training for marking.

For the module “Electricity Power Systems”, there is a 1500 word report to be submitted and a Test Paper A, which is to be completed in 1 hour 30 minutes. When the student has passed the test an authentication interview will then take place to finalise the module.

### **(10) Application of Electrical & Electronic Instruments: (DN48 33 – 1 credit)**

The student receives directed reading material and at the end of relevant sections/chapters there is a Supportive Exercise. A Supportive Exercise consists of a number of questions, which the student must answer/complete and submit to his/her tutor for marking. There is on average four supportive exercises for each module/credit.

Once the student has completed the four supportive exercises and has had feedback from his/her tutor. The student should now be in a position and more than capable/ready to sit the Test Papers of the module.

The tutor then sends the Test Paper/s to the students Industrial Supervisor, who then organises/oversees/invigilation of the test/s. The students answered paper is then returned by the industrial supervisor to A-1 Technical Training for marking.

For the module “Application of Electrical and Electronic Instruments” there is labwork and a test. The labwork is scheduled to take in total (3 x 2hrs) 6 hours and there is a Test paper A which has to be completed in 1 hour. When the student has passed the test an authentication interview will then take place to finalise the module.

### **(11) Communication: Practical Skills (D77G 34 – 1 credit)**

This module is divided up into 3 Assessments:

Assessment Task 1, is that the student receives directed reading material and must summarise and evaluate a complex technical report/article. The student must then read the text and then answer specific questions/supporting answers relating to the text

The student may also submit a workplace document, with the permission of his/her company, and have it duly approved by A-1 Technical Training. The student will as above read the text and then answer specific questions/supporting answers relating to the text. This is very beneficial to a company employee as the student is furthering their knowledge specific to the student’s company’s business.

Assessment Task 2 consists of the student producing a written document which presents and analyses complex information. This can once again be work related.

Assessment Task 3 is the planning, contributing to and documenting a formal group discussion. For this the student must provide evidence of planning materials, such as notes, powerpoint presentation, sketches. Actions, minutes.

Participation in the discussion for Assessment Task 3 must be directly observed and assessed by the tutor. This can be achieved either by arranging a meeting with candidates, or by assessing a video of performance which meets all evidence requirements or by video conferencing/web camera. When the student has passed the test an authentication interview will then take place to finalise the module.

## **(12) Electrical Engineering Graded Unit (DN3V 34 – 1 credit)**

For this unit the student has to revise the following HN modules: Three phase systems, Electrical Machines, Electrical Networks and Resonance, Electricity Power Systems and Single Phase A.C. circuits.

The student receives a Supportive Exercise consisting of a number of sample type/level exam questions. The student must answer/complete them and submit them to his/her tutor for marking.

Once the student has completed the supportive exercise and has had feedback from his/her tutor. The student should now be in a position and more than capable/ready to sit the FINAL Test Paper of the module/course.

The tutor then sends the Test Paper to the students Industrial Supervisor, who then organises/oversees/invigilation of the test. The students answered script paper and test paper is then returned by the industrial supervisor to A-1 Technical Training for marking.

For the module “Electrical Engineering Graded Unit 1” there is 6 questions, each worth 25 marks each. The student must complete 4 out of 6 questions and has 3 hours to complete. When the student has passed the test an authentication interview will then take place to finalise the module.

## HNC Electrical - Summary / Assessment Loading

HN Module	Written Papers	Time
<b>YEAR 1</b>		
Maths 1	Paper A	45 minutes
	Paper B	30 minutes
	Paper C	30 minutes
Single Phase A.C.	Paper A	1 hr 30 minutes
3 Phase Systems	Paper A	2 hrs
Electrical Networks & Resonance	Paper A	1 hr 30 minutes
Electrical Machines	Paper A	2 hrs
	Paper B	2 hrs
<b>YEAR 2</b>		
Electrical Safety	Paper A	1 hr 30 minutes
	Paper B	Permit to Work Assignment
Electrical Power	Paper A	1500 word report
	Paper B	1 hr 30 minutes
Maths 2	Paper A	30 minutes
	Paper B	1hr
Communications	Paper A	45 minutes
	Paper B	30 minutes
	Paper C	30 minutes
Application of Electrical Instruments	Paper A	1 hr
	Paper B, C & D	3 x 2hr = 6 hrs Lab
Electrical Graded Unit – Final Exam	Paper A	3 hrs

### Notes:

It should also be said that each of these HN modules are stand alone courses and are all achievements in their own merit. They are also often used for CPD (continuous professional development) to assist career progression.

If a student fails an end of unit test there is the opportunity for a resit at a later date. If a student falls short of a PASS by a few marks. The supportive exercises are then used as further evidence of the students work and the A-1 tutor can award a PASS in this instance based on academic judgement.