

Central College Nottingham Course Specification

Basic Course Information		
1.	Awarding Body:	Pearson
2.	School/Campus:	Highfields
3.	Final Award, Course Title and Modes of Study:	Higher National Diploma/Certificate in Electrical & Electronic Engineering
4.	Normal Duration:	2 years
5.	UCAS Code:	006H(HND)

Overview and general educational aims of the course

This programme is designed to educate future engineers with greater flexibility and technical capability by exploring the integrated nature of Engineering, covering the traditional disciplines of Electrical Engineering.

The programme is ideal for students who have completed studies at an advanced level, or who have more varied experience and want to pursue a career in Electrical or Electronic Engineering.

The course contains significant project-based learning including laboratory investigations, design work, projects and tutorials.

Course outcomes

Course outcomes describe what you should know and be able to do by the end of your course if you take advantage of the opportunities for learning that we provide.

Knowledge and understanding

By the end of the course you should be able to:

- Develop underpinning skills in electrical engineering
- Provide a platform for students to develop their understanding of the basic principles behind electrical engineering.
- Establish key transferable and employability skills and develop a multi-tasking and multi skills approach to professional practices.

Skills, qualities and attributes

By the end of the course you should be able to:

- **Develop Knowledge of electrical engineering and systems by**
 - Understanding of the general engineering industry and related work placements
 - Historical, theoretical and ethical positions in response to engineering design
 - Understand the relationship between traditional skills and developing technologies
 - Understand the creative process of engineering design
- **Utilise thinking skills relevant to the electrical engineering sector such as**
 - Self-reliance and self-evaluation
 - Self-reflection / analysis and critical awareness

- Creative thinking and convention
- Research skills
- **Establish Practical skills essential for the electrical engineer such as**
 - Understanding of test equipment
 - Technical aptitude
 - Understanding the design cycle
 - Presentational skills
- **Practice Skills for life and work (general skills), for example**
 - Time management - participation and working to deadlines
 - Working within groups and independently
 - Work experience
 - Interpersonal skills – engineering principles and processes

Teaching and learning methods

Your programme will be delivered in workshops and classrooms as well as design suites and labs.
You will also be working in our new Engineering centre at Highfields which opened in September 2014.

Assessment methods

The programme will cover a range of units that will be made up from the Mandatory Core Units. The standard of your work will be assessed through practical and written assignments.

Each project and assignment will have clear learning outcomes and guidance on what you need to do to be successful. The achievement of learning outcomes will contribute to your success in one or more units of study. Once all learning outcomes have been completed your achievement will be graded.

Course structure and curriculum

HNC & HND Electrical & Electronic Units Core Units

Engineering Science

This broad based unit covers the electrical and mechanical principles that underpin the design and operation of engineering systems. Its intention is to give you an overview, which will form the basis for further study in specialised areas. It covers static & dynamic engineering systems, energy transfer in thermal and fluid systems, single-phase ac theory and information and energy control systems.

Project

This core unit gives you the opportunity to integrate the skills and knowledge gained in other units on the course to develop a realistic work project. The theme will be appropriate to either the electrical, electronic, mechanical or operations pathway depending which you are taking.

Analytical Methods

This unit has been designed to enable you to use fundamental algebra, trigonometry, calculus, statistics and probability for the analysis, modelling and solution of realistic engineering problems.

Further Maths

Calculus techniques are further developed and used to show their application in engineering.

Graphs are used to solve quadratic equations. Arithmetic and geometric progressions are used to solve practical problems. Complex numbers introduced and calculus techniques are further developed and used to show their application in engineering.

HNC Electrical & Electronic Units

Electrical & Electronic Principles

This unit covers the electrical principles needed in many branches of electrical and electronic engineering. It further develops the elements of alternating current theory introduced in Engineering Science and provides the basis for further study in specialised areas.

Electrical & Electronic and Digital Principles

Learners will then use different circuit theorems to evaluate currents and voltages in electrical circuits. They will also consider the conditions for maximum power transfer and impedance matching. The differing types and classes of operation of electronic amplifiers are analysed and evaluated before some are designed and tested then compared with theoretical results. Finally, learners will investigate digital electronic device families and the design and testing of digital circuits.

Electrical Power

This unit develops an understanding of electrical power at component level and system level. This is achieved through the study of aspects such as three-phase systems, both balanced and unbalanced, using j -notation. The unit covers aspects of measurement of power, faults in three-phase systems, the effects of harmonics in power systems and common methods of power distribution with economic comparison.

Electronic Principles

In this unit, learners will examine the use of current manufacturers' data and support, apply current circuit analyses and design, implement and then test the created applications.

Although fault-finding skills are not the main emphasis of the unit they will form an integral part in the later development, in terms of testing

Programmable Logic Controllers

This unit aims to give you an introduction to Programmable Logic Controllers and their applications in engineering. As well as learning about the design characteristics and internal architecture, you will also design, implement and test programmes.

Utilization of Energy

This unit considers such aspects of energy utilisation as the operation of power transformers, circuit protection, the design of a simple lighting system and the operation of poly phase induction motors.

Additional Units for HND Electrical & Electronic

Quality Business Improvement

This unit will examine the principles of continuous improvement and will develop an understanding of the key factors that underpin the application of six-sigma methodology. It also aims to introduce the application of failure modes and effect analysis techniques, measurement systems analysis and give opportunities of practical experience to support a basic understanding in mistake/error proofing.

Engineering Design

This core unit will give you the opportunity to experience the various aspects of

designing a product from investigating the customer requirements and considering the possible design solutions to writing a design report. It will also introduce you to the role that computer technology can play in the process.

Personnel and Professional Development

This unit is designed to enable learners to assess and develop a range of professional and personal skills in order to promote future personal and career development. It also aims to develop learners' ability to organise, manage and practise a range of approaches to improve their performance as self-directed learners in preparation for work or further career development.

Health & Safety

This unit develops an awareness of the principles of health and safety planning and implementation in an industrial environment (e.g. manufacturing, service industries, etc). The unit also considers current UK and EU health and safety legislation together with the concepts of risk assessment and its evaluation when applied to any potential hazard. This is followed by the applications of risk management techniques in the context of risks to life, property and general engineering activities.

Further Electrical Power

This unit develops 'heavy current' topics. It covers transmission and distribution, and overhead lines and cables within power systems. The origin and propagation of surges and transients are analysed. The topic of power system faults is, for simplicity, limited to analysing symmetrical faults and relates to power system protection schemes. The synchronisation operation and use of synchronous machines are also investigated.

Mechatronics

This unit covers an extended range of mechanical principles, which underpin the design, and operation of mechanical engineering systems. It includes strengths of materials and mechanics of machines. The aim of the unit is to provide a firm foundation for work in engineering design and a basis for more advanced study.

Admission to the course

Applicants should have successfully completed a minimum of 4 GCSEs (or equivalent) at grade C or above including English and Maths. Applicants must also have completed one of the following level 3 qualifications equivalent to 80 UCAS points:

A levels in one or more relevant subjects

BTEC Diploma

Access Certificate

Other level 3 qualification in a relevant subject

Mature applicants with relevant experience will be considered subject to interview. All applicants will be considered on interview and must have a minimum of 80% attendance on their current course.

Support for learning

Support is available through regular contact from a variety of Tutors who are experts in their respective fields and experienced engineers in their own right. The

Course Leader will also support the learners to ascertain relevant learning objectives and monitor progress.

Graduate destinations/employability

Learners may progress onto the Electrical & Electronic Engineering HND top up and then onto an appropriate degree programme. They may also progress into employment in a broad range of industries with either a managerial or technical bias in research and development, design, technical sales or production.

Course standards and quality

All courses conform to College and Pearson requirements and a comprehensive review of Course Standards and Quality is undertaken periodically.

We would like you to contribute to the continuing development of this course and we welcome feedback from students in a number of ways including via the Blogspot on your course information page and course forum meetings. You also have an opportunity to put yourself forward to be considered as a course representative at the beginning of each of your years of study.

As part of this role you will be invited to attend the course committee meetings that occur three times a year as well as the College HE Forum which is attended by all Course Representatives.

Assessment regulations

This course is subject to the College's Assessment Regulations for HNs (located in Section D of the Quality Handbook).

Additional Information

Date this course specification approved: September 2014

Any additional information:

Further information about this programme is available from:

<http://www.centralnottingham.ac.uk>