

EMC Engineer and Technician - Professional iNARTE recognition, Education and Training Opportunities

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It is timely to consider the professional recognition of EMC engineering.

Electromagnetic Compatibility (EMC) has become a specialised discipline within electrical/electronics engineering. Although specialised, it impacts across the whole sector, affecting equipment ranging from children's toys, through consumer electronics to large installations where safety may be paramount such as Railways. The European Directive on EMC was introduced in 1989 and the new revised EMC Directive 2004/108/EC, became legally binding from 20 July 2007.

The Institution of Engineering and Technology, the IET, previously the IEE, recognised EMC as requiring special attention and has a professional network to act as a forum for EMC debate in the UK. Internationally the IEEE hosts the IEEE EMC Society, which operates in all the IEEE Chapters. However the only internationally recognised specific EMC professional endorsement comes from iNARTE.

iNARTE, with its HQ located in New Bern, North Carolina, USA, has developed credible validation criteria to establish professional recognition for EMC engineers and technicians under the titles of iNARTE Certified EMC Engineer and iNARTE Certified EMC Technician. These professional qualifications have become recognised worldwide. iNARTE approves test centres to examine both the theoretical and practical skills and knowledge of EMC engineers and technicians. iNARTE approved test centres have been established throughout the USA, Japan, and now the UK.

It is important for EMC professionals to be able to demonstrate their particular area of expertise. iNARTE certification is similar in approach to achieving Membership and Chartered status in the IET, that is to say both the experience and the education and training requirements must be met in order to achieve certification. Not only is this professional recognition for the individual it also enables employers to know that an engineer or technician has been independently assessed as an EMC professional and therefore removes any doubt as to whether they are employing a professional or merely an engineer who has 'dabbled' with EMC! This is also good news for organisations employing consultants or external test laboratories as they will be able to identify that the engineers or technicians employed on their tasks are adequately qualified.

iNARTE has appointed York EMC Services Ltd, University of York, as the first iNARTE Approved Test Centre in the UK and is looking to expand its European membership. NARTE have also worked with York to develop an education programme to enable EMC engineers and technicians to take the iNARTE certificate examinations.

York is a natural partner for iNARTE as in 2007 the University celebrates 25 years of delivering EMC continuing professional development (CPD) courses internationally.

York has also been delivering Masters degree programmes in EMC for the last 15 years, providing a limited number of engineers with a recognised specific EMC qualification. In order to provide a recognised EMC qualification to a larger number of EMC professionals, York has collaborated with iNARTE to provide the education and training programmes needed for engineers and technicians to take the iNARTE certificate examinations in the UK.

The iNARTE EMC Credentials Certification Exam is of 8 hours duration, divided into two 4-hour parts. It consists of a multiple-choice exam with 96 questions, only 80 of which should be attempted. The pass mark is 70% thus 56 questions must be answered correctly. It is an open book examination and textbooks, standards and computers can be taken into the exam room.

Preparation for the exam is a combination of familiarity with source documents and their contents and a sound understanding of the basic technical material.

There are twenty-four subject areas listed in the iNARTE exam Study Guide for the EMC Engineer Exam with a sub-set of eighteen of these for the EMC Technician Exam. The iNARTE examinations cover the following subject categories:

A – Field Theory	M – Test & Measurement/Test Facilities
B – Antennas	N – EMC Design
C – Coupling	O – Terminology
D – Shielding	P – Special Devices, Materials & Components
E – Transmission Lines	Q – EMP
F – Electrical Networks	R – ESD
G – Filters	S – Lightning
H – Amplifiers	T – Specifications & Standards
I – Mathematics	U – Grounding & Bonding
J – EMI Prediction & Analysis	V – Safety (HERO, HERF, HERP)
K – Signals & Transformers	W – EMC Management (Plans/reports, Frequency Management & Emission Control)
L – Spectrum Analysis	Z – Military Specifications, Standards & Handbooks

York has designed a training programme that can form the basis for providing a graduate engineer with the necessary education to be successful in the iNARTE examinations. This structure is shown in the flowchart.

In addition to course notes, iNARTE candidates will receive example exam questions relevant to each lecture within each course, to enable them to focus their post course self-learning programmes.

iNARTE study guides and representative examination papers will be available for inspection at all courses.

iNarte Certification

EMC Engineer/Technician Education

New Graduate Engineer

Principles of Engineering Electromagnetics
2 Days



Principles of Antennas
2 Days

Recommended Minimum Training Requirement

Fundamentals of Design and Testing for EMC
5 Days



Advanced EMC Measurement and Testing 3 Days

Optional: Reverberation Chamber for EMC 1 Day



Design, Filtering and Shielding for EMC Modules 1 + 2
5 Days (2 x 2.5)



Principles of Transmission Lines, Crosstalk and Cable Screening
2 Days



EMC Regulations, Standards and Management 3 Days

Experienced Engineers

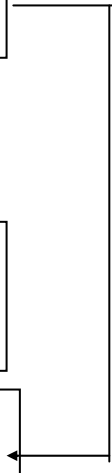
Revision
Fundamentals of Design and Testing for EMC
3-4 Days



iNARTE Exam Preparation Tutorial + Workshop 2 Days



iNARTE Exam 8 Hours



Supplementary Courses:

- Radio Spectrum Management
- Introduction to Radio Propagation
- RF & Microwave Circuit Design
- The New EMC Directive (2004/108/EC)
- EMC Technical Documentation

It should be noted that the iNARTE exams may be taken by following a programme of self-study only. The York programme has been devised to enable candidates to benefit from corporate teaching and to provide the disciplined structure very often needed by students studying in their spare time. It is not a substitute for self-study, which will still be required, but it will focus student learning and provide a professional support and advice service.

In order to prepare candidates to take the exams, York has designed an iNARTE Exam Preparation Tutorial. Prior to the Tutorial, students complete a registration form that identifies their preparation requirements. This will be used to resource a 2-day iNARTE exam preparation under the supervision of academic and experienced staff.

The preparation is in the form of a student-staff ratio of at most four to one, involving a 'help service' for the practice questions and general revision. Staff will be drawn from York EMC Services Ltd and the Department of Electronics, University of York, as required, based on the registration form information and student numbers. Staff will be proactive with the students, each of which will have an individual study schedule. Students will in effect be receiving exam revision time away from work/home with expert help available almost instantly. York also has a comprehensive array of the iNARTE source material available for the students. In addition iNARTE maintains a stock of their recommended Study Guide materials in the UK. These can be ordered from the iNARTE web site at www.narte.org

It is recognised that within industry individuals will have achieved differing levels of academic attainment and practical experience. Hence the programme allows for multi-entry points and options of courses. As a *minimum* iNARTE candidates with little or no experience will be advised to attend the 'Fundamentals of design and testing for EMC', followed by an extensive programme of self-study (supplemented by the advanced courses as necessary), the iNARTE exam preparation tutorial and finally to take the examination. Experienced candidates will be recommended to take 3 or 4 days of the 'Fundamentals' course as revision and to take the iNARTE tutorial. Experienced candidates may also consider it only necessary to take the iNARTE Tutorial option. In any case, any candidate meeting the iNARTE professional requirements, may present themselves for examination.

The first York course to be part of the NARTE education and training programme was the 'Fundamentals of design and testing for EMC' held 23 – 27 April 2007. This was followed by: 'EMC Advanced measurements and testing', 21 – 23 May. The first iNARTE Tutorial was held in November and the first examination during December 2007.

The key to the education and training programme is flexibility and the milestones to achieve NARTE certified status can be set by the individual or a combination of the individual and in many cases his or her sponsoring organisation. The need to attend formal courses will depend on the individual's experience and the time and effort they are able to devote to self-study. Both iNARTE and York can provide advice on training that should be undertaken and on the certification process.

The opportunity now exists in the UK for the formal recognition of EMC professionals and for employers to be able to identify that they are indeed employing EMC professionals!

For further information please contact:

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Course details can be found at <http://www.yorkemc.co.uk/training/narte/>