QUALIFICATION FILE: Certificate course in DSP Using MATLAB

NSDA Reference
To be added by NSDA

Revised Application Documentation: Version 7/ 20 December, 2016

QUALIFICATION FILE – CONTACT DETAILS OF SUBMITTING BODY
Name and address of submitting body:

NATIONAL INSTITUTE OF ELECTRONICS AND INFORMATION TECHNOLOGY (NIELIT), CALICUT

NIT CAMPUS POST, KOZHIKODE, KERALA.

PIN – 673601.

Name and contact details of individual dealing with the submission		
Name	**:**	Rajesh M.
Position in the organization	**:**	Scientist/Engineer 'C'
Address if different from above	**:**	NA
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E-mail address	**:**	rajesh.m@nielit.gov.in
List of documents submitted in support of the Qualifications File		

1. Annexure I – Evidence of need /Requirement in industry
2. Annexure II – Course Curriculum
3. Annexure III – Industry Validation
4. Annexure IV- : Occupational Map as identified by IT SSC mapped to Jobroles

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SUMMARY

Qualification Title:	Certificate course in DSP Using MATLAB
Qualification Code	
Nature and purpose of the qualification:	**Nature**: ❖ This certificate course will help in employment. **Purpose:** ❖ To train the students to be ready for MATLAB Engineer Job. ❖ Entrepreneurship development.
Body /bodies which will award the qualification:	National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan Lodhi Road, New Delhi. 110003.
Body which will accredit providers to offer courses leading to the qualification:	National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan Lodhi Road, New Delhi. 110003.
Body /bodies which will Be responsible for assessment:	**Examination Cell,** National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan Lodhi Road, New Delhi. 110003. Presently, Accreditation is not prescribed; affiliation is one of the models.
Occupation(s) to which the qualification gives access:	• MATLAB programmer • Embedded Software Performance Engineer - MATLAB
Licensing Requirements	N/A
Proposed level of the qualification in the NSQF	Level 7
Anticipated volume of training/learning required to complete the qualification	80 Hours
Entry requirements/ Recommendations	Engineering Degree pursuing [ECE/EEE/CSE/AEI]
Progression from the Qualification	**Professional:** Trainee Graduate Engineer-> Embedded MATLAB Programmer-> Team lead->Project Manager **Academic:** PG Diploma in Embedded real time systems(Level 8)
Planned arrangements for RPL.	RPL Policy will be incorporated once RPL strategy is finalized
International Compatibility where Known.	NA
Date of Planned review of the Qualification	After Every 2 Years

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Formal structure of the qualification:

Course Structure:

This course contains total eight modules. After completing the first seven modules, the students have to do a six weeks project using any of the topics studied to earn the PG Diploma

Module Code	***Module Name***	***Mandatory/Optional***	***Estimated Size (Learning Hours)***	***Level***
1	Introduction to MATLAB Introduction to MATLAB History Toolbox Command Window Script .m-file Function MATLAB Documentation Uses of MATLAB Basic Mathematics Using MATLAB Data types Matrix Differentiation Integration Logic Operations Using MATLAB Conditional Operators For loop While loop While loop Graph Plotting of linear variables Plotting of signals Image Processing Image Processing Toolbox Types of Image Image Resizing Color Filtering Image Restoration MATLAB Simulink Mini project	*Mandatory*	*80*	*7*

Detail Curriculum attached at **Annexure II.**

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SECTION -1

ASSESSMENT

Name of Assessment body:

Examination Cell,
National Institute of Electronics and Information Technology
6-CGO Complex, Electronics Niketan
Lodhi Road, New Delhi. 110003.

Name of body checking or verifying Assessments:

Examination Cell,
National Institute of Electronics and Information Technology
6-CGO Complex, Electronics Niketan
Lodhi Road, New Delhi. 110003.

No accreditation norms for providers and assessment bodies required.

Name of Qualification Awarding body:

National Institute of Electronics and Information Technology.

Will the assessment body be responsible for the RPL assessment?

Yes.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of NSQF:

The emphasis is on practical demonstration of skills & knowledge based on the performance criteria. Student is required to pass in all OUTCOMEs individually and marks are allotted.
Following assessment methodologies are used.

The Following assessment methodologies are used.

A. Written Assessment (Multiple Choice Questions)
B. Practical Assessment &Lab Performance
C. Mini Project

The assessment results are backed by following evidences.

1. The assessor collects a copy of the attendance for the training done under the scheme. The attendance sheets are signed and stamped by the course coordinator of the Training Centre.
2. The assessor verifies the authenticity of the candidate by checking the photo ID card issued by the institute as well as any one Photo ID card issued by the Central/Government. The same is mentioned in the attendance sheet.
3. The assessor assigns roll number.
4. The assessor takes signature of all the students along with the assessor in a prescribed attendance sheet.

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ASSESSMENT EVIDENCE

Title of Unit/Component: Certificate course in DSP Using MATLAB

Outcomes	**Assessment Criteria for the outcome**	**Means of Assessment**		
		Total Marks	**Written**	**Practical**
Design different model in MATLAB & SIMULINK Tools	Develop a digital signal processing application using MATLAB	20	5	15
	Implement digital signal processing application with MATLAB Scripting	20	5	15
	Distinguish model signal processing algorithms with Simulink modeling	20	5	15
	Use Image Processing tool box for developing various signal processing application	20	5	15
	Implement a DSP application using MATLAB Tools (Mini Project)	20	5	15
Total		**100**	**20**	**80**

Pass/Fail
Following Grading Scheme (on the basis of total marks) will be followed:

Grade	**S**	**A**	**B**	**C**	**D**	**E**	**Fail**
Marks Range (in %)	≥90%	80%-89%	70%-79%	60%-69%	50%-59%	40-49%	<40%

EVIDENCE OF LEVEL

Title : Certificate Course in DSP Using MATLAB			**Level : 7**
NSQF Domain	**Outcomes of the Qualification/Component**	**How the job role relates to the NSQF Level Descriptors**	**NSQF Level**
Process required	Detailed knowledge in developing MATLAB script for testing algorithms or simulating the different cases before actual implementation or for identifying the feasibility of new algorithms (R&D)	Requires a command of wide-ranging specialized theoretical and practical skills, involving variable routine and non-routine contexts.	7
Professional knowledge	Factual knowledge about:- Signals & Systems, DSP, Mathematical Modeling	Wide-ranging factual and theoretical knowledge in broad contexts within a field of work or study.	7
Professional skill	Acquires theoretical and practical problem solving skills in the field of MATLAB and Simulink tools	Wide range of cognitive and practical skills required to generate solutions to specific problems in a field of work of study.	7
Core skill	Good in mathematical calculation, understanding of social political and reasonably good in data collecting, organizing information and logical communication	Good logical and mathematical skill, understanding of social political and natural environment and organizing information, communication and presentation	7

		skill.	
Responsibility	Acquires the skill required to work independently and in managing a group of developers working with Matlab simulations & Modeling Will be able to learn other tool boxes in Matlab as and when required.	Full responsibility for output of group and development.	7

SECTION 3

EVIDENCE OF NEED

What evidence is there that the qualification is needed?

1. Human Resource and skill Requirements in the Electronics and IT Hardware Industry. "Study on mapping of human resource Skill gaps in India till 2022" – NSDC / ICRA management Consulting Services Limited. (IMACS)
2. Report of taskforce to suggest measures to stimulate the growth of IT, ITES, and Embedded Industry in India – Dec 2009.
3. Challenges and Solutions in bridging the gap of Skilled human Resource (HR) in Electronics System Design and Development Workshop report Feb 2012.
4. Proposal to NSDC on the formation of Sector Skills Council: Electronics.
5. Employability and skills set of newly graduated Engineers in India – Andreas Blom, Hiroshi Sakei policy research working paper (5640). World Bank.
6. *View Point* - Make in India - *"A Way to Boost Manufacturing and Employment opportunities" Electronics for You, June 2016.*

What is the estimated uptake of this qualification and what is the basis of this estimate?

Estimated uptake is 20 students / Batch with 2 Batches / Year and on the basis of Facilities and Infrastructure in NIELIT Calicut.

What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?

This QF is specialised tool training in MATLAB and there is higher level qualification PG Diploma in Embedded real time systems(Level 8) available.

What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated?

Based on feedback by participants, employers and based on market survey the qualification will be reviewed in every 2 years.

The following data will be used

- Results of assessments
- Employer feedback regarding student skill after conducting a placement drive
- Employer feedback will be sought post-placement
- Student feedbacks
- Workshops and seminar for reviewing the qualifications
- Consultation/ Tie-up with Industries or Expert for review of the Curriculum so as to meet the changing pace of technology and Industry requirements.

Please attach any documents giving further information about any of the topics above.: NIL

SECTION 4

EVIDENCE OF PROGRESSION

What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

This QF is specialised tool training in MATLAB and there is higher level qualification PG Diploma in Embedded real time systems (Level 8) available.

SECTION 5

EVIDENCE OF INTERNATIONAL COMPARABILITY

List any Comparisons which have been established

1. **Course on** Matlab

   Many courses listed in mathworks web site.

   (Source: http://mathworks.com)

Placement Details

This course helps the students to get placement in three ways.
1. Campus placement
2. Job referral programs where we direct our previous batch students to various companies
3. Students apply directly. The theory, practical as well as the projects done during the course

enables the students to pass the screening test and helps in the interview.
4. Previous batch non-placed students are also allowed to attend campus programs along with the current batch subject to conditions.
5. Students are encouraged to take up entrepreneurship/ self employment