CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

Name and address of submitting body:
NATIONAL INSTITUTE OF ELECTRONICS AND INFORMATION TECHNOLOGY
NIELIT Bhawan,Plot No. 3, PSP Pocket, Sector-8,Dwarka, New Delhi-110077,

Name and contact details of individual dealing with the submission

Name: Dr. Manish Arora

Position in the organisation: Additional Director(Systems)

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List of documents submitted in support of the Qualifications File
Annexure 1:   Detailed Syllabus of the course
Annexure 2:   Trainee Details
Annexure 3:   Evidence of Course requirement in the industry
Annexure 4:   Evidence of Job requirement from the industry
Annexure 5:   Evidence of validation from industries

Model Curriculum to be added which will include the following:
- **Indicative list of tools/equipment to conduct the training**
  Attached in section 2 of Annexure 1
- **Trainers qualification**
  Attached in section 3 of Annexure 1
- **Lesson Plan**
  Attached in section 1 of Annexure 1
- **Distribution of training duration into theory/practical/OJT component**

Theory	88 hrs
Practical	122 hrs
OJT Component /Internship/ Project	0

SUMMARY

1	Qualification Title	Certified Cloud Computing and Virtualization Expert
2	Qualification Code, if any	--
3	NCO code and occupation	3114.0801
4	Nature and purpose of the qualification (Please specify whether qualification is short term or long term)	To provide technical skill to manage Cloud based Data Centres
5	Body/bodies which will award the qualification	Certification Division, National Institute of Electronics and Information Technology, NIELIT Bhawan, Plot No. 3, PSP Pocket, Sector-8, Dwarka, New Delhi-110077
6	Body which will accredit providers to offer courses leading to the qualification	Accreditation Division, National Institute of Electronics and Information Technology, NIELIT Bhawan, Plot No. 3, PSP Pocket, Sector-8, Dwarka, New Delhi-110077
7	Whether Accreditation / affiliation norms are already in place or not, if applicable (if yes, attach a copy)	NA
8	Occupation(s) to which the qualification gives access	Cloud Computing and Virtualization Expert
9	Job description of the occupation	Cloud Engineer, Data Centre Manager, Data Centre Architect
10	Licensing requirements	NA
11	Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided)	NA
12	Level of the qualification in the NSQF	Level 4
13	Anticipated volume of training / learning required to complete the qualification	210 Hours
14	Indicative list of training tools required to deliver this qualification	Attached in section 2 of Annexure I

15	Entry requirements and / or recommendations and minimum age	2nd Year B.Tech /BE in Computer science/ Information technology/ Electronics/Electronics and Communication Engg Or 2nd Year MCA Or Final Year students of 3 Year Diploma in Computer science/ Information technology/ Electronics/Electronics and Communication Engg
16	Progression from the qualification (Please show Professional and academic progression)	In Academic Integrate Cloud Computing and Advance Diploma in Big Data analytics (NIELIT Course) in Data Centres. Many companies are providing Big Data as a Service solution to individuals and organization for analysing large data using Big Data tools over Cloud Computing and virtualization infrastructure. **Professional progression:** Initially, candidates can work as Virtualization Engineer/Programmer/Cloud and Virtualization Expert whose role would be to identify virtualization requirement and provide virtualized solution in Cloud to clients at service provider end. Later on, they can be **Data Centre Architect** whose job would be to setup Data Centre that provides various services like IaaS, SaaS and PaaS. Data Centre Architect is a very highly skilled architect with cross-industry and cross-functional know-how.
17	Arrangements for the Recognition of Prior learning (RPL)	Presently only candidates who undergo training shall be assessed. It will be incorporated once RPL strategy is finalized
18	International comparability Where known (research evidence to be provided)	NA
19	Date of planned review of the	After Every 5 years

	Qualification.		
20	**Formal structure of qualification** Mandatory Components		
	Title of component and identification code/NOSs/Learning out comes (A)	**Estimated Size (Learning Hours)**	**Level**
1	Networking and Cloud Compouting Concepts	45 hours	Level 4
2	Preparation of Infrastructure Services	75 hours	Level 4
3	Preparation of Software Services	60 hours	Level 4
4	Secured Cloud Management Concept	15 hours	Level 4
5	Enhancing Communication Skill	15 hours	Level 4
	Sub Total A	**210 hours**	
	Optional Components		
	Sub Total B	**0 hours**	
	Total (A+B)	**210 hours**	

SECTION 1
ASSESSMENT

21	**Body/Bodies which will carry out assessment:** **The Examination Section:** National Institute of Electronics and Information Technology NIELIT Bhawan, Plot No. 3, PSP Pocket, Sector-8, Dwarka, New Delhi-110077
22	**How will RPL assessment be managed and who will carry it out?** RPL Policy will be described as and when available
23	**Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.** ASSESSMENT GUIDELINE: The major point of concentration of course is solely on practical skill enhancement of the candidate and testing his core skills based on a rigorous performance criteria. Each Outcome is assessed and marked separately.

Candidate must pass in all Outcomes individually and accordingly marks are allotted for each Outcome. Following assessment methodologies are adopted.

A. Written Assessment (Multiple Choice Questions)
B. Practical Assessment
C. Internal Assignment

The candidate's overall knowledge shall be tested based on a comprehensive written assessment. His practical skills shall be equally measured with a detailed practical assessment. The technical skills of the student and his ability to express himself shall be monitored vide internal Assignment.

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ASSESSMENT EVIDENCE

24. Assessment evidences

S. No.	Title of Component and Identification Code / NOSs / Learning Outcomes	Estimated Size (Learning Hours)		
		Theory	Lab	Total
1.	Networking and Cloud Compouting Concepts	18	27	45 hrs
2.	Preparation of Infrastructure Services	30	45	75 hrs
3.	Preparation of Software Services	20	40	60 hrs
4.	Secured Cloud Management Concept	10	5	15 hrs
5.	Enhancing Communication Skill	10	5	15 hrs
	Total	88	122	210 hrs

Means of assessment

Learning Hours	NSQF Level	Theory			Practical		Internal Assessment (Marks)	Project / Presentation / Assignment (Marks)	Major Project. / Dissertation. (Marks)		Total
		Papers	No. of Ques (Q). / Paper	Marks/paper	Papers	Marks / Paper			No. of Projects.	Marks	

210	6	2 (T1 and T2)	100 Q for T1 and 100 Q for T2	100 marks for T1 and 100 marks for T2	1 (P)	90 marks	30 marks for (IA)	30 marks for (AS & P)	0	0	350

T1 (TP1): Theory paper 1

T2 (TP2): Theory paper 2

P (P): Practical paper comprising of 2 practical exams (P-1, P-2) 1 for each module.

IA: Internal Assessment

AS &P: Assignment

Examination Pattern

S. No	Examination Pattern	Modules Covered	Duration in Minutes	Maximum Marks
1	Theory Paper (TP1)–1: Networking and Cloud Infrastructure	1,2	90	100
2	Theory Paper (TP2) – 2: Software Preparation and Cloud Management	3,4	90	100
3	Practical (P) comprising of P-1, P-2and P-3 for each of the respective module.	1,2,3and 4	180	90
4	Internal Assessment (IA)	1,2.3 and 4	-	30
5	Assignments (AS)	1,2,3 and 4	-	30
	Total			**350**

Project / Presentation / Assignment

From the option Project/Presentation/Assignment, it is proposed that Assignment of 30 marks should be given to every student enrolled in the course (with 7.5 marks each for

each of the 4 modules of the course). The detailed breakup of Assignment marks is given below:

S.no	Name of the Module	Marks
1	Networking and Cloud Compouting Concepts	7.5
2	Preparation of Infrastructure Services	7.5
3	Preparation of Software Services	7.5
4	Secured Cloud Management Concept	7.5
	Total	**30**

Note:

1. Pass percentage would be 50% marks in each component, with aggregate pass percentage of 50% and above.
2. Grading will be as under:

Grade	S	A	B	C	D	Fail
Marks Range (in %)	>85%	75%>= and < 85%	65%>= and < 75%	55%>= and < 65%	50%>= and < 55%	<50%

3. Theory examination would be conducted online and the theory papers comprise of MCQ and each question will carry 1 mark.
4. Practical examination/Internal Assessment / Project / Presentation / Assignment would be evaluated internally.

5. Candidate may apply for re-examination within the validity of registration.
6. There would be no exemption for any paper/ module for candidates having similar qualification Skills.
7. A candidate would get a maximum of six examination cycles to pass the course (assuming that there is no provision for re-registration)
8. The examinations would be conducted in English Language only.

SECTION 2
25. EVIDENCE OF LEVEL

Title/Name of qualification: Certificate Course in Computer Aided Design using CREO - Level 5			
NSQF Domain	**Key requirement of job role**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
Process	Cloud and Virtualization Expert carries out jobs to manage networks and prepare data centres for virtualization. Cloud and Virtualization Expert acquires wide range of practical and conceptual skills to virtualize server and	Successful candidate Individual who has gone through the process would tend to exhibit Advance Skills in which he is both Conceptually strong and practically sound.	4

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	provide services over Cloud to clients		
Professional Knowledge	Cloud and Virtualization Expert will be competent to identify technical requirements in terms of hardware, software and other IT related devices for providing virtualized services over Cloud.	The professional knowledge gained would eventually help the candidate to enter the industry as an expert and not as a novice. He would not be required to undergo any sort of training or refresher course in order to run the operations of the concern that he joins. Network management of a company would be efficiently handled by the Candidate.	**4**
Professional Skill	Individual is able to manage and secure cloud. They are proficient in managing servers in Cloud environment based on detailed design and practical knowledge gained during course	The skill set acquired by the candidate would Encompass Installation, Configuration, implementation, Management and Troubleshooting of Data Communication Network that would be efficiently handled by him.	**4**
Core Skill	Individual is able to manage and secure cloud. They are proficient in managing servers in Cloud environment based on detailed design and practical knowledge gained during course	This skill will help the individual to manage entire cloud.	**4**
Responsibility	They are able to lead team as well as work in team.	The resposibility levels would be equally important in all the phases of the Project implementation starting from Requirement analysis , Designing the project, Implementation of the project and Maintenance and Troubleshooting of the project.	**4**

SECTION 3
EVIDENCE OF NEED

26	**What evidence is there that the qualification is needed? What is the estimated uptake of this qualification and what is the basis of this estimate?** **Need of the Qualification and industry relevance** Attached at Annexure 3 **Estimated uptake:** 10 students / Batch – 4 Batches / Year
27	**Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences** No information available
28	**What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF? Give justification for presenting a duplicate qualification** The course was scrutinized with National Qualification Register (NQR) for resemblance with other courses. As per the search it was found that, no duplicate Certified Cloud Computing and Virtualization Expert exists in the NQR as on date
29	**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? Specify the review process here** The Qualification is to be monitored and reviewed every two years. The following data will be used 1. Results of assessments. 2. Student's feedback who have completed the course. 3. The NOS approved by NSDA will also be referred from time to time

SECTION 4
EVIDENCE OF PROGRESSION

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30	**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?**
	The qualification consists of both the technical skill set and practical skill set and may be associated with any other qualification higher than this one in the NQR.