

# QUALIFICATIONS PACK – NATIONAL OCCUPATIONAL STANDARDS FOR IT-BPM INDUSTRY

## What are National Occupational Standards(NOS)?

- NOS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- NOS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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## Contents

1. Introduction and Contacts.....P.1
2. Qualifications Pack.....P.2
3. Glossary of Key Terms .....P.3
4. NOS Units.....P.5
5. Annexure: Nomenclature for QP & OS.....P.34
6. Assessment Criteria.....P.36

## Introduction

### Qualifications Pack – AI - Data Engineer

**SECTOR:** IT-ITeS

**SUB-SECTOR:** Future Skills

**OCCUPATION:** Artificial Intelligence & Big Data Analytics

**REFERENCE ID:** SSC/Q8106

**ALIGNED TO:** NCO-2015/2521.0100

**Brief Job Role Description:** Individuals at this job are responsible for working on different aspects of data architecture. S/he will be responsible for developing data integrations.

**Personal Attributes:** A data engineer needs to be well organized and have good attention to detail and problem solving abilities.



Job Details

Qualifications Pack Code	SSC/Q8106		
Job Role	<b>AI- Data Engineer</b> This job role is applicable both in national and international scenarios		
Credits (NSQF)	TBD	Version number	1.0
Sector	IT-ITes	Drafted on	29/08/2018
Sub-sector	Future Skills	Last reviewed on	17/10/2018
Occupation	Artificial Intelligence & Big Data Analytics	Next review date	31/12/2019
NSQC Clearance on	19/12/2018		

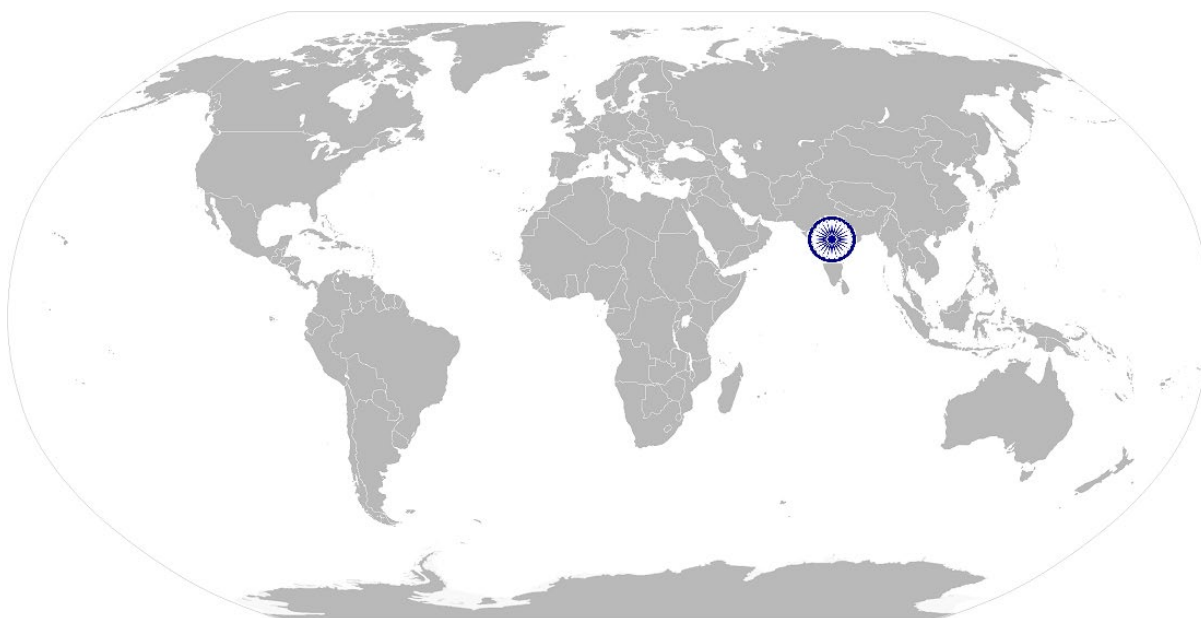
Job Role	<b>AI - Data Engineer</b> (Data Pipeline Engineer, Data Pipeline Developer, Data Warehouse Developer, Data Warehouse Engineer)
Description	Individuals at this job are responsible for working on different aspects of data architecture. S/he will be responsible for developing data integrations.
NSQF Level	7
Minimum Educational Qualifications*	Bachelor's Degree in Engineering / Technology / Statistics / Mathematics / Computer Science
Maximum Educational Qualifications*	Not Applicable
Prerequisite License or Training (Mandatory)	Not Applicable
Minimum Job Entry Age	21 years (Recommended)
Experience	2 – 5 years (Recommended)
Applicable National Occupational Standards (NOS)	<b>Compulsory:</b> <ol style="list-style-type: none"> <li>1. <a href="#">SSC/N8112 Develop data integrations as per specifications</a></li> <li>2. <a href="#">SSC/N9001 Manage your work to meet requirements</a></li> <li>3. <a href="#">SSC/N9002 Work effectively with colleagues</a></li> <li>4. <a href="#">SSC/N9004 Provide data/information in standard formats</a></li> <li>5. <a href="#">SSC/N9005 Develop your knowledge, skills and competence</a></li> <li>6. <a href="#">SSC/N9006 Build and maintain relationships at the workplace</a></li> </ol>
Performance Criteria	As described in the relevant NOS units

Definitions

Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job Role	Job role defines a unique set of tasks that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance criteria are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OSs, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
Knowledge and Understanding	Knowledge and understanding are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual need to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.

Acronyms

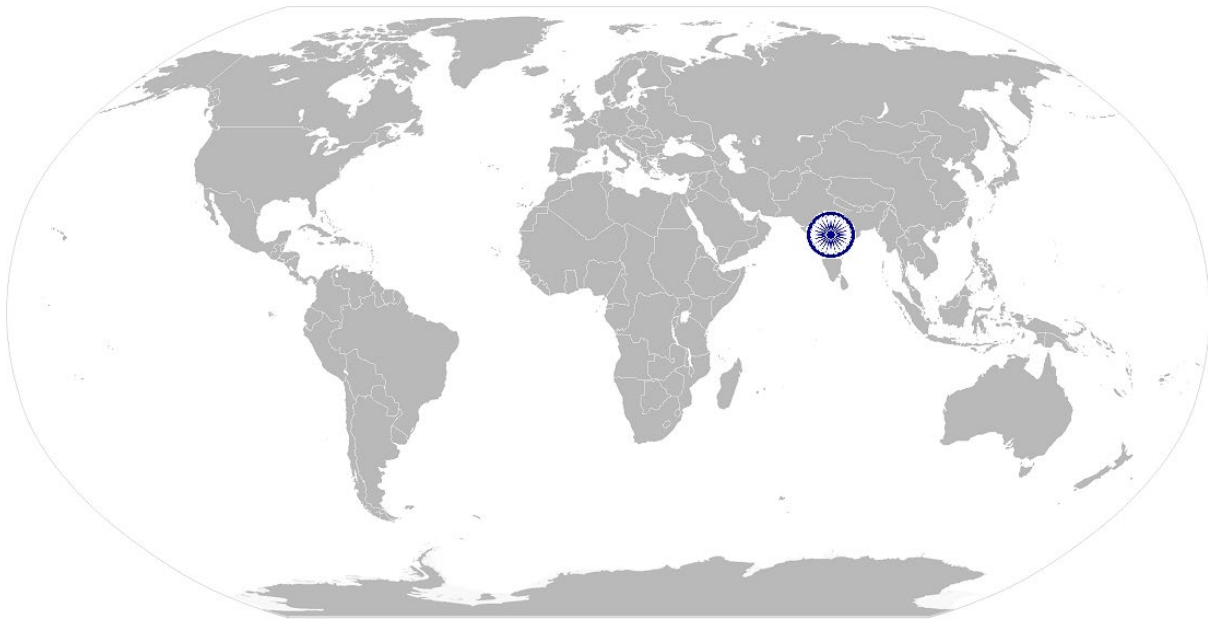
Keywords /Terms	Description
NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
IT-ITeS	Information Technology – Information Technology enabled Services
SPD	Software Product Development
ERD	Engineering and R&D
ITS	Information Technology Services
BPM	Business Process Management



SSC/N8112

Develop data integrations as per specifications

# National Occupational Standard



## Overview

This unit is about developing integrations for data transformation for internal and external clients.



SSC/N8112

Develop data integrations as per specifications

National Occupational Standard

Unit Code	SSC/N8112
Unit Title (Task)	Develop data integrations as per specifications
Description	This unit is about developing integrations for ensuring data availability for analytical or operational uses.
NSQF Level	7
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>Define requirements</li> <li>Develop data warehouses, data lakes &amp; pipelines</li> </ul> <p>Integrations: data pipelines, data warehouses, data lakes</p>
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Define requirements	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. evaluate whether the application is batch or real-time driven</p> <p>PC2. evaluate whether the application is using an SQL or NoSQL database</p> <p>PC3. evaluate feasibility and level of effort to integrate the required data</p>
Develop data warehouses, data lakes and pipelines	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC4. evaluate different data warehouse, lake or pipeline designs</p> <p>PC5. evaluate available hardware if an on-premise solution is being designed</p> <p>PC6. determine the right data format depending on the nature of the application (for ex. batch or real-time driven)</p> <p>PC7. partition or size the data as appropriate</p> <p>PC8. transform data into other formats</p> <p>PC9. develop, test and troubleshoot data pipelines</p> <p>PC10. combine tools into either macro or micro data pipelines</p> <p>PC11. design and implement ETL (Extract-Transform-Load) processes</p> <p>PC12. use data integration processes to populate and refresh the data warehouse</p> <p>PC13. define data onboarding and transformation processes to design the data lake</p> <p>PC14. create and execute proof-of-concepts for demonstrating the viability of the design approach for the data lake</p> <p>PC15. select appropriate applications to design and scale the data lake as per requirements</p> <p>PC16. develop the data lake and define appropriate mechanisms to query the data lake</p>





SSC/N8112

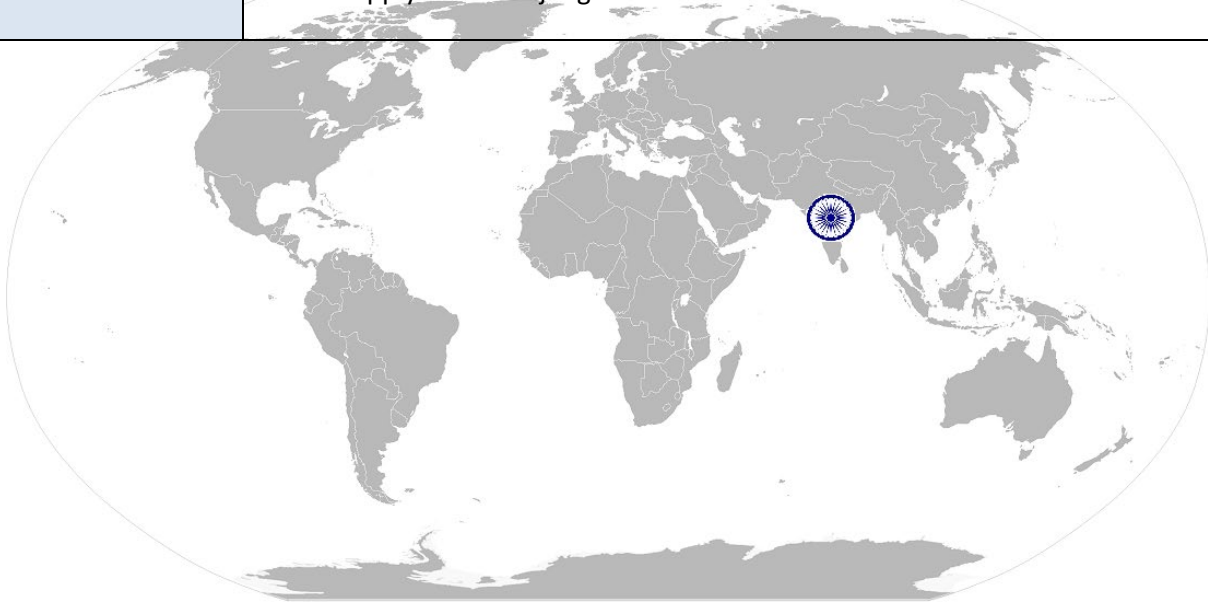
Develop data integrations as per specifications

	<p>PC17. load data, metadata and other required categories into the data lake</p> <p>PC18. develop mechanisms for error and fault handling, and system availability for the data lake</p> <p>PC19. define performance criteria for the data integrations such as response time</p> <p>PC20. optimize the data integrations on the basis of the defined performance criteria</p> <p>PC21. create documentation on developed data integrations for appropriate people</p> <p>PC22. validate data integrations with appropriate people</p>
<b>Knowledge and Understanding (K)</b>	
<p><b>A. Organizational Context</b> (Knowledge of the company/ organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. organizational policies, procedures and guidelines which relate to designing data integrations</p> <p>KA2. organizational policies and procedures for sharing data</p> <p>KA3. organizational policies and procedures for documenting data integrations</p> <p>KA4. who to involve when designing data integrations</p> <p>KA5. the range of standard templates and tools available and how to use them</p>
<p><b>B. Technical Knowledge</b></p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. different tools for developing data integrations such as Hive, Storm, Kafka</p> <p>KB2. different data sources, data integration processes and techniques</p> <p>KB3. different ETL (Extract-Transform-Load) concepts</p> <p>KB4. different methodological approaches for testing and troubleshooting data pipelines such as unit testing, component testing, black box testing</p> <p>KB5. different methodological approaches for populating data warehouses including top-down, bottom-up, hybrid and federated</p> <p>KB6. different applications used to design data lakes</p> <p>KB7. how to define mechanisms to query the data lake</p> <p>KB8. how to load data, metadata and other required categories into the data lake</p> <p>KB9. different mechanisms for management of data lakes including error and fault handling, system availability, duplication control, status updates</p> <p>KB10. different performance criteria for data integrations such as response time</p>

SSC/N8112

Develop data integrations as per specifications

	<p>KB11. different performance criteria for hardware if designing an on-premise data integration solution such as data center performance, CPU performance, I/O ratios</p> <p>KB12. how to query and write scripts to acquire and understand the data</p> <p>KB13. how to work on various operating systems such as linux, ubuntu, or windows</p>
<b>Skills (S)</b>	
<b>A. Core / Generic Skills</b>	<p><b>Problem Solving</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA1. apply problem-solving approaches in different situations</p> <p><b>Critical Thinking</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA2. apply balanced judgments to different situations</p>



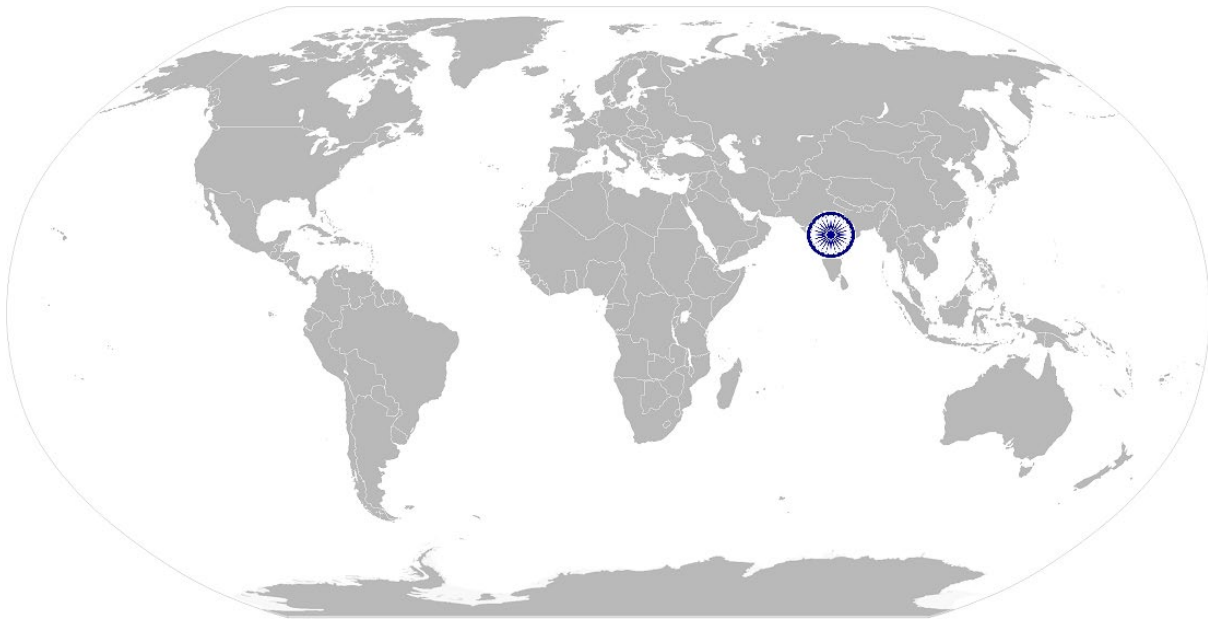


SSC/N8112

Develop data integrations as per specifications

NOS Version Control

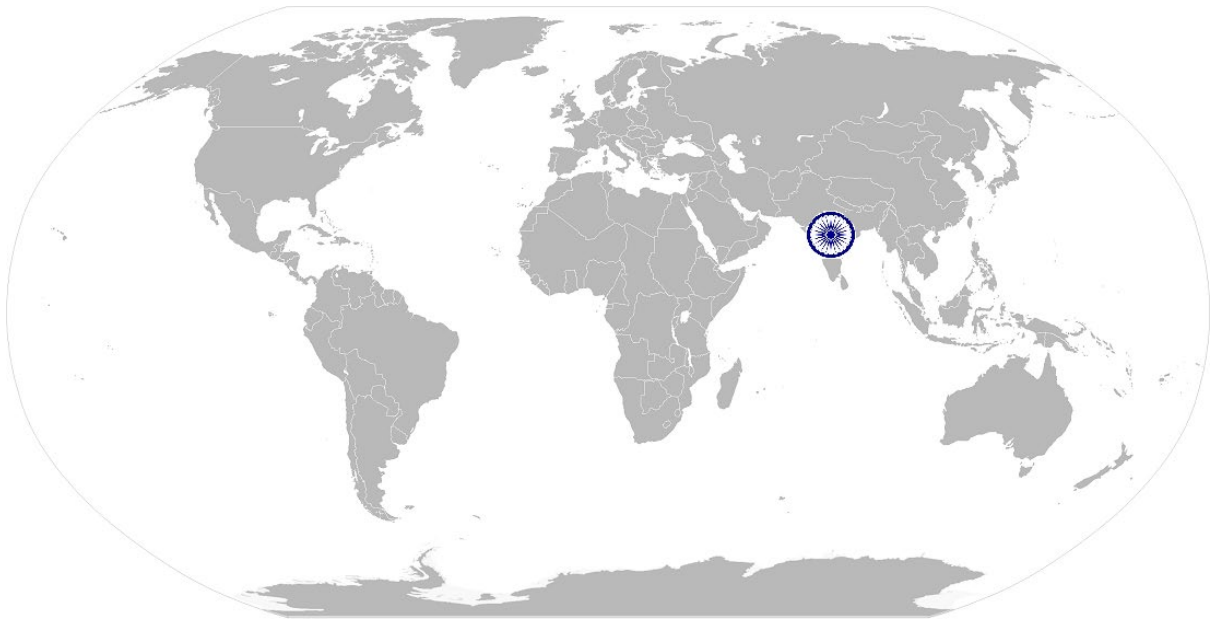
NOS Code	SSC/N8112		
Credits (NSQF)	TBD	Version number	1.0
Industry	IT-ITeS	Drafted on	29/08/2018
Industry Sub-sector	Future Skills	Last reviewed on	17/10/2018
Occupation	Artificial Intelligence & Big Data Analytics	Next review date	31/12/2019



SSC/N9001

Manage your work to meet requirements

# National Occupational Standard



## Overview

This unit is about planning and organizing your work in order to complete it to the required standards on time.

SSC/N9001

Manage your work to meet requirements

National Occupational Standard	Unit Code	SSC/N9001
	Unit Title (Task)	Manage your work to meet requirements
	Description	This unit is about planning and organizing your work in order to complete it to the required standards on time.
	NSQF Level	6
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>Utilize resources</li> <li>Ensure compliance</li> </ul> <p>Work requirements: activities, deliverables, quantity, standards, timing</p> <p>Resources: equipment, materials, information</p>
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Utilize resources	<p>To be competent, the individual working on the job must be able to:</p> <p>PC1. establish and agree your work requirements with appropriate people</p> <p>PC2. keep your immediate work area clean and tidy</p> <p>PC3. utilize your time effectively</p> <p>PC4. use resources correctly and efficiently</p> <p>PC5. treat confidential information correctly</p>
	Ensure compliance	<p>To be competent, the individual working on the job must be able to:</p> <p>PC6. work in line with your organization's policies and procedures</p> <p>PC7. work within the limits of your job role</p> <p>PC8. obtain guidance from appropriate people, where necessary</p> <p>PC9. ensure your work meets the agreed requirements</p>
	Knowledge and Understanding (K)	
	A. Organizational Context (Knowledge of the company/ organization and its processes)	<p>You need to know and understand:</p> <p>KA1. your organization's policies, procedures and priorities for your area of work and your role and responsibilities in carrying out your work</p> <p>KA2. limits of your responsibilities and when to involve others</p> <p>KA3. your specific work requirements and who these must be agreed with</p> <p>KA4. the importance of having a tidy work area and how to do this</p> <p>KA5. how to prioritize your workload according to urgency and importance and the benefits of this</p>



SSC/N9001

Manage your work to meet requirements

	<p>KA6. your organization's policies and procedures for dealing with confidential information and the importance of complying with these</p> <p>KA7. the purpose of keeping others updated with the progress of your work</p> <p>KA8. who to obtain guidance from and the typical circumstances when this may be required</p> <p>KA9. the purpose and value of being flexible and adapting work plans to reflect change</p>
<b>B. Technical Knowledge</b>	<p>You need to know and understand:</p> <p>KB1. the importance of completing work accurately and how to do this</p> <p>KB2. appropriate timescales for completing your work and the implications of not meeting these for you and the organization</p> <p>KB3. resources needed for your work and how to obtain and use these</p> <p>KB4. how to store and retrieve information</p> <p>KB5. how to identify and refer anomalies in data</p> <p>KB6. how to use information technology effectively to input and/or extract data accurately</p> <p>KB7. how to keep up to date with changes, procedures and practices in your role</p>
<b>Skills (S)</b>	
<b>A. Core / Generic Skills</b>	<p><b>Writing Skills</b></p> <p>SA1. complete accurate well written work with attention to detail</p> <p><b>Reading Skills</b></p> <p>SA2. follow instructions, guidelines, procedures, rules and service level agreements</p> <p><b>Listening and Speaking Skills</b></p> <p>SA3. ask for clarification and advice from appropriate people</p> <p>SA4. listen effectively and orally communicate information accurately</p> <p><b>Decision Making</b></p> <p>SA5. make decisions on suitable courses</p> <p><b>Plan and Organize</b></p> <p>SA6. plan and organize your own work to achieve targets and deadlines</p> <p>SA7. provide accurate reports to line managers in a timely manner as required</p> <p><b>Customer Centricity</b></p>

SSC/N9001

Manage your work to meet requirements

SA8. check that your own and/or your peers' work meets customer requirements

SA9. deliver consistent and reliable service to customers

**Problem Solving**

SA10. refer anomalies to the supervisor

SA11. seek clarification on problems from others

**Analytical Thinking**

SA12. analyze data and activities

SA13. pass on relevant information to others

**Critical Thinking**

SA14. apply balanced judgments to different situations

**Attention to Detail**

SA15. check your work is complete and free from errors

SA16. get your work checked by others

**Team Working**

SA17. work effectively in a team environment

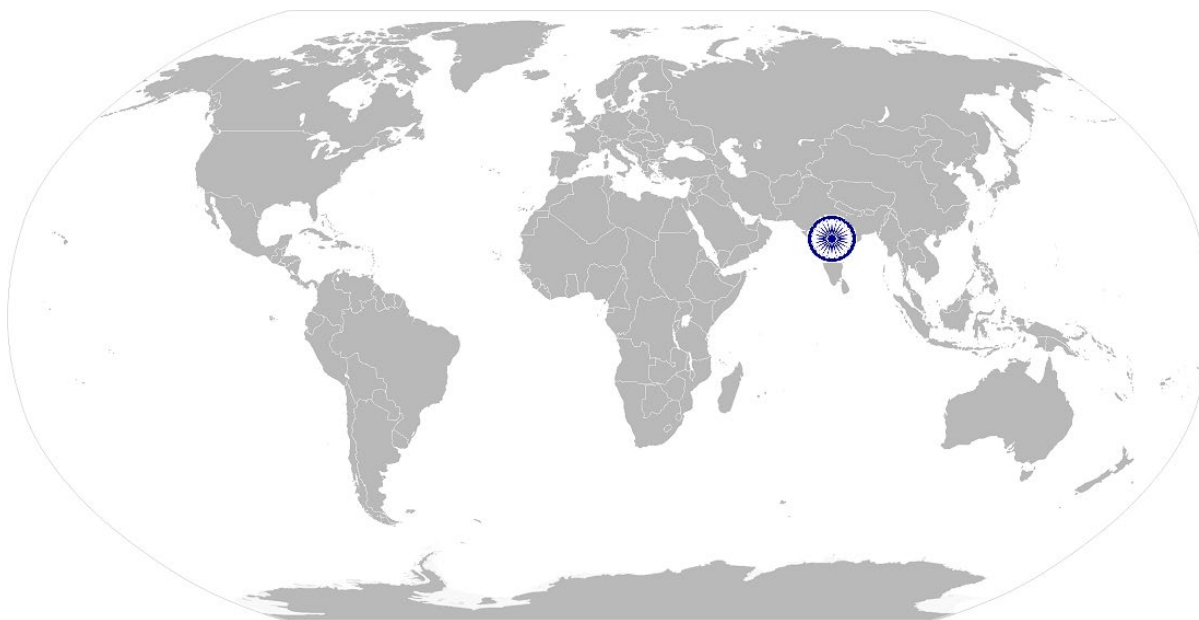


**SSC/N9001**

**Manage your work to meet requirements**

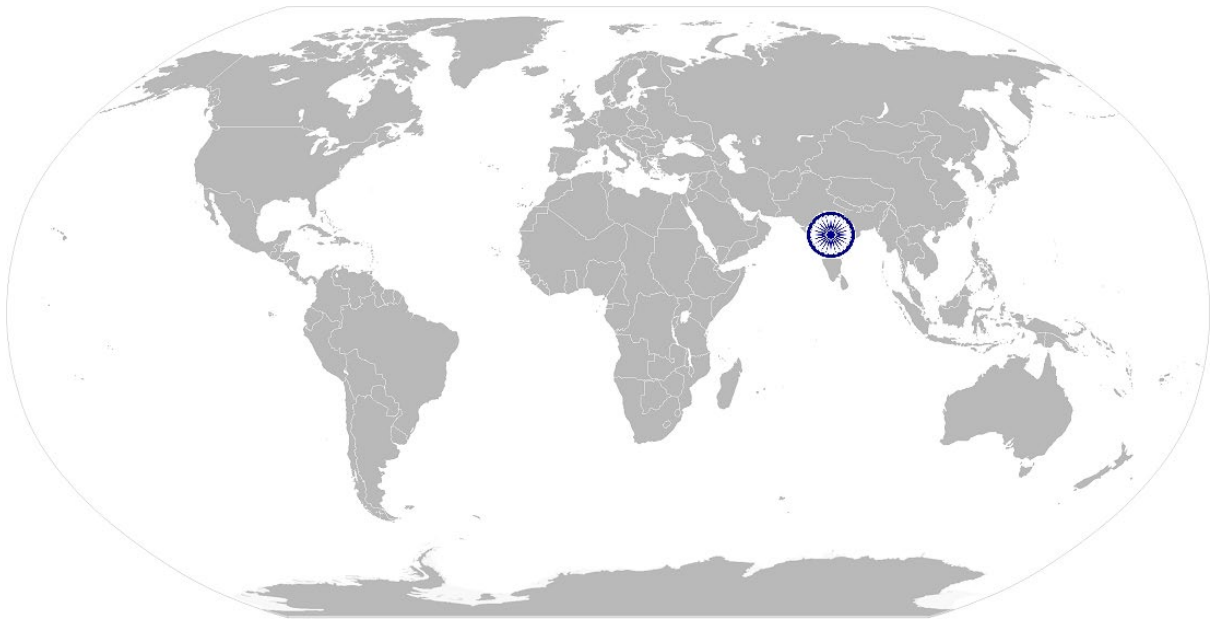
**NOS Version Control**

NOS Code	SSC/N9001		
Credits (NSQF)	TBD	Version number	1.0
Industry	IT-ITes	Drafted on	29/08/2018
Industry Sub-sector	Future Skills	Last reviewed on	17/10/2018
Occupation	Artificial Intelligence & Big Data Analytics	Next review date	31/12/2019





# National Occupational Standard



## Overview

This unit is about working effectively with colleagues, either in your own work group or in other work groups within your organization.

SSC/N9002

Work effectively with colleagues

National Occupational Standard

Unit Code	SSC/N9002
Unit Title (Task)	Work effectively with colleagues
Description	This unit is about working effectively with colleagues, either in your own work group or in other work groups within your organization.
NSQF Level	6
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>Communicate with colleagues</li> <li>Show respect</li> </ul> <p>Communicate: face-to-face, by telephone, in writing</p>
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Communicate with colleagues	<p>To be competent, the individual working on the job must be able to:</p> <p>PC1. communicate with colleagues clearly, concisely and accurately</p> <p>PC2. work with colleagues to integrate your work effectively with them</p> <p>PC3. pass on essential information to colleagues in line with organizational requirements</p>
Show respect	<p>To be competent, the individual working on the job must be able to:</p> <p>PC4. work in ways that show respect for colleagues</p> <p>PC5. carry out commitments you have made to colleagues</p> <p>PC6. let colleagues know in good time if you cannot carry out your commitments, explaining the reasons</p> <p>PC7. identify any problems you have working with colleagues and take the initiative to solve these problems</p> <p>PC8. follow the organization's policies and procedures for working with colleagues</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company/ organization and its processes)	<p>You need to know and understand:</p> <p>KA1. your organization's policies and procedures for working with colleagues and your role and responsibilities in relation to this</p> <p>KA2. the importance of effective communication and establishing good working relationships with colleagues</p> <p>KA3. different methods of communication and the circumstances in which it is appropriate to use these</p> <p>KA4. benefits of developing productive working relationships with colleagues</p>

SSC/N9002

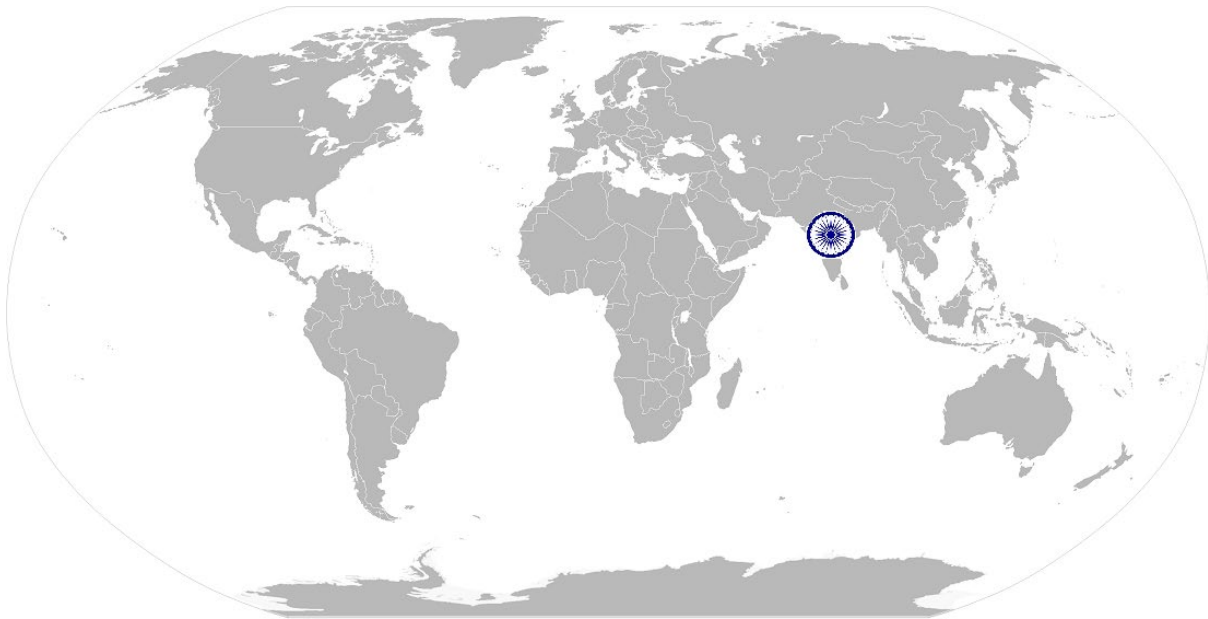
Work effectively with colleagues

	<p>KA5. the importance of creating an environment of trust and mutual respect in an environment where you have no authority over those you are working with</p> <p>KA6. where you do not meet your commitments, the implications this will have on individuals and the organization</p>
<b>B. Technical Knowledge</b>	<p>You need to know and understand:</p> <p>KB1. different types of information that colleagues might need and the importance of providing this information when it is required</p> <p>KB2. the importance of understanding problems from your colleague's perspective and how to provide support, where necessary, to resolve these</p> <p>KB3. how to identify and refer anomalies in data</p> <p>KB4. how to help reach agreements with colleagues</p> <p>KB5. how to keep up to date with changes, procedures and practices in your role</p>
<b>Skills (S)</b>	
<b>A. Core / Generic Skills</b>	<p><b>Writing Skills:</b></p> <p>SA1. complete accurate well written work with attention to detail</p> <p>SA2. communicate effectively with colleagues in writing</p> <p><b>Reading Skills:</b></p> <p>SA3. follow instructions, guidelines, procedures, rules and service level agreements</p> <p><b>Listening and Speaking Skills</b></p> <p>SA4. ask for clarification and advice from appropriate people</p> <p>SA5. listen effectively and orally communicate information accurately</p> <p><b>Decision Making</b></p> <p>SA6. make decisions on suitable courses</p> <p><b>Plan and Organize</b></p> <p>SA7. plan and organize your own work to achieve targets and deadlines</p> <p><b>Customer Centricity</b></p> <p>SA8. check that your own and/or your peers' work meets customer requirements</p> <p>SA9. deliver consistent and reliable service to customers</p> <p><b>Problem Solving</b></p> <p>SA10. apply problem solving approaches in different situations</p>

SSC/N9002

Work effectively with colleagues

	<p><b>Critical Thinking</b></p> <p>SA11. apply balanced judgments to different situations</p> <p><b>Attention to Detail</b></p> <p>SA12. check your work is complete and free from errors</p> <p>SA13. get your work checked by others</p> <p><b>Team Working</b></p> <p>SA14. work effectively in a team environment</p> <p>SA15. work effectively with colleagues and other teams</p> <p>SA16. treat other cultures with respect</p>
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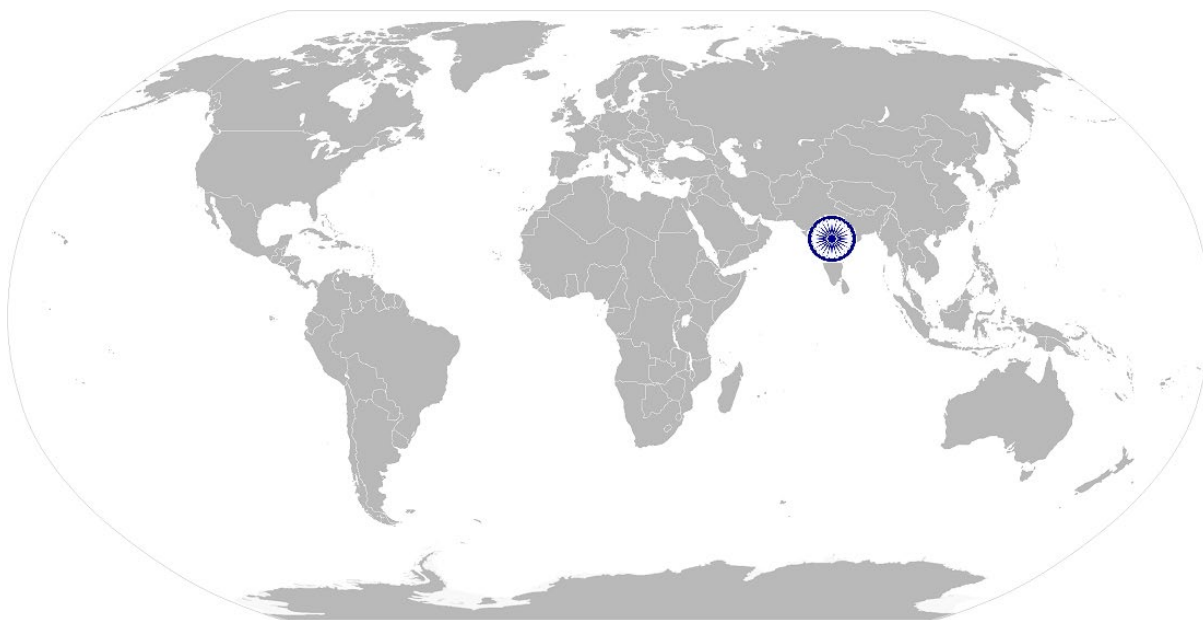


SSC/N9002

Work effectively with colleagues

NOS Version Control

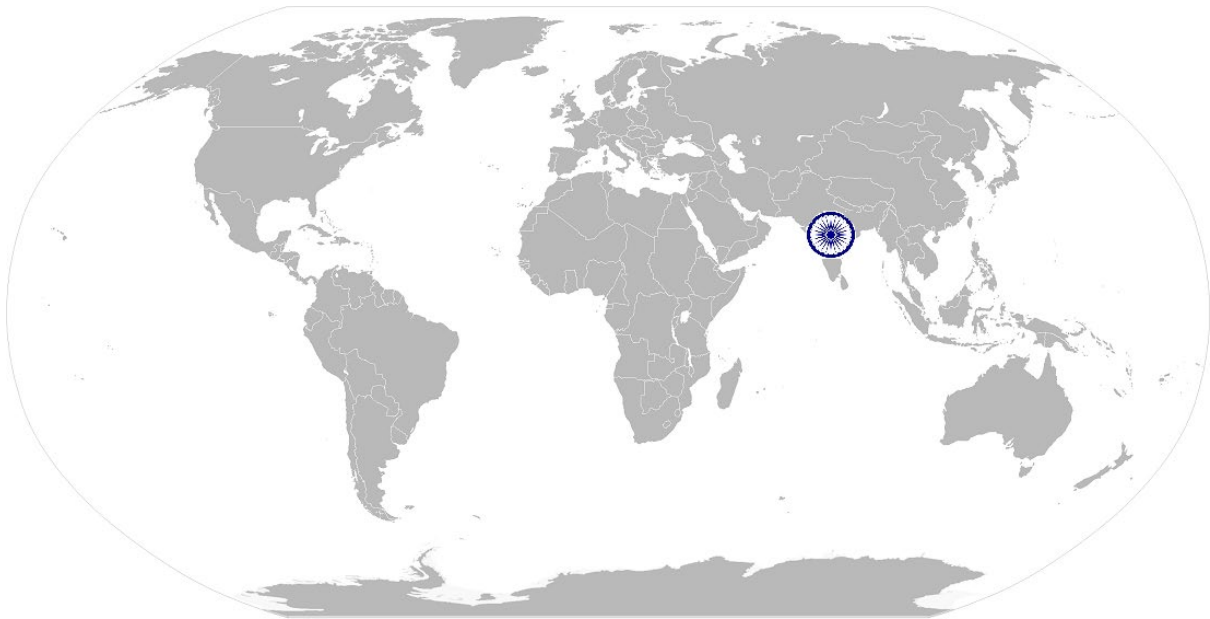
NOS Code	SSC/N9002		
Credits (NSQF)	TBD	Version number	1.0
Industry	IT-ITeS	Drafted on	29/08/2018
Industry Sub-sector	Future Skills	Last reviewed on	17/10/2018
Occupation	Artificial Intelligence & Big Data Analytics	Next review date	31/12/2019



SSC/N9004

Provide data / information in standard formats

# National Occupational Standard



## Overview

This unit is about providing specified data/information related to your work in templates or other standard formats.





SSC/N9004

Provide data / information in standard formats

National Occupational Standard

Unit Code	SSC/N9004
Unit Title (Task)	Provide data/information in standard formats
Description	This unit is about providing specified data/information related to your work in templates or other standard formats.
NSQF Level	6
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>Obtain information</li> <li>Analyze and report information</li> </ul> <p>Data/Information: quantitative, qualitative</p> <p>Sources: within your organization, outside your organization</p> <p>Formats: paper-based, electronic</p>
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Obtain information	<p>To be competent, the individual working on the job must be able to:</p> <p>PC1. establish and agree with appropriate people the data/information you need to provide, the formats in which you need to provide it, and when you need to provide it</p> <p>PC2. obtain the data/information from reliable sources</p> <p>PC3. check that the data/information is accurate, complete and up-to-date</p> <p>PC4. obtain advice or guidance from appropriate people where there are problems with the data/information</p>
Analyze and report information	<p>To be competent, the individual working on the job must be able to:</p> <p>PC5. carry out rule-based analysis of the data/information, if required</p> <p>PC6. insert the data/information into the agreed formats</p> <p>PC7. check the accuracy of your work, involving colleagues where required</p> <p>PC8. report any unresolved anomalies in the data/information to appropriate people</p> <p>PC9. provide complete, accurate and up-to-date data/information to the appropriate people in the required formats on time</p>
Knowledge and Understanding (K)	
A. Organizational	You need to know and understand:

SSC/N9004

Provide data / information in standard formats

<p><b>Context</b> (Knowledge of the company/ organization and its processes)</p>	<p>KA1. your organization's procedures and guidelines for providing data/information in standard formats and your role and responsibilities in relation to this</p> <p>KA2. the knowledge management culture of your organization</p> <p>KA3. your organization's policies and procedures for recording and sharing information and the importance of complying with these</p> <p>KA4. the importance of validating data/information before use and how to do this</p> <p>KA5. procedures for updating data in appropriate formats and with proper validation</p> <p>KA6. the purpose of the CRM database</p> <p>KA7. how to use the CRM database to record and extract information</p> <p>KA8. the importance of having your data/information reviewed by others</p> <p>KA9. the scope of any data/information requirements including the level of detail required</p> <p>KA10. the importance of keeping within the scope of work and adhering to timescales</p>
<p><b>B. Technical Knowledge</b></p>	<p>You need to know and understand:</p> <p>KB1. data/information you may need to provide including the sources and how to do this</p> <p>KB2. templates and formats used for data/information including their purpose and how to use these</p> <p>KB3. different techniques used to obtain data/information and how to apply these</p> <p>KB4. how to carry out rule-based analysis on the data/information</p> <p>KB5. typical anomalies that may occur in data/information</p> <p>KB6. who to go to in the event of inaccurate data/information and how to report this</p> <p>KB7. how to use information technology effectively to input and/or extract data accurately</p> <p>KB8. how to validate and update data</p> <p>KB9. how to identify and refer anomalies in data</p> <p>KB10. how to store and retrieve information</p> <p>KB11. how to share information using standard formats and templates</p> <p>KB12. how to keep up to date with changes, procedures and practices in your role</p>
<p><b>Skills (S)</b></p>	

SSC/N9004

Provide data / information in standard formats

A. Core / Generic Skills

**Writing Skills**

SA1. complete accurate well written work with attention to detail

**Reading Skills**

SA2. follow instructions, guidelines, procedures, rules and service level agreements

**Listening and Speaking Skills**

SA3. listen effectively and orally communicate information accurately

**Decision Making**

SA4. follow rule-based decision making processes

SA5. make decisions on suitable courses

**Plan and Organize**

SA6. plan and organize your own work to achieve targets and deadlines

**Customer Centricity**

SA7. check that your own and/or your peers' work meets customer requirements

SA8. meet and exceed customer expectations

**Problem Solving**

SA9. apply problem solving approaches in different situations

**Analytical Thinking**

SA10. configure data and disseminate relevant information to others

**Critical Thinking**

SA11. apply balanced judgments to different situations

**Attention to Detail**

SA12. check your work is complete and free from errors

SA13. get your work checked by others

**Team Working**

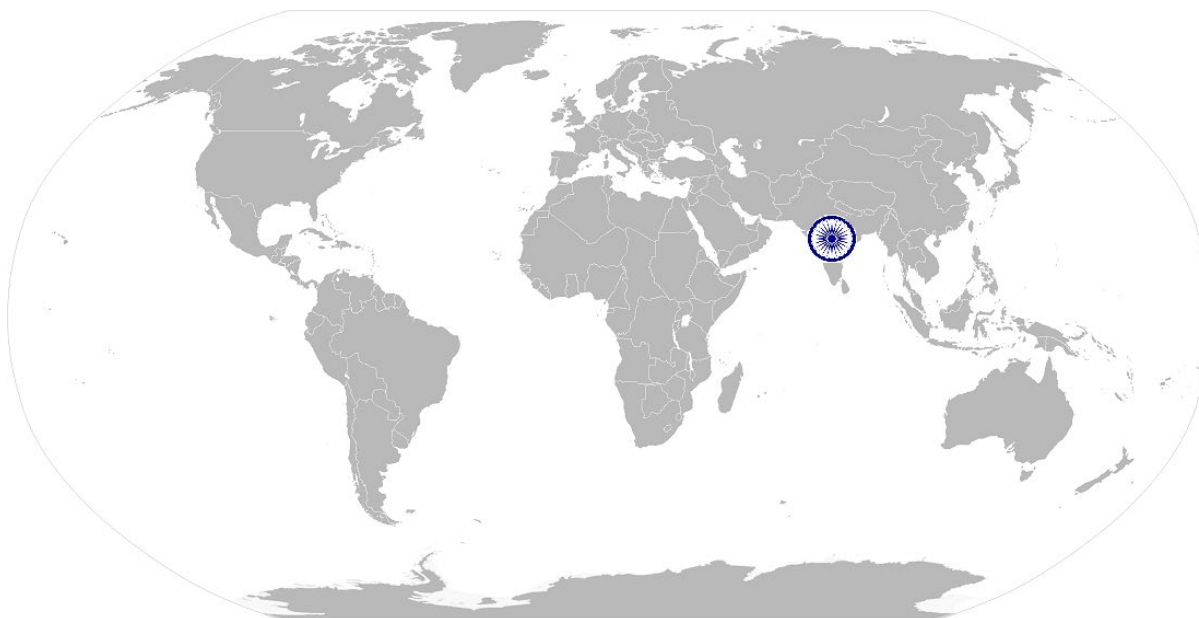
SA14. work effectively in a team environment

SSC/N9004

Provide data / information in standard formats

NOS Version Control

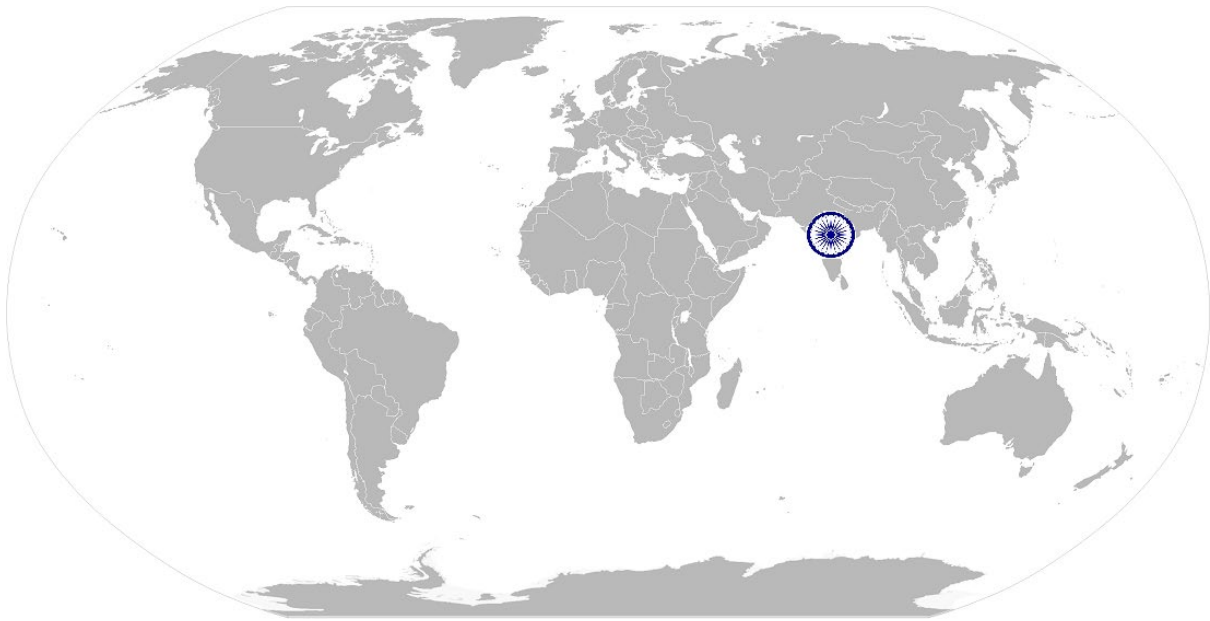
NOS Code	SSC/N9004		
Credits (NSQF)	TBD	Version number	1.0
Industry	IT-ITeS	Drafted on	29/08/2018
Industry Sub-sector	Future Skills	Last reviewed on	17/10/2018
Occupation	Artificial Intelligence & Big Data Analytics	Next review date	31/12/2019



SSC/N9005

Develop your knowledge, skills and competence

# National Occupational Standard



## Overview

This unit is about taking action to ensure you have the knowledge and skills you need to perform competently in your current job role and to take on new responsibilities, where required.



SSC/N9005

Develop your knowledge, skills and competence

National Occupational Standard

Unit Code	SSC/N9005
Unit Title (Task)	Develop your knowledge, skills and competence
Description	<p>This unit is about taking action to ensure you have the knowledge and skills you need to perform competently in your current job role and to take on new responsibilities, where required.</p> <p>Competence is defined as: the application of knowledge and skills to perform to the standards required.</p>
NSQF Level	6
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Develop knowledge</li> <li>• Apply knowledge</li> </ul> <p>Learning and Development Activities: formal education and training programs, leading to certification, non-formal activities (such as private study, learning from colleagues, project work), designed to meet learning and development objectives but without certification</p> <p>Appropriate Action: undertaking further learning and development activities, finding further opportunities to apply your knowledge and skills</p>
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Develop knowledge	<p>To be competent, the individual working on the job must be able to:</p> <p>PC1. obtain advice and guidance from appropriate people to develop your knowledge, skills and competence</p> <p>PC2. identify accurately the knowledge and skills you need for your job role</p> <p>PC3. identify accurately your current level of knowledge, skills and competence and any learning and development needs</p> <p>PC4. agree with appropriate people a plan of learning and development activities to address your learning needs</p> <p>PC5. undertake learning and development activities in line with your plan</p>
Apply knowledge	<p>To be competent, the individual working on the job must be able to:</p> <p>PC6. apply your new knowledge and skills in the workplace, under supervision</p> <p>PC7. obtain feedback from appropriate people on your knowledge and skills and how effectively you apply them</p>





SSC/N9005

Develop your knowledge, skills and competence

	PC8. review your knowledge, skills and competence regularly and take appropriate action
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the company/ organization and its processes)	<p>You need to know and understand:</p> <p>KA1. your organization's procedures and guidelines for developing your knowledge, skills and competence and your role and responsibilities in relation to this</p> <p>KA2. the importance of developing your knowledge, skills and competence to you and your organization</p> <p>KA3. different methods used by your organization to review skills and knowledge including: ☐ training need analysis ☐ skills need analysis ☐ performance appraisals</p> <p>KA4. how to review your knowledge and skills against your job role using different methods and analysis</p> <p>KA5. different types of learning and development activities available for your job role and how to access these</p> <p>KA6. how to produce a plan to address your learning and development needs, who to agree it with and the importance of undertaking the planned activities</p> <p>KA7. different types of support available to help you plan and undertake learning and development activities and how to access these</p> <p>KA8. why it is important to maintain records of your learning and development</p> <p>KA9. methods of obtaining and accepting feedback from appropriate people on your knowledge skills and competence</p> <p>KA10. how to use feedback to develop in your job role</p>
<b>B. Technical Knowledge</b>	<p>You need to know and understand:</p> <p>KB1. the knowledge and skills required in your job role</p> <p>KB2. your current learning and development needs in relation to your job role</p> <p>KB3. different types of learning styles and methods including those that help you learn best</p> <p>KB4. the importance of taking responsibility for your own learning and development</p> <p>KB5. to the importance of learning and practicing new concepts, theory and how to apply these in the work environment or on samples.</p> <p>KB6. how to explore sample problems and apply solutions</p> <p>KB7. how to use information technology effectively to input and/or extract data accurately</p>

SSC/N9005

Develop your knowledge, skills and competence

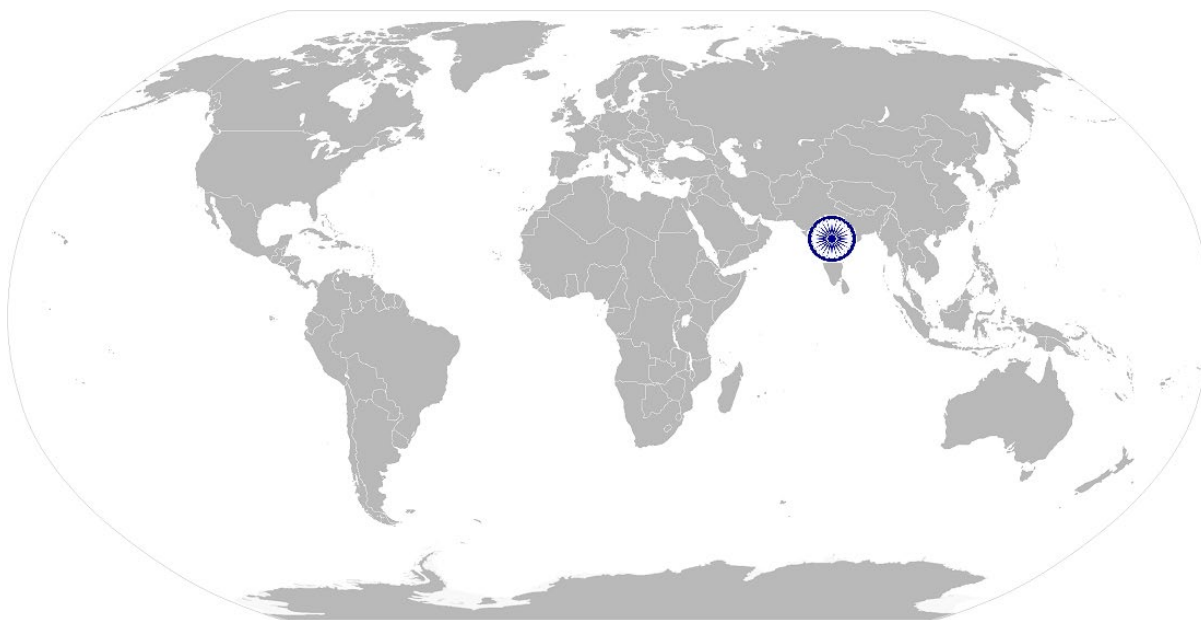
	<p>KB8. how to agree objectives and work requirements</p> <p>KB9. how to keep up to date with changes, procedures and practices in your role</p>
<b>Skills (S)</b>	
<b>A. Core / Generic Skills</b>	<p><b>Writing Skills</b></p> <p>SA1. complete accurate well written work with attention to detail</p> <p><b>Reading Skills</b></p> <p>SA2. follow instructions, guidelines, procedures, rules and service level agreements</p> <p><b>Listening and Speaking Skills</b></p> <p>SA3. ask for clarification and advice from line managers</p> <p><b>Decision Making</b></p> <p>SA4. make decisions on suitable courses</p> <p><b>Plan and Organize</b></p> <p>SA5. plan and organize your own work to achieve targets and deadlines</p> <p><b>Customer Centricity</b></p> <p>SA6. check that your own and/or your peers' work meets customer requirements</p> <p><b>Problem Solving</b></p> <p>SA7. refer anomalies to the line manager</p> <p><b>Analytical Thinking</b></p> <p>SA8. analyze data and activities</p> <p><b>Critical Thinking</b></p> <p>SA9. apply balanced judgments to different situations</p> <p><b>Attention to Detail</b></p> <p>SA10. check your work is complete and free from errors</p> <p>SA11. get your work checked by others</p> <p><b>Team Working</b></p> <p>SA12. work effectively in a team environment</p>

SSC/N9005

Develop your knowledge, skills and competence

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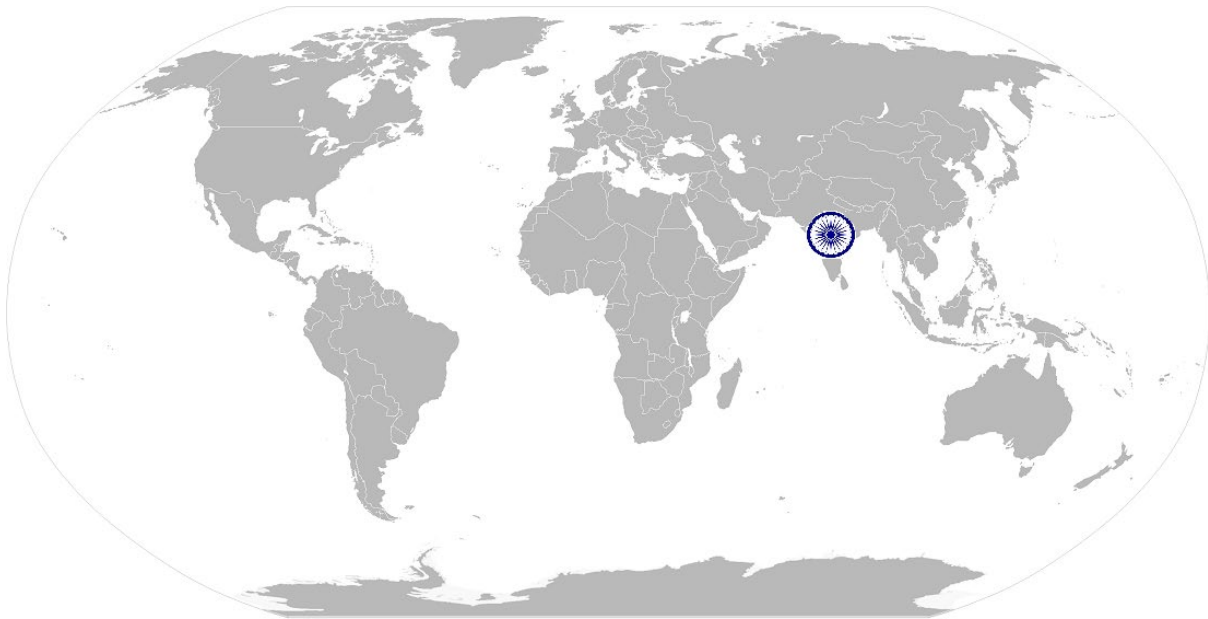
NOS Code	SSC/N9005		
Credits (NSQF)	TBD	Version number	1.0
Industry	IT-ITeS	Drafted on	29/08/2018
Industry Sub-sector	Future Skills	Last reviewed on	17/10/2018
Occupation	Artificial Intelligence & Big Data Analytics	Next review date	31/12/2019



SSC/N9006

Build and maintain relationships at the workplace

# National Occupational Standard



## Overview

This unit is about building and maintaining constructive relationships at the workplace.



SSC/N9006

Build and maintain relationships at the workplace

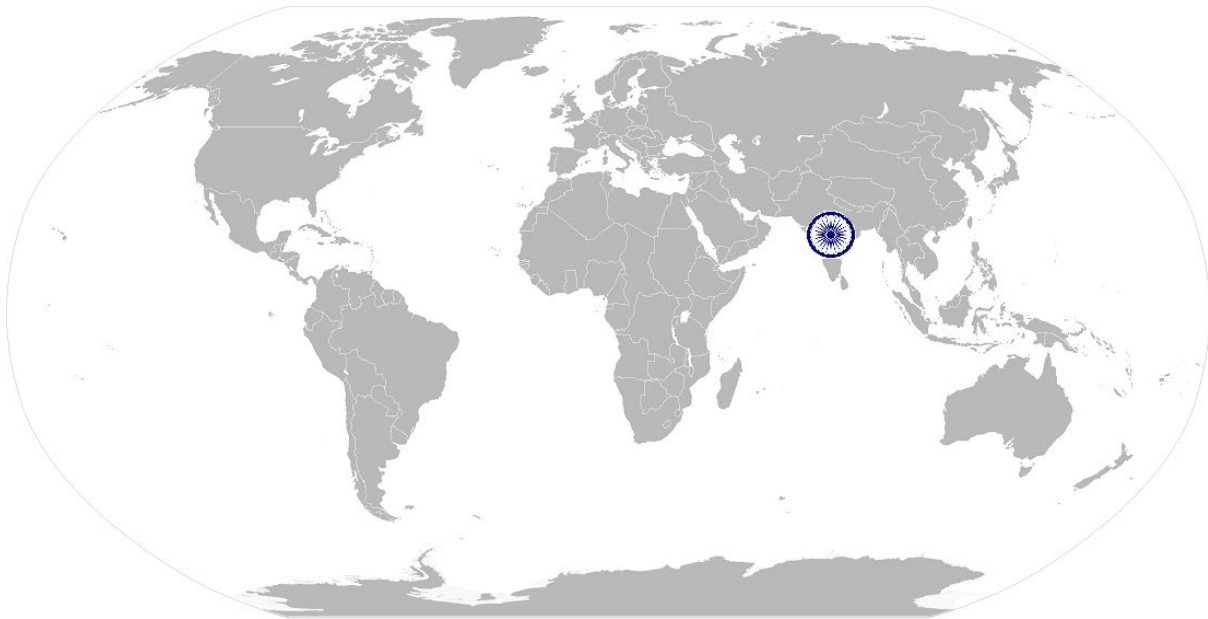
National Occupational Standard

<b>Unit Code</b>	<b>SSC/N9006</b>
<b>Unit Title (Task)</b>	<b>Build and maintain relationships at the workplace</b>
<b>Description</b>	This unit is about building and maintaining constructive relationships at the workplace.
<b>NSQF Level</b>	6
<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Build relationships</li> <li>• Maintain relationships</li> </ul> <p>Range: Appropriate people such as line manager, members of the team / department, members from other teams / departments</p>
<b>Performance Criteria (PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Build relationships</b>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. build rapport with appropriate people at the workplace</p> <p>PC2. develop new professional relationships</p> <p>PC3. build alliances to establish mutually beneficial working arrangements</p> <p>PC4. foster an environment where others feel respected</p> <p>PC5. identify and engage a diverse range of influential contacts</p>
<b>Maintain relationships</b>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC6. obtain guidance from appropriate people, where necessary</p> <p>PC7. attentively listen to ideas and give constructive feedback</p> <p>PC8. promptly resolve conflicts between team members</p> <p>PC9. work with colleagues to deliver shared goals</p> <p>PC10. recognize the contributions made by your colleagues</p>
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the company/ organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. organizational policies and procedures for building relationships and their role and responsibilities in relation to this</p> <p>KA2. different training programs to enable the development of relevant behavioural competencies</p>
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. the importance of creating an environment of trust and mutual respect in the organisation</p>

SSC/N9006

**Build and maintain relationships at the workplace**

	<p>KB2. the importance of effective communication in developing productive working relationships with colleagues</p> <p>KB3. different types of information that colleagues might need and the importance of providing this information when it is required</p>
<b>Skills (S)</b>	
<b>A. Core / Generic Skills</b>	<p><b>Listening and Speaking Skills</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA1. ask for clarification and advice from line managers</p> <p><b>Team Working</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA2. work effectively in a team environment</p>



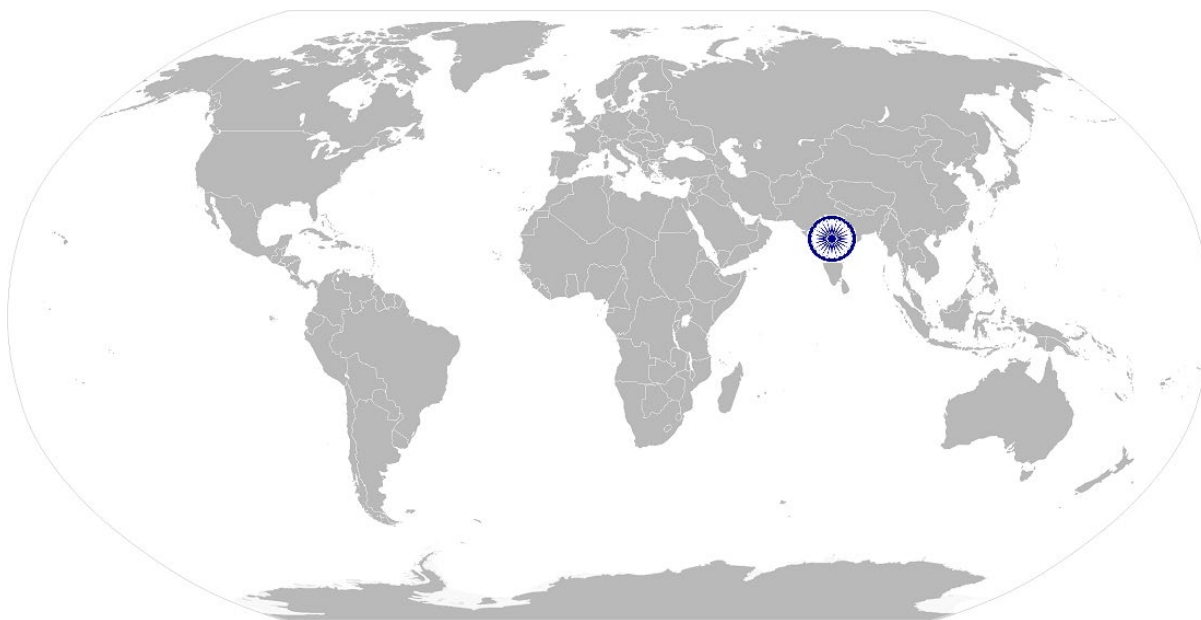


SSC/N9006

Build and maintain relationships at the workplace

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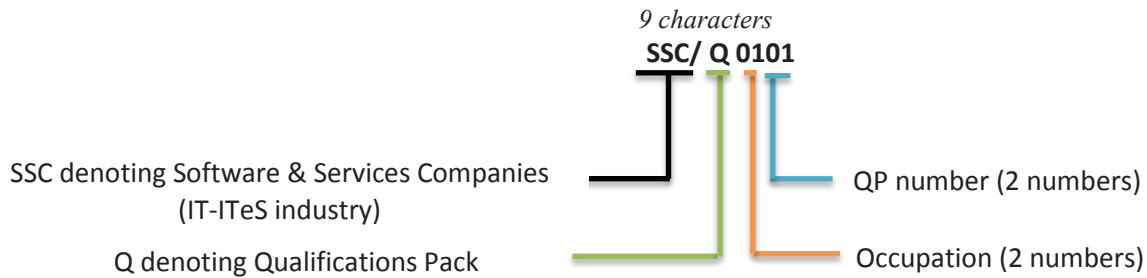
NOS Code	SSC/N9006		
Credits (NSQF)	TBD	Version number	1.0
Industry	IT-ITeS	Drafted on	29/08/2018
Industry Sub-sector	Future Skills	Last reviewed on	17/10/2018
Occupation	Artificial Intelligence & Big Data Analytics	Next review date	31/12/2019



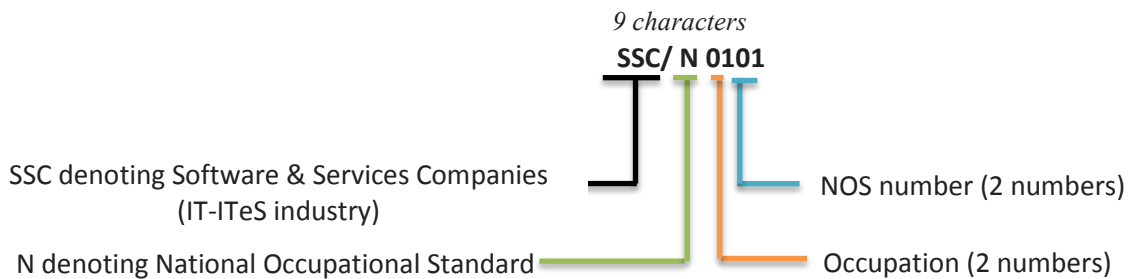
## Annexure

### Nomenclature for QP and NOS

#### Qualifications Pack



#### National Occupational Standard



The following acronyms/codes have been used in the nomenclature above:

Sequence	Description	Example
Three letters	Industry name (Software & Services Companies)	SSC
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

## Criteria For Assessment Of Trainees

**Job Role** AI - Data Engineer

**Qualification Pack** SSC/Q8106

**Sector Skill Council** IT-ITes

### Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
6. To pass a QP, a trainee should score an average of 70% across generic NOS' and a minimum of 70% for each technical NOS.
7. In case of *unsuccessful completion*, the trainee may seek reassessment on the Qualification Pack.

Compulsory NOS				Marks Allocation	
Total Marks: 600					
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out Of	Theory	Skills Practical
1. SSC/N8112 Develop data integrations as per specifications	PC1. evaluate whether the application is batch or real-time driven	100	3	0	3
	PC2. evaluate whether the application is using an SQL or NoSQL database		3	0	3
	PC3. evaluate feasibility and level of effort to integrate data		5	2	3
	PC4. evaluate different data warehouse, lake or pipeline designs		5	2	3
	PC5. evaluate available hardware if an on-premise solution is being designed		5	2	3
	PC6. determine the right data format depending on whether the application is batch or real-time driven		5	2	3

	PC7. partition or size the data as appropriate		5	2	3
	PC8. transform data into other formats		5	2	3
	PC9. develop, test and troubleshoot data pipelines		5	1	4
	PC10. combine tools into either macro or micro data pipelines		5	1	4
	PC11. design and implement ETL (Extract-Transform-Load) processes		5	1	4
	PC12. use data integration processes to populate and refresh the data warehouse		5	1	4
	PC13. define data onboarding and transformation processes to design the data lake		5	1	4
	PC14. create and execute proof-of-concepts for demonstrating the viability of the design approach for the data lake		5	2	3
	PC15. select appropriate applications to design and scale the data lake as per requirements		5	1	4
	PC16. develop the data lake and define appropriate mechanisms to query the data lake		5	2	3
	PC17. load data, metadata and other required categories into the data lake		5	1	4
	PC18. develop mechanisms for error and fault handling, and system availability for the data lake		5	1	4
	PC19. define performance criteria for the data integrations such as response time		5	2	3
	PC20. optimize the data integrations on the basis of the defined performance criteria		5	2	3
	PC21. create documentation on developed data integrations for appropriate people		2	0	2
	PC22. validate data integrations with appropriate people		2	0	2
	<b>Total</b>		<b>100</b>	<b>28</b>	<b>72</b>
2. SSC/N9001 Manage your work to meet requirements	PC1. establish and agree your work requirements with appropriate people	100	6.25	0	6.25
	PC2. keep your immediate work area clean and tidy		12.5	6.25	6.25
	PC3. utilize your time effectively		12.5	6.25	6.25
	PC4. use resources correctly and efficiently		18.75	6.25	12.5

	PC5. treat confidential information correctly		6.25	0	6.25
	PC6. work in line with your organization's policies and procedures		12.5	0	12.5
	PC7. work within the limits of your job role		6.25	0	6.25
	PC8. obtain guidance from appropriate people, where necessary		6.25	0	6.25
	PC9. ensure your work meets the agreed requirements		18.75	6.25	12.5
	<b>Total</b>		<b>100</b>	<b>25</b>	<b>75</b>
3. SSC/N9002 Work effectively with colleagues	PC1. communicate with colleagues clearly, concisely and accurately	100	20	0	20
	PC2. work with colleagues to integrate your work effectively with them		10	0	10
	PC3. pass on essential information to colleagues in line with organizational requirements		10	10	0
	PC4. work in ways that show respect for colleagues		20	0	20
	PC5. carry out commitments you have made to colleagues		10	0	10
	PC6. let colleagues know in good time if you cannot carry out your commitments, explaining the reasons		10	10	0
	PC7. identify any problems you have working with colleagues and take the initiative to solve these problems		10	0	10
	PC8. follow the organization's policies and procedures for working with colleagues		10	0	10
	<b>Total</b>		<b>100</b>	<b>20</b>	<b>80</b>
4. SSC/N9004 Provide data/information in standard formats	PC1. establish and agree with appropriate people the data/information you need to provide, the formats in which you need to provide it, and when you need to provide it	100	12.5	12.5	0
	PC2. obtain the data/information from reliable sources		12.5	0	12.5
	PC3. check that the data/information is accurate, complete and up-to-date		12.5	6.25	6.25
	PC4. obtain advice or guidance from appropriate people where there are problems with the data/information		6.25	0	6.25
	PC5. carry out rule-based analysis of the data/information, if required		25	0	25

	PC6. insert the data/information into the agreed formats		12.5	0	12.5
	PC7. check the accuracy of your work, involving colleagues where required		6.25	0	6.25
	PC8. report any unresolved anomalies in the data/information to appropriate people		6.25	6.25	0
	PC9. provide complete, accurate and up-to-date data/information to the appropriate people in the required formats on time		6.25	0	6.25
	<b>Total</b>		<b>100</b>	<b>25</b>	<b>75</b>
5. SSC/N9005 Develop your knowledge, skills and competence	PC1. obtain advice and guidance from appropriate people to develop your knowledge, skills and competence	100	10	0	10
	PC2. identify accurately the knowledge and skills you need for your job role		10	0	10
	PC3. identify accurately your current level of knowledge, skills and competence and any learning and development needs		20	10	10
	PC4. agree with appropriate people a plan of learning and development activities to address your learning needs		10	0	10
	PC5. undertake learning and development activities in line with your plan		20	10	10
	PC6. apply your new knowledge and skills in the workplace, under supervision		10	0	10
	PC7. obtain feedback from appropriate people on your knowledge and skills and how effectively you apply them		10	0	10
	PC8. review your knowledge, skills and competence regularly and take appropriate action		10	0	10
	<b>Total</b>		<b>100</b>	<b>20</b>	<b>80</b>
6. SSC/N9006 Build and maintain relationships at the workplace	PC1. build rapport with appropriate people at the workplace	100	10	3	7
	PC2. develop new professional relationships		10	3	7
	PC3. build alliances to establish mutually beneficial working arrangements		10	3	7



	PC4. foster an environment where others feel respected		10	4	6
	PC5. identify and engage a diverse range of influential contacts		10	4	6
	PC6. obtain guidance from appropriate people, wherever necessary		10	3	7
	PC7. attentively listen to ideas and give constructive feedback		10	3	7
	PC8. promptly resolve conflicts between self or others		10	2	8
	PC9. work with colleagues to deliver shared goals		10	2	8
	PC10. recognize the contributions made by your colleagues		10	3	7
	<b>Total</b>		<b>100</b>	<b>30</b>	<b>70</b>