Interim Report on

Awarding Credit Points (CP) for practical skills to ensure mobility

India's population is 1255 Mn, workforce is 510 Mn, 35% Indians are younger than 15 years, 18% between age group of 15 – 24. Average age is 25 years. Over 200 Mn enroll in class-I each year, 10% of these are able to finish class-XII, Drop-out rate between KG to class-12 is about 90% - 93%. 100 Mn children have no access to schooling. Literacy (as per Government statistics) is 67%, but functional Literacy is 33%. 60% of the workforce (510 Mn) is self employed, 25% of population is below poverty line. Unemployment of 46 Mn (in 2010) is likely to rise. 55% of population is in villages, but their GDP contribution is declining. Rural to urban migration is increasing. 70% of labor force is still illiterate or below primary level. 300 Mn of employable age are unemployed. 2.7 Mn college graduates come out every year, but they lack workplace skills. Job growth is slow, whereas potential workforce is increasing. This leads to sprawling unemployment and supply-demand mismatch. *Both per capita income and labor productivity are low.* India is a large mass but, per capita income and labor productivity are less than 1/10 and 1/7 respectively.

There is cash flow of US $ 10 Bn to 12 Bn per year on Indian students studying in foreign universities (153,000 students go abroad every year), Labor force in the age group of (20–24) years that have undergone the formal vocational training varies as India (5%), Mexico (28%), Industrialized nations (60% – 80%), Korea (96%). China has 500,000 senior higher secondary vocational schools, whereas India has about 5,500 ITIs and 600 VET schools. India's tremendous potential is demographic dividend. Working age population will be 63% by 2016. Demographic dividend of large young population is possible through VET (Vocational Educational & Training).

Over 65% population of India is below 35 years. While major world countries move towards aging, India is growing younger. This may turn into dividend if youths become skilled. Vocational Education had been in vogue, but it did not get honorable acceptance by Indian society in comparison with academic programs. Efforts were made to introduce compulsory and optional vocational subjects at school level. But their acceptance for mobility into higher education was lacking. In October 2011, AICTE launched an integrated qualification framework – NSQF / NVEQF (National Vocational Education Quality Framework) with 7 levels with varying proportion of vocational to academic class and lab hours 20% - 80% to 70% - 30% allowing horizontal and vertical mobility.

Salient characteristics of NSQF / NVEQF are as following:
- AICTE (All India Council for Technical Education) will accredit the SKPs (Skill Knowledge Providers).
- Level 1 – 8, each level requires 1000 hours/year.
- Knowledge–skill proportion varies from level-1 to level-7 requiring 800:200 hours to 700:300, 600:400, 500:500, 400:600, 300:700, and 200:800 hours respectively.
- Class-IX corresponds to Level-1, Class-X to Level-2, Class-XI to Level-3, Class-XII to Level-4, then after 10+2, Year-1 corresponds to Level-5, Year-2 to Level-6, Year-3 to Level-7, PG may correspond to Level-8 & 9.

{*In view of integrating with conventional technical academic program, it would be desirable to establish durational equivalence as well*}

At each level 6 modules are to be completed -

- 3 Skill Modules: Trade related module, Work related module, Soft Skills related module, (these are evaluated on 3 point scale A,B,C) and

- 3 Competencies Modules: Language module, Science module, Business module (these are evaluated on 5 point scale A, B, C, D, E)

Certificate Level	Contact Hours for Vocational & General Education	
	Vocational	Academic
Level-1	200 – 300	700 – 800
Level-2	200 – 300	700 – 800
Level-3	300 – 400	600 – 700
Level-4	300 – 400	600 – 700
Level-5	400 – 500	500 – 600
Level-6	500 – 600	400 – 500
Level-7	600 – 700	300 – 400

A new degree programs as B. Voc (Bachelor in Vocational Education) has also been announced. Government of India set up National Skill development Council to detail out sector-wise job roles and the corresponding skills-set. In the meanwhile NSQF / NVEQF-compliant courses were designed and offered in CBSE affiliated schools. NIOS also is launched for school level programs. But there had not been any headway towards acceptance of these courses to move into higher education. Issues pertaining to credit allocation, acceptance, accumulation, transfer, and professional mobility remained to be resolved. Focus has shifted from vocational term to skill that is considered to be better acceptable. In pursuance of the decision of the Cabinet Committee of Government of India on Skill Development, the National Skill Qualification Framework (NSQF) was notified by the Ministry of Finance on 27th December 2013.

Key concepts included the following:

"Competence" means the proven ability to use acquired knowledge, skills and personal and social abilities, in discharge of responsibility roles. It is the ability to do a job well.

"Credit" is recognition that a learner has successfully completed a prior course of learning, corresponding to a qualification at a given level.

"Knowledge" means the outcome of the assimilation of information through learning Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. Knowledge is described as theoretical and / or factual.

"Learner" refers to an individual undergoing skill development training, whether in a formal or informal setting.

"Learning Outcomes" represent what a learner knows, understands and is able to do on completion of a learning process, and which would be expressed in terms of knowledge, skills and competence;

"NSQF" stands for National Skills Qualification Framework.

"Qualification" means a formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards.

"NSQC" stands for National Skills Qualifications Committee set up in accordance with NSQF.

"Recognition of Prior Learning" or **"RPL"** is the process of recognising previous learning, often experiential, towards gaining a qualification

"Sector" means a grouping of professional activities on the basis of their main economic function, product, service or technology

"Skills" means the ability to apply knowledge and use know-how to complete tasks and solve problems. Skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments);

"Trainer" means someone who trains, instructs, teaches or otherwise enables the learner (s) to acquire the appropriate knowledge and skills.

"Training provider", **"Institute"** and **"Institution"** refer to any organization providing knowledge and skills to learners.

WHAT IS NSQF?

1. The National Skills Qualification Framework (NSQF) organizes qualifications according to a series of levels of knowledge, skills and aptitude. These levels are defined in terms of learning outcomes which the learner must possess regardless of whether they were acquired through formal, non-formal or informal learning. In that sense, the NSQF is a quality assurance framework. It is, therefore, a nationally integrated education and competency based skill framework that will provide for multiple pathways, horizontal as well as vertical, both within vocational education and vocational training and among vocational education, vocational training, general education and technical education, thus linking one level of learning to another higher level. This will enable a person to acquire desired competency levels, transit to the job market and, at an opportune time, return for acquiring additional skills to further upgrade their competencies.

2. Key elements of the NSQF provide:
   a. national principles for recognizing skill proficiency and competencies at different levels leading to international equivalency
   b. multiple entry and exit between vocational education, skill training, general education, technical education and job markets
   c. progression pathways defined within skill qualification framework
   d. opportunities to promote lifelong learning and skill development
   e. partnership with industry / employers
   f. a transparent, accountable and credible mechanism for skill development across various sectors
   g. increased potential for recognition of prior learning

1. The qualification framework is beneficial to schools, vocational education and training providers, higher education institutes, accrediting authorities as well as industry and its representative bodies, unions, professional associations and licensing authorities. The biggest beneficiaries of such a framework are the learners who can judge the relative value of a qualification at a particular level on the framework and make informed decisions about their career progression paths.

A paradigm shift from education based on inputs towards education based on learning outcomes is taking place. Outcomes-based learning is a widely used term. The shift to learning outcomes is important for a number of reasons:

   a. It shifts focus from providers to users of education and training.
   b. By explaining what a learner is expected to know, understand or be able to do at the end of a learning process, individuals are better able to see what is offered in particular course and how this links with other courses and programs.
   c. It increases transparency and strengthens accountability of qualifications – for the benefit of individual learners and employers.

Though the theoretical principles of all frameworks remain largely similar, the objectives of launching the frameworks vary. Whether the emphasis is on increasing the relevance and flexibility of education and training programs, easing recognition of prior learning, enhancing lifelong learning, improving the transparency of qualification systems, creating possibilities for credit accumulation and transfer, or developing quality assurance systems, Governments are increasingly turning to qualifications frameworks as a policy tool for reform. There is increasing activity from international agencies in the area of qualifications frameworks: the Organisation for Economic Cooperation and Development (OECD), the International Labour Office (ILO), the World Bank (WB) and the European Union (EU) have current qualification framework projects.

Through the National Policy on Skill Development, 2009, India recognized the need for the development of a national qualification framework that would transcend both general education and vocational education and training. The Ministry of Labour and
Employment developed the National Vocational Qualifications Framework (NVQF) and the Ministry of Human Resource Development developed the National Vocational

Educational Qualification Framework (NVEQF). The Ministry of Human Resource Development also launched a pilot of the NVEQF in Haryana at the secondary school level. A common framework was developed by an inter-ministerial committee as NSQF (National Skill Qualification Framework) to ensure that quality and standards meet sector specific requirements was transferred to the Agency.

Till now the focus of education and training has been almost entirely on inputs.

OBJECTIVES OF NSQF

i. The objectives of the NSQF are to provide a framework that:

- Accommodates the diversity of the Indian education and training systems
- Allows the development of a set of qualifications for each level, based on outcomes which are accepted across the nation
- Provides structure for development and maintenance of progression pathways which provide access to qualifications and assist people to move easily and readily between different education and training sectors and between those sectors and the labour market
- Gives individuals an option to progress through education and training and gain recognition for their prior learning and experiences
- Underpins national regulatory and quality assurance arrangements for education and training
- Supports and enhances the national and international mobility of persons with NSQF-compliant qualifications through increased recognition of the value and comparability of Indian qualifications

ii. The NSQF is a quality assurance framework — it facilitates the awarding of credit and supports credit transfer and progression routes within the Indian education and training system. It seeks to help everyone involved in education and training to make comparisons between qualifications offered in the country, and to understand how these relate to each other.

- NSQF is based on an outcomes-based approach, and each level is defined and described in terms of competency levels that would need to be achieved.

- Job roles corresponding to each of these competency levels would be ascertained with the involvement of industry, through the respective Sector Skill Councils (SSCs).

- Pathways of learning and progression, especially on the vocational education and training front, are generally unclear or absent. There is no clear provision for vertical or horizontal mobility. The NSQF will make the progression pathways transparent so that institutes, students and employers are clear as to what they can or cannot do after pursuing a particular course and address the issues of inequity and disparity in qualifications.

- There is lack of uniformity in the outcomes associated with different qualifications across institutions, each with its own duration, curriculum, entry requirements as well as title. This often leads to problems in establishing equivalence of certificates/diplomas/degrees in different parts of the country, which in turn impacts the employability and mobility of students.

- The negative perception associated with vocational education and training can be
- significantly removed by the development of quality qualifications that also permit acquisition of higher qualifications, including degrees and doctorates

- There exist a large section of people who have acquired skills in the informal sector but who do not have the necessary formal certifications to attest to their skills. As a Competency and outcomes based qualification framework, NSQF will facilitate RPL.

- Majority of Indian qualifications are not recognized internationally and vice-versa. This creates a problem for the students and workers as their international mobility is adversely affected and they often have to undergo a course again to get a qualification that is recognized in the host country. The NSQF will also help alignment of Indian qualifications to international qualifications in accordance with relevant bilateral and multilateral agreements. Many countries are already in the process of aligning their qualifications to international qualifications through qualification frameworks.

- The credit accumulation and transfer system that will be integrated in the NSQF will allow people to move between education, vocational training and work at different stages in their lives according to their needs and convenience. It will be possible for a student to leave education domain, get some practical experience in industry and return to studies to gain qualifications to progress higher in his chosen career

HOW IT WORKS?

- The National Skill Qualification Framework is composed of ten levels, each representing a different level of complexity, knowledge and autonomy required to demonstrate the competence commensurate for that level. Level one of the framework represents the lowest complexity while level ten represents the

highest complexity. The levels are defined by criteria expressed as learning outcomes. Volume of learning denoting notional time taken to acquire qualification may also be indicated for some levels and some sectors, but it is important to note that the NSQF Levels are not related directly to years of study. They are defined by the extent of demands made of the learner in broad categories of competence, i.e. professional knowledge, professional skill, core skill and responsibility. Over a lifetime of learning, individuals will move to higher from lower levels or across levels of qualifications as they take on new learning and acquire new skills.

- Each NSQF level is defined by a set of descriptors expressed as learning outcomes. The level descriptors are designed to allow broad comparisons to be made between outcomes of learning. However, it is not the case that every qualification will or should have all of the characteristics set out in the level descriptors. Each qualification at an NSQF level may be further defined with reference to curriculum, notional contact hours, subjects, duration of studies, workload, trainer quality and type of training institution, to indicate what is expected of the learner in terms of ability to do or apply at the end of the learning process. The positioning of two or more qualifications at the same level only indicates that they are broadly comparable in terms of the general level of outcome. It does not indicate that they necessarily have the same purpose or content.

- Some other issues associated with the NSQF are given below:

- National Occupational Standards (NOS): NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do. These standards can form the benchmarks for various education and training programs. Just as each job role may require the performance of a number of tasks, the combination of all the NOSs corresponding to these tasks would form the Qualification Pack (QP) for that job role. The NOSs and QP for each job role corresponding to each level of the NSQF are being formulated by the concerned Sector Skill Councils (SSCs).

- Curriculum Packages: The competency based curriculum packages would consist of syllabus, student manual, trainers guide, training manual, trainer qualifications, assessment and testing guidelines and multimedia packages and e-material. These will be developed for each NSQF level, and where relevant, for specific Qualification Packs (QPs) identified by the SSCs. This may be done by such agencies as the Ministries/ Departments, Sector Skills Councils and Regulatory Bodies may designate, or any other body, in accordance with the NSQF. NSQF curricula should be modular, allowing for skill accumulation and facilitating exit and entry. Curricula design will also be aligned to a credit framework that reflects credits earned and competencies acquired. Training of trainers would also be aligned to the NSQF.

- Industry Engagement: Since the NSQF is based on an outcomes-based approach, participation of the industry and employers is a critical prerequisite for the success of NSQF. Vocational education, vocational training general education and skill development courses will be designed, developed, delivered, and learners assessed

and certified in accordance with the NSQF in consultation with SSCs, industry and employers. In addition to this the industry may also provide support in terms of providing training institutions.

- Horizontal and vertical mobility: For horizontal and vertical mobility to take place, the following are essential:

- Each level is linked to the ones above and below it by a series of steps. If these steps in any industry sector or academic domain are missing, the NSQF would help identify and map these missing gaps.

- These gaps would have to be filled, and the key administrative ministry, regulatory bodies already operating in that sector, the SSCs and other stakeholders being part of the NSQC, would need to be consulted in the process

- The degree of lateral mobility that is considered desirable would have to be identified by the NSQC, and the same would have to be facilitated through on- going credit accumulation and transfer. If there are "competency gaps" identified in a candidate, a "bridge course" based on modular curricula to acquire those competencies may be imparted by the receiving Institution.

- International comparability: The NSQF will provide a means of articulation and alignment of the Indian Skill Qualification levels with those of other countries and regions. This will help in the mobility of Indian NSQF-aligned Qualification holders to work in and/or relocate to other parts of the world. The NSQF will also be the means of interface with the various geographical regional frameworks that are developing across the world.

LEVEL DESCRIPTORS

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

a. Process / Learning Objective
b. professional Knowledge,
c. Professional skill,
d. core skill and
e. Responsibility

Each of these is briefly described below:

a. Pr**ocess**
Process is a general summary of the other four domains corresponding to the level.

b.**Professional Knowledge**
Professional knowledge is what a learner should know and understand with reference to the subject. It is described in terms of depth, breadth, kinds of knowledge and complexity, as follows:

- Depth of knowledge can be general or specialized

- Breadth of knowledge can range from a single topic to multi-disciplinary area of knowledge

- Kinds of knowledge range from concrete to abstract, from segmented to cumulative

- Complexity of knowledge refers to the combination of kinds, depth and breadth of knowledge

c. **Professional skill**

Professional skills are what a learner should be able to do. These are described in terms of the kinds and complexity of skills and include:

- Cognitive and creative skills involving the use of intuitive, logical and critical thinking

- Communication skills involving written, oral, literacy and numeracy skills

- Interpersonal skills and generic skills

d. **Core skill**

Core skills refer to basic skills involving dexterity and the use of methods, materials, tools and instruments used for performing the job, including IT skills needed for that level.

e. **Responsibility**

Responsibility aspect determines the following:

- Nature of working relationships

- Level of responsibility for self and others

- Managing change

- Accountability for actions

The descriptors give broad, general, but meaningful, indicators of the learning outcomes at each level. The descriptors can be used in a number of ways:

- To allocate levels to learning programs and qualifications

- In validation and moderation of various qualifications and programs

- As a basis for communication with learners and other users of qualifications

- As a guide for mapping progression routes within and across the education and training sectors

- By program designers when making entry requirements and recommendations for programs

The NSQF level descriptors are given below:

LEVEL	Process required	Professional knowledge	Professional skill	Core skill	Responsibil Ity
Level 1	prepares person to/carry out process that are repetitive on regular basis require no previous practice	familiar with common trade terminology, instructional words meaning and understandin g	routine and repetitive, takes safety and security measures.	Reading and writing, addition subtraction personal financing, familiarity with social and religious diversity, hygiene	No responsibility. always works under continuous instruction and close supervision
Level 2	prepares pers on to/carry out process that are repetitive on regular basis	Material tools and application in a limited context, understands context of work and quality	limited service skill used in limited context, select and apply tools, assist in professional	Receive and Transmit written andoral messages, basic arithmetic personal financing understanding of social	No responsibility. works under instruction and close supervision
			works with no variables differentiate s good and bad quality	and religio us diversity, hygiene	
Level 3	person may carry put a job which may require limited range of activities routine and predictable	Basic facts, process and principle applied in trade of employment	recall and demonstrate practical skill, routine and repetitive in narrow range of application	Communication written and oral, with minimum required clarity, skill of basic arithmetic and algebraic principles, personal banking, basic understanding	Under close supervision Some Responsibility for own work within defined limit.

Level 4	work in familiar, predictable, routine, situat ion of clear choice	factual knowledge of field of knowledge or study	recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts	language to communicate written or oral, with required clarity, skill to basic arithmetic and algebraic principles, basic understanding of social	Responsibility for own work and learning
Level 5	job that requires well developed skill, with clear choice of procedures in familiar context	knowledge of facts, principles, processes and general concepts, in a field of work or study.	a range of cognitive and practical skills required to accomplish tasks, solve problems by selecting and applying basic methods, tools, materials & information	Desired mathematical skill, understanding of social, politi cal and some skill of collecting and organising information, communication .	Responsibility for own work and learning and some responsibility for other's works and learning

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Level					
Level 6	demands wide range of specialised technical skill, clarity of knowledge and practice in broad range of activity involving standard non standard practices	factual and theoretical knowledge in broad contexts within a field of work or study	a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Reasonably good in mathematical calculation, understanding of social, political and, reasonably good in data collecting organising information, and logical communication	Responsibility for own work and learning and full responsibility for other's works and learning
Level 7.	requires a command of wide ranging specialised theoretical and practical skill, involving variable routine and non-routine context.	wide ranging, factual and theoretical knowledge in broad contexts within a field of work or study	wide range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	good logical and mathematical skill understanding of social political and natural environment good in collecting and organising information, communication and presentation skill	Full responsibility for output of group and development
Level 8	Comprehensive, cognitive, theoretical knowledge and practical skills to develop creative solutions, to abstract problem. Undertakes self study, demonstrates intellectual independence, analytical rigour and good communication.			Exercise management and supervision in the context of work/study having unpredictable changes, responsible for development of	
Level 9.	Advanced Knowledge and skill Critical understanding of the subject, demonstrating mastery and innovation, completion of substantial research and dissertation.			Responsible for decision making in complex technical activities, involving unpredictable study/work	
Level 10.	Highly specialised knowledge and problem solving skill to provide original contribution to knowledge through research and scholarship.			Responsible for strategic decisions in unpredictable complex situations of	

Levels 8, 9 & 10 at PG and doctorate levels do not differentiate professional knowledge and skills.

CREDITS

- "Credit" is recognition that a learner has successfully completed a prior course of learning, corresponding to a qualification at a given level. For each such prior qualification, the student would have put in a volume of institutional or workplace learning, and the more complex a qualification, the greater the volume of learning that would have gone into it. The credit points give learners, employers and institutions a means of describing and comparing the learning outcomes achieved. Based on this, the additional learning outcomes to acquire a qualification at a higher NSQF level can be

determined. Credits quantify learning outcomes that are subject to valid, reliable methods of assessment. The number of credits may be worked out on the basis of the number of notional learning hours that an 'average' learner at a specified NSQF level might expect to take to achieve the learning outcomes, including the assessment. However, this is merely a guide and no credits are added or taken away if more or less time is taken to achieve the outcomes. No credits are 'earned' by a learner if the learning outcomes are not achieved or, in the case of RPL, demonstrated.

- Credits can be used to assist learners to transfer between programs. This can happen only when awarding bodies determine how much credit can be transferred into which of their programs. This decision will depend upon the nature/content of the learning for which the credit has been given and the requirements of the program into which transfer is being sought. This will also facilitate multiple entry and exit pathways at each level (or within a level) with the bundle of credits earned clearly certified by assessment and certification bodies which have been authorized to do so.

- Wherever notional learning time is used, it should include all learning activities required for the achievement of the learning outcomes for a particular level, including, for example:

    a. Formal learning, including classes, training sessions, coaching, seminars and tutorials Practice and learning on the job - gaining, applying and refining skills in the workplace
    b. Involvement in informal learning, example: community-based workshops, youth groups, playgroups
    c. Doing practical work in laboratories or other locations
    d. Expected private study, revision and remedial work
    e. Work-based activities which lead to assessment
    f. Undertaking all forms of assessment

Notional learning time may also be linked to the International Standard Classification of Occupations (ISCO 08), which includes reference to a nominal duration of learning and workplace training for each occupation.

- The need to undertake any or all of these will be considered when credit is being allocated to a qualification or learning program. The mix of learning activities will vary from program to program — in school, the learning might be mostly class-based; in higher education much of the learning time could be spent outside of formal lectures etc. In other situations, much of the learning will be work-based. In determining the notional learning time involved in achieving outcomes of learning (for eg. in a module/unit, program, or any piece of assessed learning), no rigid allocation of time is implied in this system, particularly as flexible and distance learning develops.

EVOLVING CREDIT FRAMEWORK

Steering committee on NVEQF held on 12th Feb 2014 resolved that NVEQF is henceforth is assimilated inti NSQF which has important components such as multiple entry and exit between vocational, general, technical and job specific education, horizontal and vertical mobility, outcomes based learning, industry engagement, National Occupational Standards, Competency-based curriculum, Credit Accumulation and Transfer System, Recognition of Prior Learning, Quality assurance and sharing of resources. There is need to develop Accreditation norms for training providers and certification agencies. Assessment and certification norms will be developed by Regulatory bodies, SSCs / industry which may be approved by NSQC.

Credit Framework will be pr-requisite and may be developed to ensure mobility of learners.

Targets for skilling are 500 Mn by 2022, out of which 50 Mn by MHRD. Annually 5.23 Lakhs skill manpower is produced by department of Higher Education, 25,000 by NIOS. 1.7 Lakhs students opt for vocational courses at secondary and senior secondary levels. Under NLM, 5 lakhs / year opted vocational courses of 1 to 6 months duration.

Challenge lies in attaining targets in both quantity as well as quality.

Let us take an example of certification in Manufacturing from Australia. The certification course may have 21 units, one of them is the unit on Soldering Technique with following details. There are core and common / elective units

AUR23808B   Carry out soldering techniques

Unit Descriptor
This unit (AUR23808B) identifies the competence required to carry out a variety of soft soldering procedures including the preparation of materials and equipment.

Element	**Performance Criteria**
1. Plan and prepare for soft soldering	1.1 Work requirements are identified from work orders and instructions.
	1.2 Information required for the work is accessed from appropriate sources to enable soft soldering to be performed in accordance with relevant legislative/regulatory, site and equipment manufacturer's requirements.
	1.3 Approved methods and equipment, according to type of work required and materials to be soft soldered are confirmed.
	1.4 Relevant occupational health and safety policies and procedures are observed throughout the soldering operations.
	1.5 Work area is prepared in accordance with work requirements and site procedures.
	1.6 Co-ordination activities with others involved in the operations throughout this work cycle are resolved through timely and effective communication.
2. Carry out soldering techniques	2.1 Materials to be soft soldered are prepared and aligned in accordance with the work plan and specifications.
	2.2 Equipment is connected, checked and set up in accordance with manufacturer's and site procedures.
	2.3 Test runs are undertaken in accordance with site procedures.
	2.4 Soft soldering procedures are completed without causing damage to any component or system.
	2.5 Joins are cleaned using appropriate tools and techniques in accordance with the work plan.

		2.6	Joins are inspected visually and defects identified and repaired using appropriate techniques and in accordance with work plan.
3.	Complete soft soldering procedures	3.1	Work is completed and appropriate personnel notified in accordance with site requirements.
		3.2	Workplace tools, equipment and materials are cleaned and stored in accordance with site procedures.

Element	Performance Criteria
3. Complete soft soldering procedures (continued)	3.3 Work area is cleared of waste, cleaned and restored in accordance with site procedures.
	3.4 Work completion details are completed in accordance with site requirements.

Range of Variables Scope of Soldering

May include cleaning components, heating and/or soldering types of various thicknesses of material and electronic circuit repairs.

Resources
May include all hand tools, soldering equipment, fluxes, different types of soft solder, power tools, gas, electric and flame heated irons and gas fired torches.

Sources of Information/Documents
Manufacturer's specifications, enterprise operating procedures, component manufacturer's specifications, customer requirements and industry/ workplace codes of practice.

Relevant Site Policies and Procedures
May include hazard policies and procedures, emergency, fire and accident procedures, personal safety procedures, procedures for the use of personal protective clothing and equipment, use of motor vehicles, issue resolution procedures, job procedures, work instructions, quality and environmental procedures.

Legislative Requirements
May include state and territory occupational health and safety legislation and national/state codes of practice.

Occupational Health and Safety Procedures
May include safe manual handling and lifting, customers, staff equipment/tools, premises and stock.

Emergency Procedures
May include sickness, accidents, fire or store evacuation involving staff or customers.

Communications
Communications may be verbal, written, by telephone or by other means.

Recording of Information
Accurate records of all relevant information are to be completed and may be stored manually, electronically or by other means.

Evidence Guide Critical Aspects
It is essential that competence in this unit signifies the ability to transfer the competency to changing circumstances and to respond to unusual circumstances in the critical aspects of:
- communicating effectively with others in associated areas
- identifying and assessing hazardous situations and rectifying, where appropriate, or reporting to the relevant personnel
- applying relevant occupational health and safety policies and procedures
- planning and preparing for soft soldering
- carrying out a variety of soft soldering procedures
- completing soft soldering procedures
- completing essential post activity housekeeping

Interdependent Assessment of Units
This unit may be assessed in conjunction with all common and technical units which form part of the normal job role.

Underpinning Knowledge
- General knowledge of soft soldering theory including types of materials and fluxes for soft soldering applications.
- General knowledge of common automotive terminology and vehicle safety requirements.
- Working knowledge of relevant occupational health and safety regulations / Requirements, equipment, material and personal safety requirements.
- Working knowledge of the types and applications of cleaning agents.
- Working knowledge of types of materials that can be soldered.
- Working knowledge of relevant hazardous substances and toxic fumes/lead poisoning.
- Detailed knowledge of soft soldering techniques and procedures.
- Detailed knowledge of site reporting procedures.

Underpinning Skills
- Plain English literacy and communication skills in relation to dealing with others involved in the work.
- Technical literacy and communication skills sufficient to interpret and apply common industry terminology, and interpret technical information and specifications related to soft soldering.
- Questioning and active listening skills, for example when obtaining information of safe working practices and soft soldering processes.
- Research and interpretative skills to locate, interpret and apply relevant for soft soldering procedures.
- Manipulative and dexterity skills to physically perform soft soldering.
- Problem solving skills for a limited range of differing procedural circumstances.

Consistency in Performance
It is preferable that assessment reflects a process rather than an event and that it occurs over a period of time to cover the varying circumstances. Evidence of performance may be provided by customers, team leaders/members or other appropriate persons subject to agreed authentication arrangements.

Context for Assessment

Assessment of this unit must be completed on-the-job or in a realistically simulated work environment which reflects a range of soft soldering applications.

Resource Implications

The following are required:
- a workplace or simulated workplace
- realistic situations requiring soft soldering
- site or equivalent instructions in soft soldering
- appropriate materials, tools and equipment
- hazardous substances information
- a qualified workplace assessor.

Key Competencies & Application to Standards

	Level		
	1	2	3
Collecting, analysing & organising information	•		
Communicating ideas & information	•		
Planning & organising activities	•		
Working with others in teams	•		
Using mathematical ideas & techniques	•		
Solving problems	•		
Using technology	•		

Herein we notice that there are 7 competencies to master for getting certificate for the unit on Aftermarket Manufacturing. Each of these competencies may require certain amount of efforts. At each level there may be N number of Units, and under i^{th} unit, there may be some competency modules. j^{th} module in N_i unit may be termed as N_{ij} that may require k notional hours of efforts to attain the competency.

We may define each competency module having as many numbers of skills as there are skill competency credits assigned. One Skill Competency credit point may be defined as 6 hours of learning in class / lab that is putting effort of one hour of learning every day in a week. The competency module may require 20 notional hours to attain that competency. This may correspond to 20 / 6 = 3 Skill Competency Credit Point.

Suppose a unit consisting of 5 competency modules requiring 20, 30, 24, 32, 20 notional hours respectively will thus have 3+5+4+5+3 = 20 skill competency credit points (SC-CP).

For equivalence with Higher Education Credit Point (HE-CP), we consider 5 SC-CP (5x6 notional hours) = 1 HE-CP that requires 30 hours of learning. Thus, this unit may be equated to 4 HE-CP. For the sake of mobility, content and efforts should be equivalent. If this condition meets, then these 4 HE-CP credit points may be accepted, accumulated and used for transfer into higher education system. Moreover certain skills may be common in other skill competency course. There these skills will be accepted and the student will not have to repeat doing the same what he has already accomplished. This is how the credit points become currency to facilitate horizontal and vertical mobility.

We may recall the work of Frederick W Taylor during the first decade of 20th century. He gave the concept of Scientific Management to improve productivity and ensure quality. Rather use of empirical "rule of thumb", he advocated breakdown of work tasks into constituent elements for which a worker can be trained. The four principles of Frederick W Taylor's scientific management are:

1. Development of a science for each element of a man's work to replace the old rule-of-thumb methods.
2. Scientific selection of worker for a work task based on his/her competencies.
3. Scientific training and development of workers for specific competencies.
4. Development of intimate and friendly cooperation between workers and management.

This approach is being adopted for skill development through the proposed vocational subject as core subject. Focus is on appropriate blending of knowledge and practice. Technical skills may be defined as **the core competencies (CC)** which focus more on generic knowledge and exposure to practical applications, and **the domain competencies (DC)** which focus competencies needed in a specific domain. The behavioral competencies may include **the Occupational Competencies (OC)** aiming at improvement of working environment to become conducive to safety and health, and **the workplace competencies (WC)** that imbibe spirit of team work, working culture and hands-on experience at work place. This may also be referred to

the work integrated learning (WIL) through entrepreneurial project-based assignments. The economist Schumpeter's concept is a synthesis of three different notions of entrepreneur: risk bearer, innovator and a coordinator cum manager. The innovation and technological change of a nation come from the entrepreneurs.

HOW TO ALLOCATE CREDITS ?

European Union Credit transfer and accumulation and transfer system (ECTS) considers 60 Credit Points for the entire academic year. For 1 CP for 25 - 30 hours of learning, these are equivalent to 1500 - 1800 hours of learning. ECVET European Credit System for Vocational Education & Training also recommends similarly 60 ECVET Points for one academic year. This would facilitate credit transfer from one qualification system to another; from one learning pathway to another compatible with ECST.

UK adopts 120 Credits/year and 1Credit Point corresponds to 10 Hours of learning.

In USA , Carnegie Unit and Student Hours are considered. 1 Carnegie Unit = 120 hours of class / contact time; 1 Hour of lecture time per week, 5-days a week, 24 weeks per semester. 50 minutes lecture means effectively 30 weeks per semester. 1 Student Hour = ~ 12 hours of contact time.

In India, in higher education, academic year has 180 working days; 30 weeks of actual teaching; in 6-days a week. 12 weeks are for admission and examination; 8 weeks for vacation; 2 weeks for public holidays. This is distribution of 52 weeks in a year. 1 credit point for learning corresponds to 1 hour contact time per week over 30 weeks per semester that is 30 Hours. This may be split into 80% class / contact time and 20% outside the class. Hence we may say that one Credit Point corresponds to 24 Hours of learning in class / contact time and 6 Hours outside the class.

In order to establish equivalence and mobility between school and university higher education programs, we may conservatively consider 30 credit points per semester, and 1 credit point (CP) = 24 hours of learning or contact time in Higher Education. This corresponds to 720 hours of learning per semester; 1440 hours of learning / contact time per academic year. With 30 hours per Credit Point, it is 900 hours of learning per semester, or 1800 hours of earning per year. This is within the range recommended for higher education. 1400 – 1800 hours of learning are recommended.

In view of the equivalence of the courses and acceptability we may have some mechanism to establish equivalence of the credit points on the lines of 60 CP per academic year. We may suggest Skill Competency Credit point (SC-CP) that corresponds to 6 hours of learning. In higher education student is motivated for learning outside class or self study, whereas at school level in vocational subject, learning is basically in class / lab, not much beyond. Thus 5 SC-CP may equate to 1 CP that will equate with prevalent CP and hours of learning criteria in Higher Education. That will ensure mobility. Skill Competency Credit Point will encourage larger mass to be benefitted at school level. Too small a value is often distraction. CBSE vocational curriculum may have 32 Credit Points per year for 192 hours of learning. We call it Skill Competency Credit Point (SC-CP). 1 SC-CP is equivalent to 6 hours of learning. Vocational

learning is basically in the class room / lab / work place. We may say that efforts put in for one hour per day for 6 days in a week are defined as unit skill competency. Thus one Skill Competency Credit Point equals 6 hours of learning. A similar approach may be adopted by DGE&T for skill courses at technician level in ITIs. Skill Competency Credit Point indicates the content and level of efforts involved to successfully acquire that specific competency. Assessment for that competency may be graded as A, B or C, or any other format. For mobility, Credit Points are considered. We can easily convince of its equivalence for Credit Transfer. 5 SC-CP will correspond to 30 hours of learning / contact hours. 1CP in Higher Education corresponds to 30 hours of learning. Hence, 5 SC-CP = 1HE-CP.

We may cite another example of CBSE course that is NVEQF compliant.

Information Technology as Core Vocational / Skill Course

NVEQ-IT Level 1 to 4 are designed for class- IX, X, XI & XII each with 192 hours of learning in class/lab. A **module** is specified as the subject at each level. These modules are further coded as **units** IT101, IT102, … IT107 at Level 1, and similarly IT201 , … IT207 at Level 2, IT301, … IT307 at Level 3 and IT401, … IT407 at Level 4. Each unit is further represented as set of **elements.** An element may be considered to yield certain skill competencies which may be identified in number equivalent to Skill Competency Credit Points. Unit sub-skill may be identified that requires 6 hours of learning in class/lab. To illustrate this approach, NVEQ IT-Level 1 is shown below. This is **module** that is named as a subject on **Basics of Information Technology.** This module contains 7 **units** which are similar to 7 papers. To explain further unit IT102 of 6 SC-CP is shown with 6 **elements.**

NVEQ IT-Level 1: Basics of Information Technology

Unit Code	Unit Title	Credit Th + Pr	Total Credits	Total Hours
ITCC-101	Introduction to IT	3+2	5	30
ITCC-102	Digital Documentation - Word Processing	2+4	6	36
ITCC-103	Effective Communication - Emailing	1+4	5	30
ITDC-104	Digital Data Tabulation	1+4	5	30

	- Spreadsheet			
ITDC-105	Digital Presentation	1+4	5	30
ITOC-106	Occupational Prospects in IT	3+1	4	24
ITWC-107	Work Integrated Learning IT - BIT	1+1	2	12
	TOTAL	**12+20**	**32**	**192**

Similar approach would hold good in designing NSQF-compliant courses. It is important to notice that along with design of the curriculum, it is crucial to conduct evaluation of the knowledge and skills achieved. In order to minimize subjectivity, test may be automated to the extent of 70%. Practice based MCQs (Multiple Choice Questions) may be designed with scenario-based questions demanding problem-finding and problem solving skills.

Credit - a policy measure for lifelong learning

Until recently, traditional credit accumulation and transfer schemes served a limited purpose well enough. However, in response to the needs of the learning society, new credit systems are developing, representing a broader vision of the application of credit. Within an increasingly diversified learning environment, credit can provide a means of linking disparate learning gained in a range of contexts and of integrating different systems. A credit system recognises learning wherever it occurs and facilitates progression, transfer between institutions and articulation between qualification pathways. It can provide the underpinning for a national qualifications framework. A national credit system is regarded as one important measure which can assist in the realisation of the new lifelong learning agenda.

Credit can be a source of honour or pride to those receiving it as an acknowledgement of merit. It also involves an element of belief and trust and its value is dependent on the good reputation of those awarding it. Credits are the currency of a credit scheme or system, providing a common unit of exchange which can be used to ascribe value to units, modules or subjects which may vary in size and complexity.

credit framework development should concentrate on promoting credit as a currency, able to relate to all learning, however achieved, and located within any qualification hierarchy, and, therefore, related to but distinct from any qualifications framework.

- A **credit** is an award made to learners in recognition of learning achievement
- A **credit scheme** is a formal mechanism for awarding credits in respect of learning achievement.

- A **credit system** is a framework with a set of specifications that is used by a range of institutions and/or awarding bodies when designing and operating credit schemes.
- A **national credit system** is a framework with a set of specifications that is used by all institutions and awarding bodies within a national education and training system. It is designed to be inclusive of all forms of learning and all types of awards.
- A **national qualifications framework** is a formal mechanism for recognising national awards, within a transparent, coherent and flexible national qualifications system. It involves, inter alia, the establishment of a credit system to provide a common basis for describing and comparing awards and for establishing equivalences between them.

The development of credit accumulation and transfer schemes is linked to the simultaneous development of modularisation in the 1980s and 1990s. Some of the most common reasons cited in favour of modularity include economic, social, political, educational and management factors.

Credit accumulation is the process by which learners accumulate credits towards an award of a particular awarding body/institution. Credit accumulation practices aim to extend flexibility in provision and extent of student choice.

Credit transfer is …a process whereby qualifications, part-qualifications and learning experiences are given appropriate recognition (or credit). This enables students to progress in their studies without having to repeat material or levels of study, to transfer from one course to another, and to gain further educational experience and qualifications without undue loss of time, thereby contributing to the maximisation of accumulated educational credit.

Components of a national credit system

A national credit system is a framework with a set of specifications that is used by all institutions and awarding bodies within the national education and training system. It is designed to be inclusive of all forms of learning and all types of awards. Those common to many credit schemes can be identified as follows:

- learning outcomes
- assessment criteria
- level of learning
- quantum or size

In the development of a comprehensive national system, a uniform and consistent definition of credit is required that will enable judgments to be made about the value of achievement, irrespective of time, place or mode of learning.

Learning outcomes are statements of what a learner is expected to know, understand and do in order to achieve credit (FEU 1992). *Specific learning outcomes* describe in detail the knowledge, skills and attitudes which the learner will be able to demonstrate as a result of the learning experience.

Assessment is the process of determining that the learner has achieved the learning outcomes of the module. Generally, the process of assessment involves the use of techniques appropriate to the type of learning outcomes involved. In practice, the relationship between learning outcomes, assessment and the recording of achievement varies.

Level of learning is one of the dimensions evaluated in the process of determining the credit rating of learning achievement within practically all credit schemes encountered in this research,

Credit schemes use different yardsticks for measuring the 'quantum of learning'. A *credit tariff* specifies a quantitative relationship between the amount of credit associated with achievement and some measure of the quantity of learning. The measure of the quantum of learning is variously defined; 'notional learning time' (e.g. FEDA, NOCN), 'tuition time' (e.g. ECTS), 'notional directed learning time' (e.g. NCVA) or 'total hours of student effort' (e.g. NCEA).

Current practice in relation to credit tariffs varies in credit schemes studied as follows:

NCVA	1 credit = 80 notional hours directed learning
NCEA	1 credit = 20 hours of student effort
NOCN, DRN, FEDA	1 credit = 30 notional hours of learning
ECTS	1 credit = 1 hour lecture/seminar per week per trimester
In CCA, SCOTCAT and NICATS	1 credit = 10 notional hours of learning

Increasingly, the concept of *notional learning time* is being adopted for credit systems that involve a separation of certification from programme delivery. Within such a credit system the credit tariff, as the agreed unit of account, is used as the basis for assigning credit (and multiple credits) to constituent parts of learning programmes, stand-alone modules, and whole awards. Using notional learning time as the basis for measuring the quantum of learning, a credit value can also be assigned to all learning, including, for example, in-company training, experiential learning or prior learning. The agreed tariff becomes the basis for assigning a credit value to any modules submitted for recognition.

QUALITY ASSURANCE- CREDIT IN NATIONAL QUALIFICATIONS FRAMEWORK

The relationship between quality of awards and quality of credits is important to place the quality assurance of credits within the broader context of quality assurance for a national qualifications framework. A national credit system should underpin a national qualifications framework. Thus, it is important to bear in mind some of the requirements for quality awards when designing quality assurance processes for a credit system. The overall purpose of quality assurance

processes in relation to awards within a National Qualifications Framework is to ensure that key goals are met. These include the following:

- all awards meet national quality criteria
- the specifications of the framework (e.g. level and credit) are applied consistently
- awards have a clear purpose and a relationship to one another
- the requirements for awards are stated explicitly, based on the nationally agreed standards for that sector, at that level
- awards have credibility with learners, employers, providers, professional bodies
- awards provide opportunities for progression and mobility.

The relationship between quality assurance for a national credit scheme and the achievement of key quality goals within an education and training system is clearly an important one.

Common specifications within the CATS credit framework

A *unit of assessment* is a set of learning outcomes, which can be of any size *Learning outcomes* are defined as what a learner is expected to know, understand and do *Assessment criteria* are standards for achievement outcomes *Level* is an indicator of the relative demand, complexity and depth of study and of learner autonomy *Credit value* is a numerical value defined form unit size.

CATS propose an 7 level framework with criteria of Intellectual skills and attributes, Process and Accountability. The level descriptors should be seen as a developmental continuum in which preceding levels are necessarily subsumed within those which follow.

CATS: COMPLETE TABLE OF GENERIC LEVEL DESCRIPTORS

	Intellectual skills & attributes	Processes	Accountability
Entry	Employ recall and demonstrate elementary comprehension in a narrow range of areas with dependency on ideas of others. Exercise basic practical skills Receive and pass on messages and information	Operate mainly in closely defined and highly structured contexts. Carry out processes that are repetitive and predictable. Undertake the performance of clearly defined tasks. Assume a limited range of roles	Carry out directed activity under close supervision. Rely on external monitoring of output and quality.
1	Employ a narrow range of applied knowledge and basic comprehension. Demonstrate a narrow range of skills. Apply known solutions to familiar problems.	Show basic competence in a limited range of predictable and structured contexts. Utilise a clear choice of routine responses. Co-	Exercise a limited degree of discretion and judgement about possible actions. Carry restricted responsibility for

	Present and record information from readily available sources	ordinate with others	quantity and quality of output. Operate under general supervision and quality control systems.
2	Apply knowledge with depth in a limited number of areas with relevant theoretical awareness and comparison of different ideas. Interpret available information. Demonstrate a broad range of well-developed practical skills	Choose from a significant range of varied procedures performed in a variety of contexts, some of which may be complex or non-routine. Actively co-operate with others.	Undertake directed activity with limited autonomy. Achieve outcomes with time constraints. Accept increased responsibility for quantity and quality of output. Rely on external quality checking.
3	Apply knowledge and skills in a broad range of complex activities with relevant theoretical understanding. Independently access and evaluate information. Make informed judgements using low level analysis. Employ a range of responses, a limited number of which are innovative, to well defined but often unfamiliar or unpredictable problems.	Operate in a variety of familiar and unfamiliar contexts using a range of technical or learning skills. Select from a considerable choice of procedures. Present information to an audience.	Engage in self-directed activity with broad guidance/evaluation. Accept responsibility for quantity and quality of output. Accept limited responsibility for the quantity and quality of the output of others.
4	Acquire a broad knowledge base incorporating theoretical concepts, with substantial depth in a limited number of areas. Employ a range of specialised skills. Determine solutions to a variety of unpredictable problems. Generate a range of responses, a limited number of which are innovative, to well defined but often-unfamiliar problems. Evaluate information, using it to plan and develop investigative strategies.	Operate in a range of varied and specific contexts involving creative and non-routine activities. Exercise appropriate judgement in planning, selecting or presenting information, methods or resources.	Undertake self-directed and a limited amount of directive activity. Operate within broad general guidelines or functions. Take responsibility for the nature and quantity of outputs. Meet specified quality standards.
5	Generate ideas through the analysis of information and concepts at an	Utilise diagnostic and creative skills in a range of	Accept responsibility and accountability

	abstract level. Command wide ranging, specialised technical, creative or conceptual skills. Formulate appropriate responses to resolve both well-defined and abstract problems. analyse, reformat and evaluate a wide range of information.	technical, professional or management functions. Exercise appropriate judgement in planning, design, technical and/or supervisory functions related to products, services, operations or processes.	within broad parameters for determining and achieving personal and/or group outcomes.
6	Critically review, consolidate, and extend a systematic and coherent body of knowledge. Utilise highly specialised technical or scholastic skills across an area of study. Utilise research skills. Critically evaluate new information, concepts and evidence from a range of sources.	Transfer and apply diagnostic and creative skills in a range of situations. Exercise appropriate judgement in a number of complex planning, design, technical and/or management functions related to products, services, operations or processes, including resourcing.	Accept accountability for determining and achieving personal and/or group outcomes.
7	Display mastery of a complex and specialised area of knowledge and skills. Demonstrate expertise in highly specialised and advanced technical, professional and/or research skills.	Conduct research, or advanced technical or professional activity. Undertake all relevant functions and roles	Accept accountability in all related decision making.

Learning towards an academic award may be gained in a number of contexts:

- higher education institution provision (short course, undergraduate and post graduate)
- higher level vocational qualifications
- awards of professional bodies
- employer in-house education and training provision
- learning from experience

Learning may be achieved through a range of learning modes including

- full-time or part-time learning
- distance learning
- independent learning

Modular structures are central to the implementation of a credit system. Credit based modular structures allow for diversity in module shape and size.

The achievement of a **comprehensive approach** is largely dependent on the existence of a policy commitment to the inclusion of the full academic-vocational continuum within a single framework, for both further and higher education. Recent developments in the design of credit systems in the UK, Europe and further afield reflect a move towards cross-sectoral frameworks.

An effective national credit system should have the features such as comprehensiveness, credibility, consistency, coherence and compatibility.

Comprehensive: -
- a single national scheme inclusive of all forms of learning, irrespective of time place or mode of learning
- an open system used by all awarding bodies and providers within a national framework of qualifications
- one that is understood by all learners, employers and providers of education and training.

Credible, consistent and coherent: -
- underpinned with quality assurance
- capable of internal and external monitoring
- with a means of detecting and remedying departure from its specifications and conventions.

Compatible with: -
- the objectives of providers and of end-users
- the systems operating in other countries

The need to achieve credibility, consistency and coherence in relation to a national credit scheme provides a focus for quality assurance measures.