

Clock and Watch Repair



Course curricula for
Modular Employable Skills (MES)



Directorate General of Employment & Training
Ministry of Labour & Employment
Government of India

1 - Skill Development based on Modular Employable Skills (MES)

1. a Background

Numbers of forums have emphasized the need for the skill development, especially for the less educated, poor and out of school youth. The skill level and educational attainment of the work force determines the productivity, income levels as well as the adaptability of the working class in changing environment. Large percentage of population in India is living below poverty line, the main reason being the lower percentage of skilled persons in the workforce.

The skill development at present is taking place mostly in the informal way, i.e. persons acquire skill at the work-place when they help their parents, relatives and employers etc. Such persons do not have a formal certificate and thus earn lower wages and are exploited by employers. They have come through informal system due to socio-economic circumstances of the family and the compulsions of earning a livelihood rather than attending a formal course. While their productivity is low, their contribution to the national GDP cannot be ignored. If the country can create a system of certification which not only recognizes their skills but also provides education and training in a mode that suits their economic compulsions, it will not only benefit the workforce to earn a decent living but also contribute to the national economy by better productivity of this workforce.

Another related problem is the large number of students drop outs (About 63% of the school students drop out at different stages before reaching Class-X).

The third problem is that the industries are facing shortage of skilled people to operate the machines and produce the materials, and the skills available are not adequate considering the changing requirement of the technology.

1. b. Frame work for Skill Development based on ‘Modular Employable Skills (MES)’

Very few opportunities for skill development are available for the above referred groups (out of school youth and existing workers especially in the informal sector). Most of the existing Skill Development programmes are long term in nature. Poor and less educated persons cannot afford long term training programme due to higher entry qualifications, opportunity cost etc. Therefore, new frames work for Skill Development for the Informal Sector has been evolved by the DGET to address to the above mentioned problems. The **key features of the new frame work for skill development** are:

- Demand driven short term training courses based on modular employable skills decided in consultation with Industry.
- Flexible delivery mechanism (part time, weekends, full time)

- Different levels of programme (Foundation level as well as skill up gradation) to meet demands of various target groups.
- Central Government will facilitate and promote training while Vocational Training (VT) Providers under the Government and Private Sector will provide training
- Optimum utilization of existing infrastructure to make training cost effective.
- Testing of skills of trainees by independent assessing bodies who would not be involved in conduct of the training programme, to ensure that it is done impartially.
- Testing and certification of prior learning (skills of persons acquired informally)

The Short Term courses would be based on ‘Modular Employable Skills (MES)’.

The **concept for the MES** is:

- Identification of ‘minimum skills set’ which is sufficient to get an employment in the labour market.
- It allows skills up-gradation, multiskilling, multi entry and exit, vertical mobility and life long learning opportunities in a flexible manner.
- It also allows recognition of prior learning (certification of skills acquired informally) effectively.
- The modules in a Sector when grouped together could lead to a qualification equivalent to National Trade Certificate or higher.
- Courses could be available from level 1 to level 4 in different vocations depending upon the need of the employer organizations.
- MES would benefit different target groups like :
 - ✓ Workers seeking certification of their skills acquired informally
 - ✓ workers seeking skill upgradation
 - ✓ early school drop-outs and unemployed
 - ✓ previously child labour and their family

1. c. Age of participants

The minimum age limit for persons to take part in the scheme is 14 years but there is no upper age limit.

1. d. Curriculum Development Process

Following procedure is used for developing course curricula

- Identification of Employable Skills set in a Sector based on division of work in the labour market.
- Development of training modules corresponding to skills set identified so as to provide training for specific and fit for purpose
- Organization of modules in to a Course Matrix indicating vertical and horizontal mobility. The course matrix depicts pictorially relation among various modules, pre requisites for higher level modules and how one can progress from one level to another.

- Development of detailed curriculum and vetting by a trade committee and by the NCVT (Close involvement of Employers Organizations, State Governments, experts, vocational training providers and other stake holders is ensured at each stages).

1. e. Development of Core Competencies

Possession of proper attitudes is one of the most important attribute of a competent person. Without proper attitudes, the performance of a person gets adversely affected. Hence, systematic efforts will be made to develop attitudes during the training programme.

The trainees deal with men, materials and machines. They handle sophisticated tools and instruments. Positive attitudes have to be developed in the trainees by properly guiding them and setting up examples of good attitudes by demonstrated behaviours and by the environment provided during training.

Some important core competencies to be developed are:

1. Safety consciousness and safe working practices
2. Care of equipment and tools
3. Punctuality, discipline and honesty
4. Concern for quality
5. Respect for rules and regulations
6. Concern for health and hygiene
7. Cordial relationship and Cooperation with co-workers and team work
8. Positive attitude and behaviour
9. Responsibility and accountability
10. Learn continuously
11. Communication skills
12. Concern for environment and waste disposal

Following competencies should also be developed during level-II and higher courses:

1. Ability for planning, organizing and coordinating
2. Creative thinking, problem solving and decision making
3. Leadership
4. Ability to bear stress
5. Negotiation

1. f. 6. Duration of the Programme

Time taken to gain the qualification will vary according to the pathway taken and will be kept very flexible for persons with different backgrounds and experience. Duration has been prescribed in hours in the curriculum of individual module, which are based on the content and requirements of a MES Module. However, some persons may take more time

than the prescribed time. They should be provided reasonable time to complete the course.

1. g. Pathways to acquire Qualification:

Access to the qualification could be through:

- An approved training programme;
Or
- A combination of an approved training programme plus recognition of prior learning including credit transfer;
Or
- The recognition of prior learning that provides evidence of the achievement of the competencies for the qualification.

1. h. Methodology

The training methods to be used should be appropriate to the development of competencies. The focus of the programme is on “Performing” and not on “Knowing”. Lecturing will be restricted to the minimum necessary and emphasis to be given for ‘Hands on training’.

The training methods will be individual centered to make each person a competent one. Opportunities for individual work will be provided. The learning process will be continuously monitored and feedback will be provided on individual basis.

Demonstrations using different models, audio visual aids and equipment will be used intensively.

1. i. Instructional Media Packages

In order to maintain quality of training uniformly all over the country, Instructional Media Packages (IMPs) will be developed by the National Instructional Media Institute (NIMI), Chennai.

1. j. Assessment

DGEandT will appoint assessing bodies to assess the competencies of the trained persons. The assessing body will be an independent agency, which will not be involved in conducting the training programme. This, in turn, will ensure quality of training and credibility of the scheme. Keeping in view the target of providing training/testing of one million persons through out the country and to avoid monopoly, more than one assessing bodies will be appointed for a Sector or an area.

1. k. Certificate

Successful persons will be awarded certificates issued by National Council for Vocational Training (NCVT).

1.1. MES courses approved by NCVT

The NCVT released a list of 340 approved courses on 15th September 2008, i.e. on the Engineers day (128th birth day of Sir. M. Visweswariah). The courses were allotted 6 digit alpha numerical codes with the following formula

From Left side:

1st, 2nd and 3rd digits –Sector Codes (Alpha Codes)

4th digit – Level Code (1 for level 1, 2 for level 2, 3 for level 3 and so on. As the level increases, the position in the industry also increases)

5th and 6th digits – Course serial number (separate series for courses at same level with in each 2. Sector)

1.m Watch Repair sector

Importance of time and aligning the activities with time has been felt by one and all. Clock and Watch have become an indispensable parts of present day human life, may be male or female, youngster or an elderly one. Some people do not remove their watch even when they are sleeping. Watch is a tiny machine having number of parts in it. It is supposed to work always along with the time; no rest can be given to a watch. But, due to various reasons, the watches do stop functioning. As the watch contains number of small parts, only a highly skilled person with very good vision power and high finger dexterity can repair the watches. Compared to earlier models of clocks and watches, the present models are highly reliable, still sometimes we need them to be attended and serviced.

Although number of skills and sectors are identified and approved by NCVT, the Clock and Watch Repair sector has not been covered. It was therefore decided to form a Sectoral Skill Panel to identify the skills in Clock and Watch Repair Sector. The panel was headed by Mr. S. J. Amalan, Director, Apex Hi-Tech Institute, Bangalore and Regional Director D.G.E.T, Ministry of Labour and Employment, Karnataka, Andhra Pradesh and Orissa. The committee identified various skills in this sector.

LEVEL – 1

1. Module name	Basic Clock and Watch Repair
2. Sector	Clock and Watch Repair
3. Code	CWR - 101
4. Entry Qualification	Minimum 5 th Std, 14 Years of Age
5. Terminal competency	Successful candidate would be able to carry out minor repairs of Clock and Watch.
6. Duration	180 Hours
7. Course content	
Practical Competencies	Underpinning Knowledge [Theory]
<ul style="list-style-type: none"> ✚ Practice Health and safety—Select, use, maintain and store –tools, equipments and clothing safety ✚ Practices 5S technique ✚ Identify / Familiarize with the tools and equipments ✚ Identify components of clock and watch from Assembly, drawings and diagrams ✚ Washing and Cleaning of parts ✚ Repair or replace of parts ✚ Check Train Wheel ,Escapement , Dial train , Hand setting mechanism, train wheel bridge, ✚ Clean Para shock upper and lower ✚ Clean pivot and bearings ✚ Lubricants ✚ Adjust balance and regulator ✚ Change water proof washer 	<ul style="list-style-type: none"> ✚ General health and Safety precautions to be observed in work shop. ✚ Over view on 5S technique [Sort, Set in order, Shine/ Sweep, Standardize and Sustain] – advantages in implementation of 5S ✚ Working principle of clock and watch mechanism ✚ Procedure for dismantling, assembling, ✚ Types of lubrication ✚ Function of balance and adjustment ✚ Brief introduction on main 6 division ✚ General defects ✚ Balance wheel and caliber NO and size Procedure for repairing
8. Tools and equipments needed for training	
<ol style="list-style-type: none"> 1.Multipurpose watch case opener 2.Ultrasonic cleaning machine 3.Watch timing machine 4.Demagnetiser 5.Case opener –box and nap type 6.Plier for hands removing 7.Canon tightening 8.movement holder [gents and ladies] 9.Escapement trying tool 10.Pinvice 11.Rivetting stake 12.Eye glass 13.Screw driver [1 to 10 Set] 14. Tweezers A A 	<p>CONSUMABLES ;</p> <p>Moebius Synt –A lube Moebius Synt –V lube B M-125 grease Moebius grease with molybdenum Fine chromic oxide [green rouge] Fine ferric oxide [red rouge] Loctite Cemendine Shellac Benzene for cleaning purpose</p>

<ol style="list-style-type: none">15. Hair spring tweezers [Straight and bend type]16. Brass tweezers17. Stand type oilier18. Dial cleaning brush19. Watch maker brush20. Side cutting nipper21. Flat cutting nipper22. Scraper23. Reamer24. Collet tuning tool25. Files26. Oil stone27. Grinding stone28. Benzene cup29. Dear skin stick30. Peg wood stick31. Finger stalls32. Siliconised cloth33. Wooden punch34. Acrylic punch35. Hand punch36. Screw driver for general work	
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LEVEL – 1

1. Module	Basic Clock Repairer Analog and Digital
2. Sector	Clock and Watch Repair
3. Code	CWR - 102
4. Entry Qualification	Minimum 5 th Std, 14 Years of Age
5. Terminal competency	Successful candidate would be able to carry out minor repairs of Clock
6. Duration	180 Hours
7. Course content	
Practical Competencies	Underpinning Knowledge [Theory]
<ul style="list-style-type: none"> + Practice Health and safety—Select, use, maintain and store –tools, equipments and clothing safety + Practices 5S technique + Identify / Familiarize with the tools and equipments + Identify components Clock and watch from Assembly, drawings and diagrams + Washing and Cleaning of parts + Repair or replace of parts + Salient feature of Q A W + Block diagram of Q A W + Power source + Oscillating and timing system + Motion Transfer + Maintenance + Assembly flow chart + Power cell + E C B + I C and L C + Seven segment + L E D + Step motor + Rotor + Stator 	<ul style="list-style-type: none"> + General health and Safety precautions to be observed in work shop. + Over view on 5S technique [Sort, Set in order, Shine/ Sweep, Standardize and Sustain] – advantages in implementation of 5S + Working principle of QAW + Procedure for dismantling, assembling, + Types of lubrication + Types of power cell + Gear train + Function E C B and I C + Function of L E D + Function of rotor and stator + Brief introduction on main 6 division + General defects
8. Tools and equipments needed for training	
<ol style="list-style-type: none"> 1.Multipurpose watch case opener 2.Ultrasonic cleaning machine 3.Watch timing machine 4.Demagnetiser 5.Case opener –box and nap type 6.Plier for hands removing 	CONSUMABLES ; Moebius Synt –A lube Moebius Synt –V lube B M-125 grease Moebius grease with molybdenum Fine chromic oxide [green rouge]

7.Canon tightening	Fine ferric oxide [red rouge]
8.movement holder [gents and ladies]	Loctite
9.Escapement trying tool	Cemendine
10.Pinvice	Shellac
11.Rivetting stake	Benzene for cleaning purpose
12.Eye glass	
13.Screw driver [1 to 10 Set]	
14. Tweezers A A	
15.Hair spring tweezers [Straight and bend type]	
16.Brass tweezers	
17.Stand type oilier	
18.Dial cleaning brush	
19.Watch maker brush	
20.Side cutting nipper	
21.Flat cutting nipper	
22. Scraper	
23.Reamer	
24.Collet tuning tool	
25.Files	
26.Oil stone	
27. Grinding stone	
28. Benzene cup	
29. Dear skin stick	
30. Peg wood stick	
31. Finger stalls	
32. Siliconised cloth	
33. Wooden punch	
34. Acrylic punch	
35. Hand punch	
36. Screw driver for general work	

LEVEL - 2

1. Module name	Automatic Watch Repairer
2. Sector	Clock and Watch Repair
3. Code	CWR - 203
4. Entry Qualification	Minimum 5 th Std + CWR 102, 14 Years of Age
5. Terminal competency	Successful candidate would be able to carry out minor repairs of Automatic watch
6. Duration	280 hours
7. Course content	
Practical Competencies	Underpinning Knowledge [Theory]
<ul style="list-style-type: none"> ✚ Practice Health and safety—Select, use, maintain and store –tools, equipments and clothing safety ✚ Practices 5S technique ✚ Identify / Familiarize with the tools and equipments ✚ Identify components Clock and watch from Assembly, drawings and diagrams ✚ Washing and Cleaning of parts ✚ Repair or replace of parts ✚ Check Train Wheel ,Escapement , Dial train , Hand setting mechanism, train wheel bridge, ✚ Clean Para shock upper and lower ✚ Clean upper and lower jewel ✚ Lubricants ✚ Adjust balance and regulator ✚ Principle of automatic watch ✚ Construction of automatic watch ✚ Automatic mechanism working ✚ Day and Date mechanism ✚ Uni and Bi directional auto winding ✚ Slipping main spring 	<ul style="list-style-type: none"> ✚ General health and Safety precautions to be observed in work shop. ✚ Over view on 5S technique [Sort, Set in order, Shine/ Sweep, Standardize and Sustain] – advantages in implementation of 5S ✚ Working principle of clock and watch mechanism ✚ Procedure for dismantling, assembling, ✚ Types of lubrication ✚ Function of balance and adjustment ✚ Brief introduction on main 6 division ✚ General defects ✚ Balance wheel and caliber NO and size ✚ Procedure for repairing ✚ Time adjusting ✚ How mechanism works ✚ Oscillating weight ✚ Jumper and jumper spring ✚ Date driving wheel ✚ Date driving pinion ✚ Intermediate wheel ✚ Uni and Bi directional mechanism ✚ Characteristics of main spring

1. n. The members of the Sectoral Skill Panel for Clock and Watch Repair Sector

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